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The main purpose of the Journal of Sport Sciences Research is to analyze the current developments in the field of Sport Sciences in a holistic and inclusive way and to share the original articles and reviews that emerged in this direction with the target audience.

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Journal of Sports Sciences Research is an international refereed journal that began its publication life in 2016 and is published 3 times a year. The journal welcomes articles in Turkish and English languages. Regarding the field of Sport Sciences, the Journal publishes conceptual or research-based original research and review articles in the fields of Physical Education and Sports Teaching, Sports Management, Recreation, Movement and Training Sciences, Psycho-social Fields in Sports and Sports-Health Sciences.

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Scale Development Study on Match Analysis

Oğuz GÜRKAN^{1*}, Çağdaş CAZ¹, Oktay ÇOBAN¹

¹Yozgat Bozok University, Faculty of Sports Sciences, Yozgat.

Research Article

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Abstract

Match analysis is a method used to evaluate and improve teams' game understanding, tactical structure, and individual-based player performances. Today, with match analysis methods, coaches can make detailed analyzes of both their own teams, rival teams and individual athletes. This present study aims to develop a scale for match analysis. Within the scope of this objective, an item pool consisting of 51 items was created by the researchers, and a 47-item scale was drafted by excluding 4 items in line with expert opinions. Explanatory and confirmatory factor analyses, internal consistency analysis and test-retest reliability methods were used for statistical purposes. As a result of the exploratory factor analysis, a measurement structure was obtained consisting of 4 sub-scales and a total of 22 items. The fit indices of the scale were evaluated within the relevant reference range. The reliability of the scale was examined by test-retest method and internal consistency analysis. As a result, the stability coefficient of the scale was calculated as 0.792 and the Cronbach Alpha internal consistency coefficient as 0.911. Internal consistency analysis results showed that the items had high reliability. The current scale has a 7-point Likert-type rating. There are negative items in the scale. In this context, these items should be reversed when scoring. It was concluded that the scale developed is a reliable and valid measurement tool.

Keywords: Match, Match analysis, Scale development

Maç Analizine Yönelik Ölçek Geliştirme Çalışması

Öz

Maç analizi, takımların oyun anlayışlarını, taktiksel yapılarını, bireysel bazlı oyuncu performanslarını değerlendirmek ve geliştirmek için kullanılan bir yöntemdir. Günümüzde maç analiz yöntemleri ile antrenörler hem kendi takımlarının hem rakip takımların hem de bireysel bazlı sporcu analizlerini detaylı bir şekilde yapabilmektedirler. Çalışmanın amacı, maç analizine yönelik ölçek geliştirmektir. Bu amaç kapsamında araştırmacılar tarafından 51 maddeden oluşan madde havuzu oluşturulmuş, uzman görüşleri doğrultusunda 4 madde kapsam dışı bırakılarak 47 maddelik taslak ölçek elde edilmiştir. İstatistiksel yöntem olarak açımlayıcı ve doğrulayıcı faktör analizleri, iç tutarlılık analizi ve test tekrar test yöntemi kullanılmıştır. Taslak ölçeğe uygulanan açımlayıcı faktör analizi sonucunda 4 alt boyut ve 22 maddeden oluşan bir ölçek yapısı elde edilmiş, doğrulayıcı faktör analizi sonucu 4 alt boyut ve 22 maddelik yapının geçerliği teyit edilmiştir. Ölçeğin uyum indekleri ilgili referans aralığı kapsamında değerlendirilmiştir. Ölçeğin güvenilirliği test tekrar test yöntemi ve iç tutarlılık analizi ile incelenmiştir. Yapılan analizler sonucunda ölçeğin kararlılık katsayısı 0,792, Cronbach Alpha iç tutarlılık katsayısı ise 0,911 olarak hesaplanmıştır. İç tutarlılık analiz sonuçları, maddelerin yüksek güvenilirliğe sahip olduğunu göstermiştir. Mevcut ölçek, 7'li likert tipi derecelendirmeye sahiptir. Ölçekte olumsuz maddeler yer almaktadır. Bu kapsamda puanlama yapılırken bu maddeler tersine çevrilmelidir. Bu bulgulara göre geliştirilmiş olan ölçeğin güvenilir ve geçerli bir ölçme aracı olduğu sonucuna varılmıştır.

Anahtar Kelimeler: Maç, Maç analizi, Ölçek geliştirme

* Corresponding Author: Oğuz GÜRKAN, Email: oguz.gurkan@yobu.edu.tr

INTRODUCTION

Although the human eye-brain function is excellent for problem solving and obtaining results, its capacity for observing and remembering is rather limited. It is rather difficult for the coach to observe the match accurately and objectively due to the limited abilities of the ears, eyes, concentration, and continuity of attention and memory capacity. Many of the events attended by the brain are forgotten when the stored information is not repeated and used. Thus, "mental notes" created by the coach using his memory and eyes are naturally forgotten (Müniroğlu & Deliceoğlu, 2008). The rationale behind the analysis of sporting events dates back to centuries. For example, Egyptians use pictograms (pictures and crayons) to read dancers, and Romans use basic symbolic methods to record movements. The method of analysis that began in this way continues to this day with the observation method developed by Rudolf Laban in 1948, inspired by his dance teacher (Carling et al., 2005).

Today, video and computer analysis technology is changing and developing very rapidly. It is not possible to ignore the contributions of technology to match analysis, game and athlete performance (Carling et al., 2005). The most important feature of computer science is software programs that can make advanced applications. Early applications used for match analysis in computer technology were limited to data processing only. The movements of the athlete were detected and classified, and then the analysis was performed. Prior to the development of computer technology, analyzes were difficult and time consuming (Lames, 2008). Analyzes that were previously made with the paper-pencil method have started to be performed in more detail thanks to the development of computer video technology and advanced tracking systems (Rein & Memmert, 2016). Due to the fact that both statistical records can be kept and reported and visual analyzes can be made, the increase in match analysis by computer and video is much higher (Mackenzie & Cushion, 2016). In today's world, a lot of research is done about football and it is tried to contribute to this field (Strudwick, 2016). Although the number of studies in football is very high, it is seen that this area is very limited in the field of analysis, especially in our country. Again, although professional clubs recruit analysts to provide analysis support to their teams in the world, it is observed that the number of studies in this field is quite limited (Mackenzie & Cushion, 2016).

As mentioned above, match analysis is very important to achieve sportive success (Carling, 2010; Sarmiento et al., 2014). Match analysis is the objective analysis and evaluation of all behaviors that occur during the match (Carling et al., 2005). It is also the evaluation of all positive and negative actions of teams or individual athletes with video and computer technology (Michailidis et al., 2013). The main purpose of match analysis is to provide feedback to coaches about their teams and athletes (Donoghue, 2004). Again, it is to analyze all the movements that occur during the match and training in an objective way and to reveal the numerical results about the parameters taken into consideration (Müniroğlu, 2009). Match analysis assists coaches in preparing the team, evaluating, and gaining insights into various performance strategies. Key strategies are discussed in three stages: pre-game analysis, half-game and post-game analysis. Coaches should know when and what kind of analysis should be done at which stages and should prepare accordingly. In addition, match analysis can be used to objectively evaluate the performance of the team and players in pre-season, mid-season and

end-of-season, training and preparation matches (Carling et al., 2005). When the literature is examined, no measurement tool has been found to scientifically reveal the attitudes and thoughts of the participants towards sports branches. In this context, this present paper aims to develop a scale that will measure the thoughts of the participants about the match analysis.

METHOD

Research Model

In the research, scanning model, which is one of the quantitative research methods, was applied. Within the scope of scale development, construct and content validity were taken into account.

Study Group

The study group consists of 785 people (500 men, 285 women) knowledgeable about match analysis. Convenience sampling method was preferred to define the research group. Data were collected from the participants through an online data collection tool. Data from 270 individuals (171 males, 99 females) were used for exploratory factor analysis, which was required in the phase of examining the construct validity, and data from 291 individuals (190 males, 101 females) were used for confirmatory factor analysis, and these two examples were independent of each other. In the reliability analysis of the scale, data from 71 individuals (53 males, 18 females) were evaluated by the test-retest, and data from 153 individuals (86 males, 67 females) were evaluated for the item analysis and calculation of the Cronbach Alpha coefficient.

Scale Structure

The scale was developed based on a 7-point likert type rating. Items in the scale are scored ranging from “7=Strongly Agree”..... to “1=Strongly Disagree”. Higher score from the items shows that the level of agreement with the proposition in that item is high, and as it approaches lower scores, the level of agreement is indicated to be lower. Items with expressions reflecting a negative attitude about the subject are reverse scored.

The steps followed for the scale development study are:

- ✓ Creating the item pool (literature review),
- ✓ Submitting the item pool to expert opinion to examine the content validity,
- ✓ Presenting the draft scale to the language experts and applying it to the study group,
- ✓ Performing Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to evaluate the construct validity of the scale,
- ✓ Making item analysis,
- ✓ Evaluating the reliability of the scale through test-retest,
- ✓ Calculating the Cronbach Alpha internal consistency coefficient regarding the reliability of the scale.

Creating Item Pool

The items in the pool were created by the researchers. In creating the items for the scale to be developed, resources related to match analysis in the literature were used. Thus, a pool of 51 items (47 positive, 4 negative) was prepared by taking the opinions of trainers, athletes, and technical directors as well as sports scientists.

Expert Opinion for Content Validity

For a scale to have content validity, all of the items covered by the scale should measure all the characteristics to be measured, and every detail of the measured characteristic should be questioned by the items in the scale (Kartal & Bardakçı, 2018). The item pool, which was created for the purpose of evaluating the match analysis scale items in the context of content validity, was presented to 8 experts (trainer, athlete, technical director, sports scientist) who have knowledge, skills and experience in match analysis and their opinions were taken. All opinions from eight experts were obtained via e-mail.

An important issue as to scope validity is meeting the Content Validity Index (CVI). The minimum CVI value of eight expert opinions is calculated as 0.75 (Karagöz & Bardakçı, 2020). In this context, experts evaluated each item in the item pool whether it should be included in the scale or not, and consequently of the calculation, 4 items (positive) with a CVI value below 0.75 were removed from the scale. In this way, a draft scale including a total of 47 items was obtained of which 43 favorable and 4 unfavorable. The expressions in the scale were rearranged and the draft scale was finalized by consulting 2 academics who are experts in the field of Turkish Language, about whether the item expressions in the draft scale were appropriate in terms of expression and their compliance with the spelling rules.

Research Publication Ethics

The ethics committee approval of the research was obtained with the decision numbered 45513789-770-E.62965 of the Ethics Committee of Yozgat Bozok University, which was given at the ethics committee meeting dated 21.03.2022 and numbered 31/07.

Analysis of Data

The analysis of the data collected within the scope of the study was carried out step by step. First, the draft scale was created. Exploratory Factor analysis was applied to the data collected within the scope of the draft scale. After EFA, data were collected again with the remaining items and Confirmatory Factor Analysis was applied to the collected data. After CFA, data were collected again and Cronbach's alpha was calculated by the correlation between the collected data and the item-total score. In addition, data were collected within the scope of test-retest. The data collected for all these analyzes were obtained from different groups.

FINDINGS

Findings on Construct Validity

In scale development studies, it is stated that factor analysis is the most widely used method to reveal structure. As a result of factor analysis, information is obtained about the general factor and the number of sub-scales. By naming the existing sub-scales, a scale structure is created (Tavşancıl, 2002). Firstly, exploratory factor analysis was applied on the data obtained from 270 participants in order to determine the structure of the scale.

The first of the necessary criteria for applying EFA to a data set is the existence of sufficient sample size. In this context, first of all, Kaiser-Meyer-Olkin (KMO) statistics were taken into

account in order to determine the factor analysis adequacy of the sample size. Kaiser states that the calculated KMO value is excellent at 0.90, very good at 0.80, mediocre at 0.70 and 0.60, and unacceptable if below 0.50 (Tavşancıl, 2002). At this stage, the KMO statistics for the data of the 47-item draft scale were calculated as 0.932. Accordingly, it was determined that the sample size was perfectly adequate for factor analysis. Another test required to apply EFA to the data set is the Bartlett sphericity test. In factor analysis, a high correlation relationship is sought between the variables. The Bartlett test is used to examine whether there are significant relationships between the variables in the population (Nakip, 2006). In order to provide the assumption of sphericity, it is expected that the Bartlett test statistics shall be high and significant as a result of the analysis (Tavşancıl, 2002). As a result of the analysis for the draft scale, a high and significant relationship between the variables was found and the assumption of sphericity was satisfied ($\chi^2=3572,621$; $p<0.001$).

In order to determine the factor structure of the match analysis scale, EFA was applied to 47 items in the draft scale by using Principal Components Analysis and Varimax Rotation methods. Items that did not fit under any factor and whose factor loadings were very close in two or more factors and could be described as overlapping were determined and removed from the scale. In this way, after removing 25 (positive) items from the scale, EFA was ultimately applied to the remaining 22 items (18 positive, 4 negative) and relevant results were provided in the table (Table 1).

Table 1. Results of exploratory factor analysis

Sub-scales	Items	Factor Loading Value	Eigenvalue	Variance (%)	Cumulative Variance (%)
Factor 1: Performance	Item 17	0.752	9.304	42.289	42.289
	Item 15	0.727			
	Item 31	0.702			
	Item 13	0.685			
	Item 29	0.668			
	Item 19	0.653			
	Item 33	0.617			
Factor 2: Progress	Item 14	0.770	2.936	13.344	55.633
	Item 16	0.756			
	Item 12	0.720			
	Item 20	0.645			
	Item 10	0.632			
	Item 18	0.622			
Factor 3: Importance status	Item 45	0.883	1.179	5.360	60.994
	Item 44	0.882			
	Item 43	0.866			
	Item 46	0.854			
Factor 4: Appreciation	Item 47	0.703	1.008	4.583	65.576
	Item 37	0.680			
	Item 38	0.670			
	Item 39	0.611			
	Item 36	0.603			

The eigenvalue is an important coefficient used to determine the appropriate number of

factors, and in practice, factors with an eigenvalue of 1 or greater than 1 are usually taken as the appropriate factor. This criterion is called the Kaiser criterion (Kartal & Bardakçı, 2018). As can be seen in Table 1, as a result of EFA, 4 sub-scales with an eigenvalue greater than 1 were obtained according to the Kaiser criterion. Another criterion that is important in determining the number of sub-scales in the scale and ensuring construct validity is the total explained variance. Considering the explained variance values in Table 1, it is seen that the 4-factor structure in question explains 65,576 % of the total variance. The variance rates explained by the factors were 42.289 % for Factor 1: Performance, 13,344 % for Factor 2: Progress, 5.360 % for Factor 3: Importance status and 4.583% for Factor 4: Appreciation.

In the literature, it is stated that values above 0.45 are generally sufficient for factor load values in the selecting the items (Büyüköztürk, 2002). Upon the analysis, it was determined that the factor load values of the items of the current scale were in the range of 0.603-0.883. Accordingly, it can be said that the factor loading values of each item in the 4-factor model are high and sufficient (Table 1).

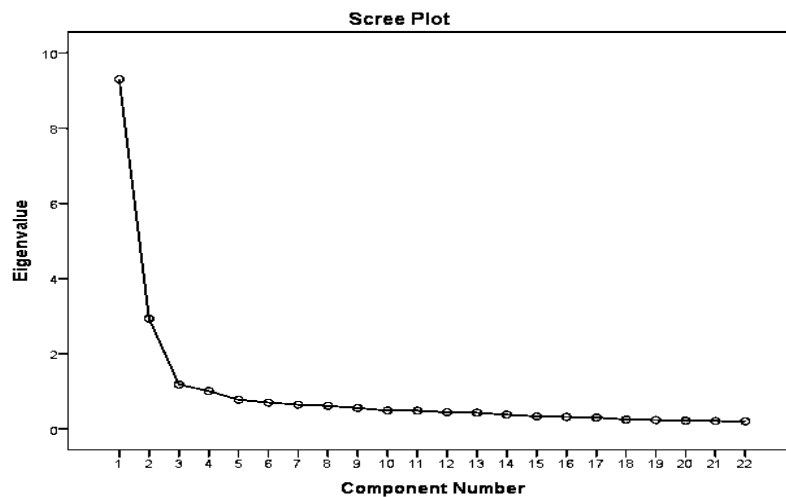


Figure 1. Scree Plot of EFA

As seen in the Scree plot in figure 1, there are four sub-scales with eigenvalues greater than 1. These sub-scales and related items are given in Table 2. As a result of the explanatory factor analysis, CFA was applied to the data of 291 participants, who formed another independent sample, in order to examine the validity of the measurement structure of the 4-factor 22-item scale.

Table 2. Critical values for goodness of fit indices

Fit Indices	Good Fit	Acceptable Fit
χ^2/sd	≤ 3	≤ 5
GFI	≥ 0.90	≥ 0.85
IFI	≥ 0.95	≥ 0.90
TLI	≥ 0.95	≥ 0.90
CFI	≥ 0.97	≥ 0.95
RMSEA	≤ 0.05	≤ 0.08

Whether or not the measurement model established as a result of CFA is compatible with the data is determined by the goodness of fit indices. These goodness-of-fit indices χ^2/sd , GFI,

IFI, CFI, RMSEA, TLI (Karagoz, 2016) and the critical values they must provide (Meydan & Şeşen, 2015) are as in Table 2.

Goodness of fit index values of the scale in which Confirmatory Factor Analysis was applied were calculated as $\chi^2/df=1.974$, GFI=0.889, IFI=0.952, TLI=0.944, CFI=0.952 and RMSEA=0.058. When the relevant values were compared with the critical values in Table 3, it was determined that the model showed a good fit according to the χ^2/sd index, and an acceptable level of fit according to the goodness of fit indices such as IFI, TLI, GFI and RMSEA. The findings obtained as a result of CFA showed that the validity of the 4-factor measurement structure revealed by EFA was also confirmed on an independent sample.

The regression coefficients must be significant in order for the regression to be valid (Karagöz, 2016). In this context, CFA was applied to the data and the regression coefficients of the items in the scale were found to be significant.

Table 3. Standard regression coefficients of items based on DFA

Factor and Related Items	Factor Load
Factor 1: Performance	
17. Match analysis can help athletes mentally prepare for match.	0.754
15. Match analysis helps coaches make a positive difference in the match.	0.768
31. Match analysis has an important effect on the maximum performance of the athletes in the matches.	0.675
13. As a result of the statistical data obtained through the match analysis, the coaches adopt different tactics.	0.745
29. Match analysis objectively reveals all the behaviors of the athletes during the match.	0.676
19. With match analysis, coaches objectively evaluate the performances of the opponents.	0.709
33. Match analysis allows the athletes to get to know themselves in the sportive sense.	0.749
Factor 2: Progress	
14. Match analysis helps coaches in their professional development.	0.689
16. Match analysis increases the knowledge of the coaches about their branch.	0.721
12. Match analysis provides information about the opponent's weaknesses.	0.742
20. Match analysis allows coaches to improve their tactical skills.	0.797
10. Match analysis helps to collect data on many parameters (sports performance etc.) during the match.	0.657
18. With match analysis, coaches evaluate the performance of their athletes objectively.	0.740
Factor 3: Importance status	
45. The field of sports sciences does not place a high importance on match analysis.	0.927
44. Match analysis is of no importance for athlete development.	0.946
43. Coaches do not attach importance to match analysis.	0.849
46. Match analysis methods do not have an important place in winning the matches.	0.819
Factor 4: Appreciation	
47. Thanks to the rapid development of match analysis, there is an increase in the number of clubs that need analysts.	0.446
37. There is an increase in the number of analysts working in clubs.	0.667
38. Match analysis has turned into a profession, match analyst.	0.721
39. With the development of technology, the level of development of analysts interested in match analysis is increasing.	0.702
36. There is an increase in the number of scientific publications on match analysis.	0.624

In terms of construct validity, it is important that the standard factor load values are above 0.40 based on CFA (Hair et al., 1999). It is safe to state that the lowest values of the factor loads of

the items in the scale are above 0.40, which means that the values are acceptable as to construct validity (Table 3).

Findings as to Item Analysis

The item analysis of the scale was carried out with the data obtained from 153 people. The scale which consists of 4 sub-scales and 22 items was previously revealed to have construct validity. For this reason, item analysis method based on item-total score correlation was used.

Item Analysis Based on Item-Total Score Correlation

Item-total score correlation is an objective criterion that reveals the correlation between the scores obtained from each item in a scale and the total score obtained from the scale (Tezbaşaran, 1996). The item-total correlation coefficient should not be less than 0.20. Items with an item-total correlation less than 0.20 should be removed from the scale, and items with values between 0.20-0.30 should be included in the scale if deemed necessary. Items with an item-total correlation value higher than 0.30 is concluded to act in a similar direction with the scale in general and these items should remain in the scale (Büyüköztürk, 2010). The item-total correlation scores for the scale items developed for the match analysis were calculated and the findings are provided in Table 4.

Table 4. Item-total score correlations

Item	Item-Total Correlation	Item	Item-Total Correlation
Item 10	0.680	Item 31	0.610
Item 12	0.710	Item 33	0.566
Item 13	0.753	Item 36	0.530
Item 14	0.636	Item 37	0.511
Item 15	0.733	Item 38	0.552
Item 16	0.651	Item 39	0.624
Item 17	0.650	Item 43	0.337
Item 18	0.700	Item 44	0.395
Item 19	0.684	Item 45	0.401
Item 20	0.707	Item 46	0.363
Item 29	0.717	Item 47	0.437

Item analysis determined that the item-total correlation values of all 22 items in the scale were greater than 0.30 (Table 4). Therefore, it was concluded that all of the items were in line with the scale in general, and therefore, no item were removed from the scale.

Findings as to the Reliability of the Scale

Test-Retest Reliability of the Scale

Stability is a reliability criterion that aims to measure the characteristics that are permanent and not easily changed, such as attitudes (Tavşancıl, 2002). The stability of the match analysis scale was handled by the test-retest method. The difference between the scores of the match analysis scale and its sub-scales, which were applied to 71 participants at two different times, were tested with the dependent groups' t-test. The stability coefficients of the scale and sub-scales were obtained by calculating the pearson correlation coefficients (Table 5).

Table 5. Test-retest reliability results

Scale and Sub-scales	Tests	N	Avg.	SD	t	p	r (p)
Factor 1	First Application	71	6.35	0.52	0.824	0.413	0.804 (0.000)
	Second Application	71	6.31	0.58			
Factor 2	First Application	71	6.52	0.44	-0.308	0.759	0.837 (0.000)
	Second Application	71	6.53	0.45			
Factor 3	First Application	71	1.18	0.34	-0.261	0.795	0.787 (0.000)
	Second Application	71	1.19	0.35			
Factor 4	First Application	71	6.24	0.67	-1.252	0.215	0.679 (0.000)
	Second Application	71	6.32	0.69			
Total	First Application	71	5.42	0.36	-0.747	0.457	0.792 (0.000)
	Second Application	71	5.44	0.39			

T test results showed that there was no significant difference between the first and second application results of the whole scale and its sub-scales ($p > 0.05$). Finding similar results between two different application is an indicator of the reliability of the scale (Aksayan & Gözüm, 2002). The analyzes showed that the test-retest stability coefficients of the whole scale and its sub-scales were significant (Table 5).

Internal Consistency Analysis

In developing a likert-type scale, one of the basic assumptions is that each item should measure basically the same attitude (Tavşancıl, 2002). In the literature, it is considered appropriate to calculate the Cronbach α coefficient to control this assumption and determine its reliability. It can be said that the higher the α coefficient of the scale, the more consistent the items in the scale are (Tezbaşaran, 1996). The fact that the Cronbach α internal consistency coefficient of the scale items is greater than 0.70 can be interpreted that the scale is reliable (Kartal & Bardakçı, 2018). The internal consistency reliability of the scale was calculated based on the data collected from 153 participants for item analysis. This calculation was applied to the overall scale and its sub-scales (Table 6).

Table 6. Cronbach α coefficients of the scale

Scale	Sub-scales	Number of items	Cronbach α coefficient for sub-scales	Cronbach α coefficient for total scale
Match Analysis	Performance	7	0.913	0.911
	Progress	6	0.891	
	Importance status	4	0.944	
	Appreciation	5	0.839	

Cronbach α values were found to be greater than 0.70. It can be said that these values are sufficient for the reliability of the scale (Table 6).

DISCUSSION and CONCLUSION

In the present study, it was aimed to develop a likert type scale to measure the attitudes of individuals towards match analysis, and to perform its reliability and validity analyzes. To this end, an item pool consisting of 51 items was created in the first place. It was presented to the opinions of the experts and 4 items were excluded upon their feedback. Thus, a draft scale consisting of 47 items was obtained. After proof-reading the draft in terms of Turkish language and expression, the scale was given its final form before its administration. It was seen that the scale developed in the study conducted by Tabuk consisted of 3 sub-dimensions and 9 items (Tabuk, 2022). It was determined that the developed scale consisted of 2 sub-dimensions and 13 items (Taşmektepligil et al., 2014). In another study, it was determined that the developed scale consisted of 20 items and 4 sub-dimensions (Kayhan et al., 2020).

With the EFA applied to the scale, items that did not fit into any factor or were expressed as overlapping were removed from the scale. The measurement structure, which ended up with 4 sub-scales and a total of 22 items after the exclusion of certain items from the scale, explained 65,576 % of the total variance. In this context, it can be said that the variance explained by the scale structure is sufficient in terms of construct validity. In addition, it can be said that the factor load values of the items of the developed scale are in the range of 0.603-0.883 which are sufficient values. As a result of CFA applied to the data collected from another independent sample after EFA, it was determined that the 4-factor model consisting of 22 items showed good agreement with the data. This agreement showed that the scale structure revealed by EFA was also valid on a different sample. In addition, item analysis based on item-total correlation was applied, and it was concluded that no item should be removed from the scale. When the literature is examined, it has been concluded that the scale is a valid and reliable measurement tool, it will provide ease of application due to the small number of items, and the variance is explained at the level of 72.71% (Tabuk, 2022). The factor loads of the items of the developed scale were found to be between 0.466 and 0.775 (Taşmektepligil et al., 2014).

The reliability of the current scale was discussed in the context of its stability and Cronbach α internal consistency. A test-retest was performed to determine the stability of the scale. The scale was applied to the same sample with an interval of two weeks, and it was determined that the scores were similar. This finding indicates the invariance and stability of the measurement results. The internal consistency of the scale was examined by calculating the Cronbach's α coefficient for the whole scale and its sub-scales. Cronbach α coefficient values higher than 0.70 indicate that the scale has internal consistency. As a result, it is safe to say that the scale for match analysis consisting of 4 factors and 22 items is a valid and reliable measurement tool.

Conflicts of Interest: The authors declare that they have no conflict of interest.

Authors' Contribution: All three authors have made a substantial and intellectual contribution to the study and approved it for publication.

Research Ethics Informations:

Ethics Committee: Yozgat Bozok University, Ethics Commission

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Decision No: 31/07

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APPENDIX –MATCH ANALYSIS SCALE

Draft Item Number	Item Number	ITEMS	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
-PERFORMANCE-									
17	1	Match analysis can help athletes mentally prepare for match.	1	2	3	4	5	6	7
15	2	Match analysis helps coaches make a positive difference in the match.	1	2	3	4	5	6	7
31	3	Match analysis has an important effect on the maximum performance of the athletes in the matches.	1	2	3	4	5	6	7
13	4	As a result of the statistical data obtained through the match analysis, the coaches adopt different tactics.	1	2	3	4	5	6	7
29	5	Match analysis objectively reveals all the behaviors of the athletes during the match.	1	2	3	4	5	6	7
19	6	With match analysis, coaches objectively evaluate the performances of the opponents.	1	2	3	4	5	6	7
33	7	Match analysis allows the athletes to get to know themselves in the sportive sense.	1	2	3	4	5	6	7
-PROGRESS-									
14	8	Match analysis helps coaches in their professional development.	1	2	3	4	5	6	7
16	9	Match analysis increases the knowledge of the coaches about their branch.	1	2	3	4	5	6	7
12	10	Match analysis provides information about the opponent's weaknesses.	1	2	3	4	5	6	7
20	11	Match analysis allows coaches to improve their tactical skills.	1	2	3	4	5	6	7
10	12	Match analysis helps to collect data on many parameters (sports performance etc.) during the match.	1	2	3	4	5	6	7
18	13	With match analysis, coaches evaluate the performance of their athletes objectively.	1	2	3	4	5	6	7
- IMPORTANCE STATUS -									
45	14	*The field of sports sciences does not place a high importance on match analysis.	1	2	3	4	5	6	7
44	15	*Match analysis is of no importance for athlete development.	1	2	3	4	5	6	7
43	16	*Coaches do not attach importance to match analysis.	1	2	3	4	5	6	7
46	17	*Match analysis methods do not have an important place in winning the matches.	1	2	3	4	5	6	7
-APPRECIATION-									
47	18	Thanks to the rapid development of match analysis, there is an increase in the number of clubs that need analysts.	1	2	3	4	5	6	7
37	19	There is an increase in the number of analysts working in clubs.	1	2	3	4	5	6	7
38	20	Match analysis has turned into a profession.	1	2	3	4	5	6	7
39	21	With the development of technology, the level of development of analysts interested in match analysis is increasing.	1	2	3	4	5	6	7
36	22	There is an increase in the number of scientific publications on match analysis.	1	2	3	4	5	6	7

The Match analysis scale consists of a total of 22 items and 4 factors (sub-scales). There are 18 positive and 4 negative statements in the scale. Items in the importance status sub-scale with negative meaning (*) should be reverse coded while scoring.

Note: You can use the scale without permission within the framework of citation rules.

EK-MAÇ ANALİZİ ÖLÇEĞİ

Taslak Madde No	Madde No	MADDELER	Kesinlikle Katılmıyorum	Katılmıyorum	Pek Katılmıyorum	Kararsızım	Kısmen Katılıyorum	Katılıyorum	Tamamen Katılıyorum
-PERFORMANS-									
17	1	Maç analizi, sporcuların zihinsel antrenman hazırlıklarına olumlu katkı sağlar.	1	2	3	4	5	6	7
15	2	Maç analizi, antrenörlerin oyun içerisinde olumlu yönde farklılık yaratmasına yardımcı olur.	1	2	3	4	5	6	7
31	3	Sporcuların maçlarda maksimum performans göstermelerinde maç analizi önemli bir etkiye sahiptir.	1	2	3	4	5	6	7
13	4	Maç analizi ile elde edilen İstatistiksel veriler sonucunda antrenörler, farklı taktikler belirler.	1	2	3	4	5	6	7
29	5	Maç analizi, sporcuların maç içerisindeki bütün davranışlarını objektif bir şekilde ortaya koymaktadır.	1	2	3	4	5	6	7
19	6	Maç analiziyle antrenörler, rakip sporcuların performanslarını objektif olarak değerlendirir.	1	2	3	4	5	6	7
33	7	Maç analizi, sporcuların sportif anlamda kendilerini tanımalarına olanak sağlar.	1	2	3	4	5	6	7
-GELİŞİM GÖSTERME-									
14	8	Maç analizi, antrenörlerin mesleki gelişimlerine yardımcı olur.	1	2	3	4	5	6	7
16	9	Maç analizi, antrenörlerin branşı ile ilgili bilgi birikimlerini artırır.	1	2	3	4	5	6	7
12	10	Maç analizi rakibin zayıf yanları hakkında bilgi edinilmesini sağlar.	1	2	3	4	5	6	7
20	11	Maç analizi, antrenörlerin taktiksel yetilerini geliştirmelerine olanak sağlar.	1	2	3	4	5	6	7
10	12	Maç analizi, maç esnasında birçok parametre (sportif performans vb.) hakkında veri toplamaya yardımcı olur.	1	2	3	4	5	6	7
18	13	Maç analiziyle antrenörler, sporcularının performanslarını objektif olarak değerlendirir.	1	2	3	4	5	6	7
-ÖNEM DURUMU-									
45	14	*Spor bilimleri alanında maç analizine önem verilmez.	1	2	3	4	5	6	7
44	15	*Sporcu gelişimi için maç analizinin bir önemi yoktur.	1	2	3	4	5	6	7
43	16	*Antrenörler maç analizine önem vermez.	1	2	3	4	5	6	7
46	17	*Maç analiz yöntemleri, maçların kazanılmasında önemli bir yere sahip değildir.	1	2	3	4	5	6	7
-DEĞER GÖRME-									
47	18	Maç analizinin hızlı gelişimi sayesinde analiste ihtiyaç duyan kulüp sayısında bir artış söz konusudur.	1	2	3	4	5	6	7
37	19	Kulüplerde çalışan analist sayısında bir artış söz konusudur.	1	2	3	4	5	6	7
38	20	Maç analistliği bir meslek dalına dönüşmüştür.	1	2	3	4	5	6	7
39	21	Teknolojinin gelişmesiyle birlikte maç analizi ile ilgilenen analistlerin gelişim düzeyi artmaktadır.	1	2	3	4	5	6	7
36	22	Bilimsel çalışmalarda maç analiziyle ilgili yapılan yayın sayısında bir artış söz konusudur.	1	2	3	4	5	6	7

Maç Analiz ölçeği, toplam 22 madde ve 4 faktör (alt boyut)'den oluşmaktadır. Ölçekte 18 olumlu, 4 olumsuz ifade yer almaktadır. Önem Durumu alt boyutunda yer alan ve olumsuz anlam içeren (*) maddeler, puanlama yapılırken tersine kodlanmalıdır.

Not: Ölçeği, alıntı yapma kuralları çerçevesinde izin almadan kullanabilirsiniz.

İlkokul Öğrencilerine Uygulanan Cimnastik ve Taekwondo Antrenmanlarının Denge, Esneklik ve Sıçrama Parametrelerine Etkisi*

İsmail ÇİÇEK^{†1}, Cenab TÜRKERİ¹

¹Çukurova Üniversitesi, Spor Bilimleri Fakültesi, Adana.

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Öz

Bu çalışma 8-10 yaş aralığındaki ilkököl öğrencilerine uygulanan 8 haftalık cimnastik ve taekwondo antrenmanlarının denge, esneklik ve sıçrama parametrelerine etkisini incelemek amacıyla yapılmıştır. Çalışmaya toplamda 30 öğrenci katıldı ve öğrenciler rastgele yöntemle cimnastik grubu (CG=10, \bar{X} yaş=8.70±0.48), taekwondo grubu (TG=10, \bar{X} yaş=8.20±0.42) ve kontrol grubu (KG=10, \bar{X} yaş=9.50±0.52) olarak ayrıldı. CG ve TG 48 saat aralıklarla haftada 2 gün ve toplamda 8 hafta boyunca branşa özgü antrenmanlarını gerçekleştirdi. KG ise 8 hafta boyunca herhangi bir sportif aktiviteye katılmadı. Performansların değerlendirilmesi için katılımcılara Y dinamik denge testi, esneklik testi ve dikey sıçrama testi 8 haftanın öncesinde ve sonrasında uygulandı. Verilerin normallik dağılımını belirlemek için Shapiro-Wilk testi uygulandı. Verilerin normal dağılım göstermesi üzerine grup içi farkı belirlemek için Paired Sample T Test, gruplar arasındaki farkın belirlenebilmesi için ise Independent Sample T Test kullanıldı. Çalışma sonucunda CG ve TG'nin grup içi esneklik ve sıçrama ön ve test sonuçlarında anlamlı farklılıklar tespit edilirken ($p<0.05$), KG'de ise anlamlı fark bulunmadı. Grupların alt ve üst ekstremite dinamik denge grup içi karşılaştırma sonuçlarında CG lehine anlamlı farklılıklar bulunmasına karşın, TG'nin sadece sağ bacak anterior değerinde anlamlı farklılık tespit edildi ($p<0.05$). KG'de ise herhangi bir anlamlı farklılık bulunmadı. Gruplar arası karşılaştırma sonucunda alt ekstremite sol bacak composite değişkeninde CG lehine anlamlı bir fark tespit edilirken ($p<0.05$), diğer bütün değişkenlerde istatistiksel açıdan bir fark bulunmadı. Cimnastik antrenmanlarının taekwondo antrenmanlarına kıyasla denge, esneklik ve dikey sıçrama parametreleri üzerinde olumlu etkisinin daha yüksek olduğu sonucuna varıldı.

Anahtar kelimeler: Cimnastik, Taekwondo, Y Dinamik Denge, Esneklik, Dikey sıçrama

The Effect of Gymnastics and Taekwondo Trainings on Balance, Flexibility and Jumping Parameters in Primary School Students

Abstract

This study was conducted to examine the effects of 8-week gymnastics and taekwondo training applied to 8-10 year old primary school students on balance, flexibility and jump parameters. A total of 30 students participated in the study, and the students were randomly assigned to the gymnastics group (GG=10, \bar{X} age=8.70±0.48), the taekwondo group (TG=10, \bar{X} age=8.20±0.42) and the control group (CG=10, \bar{X} age=9.50±0.52). GG and TG performed their branch-specific training at 48-hour intervals, 2 days a week, for a total of 8 weeks. CG did not participate in any sports activities for 8 weeks. In order to evaluate their performance, Y dynamic balance test, flexibility test and vertical jump test were applied to the participants before and after 8 weeks. Shapiro-Wilk test was used to determine the normality distribution of the data. Due to the normal distribution of the data, Paired Sample T Test was used to determine the difference within the group, and the Independent Sample T Test was used to determine the difference between the groups. As a result of the study, significant differences were found in the flexibility and jump pre-test results of GG and TG within the group ($p<0.05$), but no significant difference was found in CG. Although there were significant differences in favor of CG in the lower and upper extremity dynamic balance in-group comparison results of the groups, only the right leg anterior value of TG was significantly different ($p<0.05$). No significant difference was found in CG. As a result of the comparison between the groups, a significant difference was found in favor of GG in the lower extremity left leg composite variable ($p<0.05$), while there was no statistical difference in all other variables. It was concluded that gymnastics training had a higher positive effect on balance, flexibility and vertical jump parameters compared to taekwondo training.

Keywords: Gymnastics, Taekwondo, Y Dynamic Balance, Flexibility, Vertical Jump

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† Sorumlu yazar: İsmail ÇİÇEK, E-posta: ismailcicekismail@gmail.com

GİRİŞ

Cimnastik bütün dünyada teknik ve estetik açıdan rağbet gören ve nöromüsküler sistemin optimal bir şekilde çalışmasını gerektiren temel bir spor branşıdır. Cimnastik hareketlerinin uygulanışında üst düzey fiziksel ve zihinsel beceri sergilemek gerekir. Bu nedenle çocukların fiziksel ve zihinsel becerilerinin gelişmesine doğrudan katkı sağlayan bu branş oldukça önemlidir. Ayrıca temel cimnastik eğitiminin gelişme çağındaki çocukların motor becerileri üzerine etkisi göz önüne alındığında bu yaşlarda alınan eğitimin ne kadar önemli olduğu tekrar vurgulanmaktadır (Erkut ve Pınar, 2000; Mitchell vd., 2002). Taekwondo ise olimpik bir spor branşı olmasının yanı sıra, çocuklar ve ergenler arasında yaygın olarak tercih edilen dünyanın en popüler sporlarından birisidir. Ayrıca tek yönde duruş stabilitesinin çok önemli olduğu yumruk ve tekme teknikleriyle ünlüdür ve bu durum müsabakalarda galibiyet için belirleyici faktördür (Kordi vd., 2009).

Spor alanında bireylerin hareketleri gerçekleştirebilmesi için bazı temel motorik özellikleri kazanması gerekir. Bu yüzden denge, esneklik, sıçrama, kuvvet, hız, güç, koordinasyon ve çeviklik gibi motorik özellikler sportif başarıda belirleyici etkenlerdir (William vd., 2012). Ancak cimnastik ve taekwondo gibi branşlarda özellikle denge, esneklik ve sıçrama parametreleri sporcuların becerilerini olumlu yönde etkileyen ve sportif başarıya ulaştıran temel unsurlardır (Marsh vd., 2004). Ayrıca becerileri en üst düzeye çıkarmak için bu parametrelerin bir kombinasyon içinde gerçekleştirilmesi gerekir (Behm ve Chaouachi, 2011; Hindle vd., 2012).

Taekwondo hızlı tekme atılan bir spordur (Shirley ve William, 2012). Bu nedenle performansın üst düzeye çıkması ve müsabakalarda başarıya ulaşmak için sporcunun alt ekstremitelerde denge yeteneğinin gelişmesi gerekir (Park, 2005). Benzer şekilde cimnastik de yüksek düzeyde denge yeteneği gerektiren bir spordur. Çünkü alt ekstremitelerin stabilitesi hareketin doğru şekilde uygulanmasında önemli bir etkidir (Ross ve Guskiewicz, 2004; Ross vd., 2005). Eğer sporcularda denge yeteneği gelişmezse, bu durum sporcuların performanslarını olumsuz yönde etkiler ve sporcularda sakatlanma riskini artırır (Hrysonmallis, 2007). Uzun vadede spor yapan tüm bireylerde denge özelliğinin geliştiği aktarılmıştır (Perrin vd., 2002). Öte yandan Hazar ve Taşmektepligil (2008), dengenin çocukların genel olarak performanslarını arttırdığını belirtmişlerdir.

Sporda (özellikle cimnastik ve taekwondoda) dengenin yanı sıra esneklik ve sıçrama önemli diğer parametrelerdir. Çünkü taekwondo sporcularında yüksek vuruşlar yapmak ve hareketleri yüksek hızda gerçekleştirmek için esneklik son derece önemlidir. Aynı şekilde cimnastik de yüksek düzeyde esneklik gerektiren bir spordur (Arkaev ve Suchilin, 2004). Bu nedenle tekniklerinin uygulanmasında güçlü bir iskelet, kuvvet, sinir-kas ve optimal esneklik gerekir (Pınar, 1991). Sıçrama performansı, sporcunun denge, esneklik, kas gücü ve patlayıcı hız gibi temel motorik özelliklerine bağlıdır (Di Cagno vd., 2009; Sharma vd., 2017). Ayrıca bütün cimnastik uygulamalarında sıçrama temel bir beceridir ve atlama yüksekliği sporcunun başarısını belirlemede önemli bir faktördür (Di Cagno vd., 2009).

Cimnastik ve taekwondo branşlarında hareketlerin başarılı bir şekilde uygulanması için sporcuların bazı motorik özelliklere sahip olması gerekir. Bu konuyla ilgili literatüre

bakıldığında, cimnastik ve taekwondo sporcularının motorik özelliklerini araştıran birçok çalışma mevcuttur. Genel olarak cimnastik ve taekwondo antrenman programlarının esneklik, denge ve sıçrama parametrelerini arttırdığı ortaya konulmuştur (Alpkaya, 2013; Bayraktar, 2005; Delac vd., 2007; Demirel vd., 2016; Durukan vd., 2016; Fallah vd., 2015; Heller vd., 1998; Kesilmiş, 2012; Mickle vd., 2011; Thompson ve Vinueza, 1991). Ancak ilkokul öğrencilerinde cimnastik ve taekwondo antrenmanlarının denge, esneklik ve sıçrama parametrelerine etkisi hakkında sınırlı sayıda çalışma mevcuttur. Bu bakımından ilkokul öğrencilerine uygulanan 8 haftalık cimnastik ve taekwondo antrenmanlarının denge, esneklik ve sıçrama parametrelerine etkisinin incelenmesi ve tartışılması literatüre önemli katkı sağlayacağı düşünülmektedir.

METOT

Araştırma Modeli

Bu araştırma, nicel araştırma yöntemlerinden deneysel modeldir.

Çalışma Grubu

Çalışmada örneklem sayısını belirlemek için GPower güç analizi yapıldı. Park ve diğerlerinin (2014) Taekwondo, futbol ve cimnastik sporcularında denge yeteneği, kas gücü ve kas dayanıklılığı arasındaki ilişkiyi incelemeye yönelik yapmış oldukları çalışma verilerinden yola çıkarak (Taekwondo n:10, Cimnastik n:10, Futbol n:10) %80 güç indeksi elde etmek için hesaplama yapılmıştır. Yapılan GPower analiz sonucuna göre grupların 10'ar kişiden oluşmasına karar verilmiştir.

Çalışmaya yaşları 8-10 arasında olan toplamda 30 öğrenci katılmıştır. Çalışmaya katılan öğrenciler basit rastgele yöntemle cimnastik grubuna (CG=10), taekwondo grubuna (TG=10) ve kontrol grubuna (KG=10) ayrılmıştır. Çalışmaya katılan öğrenciler cimnastik ve taekwondo branşlarına yeni başlamış özel bir spor kulübü öğrencilerinden oluşmaktadır. CG ve TG 48 saat aralıklarla haftada 2 gün ve toplamda 8 hafta boyunca branşa özgü antrenmanlarını gerçekleştirmişlerdir. KG ise 8 hafta boyunca herhangi bir sportif aktiviteye katılmamıştır. Bütün öğrenci ve velileri bilgilendirilmiş onam formunu imzalamıştır. Sporcuların demografik özellikleri Tablo 1'de sunulmuştur.

Tablo 1. Öğrencilerin demografik özellikleri

	CG n=10	TG n=10	KG n=10
	($\bar{X}\pm S$)	($\bar{X}\pm S$)	($\bar{X}\pm S$)
Yaş (yıl)	8,70±0,48	8,20±0,42	9,50±0,52
Boy (cm)	131±9,68	129,90±8,22	134±4,34
Vücut Ağırlığı (kg)	31,32±8,54	90,83±5,08	28,96±4,68
BMI (kg/m²)	17,99±3,21	18,23±2,59	16,03±1,59

Veri Toplama Araçları

Boy Uzunluğu ve Vücut Ağırlığı Ölçümü: Boy uzunluğu ölçümü yapılırken duvara monte edilmiş mesilife marka (PT810A) boy skalası kullanılmıştır. Öğrencilerin ayakları çıplak şekilde ölçümleri alınmıştır. Ölçüm alınırken öğrencinin vücut ve başı dik, ayakları bitişik bir şekilde alınıp cm cinsinden kaydedilmiştir. Ağırlıkları ise tanita marka (BC-730) dijital tartı kullanılarak alınmış ve kg cinsinden kaydedilmiştir. Öğrencilerin üzerinde vücut ağırlıklarını etkileyecek giysiler olmamasına dikkat edilmiştir

Esneklik Testi: Ölçümler Baseline marka otur eriş sehпасıyla yapılmıştır. Ölçüm cetveli aralığı 0,5 cm hassasiyettedir. Öğrenci yere oturur pozisyona getirilip ayak tabanlarını sehpaaya dayayıp iki eliyle ve dizlerini kırmadan uzanabildiği noktaya kadar uzaması gerektiği talimatı verildi. Bu şekilde 2 deneme yapıp en iyi sonuç cm cinsinden kaydedilmiştir.

Dikey Sıçrama Testi: Duvara monte edilmiş sıçrama düzeneği ile ölçüm yapılmıştır. Öğrencinin eli tebeşir tozu ile işaretlenerek sıçrama düzeneğinin önünde en yüksek noktaya sıçraması gerektiği talimatı verilmiştir. Bu şekilde 2 deneme yapıp en iyi değer cm cinsinden kaydedilmiştir.

Üst Ekstremitte Y Dinamik Denge Testi: Bu testte katılımcı 3 düzlemde (medial (0°), inferolateral (45°) ve superolateral (45°) oluşan Y Denge (YBT) test platformunun üzerine eli merkez noktada sabit bir şekilde sınav pozisyonunda durur. Test her iki kol için ayrı ayrı uygulanmıştır. Katılımcıya teste başlamadan önce her iki kol ve her 3 düzlemde testi denemesi için zaman verilmiştir. Deneme safhası geçildikten sonra katılımcıya ayaklar omuz genişliğinde açık, bacaklar ve kalça merkezi sabit olacak şekilde ve el parmak uçlarıyla blokları medial, inferolateral ve superolateral yönlere itmeleri (her seferinde sabit duruş noktasına kolu yere indirmeden geri getirerek) gerektiği talimatı verilmiştir. Her yön için 3 deneme yapıp en iyi değer cm cinsinden kaydedilmiştir. Daha sonra katılımcıların kol uzunlukları alınıp normalleştirme formülü kullanılmıştır.

Alt Ekstremitte Y Dinamik Denge Testi: Bu testte katılımcı 3 düzlemde (biri bireyin yüzünün dönük olduğu doğultuda uzanan, diğer ikisi bireyin arkasında ve birbirinden 135° lik açıyla ayrılan 3 düzlem) oluşan Y- Denge (YBT) testi aleti üzerine çıkar. Test her iki ayak için de ayrı ayrı uygulanmıştır. Katılımcıya teste başlamadan önce her iki ayak ve her 3 düzlemde testi denemesi için zaman verilmiştir. Deneme safhası geçildikten sonra katılımcıya ellerin bel bölgesinde sabit, ayağın aletin merkez noktasında olması gerektiği ve ayak parmak ucuyla blokları anterior, posteromedial ve posterolateral yönlere doğru itmeleri (her seferinde sabit duruş noktasına ayağı yere değıdirmeden geri getirerek) gerektiği talimatı verilmiştir. Her yön için 3 deneme yapıp en iyi değer cm cinsinden kaydedilmiştir. Daha sonra katılımcıların bacak uzunlukları alınıp normalleştirme formülü (Cook, 2010) kullanılmıştır.

$$\frac{(\text{sum of the greatest reach in each direction})}{(3 \times \text{Limb Length})} \times 100$$

Antrenman Programları

Her antrenman seansından önce öğrenciler koşu, branşa özgü ısınma ve germe egzersizlerinden oluşan (15dk) bir ısınma gerçekleştirmişlerdir. Isınma ve soğuma evrelerinin çalışma sonuçlarını etkilememesi için süre ve içeriğinin aynı tutulmasına özen gösterilmiştir. Antrenmanın ana evresinde CG ve TG branşa özgü antrenman egzersizlerini gerçekleştirmişlerdir. KG ise herhangi bir uygulamaya katılmamıştır. CG ve TG'ye uygulanan branşa özgü antrenman programları Tablo 2'de sunulmuştur.

Tablo 2. Cimnastik ve taekwondo antrenman programları

Hafta	Isınma (15 dakika)	Ana evre (50 dakika)		Soğuma (10 dakika)
CİMNASTİK				
		1.gün	2.gün	
1.Hafta		Öne takla	Kartal Spagat	
2.Hafta	5 dakika	Vücut Tutuşu	Amut	5 dakika
3.Hafta	hafif koşu	Atlama Masasında Überşlak	Atlama Masasında Überşlak	hafif koşu
4.Hafta	+	Flik Flak Hareketi	Flik Flak Hareketi	+
5.Hafta	5 dakika	Kartvil	Kartvil	5 dakika
6.Hafta	branşa özgü	Tek Ayak Üzerinde Dönüşler	Tek Ayak Üzerinde Dönüşler	statik germe
7.Hafta	ısınma	Spaqat Sıçraması	Spaqat Sıçraması	
8.Hafta	+	Barda Sallanma	Barda Sallanma	
	5 dakika			
	dinamik			
	germe			
TAEKWONDO				
		1.gün	2.gün	
SOHGI (DURUŞLAR)				
1.Hafta		- Naranhi Sohgi - Pyonhi Sohgi	- Moa Sohgi - Ahp Sohgi	
SOHGI (DURUŞLAR)				
2.Hafta		- Ahpkubi Sohgi - Dwikubi Sohgi - Juchoom Sohgi	- Bum Sohgi - Koa Sohgi	
JIRUGI (YUMRUK VURUS TEKNİKLERİ)				
3.Hafta		- Neryo-Jirugi - Yop-Jirugi - Chi-Jirugi	-Doolyo-Jirugi -Digeut-Jirugi	
CHIGI (DAIRESEL VURUS TEKNİKLERİ)				
4.Hafta	5 dakika hafif koşu +	- An-Chigi - Chigi	- Ape-Chigi - Neryo-Chigi	5 dakika
CHAGI (AYAK VURUŞ TEKNİKLERİ)				
5.Hafta	5 dakika branşa özgü ısınma +	- Ap-Chagi - Yop-Chagi - Dollyo-Chagi	- Momdollyo-Chagi - Bande-Dollyo-Chagi	hafif koşu +
CHAGI (AYAK VURUŞ TEKNİKLERİ)				
6.Hafta	5 dakika dinamik germe	-Düt-Chagi -Balding-Chagi -Puşa-Chagi	-Eryo-Chagi -Bitro-Chagi	5 dakika statik germe
POOMSÆ 1-8 ARASI TEKNİKLER				
7.Hafta		1-Poomsae Taegeuk il-Jang 2- Poomsae Taegeuk ee-Jang 3- Poomsae Taegeuk Sam-Jang 4- Poomsae Taegeuk Sa-Jang	5- Poomsae Taegeuk Oh-Jang 6- Poomsae Taegeuk Yuk-Jang 7- Poomsae Taegeuk Chil-Jang 8- Poomsae Taegeuk Pal-Jang	
POOMSÆ 9-16 ARASI TEKNİKLER				
8.Hafta		9- Poomsae Koryo 10- Poomsae Keumgang 11- Poomsae Taebaek 12- Poomsae Pyongwon	13- Poomsae Sipjin 14- Poomsae Jitae 15- Poomsae Chonkwon 16- Poomsae Hansu	

Araştırma Yayın Etiği

Araştırmaya başlamadan önce 13.05.2022 tarih ve 122/37 sayılı yazı ile Adana Çukurova Üniversitesi Tıp Fakültesi Girişimsel Olmayan Klinik Araştırmalar Etik Kurulundan onay alınmıştır.

Verilerin Toplanması

Veriler toplanmadan önce tüm öğrencilere ve velilerine bilgilendirilmiş onam formu imzalatıldı. Araştırmanın amacı ve önemi, elde edilen verilerin sadece bilimsel amaçlı olarak kullanılacağı, üçüncü kişilerle paylaşılmayacağı konusunda gerekli açıklamalar yapıldı. Bu açıklamalar sonucunda çalışmaya katılmak istemediğini belirten öğrenciler çalışmaya dahil edilmedi.

Verilerin Analizi

Örnek sayısı 50'den az olduğu için normallik testlerinden Shapiro-Wilk testi uygulandı (Büyüköztürk vd., 2019). Test sonucunda verilerin normal dağılım gösterdiği tespit edildi. Bu nedenle analizlerde, grup içi farkı belirlemek için Paired Sample T Test, gruplar arasındaki farkın belirlenebilmesi için ise Independent Sample T Test kullanıldı. Anlamlılık düzeyi $p<0,05$ olarak kabul edildi. İstatistiksel analizler SPSS 23 programı kullanılarak yapıldı.

BULGULAR

Tablo 3. CG, TG ve KG'nin esneklik ve sıçrama grup içi ön-son test değerleri ve yüzdelik gelişimleri

Değişkenler	Grup	n	Ön test ($\bar{X}\pm S$)	Son test ($\bar{X}\pm S$)	t	p	Fark (%)
Esneklik	CG	10	29,70±4,49	33,70±3,71	-2,98	0,01*	13,47
	TG	10	29,00±2,10	30,60±1,89	-3,07	0,01*	5,52
	KG	10	24,50±3,30	24,80±3,64	-1,40	0,19	1,22
Dikey sıçrama	CG	10	21,70±3,30	26,40±4,16	-2,77	0,02*	21,66
	TG	10	20,80±3,58	23,20±3,19	-9,00	0,00**	11,54
	KG	10	19,70±2,71	19,60±3,13	0,11	0,90	-,51

* $p<0,05$, ** $p<0,01$, CG=Cimnastik Grubu, TG=Taekwondo Grubu, KG=Kontrol Grubu

Tablo 3 incelendiğinde CG, TG ve KG'nin grup içi esneklik ve dikey sıçrama ön ve son test değişkenleri karşılaştırılmıştır. Yapılan analiz sonucunda hem CG hem de TG'nin esneklik ve dikey sıçrama değişkenlerinin ön ve son test verileri arasında istatistiksel olarak anlamlı fark bulunmuştur ($p<0,05$). KG'nin ise ön ve son test verileri arasında istatistiksel olarak anlamlı fark bulunmamıştır. Ayrıca grupların gelişim yüzdelerine bakıldığında; CG'nin esneklik değişkeninde %13,47 ve dikey sıçrama değişkeninde %21,66 ile en fazla gelişim gösterdiği, TG'nin esneklik değişkeninde %5,52 ve dikey sıçrama değişkeninde %11,54 ve KG'nin esneklik değişkeninde %1,22 ve dikey sıçrama değişkeninde %-0,51 gelişim gösterdiği bulunmuştur.

Tablo 4. CG, TG ve KG'nin grup içi alt ekstremite y dinamik denge ön-son test değerleri ve yüzdelik gelişimleri

Değişkenler	Grup	n	Ön test ($\bar{X}\pm S$)	Son test ($\bar{X}\pm S$)	t	p	Fark (%)
Anterior (cm)	CG	10	39,50±4,99	42,90±6,36	-1,55	0,15	8,61
	TG	10	36,60±4,06	42,30±9,39	-2,20	0,05*	15,57
	KG	10	38,60±4,50	39,80±5,07	-1,05	0,31	3,11
Posteromedial (cm)	CG	10	58,50±5,29	63,70±5,63	-2,36	0,04*	8,89
	TG	10	60,10±4,28	61,60±4,92	-0,61	0,55	2,50
	KG	10	55,00±6,97	54,90±11,08	0,03	0,97	-,18
Sağ Posterolateral (cm)	CG	10	56,70±5,41	61,20±4,44	-2,04	0,07	7,94
	TG	10	57,30±5,41	58,30±5,67	-0,47	0,64	1,75
	KG	10	52,30±6,78	52,60±8,66	-0,19	0,85	,57
Composite (cm)	CG	10	71,20±6,73	77,33±9,09	-2,89	0,01*	8,61
	TG	10	69,25±5,92	72,70±5,46	-1,22	0,25	4,98
	KG	10	65,42±5,18	65,88±7,89	-0,30	0,76	,70
Anterior (cm)	CG	10	40,40±3,74	44,40±7,08	-2,30	0,04*	9,90
	TG	10	37,60±5,33	39,60±5,92	-0,82	0,42	5,32
	KG	10	38,00±4,08	39,70±3,71	-1,25	0,24	4,47
Posteromedial (cm)	CG	10	57,10±4,97	65,00±4,85	-3,61	0,006*	13,84
	TG	10	61,20±4,70	61,90±3,47	-0,31	0,75	1,14
	KG	10	57,80±6,51	56,60±7,47	1,16	0,27	-2,08
Sol Posterolateral (cm)	CG	10	56,10±4,45	60,70±4,71	-2,33	0,04*	8,20
	TG	10	58,10±4,09	57,90±4,53	0,10	0,91	-,34
	KG	10	51,10±5,74	54,00±8,16	-2,09	0,06	5,68
Composite (cm)	CG	10	70,64±5,74	78,33±8,98	-3,33	0,009*	10,89
	TG	10	70,48±5,05	71,57±4,01	-0,46	0,65	1,55
	KG	10	65,78±4,93	67,29±6,20	-1,57	0,15	2,30

***p<0,05**, CG=Cimnastik Grubu, TG=Taekwondo Grubu, KG=Kontrol Grubu

Tablo 4'te CG, TG ve KG'nin grup içi Alt Ekstremitte Y Dinamik Denge ön test ve son test sonuçları karşılaştırılmıştır. Bu karşılaştırmada CG'nin sağ bacak posteromedial (p=0,04) ve composite (p=0,01), sol bacak anterior (p=0,04), posteromedial (p=0,006), posterolateral (p=0,04) ve composite (p=0,01) değişkenlerinde istatistiksel olarak anlamlı fark tespit edilmiştir (p<0,05). TG'nin sadece sağ bacak anterior (p=0,05) değişkeninde istatistiksel olarak anlamlı fark bulunmuştur (p<0,05). KG'nin ise ön test ve son test değerlerinde istatistiksel olarak anlamlı fark bulunmamıştır. Ek olarak grupların yüzdelik gelişimlerinde CG'nin diğer gruplardan daha iyi gelişim gösterdiği tespit edilmiştir (sağ bacak composite= CG:%8,61, TG:%4,98, KG:%0,70, sol bacak composite= CG:%10,89, TG: %1,55, KG:%2,30).

Tablo 5. CG, TG ve KG'nin grup içi üst ekstremitte y dinamik denge ön-son test değerleri ve yüzdelik gelişimleri

Değişkenler	Grup	n	Ön test ($\bar{X}\pm S$)	Son test ($\bar{X}\pm S$)	t	P	Fark (%)
Medial (cm)	CG	10	42,90±9,32	46,10±8,76	-0,87	0,40	7,46
	TG	10	41,80±6,81	40,40±5,05	0,56	0,58	-3,35
	KG	10	38,80±5,22	37,40±4,37	0,98	0,35	-3,61
inferolateral (cm)	CG	10	50,10±5,58	58,60±6,65	-3,03	0,01*	16,97
	TG	10	55,10±6,67	57,10±3,10	-0,91	0,38	3,63
	KG	10	50,50±4,64	53,60±7,96	-1,40	0,19	6,14
Sağ Superolateral (cm)	CG	10	34,70±7,55	41,40±8,84	-2,62	0,02*	19,31
	TG	10	37,70±6,21	41,20±5,07	-1,53	0,15	9,28
	KG	10	40,60±3,92	37,20±3,85	2,33	0,04*	-8,37
Composite (cm)	CG	10	65,61±6,57	75,49±11,29	-2,77	0,02*	15,06
	TG	10	70,41±5,13	72,73±5,96	-0,98	0,35	3,29
	KG	10	66,16±5,99	65,25±5,71	0,57	0,58	-1,38
Medial (cm)	CG	10	41,90±6,64	46,00±6,99	-1,50	0,16	9,79
	TG	10	40,60±5,29	41,60±6,29	-0,42	0,68	2,46
	KG	10	36,90±5,08	37,80±3,58	-0,91	0,38	2,44
inferolateral (cm)	CG	10	49,10±6,00	56,50±4,83	-3,34	0,009*	15,07
	TG	10	53,20±2,09	55,90±5,15	-1,95	0,08	5,08
	KG	10	53,00±6,68	54,20±7,56	-0,54	0,59	2,26
Sol Superolateral (cm)	CG	10	35,80±7,26	42,30±6,56	-2,62	0,02*	18,16
	TG	10	40,70±4,49	41,60±6,16	-0,38	0,70	2,21
	KG	10	40,30±6,30	41,30±4,27	-0,64	0,53	2,48
Composite (cm)	CG	10	65,31±7,20	74,72±8,36	-3,03	0,01*	14,41
	TG	10	70,40±3,79	72,86±7,09	-0,96	0,36	3,49
	KG	10	66,39±7,20	67,85±5,85	-0,97	0,35	2,20

***p<0,05**, CG=Cimnastik Grubu, TG=Taekwondo Grubu, KG=Kontrol Grubu

Yapılan analiz sonucunda Tablo 5'te CG, TG ve KG'nin grup içi Üst Ekstremitte Y Dinamik Denge ön ve son test sonuçları karşılaştırılmıştır. Karşılaştırma sonucunda CG'nin sağ kol inferolateral (p=0,01), superolateral (p=0,02), composite (p=0,02) ve sol kol inferolateral (p=0,009), superolateral (p=0,02), composite (p=0,02) değişkenlerinin ön ve son testleri arasında istatistiksel olarak anlamlı fark bulunmuştur (p<0,05). Analiz sonucunda TG ve KG'nin ön ve son testleri arasında istatistiksel olarak anlamlı fark tespit edilmemiştir. KG'nin sadece sağ kol superolateral (p=0,04) değişkeninde anlamlı fark bulunmasına karşın, bu farkın negatif düzeyde olduğu tespit edilmiştir (ön test=40,60±3,92, son test=37,20±3,85, fark=%-8,37). Ayrıca grupların yüzdelik değişimlerinde CG'nin diğer gruplardan daha iyi gelişim gösterdiği tespit edilmiştir (sağ kol composite= CG:%15,06, TG:%3,29, KG:%-1,38, sol kol composite= CG:%14,41, TG: %3,49, KG:%2,20).

Tablo 6. CG ve TG'nin esneklik ve sıçrama gruplar arası ön-son test değerleri

Değişkenler	Grup	n	Ön test ($\bar{X}\pm S$)	t	p	Son test ($\bar{X}\pm S$)	t	p
Esneklik	CG	10	29,70±4,49	0,44	0,66	33,70±3,71	2,35	0,03*
	TG	10	29,00±2,10					
Dikey sıçrama	CG	10	21,70±3,30	0,58	0,56	26,40±4,16	1,92	0,07
	TG	10	20,80±3,58					

***p<0,05**, CG=Cimnastik Grubu, TG=Taekwondo Grubu

Tablo 6’da CG ve TG’nin gruplar arası esneklik ve dikey sıçrama ön ve son test değerleri karşılaştırılmıştır. Grupların ön test değerlerine bakıldığında her iki değişken arasında anlamlı bir fark bulunmamıştır. Son test değerlerine bakıldığında ise esneklik ($p=0,03$) değişkeninde iki grup arasında anlamlı bir fark bulunurken ($p<0,05$), bu farkın CG lehine olduğu tespit edilmiştir. Dikey sıçrama ($p=0,07$) değişkeninde ise gruplar arasında anlamlı bir fark bulunmamıştır.

Tablo 7. CG ve TG’nin gruplar arası alt ekstremite y dinamik denge ön-son test değerleri

Değişkenler	Grup	n	Ön test ($\bar{X}\pm S$)	t	p	Son test ($\bar{X}\pm S$)	t	p	
Sağ	Anterior (cm)	CG	10	39,50±4,99	1,42	0,17	42,90±6,36	0,16	0,86
		TG	10	36,60±4,06			42,30±9,39		
	Posteromedial (cm)	CG	10	58,50±5,29	-,74	0,46	63,70±5,63	0,88	0,38
		TG	10	60,10±4,28			61,60±4,92		
	Posterolateral (cm)	CG	10	56,70±5,41	-,24	0,80	61,20±4,44	1,27	0,22
		TG	10	57,30±5,41			58,30±5,67		
Composite (cm)	CG	10	71,20±6,73	0,68	0,50	77,33±9,09	1,37	0,18	
	TG	10	69,25±5,92			72,70±5,46			
Sol	Anterior (cm)	CG	10	40,40±3,74	1,35	0,19	44,40±7,08	1,64	0,11
		TG	10	37,60±5,33			39,60±5,92		
	Posteromedial (cm)	CG	10	57,10±4,97	-,89	0,07	65,00±4,85	1,64	0,12
		TG	10	61,20±4,70			61,90±3,47		
	Posterolateral (cm)	CG	10	56,10±4,45	0,47	0,64	60,70±4,71	1,35	0,19
		TG	10	55,20±4,02			57,90±4,53		
Composite (cm)	CG	10	70,64±5,74	0,06	0,94	78,33±8,98	2,17	0,04*	
	TG	10	70,48±5,05			71,57±4,01			

* $p<0,05$, CG=Cimnastik Grubu, TG=Taekwondo Grubu

Tablo 7’ de gruplar arası karşılaştırma sonucunda CG ve TG’nin Alt Ekstremitte Y Dinamik Denge ön test değerlerinde istatistiksel olarak anlamlı bir fark bulunmamıştır. Grupların son test değerlerine bakıldığında ise sol bacak composite ($p=0,04$) değişkeninde CG lehine anlamlı bir fark olduğu bulunmuştur ($p<0,05$). Buna karşın sağ bacak anterior ($p=0,86$), posteromedial ($p=0,38$), posterolateral ($p=0,22$), composite ($p=0,18$) ve sol bacak anterior ($p=0,11$), posteromedial ($p=0,12$), posterolateral ($p=0,19$) değişkenlerinde anlamlı bir fark tespit edilmemiştir.

Tablo 8. CG ve TG'nin gruplar arası üst ekstremite y dinamik denge ön-son test değerleri

Değişkenler	Grup	n	Ön test ($\bar{X}\pm S$)	t	p	Son test ($\bar{X}\pm S$)	t	p		
Sağ	Medial (cm)	CG	10	42,90±9,32	0,30	0,76	46,10±8,76	1,78	0,09	
		TG	10	41,80±6,81			40,40±5,05			
	inferolateral (cm)	CG	10	50,10±5,58	-1,81	0,08	58,60±6,65	0,64	0,52	
		TG	10	55,10±6,67			57,10±3,10			
	Superolateral (cm)	CG	10	34,70±7,55	-0,96	0,34	41,40±8,84	0,06	0,95	
		TG	10	37,70±6,21			41,20±5,07			
	Composite (cm)	CG	10	65,61±6,57	-1,81	0,08	75,49±11,29	0,68	0,50	
		TG	10	70,41±5,13			72,73±5,96			
	Sol	Medial (cm)	CG	10	41,90±6,64	0,48	0,63	46,00±6,99	1,47	0,15
			TG	10	40,60±5,29			41,60±6,29		
		inferolateral (cm)	CG	10	49,10±6,00	-2,03	0,06	56,50±4,83	0,26	0,79
			TG	10	53,20±2,09			55,90±5,15		
Superolateral (cm)		CG	10	35,80±7,26	-1,81	0,08	42,30±6,56	0,24	0,80	
		TG	10	40,70±4,49			41,60±6,16			
Composite (cm)		CG	10	65,31±7,20	-1,97	0,06	74,72±8,36	0,53	0,59	
		TG	10	70,40±3,79			72,86±7,09			

* $p<0,05$, CG=Cimnastik Grubu, TG=Taekwondo Grubu

Tablo 8'e bakıldığında CG ve TG'nin Üst Ekstremitte Y Dinamik Denge gruplar arası ön test ve son değerleri karşılaştırmıştır. Grupların ön test değerlerinde istatistiksel açıdan anlamlı bir fark bulunmamıştır. Son test değerlerine bakıldığında ise sağ kol medial ($p=0,09$), inferolateral ($p=0,52$), superolateral ($p=0,95$), composite ($p=0,50$) ve sol kol medial ($p=0,15$), inferolateral ($p=0,79$), superolateral ($p=0,80$), composite ($p=0,59$) değişkenlerinde her iki grup arasında anlamlı bir fark tespit edilmemiştir.

TARTIŞMA VE SONUÇ

Bu çalışmada ilkokul öğrencilerine uygulanan cimnastik ve taekwondo antrenmanlarının denge, esneklik ve dikey sıçrama etkileri branşa göre karşılaştırılmıştır. Çalışmaya CG ($n=10$), TG ($n=10$) ve KG ($n=10$) olmak üzere 3 grup katılmıştır. CG ve TG haftada 2 gün ve toplamda 8 hafta boyunca branşa özgü antrenmanlarını gerçekleştirmişlerdir (Tablo 2). KG ise bu süre içerisinde herhangi bir antrenman programına katılmamıştır. Katılımcılardan 8 haftanın başında ve sonunda olmak üzere iki defa ölçümler alınmıştır. Çalışma bulguları bu spor

branşlarının öğrencilerin denge, esneklik ve sıçrama becerilerini geliştirmede önemli bir rol oynadığını göstermektedir.

Araştırma bulgularına dayanarak, grup içi karşılaştırma sonucunda CG ve TG'nin esneklik ve dikey sıçrama değişkenlerinde anlamlı farklılık bulunmuştur (Tablo 3). Buna ek olarak gruplar arası karşılaştırmada CG ve TG'nin esneklik değişkeninde CG lehine istatistiksel açıdan anlamlı farklılık bulunmasına karşın, dikey sıçrama değişkeninde ise her iki grup arasında anlamlı bir fark tespit edilmemiştir (Tablo 6). Ayrıca 8 haftalık çalışma sonunda esneklik parametresinde CG %13,47, TG %5,52 ve KG %1,22 gelişim göstermiştir. Dikey sıçrama parametresinde ise CG %21,66, TG %11,54 ve KG'nin %-0,51 gelişim gösterdiği bulunmuştur. Bu sonuçlar cimmastik eğitimi alan öğrencilerin esneklik ve dikey sıçrama becerilerinin taekwondo eğitimi alan öğrencilere kıyasla belirgin bir şekilde daha iyi olduğunu göstermektedir.

Çalışmamızda esneklik parametresiyle ilgili yapılan analiz sonucunda, her iki grupta da gelişim gözlenmiştir. Herhangi bir çalışma yapmayan öğrencilerin (KG) gelişim düzeylerinde ise kayda değer bir ilerleme görülmemiştir. Özellikle cimmastik eğitime katılan öğrencilerde bu gelişim görece daha fazladır. Bunun sebebinin cimmastik antrenman programının vücut esnekliğini içeren bir dizi egzersiz ve tekniklerden oluşması ve böylece kas esnekliğini artırarak öğrencilerin daha geniş bir hareket aralığına sahip olmalarını sağlamasından kaynaklandığı düşünülmektedir. Elde edilen bu sonuçlar önceki çalışma bulgularıyla uyumludur (Alpkaya, 2013; Delac vd., 2007; Demirel vd., 2016; Kesilmiş ve Akın, 2018; Sevinç vd., 2015). Ek olarak Savucu ve diğerleri (2018) 12 haftalık cimmastik antrenmanının 6-7 yaş grubu öğrencilerde esneklik performansını arttırdığını ortaya koymuşlardır. Çoknaz ve diğerleri (2008) cimmastik öğrencilerine farklı germe egzersizleri uygulayarak esneklik performansında artış olduğunu belirtmişlerdir. Öte yandan taekwondo sporunda ise yüksek seviyeye yapılan vuruşları gerçekleştirmek, güçlü ve yüksek hızda bir vuruş yapabilmek ve aynı zamanda rakipten gelen hücum tekniklerinden korunmak için esneklik son derece önemlidir. Bu kapsamda Chang (2014), ilkokul öğrencilerine 12 hafta boyunca taekwondo antrenman programı uygulamış ve bunun sonucunda öğrencilerin esneklik parametresinde artış olduğunu ortaya koymuştur. Benzer şekilde Koh'da (2018) ilkokul öğrencilerinde taekwondo antrenmanının esnekliği arttırdığını tespit etmişlerdir. Bu sonuçlar çalışma bulgularımızla uyumludur. Taekwondo branşı gereği esneklik bu sporun temel unsurlarından biridir. Antrenman içeriğindeki yüksek vuruşlar, düşük vuruşlar ve dönüş hareketleri gibi teknik unsurların sıklıkla kullanılması nedeniyle esnekliğin bu branşta geliştiği düşünülmektedir. Çalışmamızda cimmastik ve taekwondo antrenmanlarının öğrencilerin sıçrama becerisi üzerinde olumlu bir etkisi olduğu bulunmuştur. Her iki sporda da öğrencilerin sıçrama yeteneklerinin arttığı gözlenmiştir. Bu sonuçlar öğrencilerin kas gücünü arttırarak sıçrama becerilerini geliştiren cimmastik ve taekwondo sporlarının ilkokul çağındaki çocuklar için faydalı olabileceğini göstermektedir.

Grupların alt ekstremite denge sonuçlarına bakıldığında, grup içi karşılaştırmada CG lehine istatistiksel açıdan anlamlı farklılıklar olduğu bulunmuştur. TG'nin sağ bacak anterior değişkeni hariç diğer bütün değişkenlerinde ve KG'nin bütün değişkenlerinde istatistiksel açıdan bir fark tespit edilmemiştir (Tablo 4). Gruplar arası karşılaştırmada sol bacak composite değişkeninde CG lehine anlamlı fark bulunmuştur (Tablo 7). Grupların üst ekstremite denge

sonuçlarında grup içi karşılaştırmada CG lehine istatistiksel açıdan anlamlı farklılıklar olduğu ortaya konulmuştur (Tablo 5). Gruplar arası karşılaştırmada ise her iki grup arasında istatistiksel açıdan anlamlı bir fark bulunmamıştır (Tablo 8). Ek olarak analiz sonucunda denge parametresinde en fazla gelişimin CG’de olduğu görülmektedir. TG’de bu gelişim nispeten küçük yüzdelerde olduğu bulunmuştur. KG’de ise gelişim gözlenmemiştir. Buradan hareketle cimnastik antrenmanına katılan öğrencilerin denge becerilerinin taekwondo antrenmanına katılan öğrencilerden daha iyi olduğu sonucuna ulaşılmıştır.

Çalışmamızda cimnastik ve taekwondo antrenmanlarının ilkökul öğrencilerinin denge becerisini geliştirmede etkili olduğu bulunmuştur. Bu etki özellikle cimnastik antrenmanlarında daha fazladır. Çünkü cimnastik branşında, yarışma puanlamalarında dahi dengenin en önemli parametrelerden birisi olması, antrenman içeriğinde denge geliştirici çalışmalara daha fazla yer verilmesi ve sürekli olarak dengenin ön planda olması bunun sebebi olduğunu düşündürmektedir. Bu sonuçlar önceki çalışma bulgularıyla benzerlik göstermektedir (Asseman vd., 2008; Kesilmiş ve Akın 2018). Ayrıca Bayraktar (2005) cimnastik, yüzme ve atletizm öğrencilerinin denge performanslarını karşılaştırmış ve cimnastik eğitimi alan öğrencilerin denge performanslarının diğer branştaki öğrencilerden daha iyi geliştiğini ortaya koymuştur. Benzer şekilde Davlin (2004) cimnastik öğrencilerinin denge yeteneğinin yüzücülere, futbolculara ve kontrol grubuna göre daha iyi olduğu sonucuna ulaşmıştır. Aydın ve diğerleri (2002) cimnastik ve kontrol grubunun denge yeteneğini karşılaştırmış ve cimnastik lehine anlamlı farklılıklar ortaya koymuşlardır. Cimnastik branşında alt ve üst ekstremitelerin doğru bir şekilde hareket etmesi için vücut dengesinin önemi göz önüne alındığında, bu bulgular cimnastiğin bedensel farkındalığı, koordinasyonu ve dolayısıyla dengeyi geliştirme potansiyeline sahip olduğunu doğrulamaktadır. Çalışmamızda taekwondo antrenmanı yapan öğrencilerin ise denge becerilerinde kısmen gelişim saptanmış, ancak bu gelişim istatistiksel olarak anlamlı çıkmamıştır. Araştırmada sadece alt ekstremiten sağ bacak anterior değerinde anlamlı bir fark tespit edilmiştir. Yapılan gözlem sonucunda, taekwondo öğrencilerinin antrenmanlarda sürekli olarak öne sert ayak vuruşları gerçekleştirmesinden ve tek ayak dengede durmaları gerektiğinden dolayı bu farkın oluştuğu düşünülmektedir. Bu sonuçlar diğer çalışma bulgularıyla örtüşmemektedir. Çünkü Choo (2011), ilkökul öğrencilerine 8 haftalık taekwondo antrenman programı uygulamış ve bu süre sonunda öğrencilerin denge performanslarında anlamlı farklılık olduğunu ortaya koymuştur. Başka bir çalışmada Sevinç ve diğerleri (2015) taekwondo antrenmanının dengeye etkisini incelemişler ve araştırma sonunda öğrencilerin denge parametrelerinde anlamlı farklılıklar olduğunu tespit etmişlerdir.

Sonuç olarak, bu çalışmanın bulguları ilkökul öğrencilerinde cimnastik ve taekwondo antrenmanlarının denge, esneklik ve sıçrama parametrelerini geliştirmede etkili olduğunu göstermektedir. 8 haftanın sonunda cimnastik antrenmanı yapan öğrencilerin denge, esneklik ve dikey sıçrama parametrelerinde gelişim gösterdiği, taekwondo antrenmanı yapan öğrencilerin ise esneklik ve dikey sıçrama parametrelerinde gelişim gösterdiği bulunmuştur. Çalışmadaki antrenman programları dikkate alındığında cimnastik antrenmanlarının temel taekwondo antrenmanlarına kıyasla denge, esneklik ve dikey sıçrama parametreleri üzerinde olumlu etkisinin görece daha yüksek olduğu olduğu söylenebilir. İlkokul çağındaki öğrencilerin fiziksel gelişimlerini desteklemek için cimnastik ve taekwondo gibi sporlara yönelmeleri tavsiye edilebilir.

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Gençlik Spor Bakanlığının Kurumsal İmajının İşe Başvurma Niyetine Etkisinde Kişi-İş Uyumunun Aracı Rolü

Mustafa Ertan TABUK^{1*} 

¹ Hitit Üniversitesi, Spor Bilimleri Fakültesi, Çorum.

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Öz

Araştırma spor bilimleri alanından mezun olacak öğrencilerin istihdam amaçlı iş başvurularında Gençlik Spor Bakanlığının (GSB) kurumsal imajının işe başvurma niyetine etkisinde kişi-iş uyumunun rolünü belirlemek amacıyla yapılmıştır. Bu amaçla oluşturulan araştırma modeli yapısal eşitlik modeliyle test edilmiştir. Araştırma kolayda örneklem yöntemi ile 7 farklı coğrafi bölgeden 18 üniversitenin 3. ve 4. sınıfta öğrenim gören öğrencilerinden oluşturulan örneklem (n=407) ile gerçekleştirilmiştir. Verilerin elde edilmesinde Saks ve Ashforth (2002) tarafından geliştirilen dört maddeli tek boyutlu kişi-iş uyumu ölçeği, Lemmink vd., (2003) tarafından kullanılan kurumsal imaj ölçeği, Rau ve Hyland (2002) tarafından ortaya atılan Cable ve Judge (1994) ile Honeycutt ve Rosen (1997) tarafından geliştirilen örgütsel çekicilik ölçeği, Herdman ve Carlson (2009) tarafından geliştirilen işe başvurma niyeti ölçeği ve Gomes ve Neves (2011) tarafından geliştirilen tanınırlık ölçeğinden yararlanılmıştır. Elde edilen verilerin analizinde güvenilirlik analizi, tanımlayıcı istatistikler, doğrulayıcı faktör analizi ve yol analizi kullanılmıştır. Araştırma sonuçlarına göre; kurumsal imajın örgütün sektörde bulunan pozisyonuna katkı sağladığı yani örgütün tanınırlığını artırdığı belirlenmiştir. Örgütsel çekiciliğin ise işe başvurma niyeti ile olan ilişkiye önemli ölçüde etkiye sahip olduğu ifade edilebilir. Sonuç olarak belirlenen değişkenlerden tanınırlık, kişi-iş uyumu ve kurum imajının işe başvurma niyeti ile orta ve yüksek düzeyde ilişkili olduğu, örgütsel çekiciliğin ise bu ilişkide aracı rol oynadığı belirlenmiştir.

Anahtar Kelimeler: Gençlik Spor Bakanlığı, İşe başvurma niyeti, Kişi-iş uyumu, Kurum İmajı, Örgütsel Çekicilik, Örgütsel Tanınırlık.

The Mediating Role of Person-Job Fit in the Effect of Corporate Image Perception of the Ministry of Youth and Sports on Intention to Apply for a Job

Abstract

The research was conducted to determine the role of person-job fit in the effect of the corporate image of the Ministry of Youth and Sports on the job application intention of students who will graduate from sports sciences. The research model created for this purpose was tested with the structural equation model. The research was carried out with the convenience sampling method, with a sample (n=407) consisting of 3rd and 4th grade students of 18 universities from 7 different geographical regions. In obtaining the data, a) the person-job fit scale developed by Saks and Ashforth (2002), b) the corporate image scale used by Lemmink et al. (2003), c) the organizational attractiveness scale developed by Cable and Judge (1994) and Honeycutt and Rosen (1997) put forward by Rau and Hyland (2002), d) the job application intention scale developed by Herdman and Carlson (2009) and e) the recognition scale developed by Gomes and Neves (2011) were used. Reliability analysis, descriptive statistics, confirmatory factor analysis and path analysis were used in the analysis of data obtained. According to the research results, it has been determined that corporate image contributes to the position of the organization in the sector, that is, it increases the recognition of the organization. It can be stated that organizational attractiveness has a significant effect on the relationship with the intention to apply for a job. As a result, it was determined that familiarity, person-job fit and corporate image were moderately and highly correlated with the intention to apply for a job, while organizational attractiveness played a mediating role in this relationship.

Keywords: Ministry of Youth and Sports, Intention to Apply, Person-job Fit, Corporate Image, Organizational Attractiveness, Familiarity.

* Sorumlu yazar: Doç. Dr. Mustafa Ertan TABUK, E-posta: ertantabuk@gmail.com

GİRİŞ

Spor faaliyetlerinin yürütülebilmesi gerekli olan etmenlerden biri de insan kaynağıdır. Sektörün insan kaynağı ihtiyacı büyük ölçüde üniversiteler tarafından sağlanmaktadır. Spor elemanlarının yetiştirilmesi için üniversitelerde akademik disiplinler bulunmaktadır. Ülkemizde spor bilimleri disiplini hızla gelişmekte olup yükseköğretim kurumlarında, 56 spor bilimleri biriminde spor elemanı yetiştirilmektedir. Üniversitelerin Spor bilimleri birimlerinde antrenörlük eğitimi, beden eğitimi öğretmenliği, rekreasyon eğitimi, spor yöneticiliği, spor bilimleri bölümü, engelliler için spor gibi programlar bulunmaktadır. Üniversite eğitimi ile spor bilimlerinde uzmanlaşan spor elemanları mesleki kariyerlerini gerçekleştirmek için kamu ve özel sektörde iş sahibi olmaya çalışmaktadırlar. Beden eğitimi öğretmenleri Milli Eğitim Bakanlığına (MEB) bağlı kamu ve özel okullarda istihdam edilerek öğretmenlik görevi yürütmektedirler. Antrenör, spor yöneticisi ve rekreasyon alanı mezunları ise, spor veya rekreasyon uzmanı gibi unvanlarla kamuda Gençlik ve Spor Bakanlığı'nda (GSB) özel sektörde ise diğer spor örgütlerinde istihdam edilmektedir.

Türkiye Cumhuriyeti Devleti politikaları doğrultusunda GSB'de çalıştırılmak üzere istihdam edilecek personel nitelikleri ve sayısı ilan edilmek suretiyle istihdam olanakları sunulmaktadır. Özel sektörde ise çeşitli spor federasyonları, spor kulüpleri ile vakıf ve dernekler gibi kar amacı gütmeyen, sportif faaliyetleri sürdüren kuruluşlar ile spor hizmeti sunan ticari kuruluşlar istihdama katkı sağlamaktadır. Dolayısıyla spor bilimleri mezunlarının kamu kurum ve kuruluşlarında çalışmak amacıyla başvuru yapabilecekleri iki temel kurum MEB ve GSB'dir. 2011 yılında kurulan GSB'nin tanınırlığı, cazibesi ve kurumsal imajının artmasıyla birlikte, spor bilimleri elemanlarının bu kurumda çalışmaya yönelik tercihlerini etkilediği düşünülmektedir.

Spor bilimi sektör uzmanları akademik açıdan üniversiteler tarafından yetiştirilmektedir. Tercih edilebilirlik anlamında yüksek rekabetin yaşandığı yüksek öğrenimde, üniversiteler de çeşitli yöntemlerle farklılık oluşturmaya çalışmaktadırlar. Benzer şekilde akreditasyon süreçlerini tamamlamış, eğitim-öğretim kalitesini geliştirmeye devam eden üniversitelerden mezun olan nitelikli spor bilim meslek çalışanlarının, GSB kadrolarında istihdam edilmesi kamu spor hizmetleri ve sporun geleceği açısından son derece önemlidir. Bu nedenle GSB'nin insan kaynaklarını geliştirmek adına kurumsal imaj çalışmaları yapması, tanınırlık ve çekiciliğini artırması ile sağlanabilir. Bu açıdan literatürde de belirtildiği üzere, kurumsal imaj çalışmalarının spor örgütlerinin stratejik hedefleri doğrultusunda rekabet avantajı sağlamak ve uzun dönemli kazanımlar elde etmek için önemli olduğu düşünülmektedir. Bununla birlikte kamu yönetimi anlayışının değişmesi ile birlikte bu tür uygulamaların artacağı, stratejik yönetim anlayışına önem verileceği dikkate alındığında, kurumsal imajın öneminin artacağı öngörülmektedir. İfade edilen bu nedenlerle araştırma konusu GSB'nin kurumsal imajının işe başvurma niyetine etkisi olarak tasarlanmış, mezunların sahip olduğu bilgi, beceri ve yeteneklerinin çalışma alanına uygunluğunu inceleyen kişi-iş uyumunun bu tercih sürecinde ne derece etkili olacağının belirlenmesi olarak tanımlanmıştır.

Türkiye’de Spor Yönetimi ve Gençlik ve Spor Bakanlığı

Türkiye’de spor yönetimi faaliyetleri 1922 yılında kurulan “*Türkiye İdman Cemiyetleri İttifakı*” (TİCİ) tarafından 1936 yılına kadar sürdürülmüş, 1936 – 1938 yıllarında Türk Spor Kurumu ve devamında birçok isim değişikliği geçirerek bugünkü adıyla anılan Spor Hizmetleri Genel Müdürlüğü (SGM) sporun tepe örgütü olarak konumlandırılmıştır. Günümüzde spor, GSB’na bağlı Spor Hizmetleri Genel Müdürlüğü (SGM) merkez ve taşra teşkilatı tarafından sevk ve idare edilmektedir (Fişek,1985; Özsoy vd., 2014). Spor Hizmetleri Genel Müdürlüğü 1938’den beri çeşitli isimlerle (*Beden Terbiyesi Umum Müdürlüğü, Beden Terbiyesi Genel Müdürlüğü, Gençlik ve Spor Genel Müdürlüğü vb.*) farklı bakanlıklara (Başbakanlık, 1970-GSM, MEB) bağlanarak sporun yaygınlaştırılması temel görevini yerine getirmeye çalışmıştır.

Gençlik ve Spor Bakanlığı; gençliğin kişisel ve sosyal gelişimi ile sporun yaygınlaştırılması için gençlik ve spor faaliyetlerine dair politikalar üretmek, organizasyonların sevk ve idaresi ile ilgili örgütlerin kanunlara uygun olarak yürütülmesi ve spor faaliyetlerinin koordinasyonunu sağlamakla görevli kamu kuruluşudur. Gençlik ve Spor Bakanlığı, bünyesinde faaliyet gösteren a) Gençlik Hizmetleri Genel Müdürlüğü, b) Kredi ve Yurtlar Genel Müdürlüğü ve c) Spor Hizmetleri Genel Müdürlüğü birimleri aracılığı ile gençliğin gelişim ve barınma ihtiyaçlarının sağlanmasına, kültürel-sosyal etkinlikler ile spor faaliyetleri oluşturulmasına imkan sunar. Her yaştaki Türk vatandaşlarına yapılacak tüm spor hizmetleri GSB tarafından gerçekleştirilmektedir. GSB Türk vatandaşlarına yönelik spor, sanat ve kültürel faaliyetler düzenleyen iki ayrı genel müdürlük yapısı ile faaliyetlerini sürdürmektedir. Özellikle Spor Hizmetleri Genel Müdürlüğü yurt çapında örgütlü yapısı ile spor faaliyetlerinin sevk ve idaresini merkez ve taşra teşkilatı örgütlenme yapısı ile gerçekleştirir. Merkez teşkilatı spor ile ilgili daire başkanlıkları ve federasyonlar gibi unsurlardan oluşmaktadır. Taşra teşkilatı ise; ülke çapında il ve ilçelerde kamu yönetim prensiplerine dayalı örgütlü yapısı ile sorumluluk alanında sporun geliştirilmesini ve yaygınlaştırılmasını sağlamaya çalışan yerel birimlerdir (T.C. Resmi Gazete, 1986). Bu yapıda merkez teşkilatında bulunan spor federasyonları özel bir yönetime sahiptir. Spor dallarının gelişmesi ve yaygınlaştırılmasından sorumlu ve yükümlü, devlet desteği ve imkanları ve diğer federasyon gelirleri ile faaliyet gösteren, seçimle belirlenen bağımsız bir yönetim ve denetim organlarına sahip ulusal spor federasyonları (Nagel vd., 2015), sporun sevk ve idaresinde yetki devri yapılmış kurumlardandır (T.C. Resmi Gazete, 2012). Spor federasyonları hem kamu görevlileri hem de kendi istihdam ettikleri sözleşmeli personel ile faaliyet sürdürmeye devam etmektedir. Kamu tarafından istihdam edilen spor elemanları; spor genel müdürlüğü merkez ve taşra teşkilatında görevlendirilmektedir. Dolayısıyla spor bilimleri mezunlarının çalışmak istediği en önemli kamu kurumunun GSB ve bağlı birimleri olduğu düşünülmektedir. Bu bağlamda GSB’nin kurumsal imajı önem kazanmaktadır.

İşe Başvurma Niyeti

İşe başvurma niyeti, bireyin iş seçimi ve örgütün çekicilik düzeyi arasındaki ilişkiye odaklanır (Gomes ve Neves, 2011). Örgüt standartları, değer ve normları ile kalite algısı gibi faktörler bireylerin işe başvurma niyetinde etkilidir (Tsai vd., 2009). Aday çalışanlar iş ilanı veren örgüt ve iş hakkında araştırmalar yaparak bunları çözümlenmeye çalışırlar. İşe alım ve başvuru sürecinde uygulanan yöntem ve araçlar, bireyin işe başvurma niyetinde önemli bir rol oynar (Madera, 2012). Spor hizmetlerinde kamusal istihdamın en yüksek kapasiteye sahip temel

örgütü olan GSB önemli bir marka değeri olarak görüldüğü düşünülmektedir. GSB'nin spor yönetiminde tekel olması ve iş güvencesi sağlaması tercih edilirliliğini artırırken, yükseköğretimde işsizlik rakamlarındaki artış (TÜİK, 2022) ile spor bilimleri alanı mezunlarının sayısının fazlalığı nedeniyle GSB'nin tercih edilebilirliği sınırlandırılmaktadır. Özel sektördeki kurumsallaşma ve iş güvencesi problemleri ile başka iş olanaklarının azlığı marka değeri veya imajın sorgulanmasını geri plana itebilir.

Örgütsel Tanınırlık

Örgütsel tanınırlık, adayın örgüte karşı algıladığı farkındalık derecesidir (Cable ve Turban, 2001). Tanınırlık hem örgüt hem de birey açısından önemli bir kavramdır. Bireylerin sosyal kimliğine katkı sağladığı, örgütlerin ise nitelikli çalışanların örgüte çekilmesi ve var olanların bağlılığını artırması açısından önemlidir. Birey açısından bakıldığında örgüt imajının ve tanınırlığın niteliği bireyin sosyal sınıfı açısından önemli görülmektedir. Bireyler tanınırlığı yüksek örgütlerde çalışmaya daha isteklidirler. Son yıllarda örgüt imajı üzerine yapılan çalışmalarda tanınırlığın artırılmasının önemli olduğu vurgulanmıştır (Abell ve Becker, 2021). Nitelikli çalışan adaylarının örgüte çekilmesi örgüt açısından önemlidir. Bir örgüte karşı bireysel olarak hissedilen çalışma isteği çekicilik olarak ifade edilmektedir (Abell ve Becker, 2021; Gomes ve Neves, 2011; Katz, 2018; Turban, 2001). Aday çalışanlar işe başvuracakları örgütün çekiciliğini önemsemektedir. Çekicilik ve tanınırlık arasındaki bu korelasyon kurumsal imajın tanınırlık boyutunun her iki taraf (birey-örgüt) için de önemli bir etken olduğu düşünülmektedir.

Örgütsel Çekicilik

Uzmanlık sahibi olan bireyler çalışma hayatına atılarak kariyer sahibi olma isteği doğrultusunda uzmanlık alanı ile ilgili örgütlerde çalışma niyetiyle iş başvurusu yaparlar. Bireyin çalışmak istediği örgütün çekiciliği, iş başvurularında önemli görülmekle birlikte örgütsel çekiciliğinin, kurumsal itibarın önemli bir etkeni olduğu belirlenmiştir (Nugroho ve Liswandi, 2018). Örgütsel çekicilik kariyer adaylarının yeteneklerinin, nitelikli işgücü, etkililik ve firma imajı gibi örgüt beklentileri (Dural vd., 2014) ile uyumlu hale getirilmesidir. Diğer bir deyişle, aday çalışanların beklentilerinin örgütsel kurallarla uyumlu hale getirilmesi anlamına gelen örgütsel çekicilik (Eren, 2000:67), entelektüel sermaye birikiminin bir sonucu olarak değerlendirilebilir. Örgütsel çekicilik, örgüte karşı tutum, pozitif duygu ve düşünceler, bireyin örgütte çalışma arzusu ve örgüt imajını güçlendirmeye yönelik yönetim faaliyetleri gibi ifadelerle tanımlanmaktadır (Aiman-Smith vd., 2001; Gomes ve Neves, 2011; Highhouse vd., 1998; Sparvero ve Chalip, 2007; Tsai ve Yang, 2010).

Kavram, birey tepkilerinin oluşum ve gelişimine odaklanan *çevresel süreç kuramı*, birey-çevre uyumu kavramından oluşan *etkileşimsel süreç kuramı* ve bireyin benlik ve yeterlilik gibi içsel özelliklerine dayanan *özsel süreç kuramı*, örgütsel çekicilik algısının ortaya konulması için tanımlanan ana kuramlardır (Ehrhart ve Ziegert, 2005). Bu kuramlar aracılığıyla tanımlanan kavram, birey ve örgüt arasında kurulacak iş ilişkisinin niteliği ile örgütün nitelikli çalışma ortamının oluşturulmasında, örgüt imajının geliştirilmesinde, örgütsel çekiciliğin kurumsal açıdan önemini vurgulamaktadır. Birey tarafından çekici olarak algılanan örgüte yönelik yaklaşma niyetiyle işe başvuru ile sonuçlanabilirken, örgütün çalışan kazanması, bireyin işe sahip olması açısından önemli bir kavram olduğu vurgulanmaktadır.

Örgütsel tanınırlığın artmasıyla birlikte çekiciliğinin de artacağı bu nedenle işe başvurma niyetinin de olumlu yönde etkileneceği düşünülmektedir. Birey açısından sosyal sınıf etkisi olan tanınırlık, örgütte çalışma isteğini artırmaktadır (Gomes ve Neves, 2011; Turban, 2001). Bununla birlikte bireyler yalnızca çekici buldukları örgütlerde çalışmaya yönelik başvuru yaptıkları belirlenmiştir (Turban ve Keon, 1993). Aday çalışanların işe başvurma niyetini etkileyen örgütsel çekicilik iş yeri seçimi kararında önemli bir faktördür (Dündar Akçay, 2012). Çekici bulunan örgütlere çalışma isteğinin işe başvurma niyetini artıracacağı düşünülmektedir. Örgütsel tanınırlık, çekicilik ve işe başvurma niyeti arasındaki olumlu ilişkiyi destekleyen araştırma bulgularından oluşturulan ilk hipotez:

H₁: Tanınırlığın işe başvurma niyeti üzerindeki etkisinde çekicilik aracı rol oynamaktadır.

Kişi-İş Uyumu

Edwards ve Cooper (1990) tarafından literatüre kazandırılan kişi-iş uyumu bireyin yaptığı iş ile ne derece uyumlu olduğunu tanımlamaktadır (Earnhardt, 2012). Kişi-iş uyumu yalnızca kişi ile iş arasındaki uyuma odaklanan kişi-çevre uyumunun alt boyutudur (Edwards vd., 2006). Sadece işin önemini ortaya koyan (Polatçı ve Cindiloğlu, 2013) kişi-iş uyumu, iş nitelikleri ve bireyin yetenekleri arasında gerçekleşen eşleşme (Tomlinson ve Winston, 2011), yani birey özellikleri ile iş tanımında belirtilen ve adayda aranan özelliklerin uyumudur (O'Reilly vd., 1991; Yıldırım-Bulut ve Torun, 2007). İş talepleri genellikle işi kabul edilebilir düzeyde gerçekleştirmek için gereken bilgi, beceri ve yeteneklerden oluşur (Caldwell ve O'Reilly, 1990; Wilk ve Sackett, 1996). Yetenekler; eğitim, deneyim ve çalışan yeteneklerini ya da bilgi, beceri ve yetenekleri içerir (Dawis ve Lofquist, 1984; French vd., 1982). İşveren tarafından ortaya konulan iş talepleri bilgi ve beceri üzerine odaklanırken, yetenekler çalışan adayının eğitim durumu, deneyim ve kişisel becerilerine odaklanmaktadır.

Spor bilimleri alanında eğitim alan öğrencilerin çoğunluğu özel yeteneklerini mesleki kariyere dönüştürmektedir. Bu nedenle ilgili oldukları spor dalında uzmanlaşma amacıyla bu bölümlerde eğitim-öğretim görmektedirler. Öğrenim süresi boyunca uzmanlık alanına yönelik çeşitli çalışmalar vasıtasıyla süreci yaşayarak deneyim kazanırlar. İş nitelikleri ve bireyin yetenekleri arasındaki uyum olan kişi-iş uyumunun (Sekiguchi ve Huber, 2011; Tomlinson ve Winston, 2011; Wheeler, vd., 2005) spor bilimleri öğrencilerinde daha yüksek olduğu düşünülmektedir. Bu nedenle spor sektöründe kamusal personel istihdamı sağlayan temel kurum olan GSB'yi daha çekici bulacakları öngörülebilir. İlk hipotezde de belirtildiği gibi çekiciliğin işe başvurma niyetine olan olumlu etkisi de dikkate alındığında kişi-iş uyumu, çekicilik ve işe başvurma niyeti arasındaki olumlu ilişki destekleyen araştırma bulgularından hareketle oluşturulan hipotez;

H₂: Kişi iş uyumunun işe başvurma niyeti üzerindeki etkisinde çekicilik aracı rol oynamaktadır.

Kurum İmajı

Kurumsal imaj, "örgütün bireylerin zihninde bıraktığı toplam izlenim" olarak tanımlanır (Dichter, 1985) ve "örgüt bileşenlerinin örüntüsünü kapsayan genel tahmindir" (Fombrun, 1996: 37). Dichter (1985) göre kurumsal imaj reklam, pazarlama ve iletişim faaliyetlerine yönelik yönetim uygulamalarının yön veren ve insanların algı biçimindeki en güçlü etkiye sahip olarak önemi vurgulanan bir kavramdır. Kurumsal süreçlerde ve personel davranışında

kendini gösteren değerler, inançlar ve temel varsayımlar kurumsal imajın şekillenmesinde önemli bir faktör olacaktır (Hatch ve Schultz, 1997). Kurumsal imaj, örgütsel pazarlama iletişimi, örgüt ile doğrudan temas ve sözel iletişim yoluyla insanlar arasında aktarımla gerçekleşerek örgüt ürün ve hizmetlerine yönelik yabancıların farkındalığı ve aşinalığı ile şekillenmektedir (Dowling, 1993; Pope ve Voges, 2000). Kurumsal imajı belirlemeye yönelik bir yaklaşımda, örgütlerin "kurumsal karakterini" veya "kişiliğini", örneğin uyumluluk, acımasızlık ve şıklık gibi insani özellikler açısından değerlendirmektir (Davies vd., 2004). Kurum imajı örgüt çalışanları ile hizmet alan kitle arasındaki etkileşimden ortaya çıkmaktadır. Sportif ürün ve hizmetlerin sunumu ile bu etkileşim meydana gelir. Spor sektöründe kurumsal imajın tüketicinin satın alma niyetinde önemli bir faktör olduğu söylenebilir (Pope ve Voges, 2000). Bu bağlamda kamusal spor yönetimini sevk ve iare ederek spor ürün ve hizmetlerinin yayılması ve yaygınlaştırması görevi ile topluma hizmet eden GSB'nın kurum imajı önem kazanmaktadır.

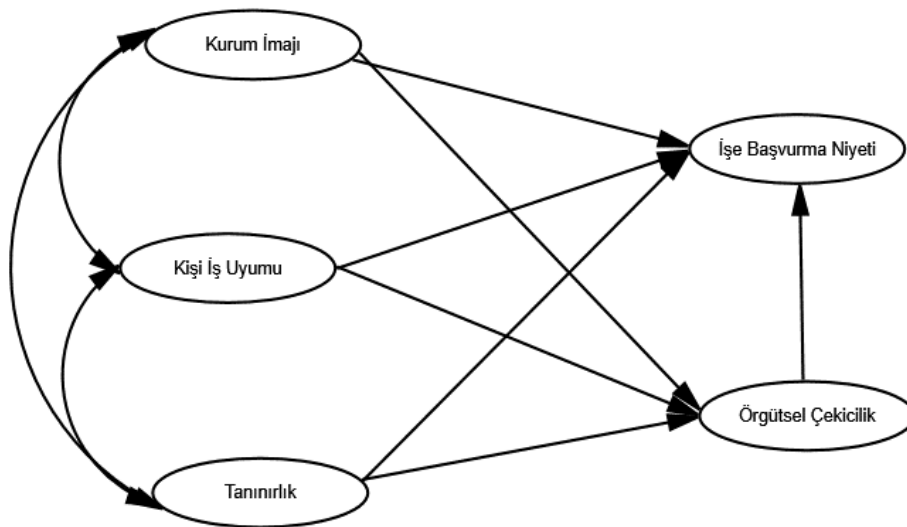
Kurum imajı, örgütün sektördeki prestijini artırıp tanınırlığa katkı sağlamaktadır (Altun, 2021). Örgütlerin reklam, pazarlama ve iletişim faaliyetlerini temel sebebi örgütün gelişmesini sağlamaktır. Bu amaçla gerçekleştirilen tüm yönetim faaliyetleri örgütün imajına katkıda bulunmaktadır (Poon Teng Fatt vd., 2000). İnsanların kurum hakkındaki algıları o örgüt ile bağ kurmaya yönelik davranışlar geliştirilmesiyle sonuçlanabilir (Pina vd., 2006). Yüksek kurum imajına sahip örgütlerde çalışma isteği daha fazladır. Algılanan yüksek kurum imajının örgütsel çekicilik ile işe başvurma niyetine olumlu etki sağlayacağı görüşüne dayanarak oluşturulan araştırma hipotezi;

H₃: Kurum imajının işe başvurma niyeti üzerindeki etkisinde çekicilik aracı rol oynamaktadır.

YÖNTEM

Araştırma Modeli

Hipotezlerden hareketle araştırmada test edilmek istenilen model Şekil 1'de görülmektedir.



Şekil 1. Araştırma modeli

Modelde görülen araştırma değişkenleri ile birlikte cinsiyet, öğrencinin kayıtlı olduğu program, antrenörlük-liderlik-spor uzmanlığı gibi sertifikalara sahip olmak gibi değişkenler, araştırmaya katılan öğrencilerin nitelik değerlendirmesi ve bu sayede güvenilirliğin artırılması amacıyla eklenmiştir. Bu özelliklerin araştırmada kullanılan değişkenler üzerinde etkili olduğu düşünülmektedir. Örneğin antrenörlük liderlik veya spor uzmanlığı sertifikası sahibi olan öğrencilerin GSB teşkilatını daha çekici buldukları ifade edilebilir. Araştırma örnekleminin GSB'na başvuru yapacak nitelikleri taşıdığı düşünülen uzmanlık belgesi sahibi adaylardan oluşmasının çalışmanın güvenilirliğini artıracakı düşünülmektedir. Araştırmanın demografik değişkenlerine ilişkin bulgular Tablo 1'de sunulmuştur.

Evren-Örneklem

Araştırma evreni spor bilimleri fakülte/yüksekokullarında eğitim-öğretime devam eden, antrenörlük, spor yöneticiliği ve rekreasyon bölümü son sınıf öğrencileridir. İfade edilen eğitim-öğretim programlar kontenjanlarına ve dağılımı Tablo 1'de görülmektedir.

Tablo 1. 2021 Spor Bilimleri kontenjanları (YKS sonucu ile Özel Yetenek Sınavı toplamı)

	Antrenörlük		Spor	Toplam	Genel Toplam
	Eğitimi	Rekreasyon	Yöneticiliği		
Spor Bilimleri Fakültesi n=37	665	602	1121	2428	4539*
Beden Eğitimi ve Spor Yüksekokulu n=19	1020	222	869	2111	

* YKS sonucu ve Özel Yetenek Sınavı ile öğrenci alan programların toplamı, Kaynak: 2021 Yükseköğretim programları ve kontenjanları kılavuzu

Türkiye'de spor bilimleri fakülte/yüksekokul yapılanmasında eğitim öğretim gören yaklaşık 18.000 öğrenci bulunmaktadır. Bu öğrencilerin yalnızca son sınıfta okuyanlar (n=4500 +/-100) araştırma evreni olarak belirlenmiştir. Araştırma kapsamında Türkiye coğrafi bölgeleri (n=7) dikkate alınarak her bölgeden en az bir üniversite belirlenmesi hedeflenmiştir.

Araştırmada kolayda örnekleme kapsamında 7 farklı coğrafi bölgeden, 18 üniversitede spor bilimler fakültesinde eğitim öğretime devam eden 3 ve 4. sınıfa kayıtlı öğrencilere anket uygulanmıştır. Mezuniyet sonrası işe başvurma niyeti içinde olduğu düşünülen 487 öğrenciye uygulanan anketlerden 80 (n=62 eksik, n=18 hatalı doldurma) anket çalışma güvenilirliği nedeniyle veri setinden çıkarılmış, kalan 407 anket SPSS 21 ve Amos 6.0 paket programları ile analiz edilmiştir.

Yapısal eşitlik modellemesinde değişkenler ve faktör sayısı ile ilişkilerin güvenilirliğini sağlamak amacıyla, örneklemin büyüklüğü ölçek toplam ifade sayısının en az 10 katına veya en az 200 örneklem sayısına ulaşılması beklenmektedir (Büyüköztürk, 2002). Bununla birlikte sosyal bilimlerde yapılan bu tür araştırmalar için örneklemin belirlenmesinde Yazıcıoğlu ve Erdoğan (2014) göre ± 0.05 örnekleme hatası $p=0,05$ anlamlılık düzeyinde 357 olarak belirlenmiştir. Çalışmada örnekleme ilgili literatürde ifade edilen tüm koşullar sağlanmıştır (n=407). Araştırma bulgularından oluşturulan demografik özellikler Tablo 2'de verilmiştir.

Araştırma Yayın Etiği

Bu çalışmanın etik kurul onayı araştırma öncesinde 16.05.2022 tarih, 2022-09 karar numarası ile Hitit Üniversitesi Girişimsel Olmayan Araştırmalar Etik Kurulu'ndan alınmıştır.

Veri Toplama Yöntemi ve Araçları

Araştırma iki bölümlü bir veri toplama aracı kullanılarak gerçekleştirilmiştir. Birinci bölümde; cinsiyet, kayıtlı olunan akademik program, sınıf, sertifika sahipliği, spor sektör deneyimi (tam/yarı zamanlı, stajyer) ve çalışma süresini içeren açık uçlu 8 özellikten oluşan demografik değişken yer almaktadır. İkinci bölüm ise 5 farklı değişken ile ilgili ölçeklerin kullanıldığı, 5'li likert formatında hazırlanmış toplam 18 ifadeden oluşmaktadır. Katılımcıların sektörel ilgi alanlarında farklılık olacağı düşünülerek yalnızca kamu istihdamı sağlayan GSB tercih edilmiştir.

Kişi-iş Uyumu Ölçeği: Araştırmada Saks ve Ashforth (2002) tarafından geliştirilen dört maddeli tek boyutlu kişi-iş uyumu ölçeği kullanılmıştır. Çeşitli araştırmalarda ölçeğin Cronbach alpha değerini 0,80 (Bayram, 2016) ve 0,79 (Söylemez ve Tolon, 2019) olduğu belirlenmiştir.

Kurum İmajı Ölçeği: Lemmink vd., (2003) tarafından kullanılan kısa dönemli deneyimlerin ölçümlenmesine yönelik olarak hazırlanan ölçek 3 ifadeden oluşmaktadır. Türkçe geçerlik ve güvenilirlik çalışması Yıldız (2013) tarafından gerçekleştirilen ölçeğin Cronbach alfa değerini .81 olarak rapor etmiş, üniversite öğrencileri ile ilgili bir araştırmada ise .84 olarak hesaplanmıştır (Erçetin ve Büyükgöze, 2017).

Örgütsel Çekicilik Ölçeği: Rau ve Hyland (2002) tarafından ortaya atılan Cable ve Judge (1994) ile Honeycutt ve Rosen (1997) tarafından geliştirilip test edilen 5 ifadeli ölçek kullanılmıştır. Farklı araştırmacılar tarafından yapılan çalışmalarda ölçeğin güvenilirlik değerleri ,83 (Ergun ve Tatar, 2016) ve 0,88 (Torres-Moraga vd., 2010) olarak belirlenmiştir. Geçerlilik ve güvenilirlik çalışması Akman ve Özdemir (2018) tarafından yapılan ölçeğin Cronbach Alfa katsayısı .94 olarak hesaplanmıştır.

İşe Başvurma Niyeti Ölçeği: Araştırmada Turban ve Greening (1996) tarafından geliştirilip zaman içerisinde sırasıyla Aiman-Smith vd. (2001), Turban (2002) ile Herdman ve Carlson (2009) tarafından revize edilen ölçek kullanılmıştır (Yıldız, 2013). Ölçek 4 ifadeden oluşmaktadır. Ergun ve Tatar (2016) örgütsel çıktılar üzerine yaptığı araştırmasında işe başvurma niyetinin Cronbach Alfa katsayısı ,83 olarak hesaplanmıştır.

Tanınırlık Ölçeği: Gençlik Spor Bakanlığının tanınırlığını belirlemek amacıyla, Roberson vd. (2005) tarafından geliştirilen iki ifadeli ölçek ile Gomes ve Neves (2011) tarafından geliştirilen ölçekten alınan iki ifade ile gerçekleştirilmiştir. Yardım kuruluşlarında tanınırlık üzerine yapılan bir araştırmada ölçeğin Cronbach Alfa katsayısı ,86 olarak hesaplanmıştır (Torres-Moraga vd., 2010). Görüldüğü üzere araştırmada kullanılan tüm ölçekler geçmiş çalışmalarda yüksek güvenilirlik değerleri elde etmişlerdir.

BULGULAR

Araştırmada elde edilen veriler ile gerçekleştirilen analizler ve hipotez testlerine dair bulgular şunlardır:

Tablo 2. Katılımcıların demografik özellikleri

		N	%
Cinsiyet	Erkek	247	60,5
	Kadın	161	39,5
Öğrenim programı	Spor yönetimi	180	44
	Antrenörlük	154	38
	Rekreasyon	73	18
Kaçınıcı sınıf öğrenci olduğu	4. sınıf	200	50,9
	3. sınıf	107	49,1
Antrenörlük belgesi sahibi	Evet	317	78
	Hayır	90	22
Gençlik Lideri sertifikası sahibi	Evet	53	13
	Hayır	354	87
Spor Yönetimi Sertifikası sahibi	Evet	42	10,4
	Hayır	367	89,6
Sektörel deneyim	Çalıştım	169	41,5
	Çalışmadım	238	58,5
Çalışma statüsü	Tam zamanlı	98	24,1
	Yarı zamanlı	127	31,2
	Stajyer	59	14,5
	Çalışmadım	123	30,2
Toplam		407	100,0

Araştırmaya katılan 407 bireyin demografik özellikleri (Tablo 2) incelendiğinde, erkeklerin (%60,5) kadınlara (%39,5) oranla daha fazla olduğu görülmektedir. Katılımcılar spor yöneticiliği 180 (%44), antrenörlük eğitimi 154 (%38) ve rekreasyon 73 (%18) bölümlerinde eğitim öğretim görmektedirler. Katılımcı öğrencilerin %49,1'i 3. sınıf (n=107) ve %50,9'u 4. sınıfta (n=200) eğitime devam etmektedir. Öğrencilerin büyük çoğunluğunun (n=317, %78) en az bir spor dalında antrenörlük belgesi sahibi olmasına rağmen, düşük düzeyde gençlik liderliği sertifikası (n=53, %13) ve spor yönetimi sertifikası (n=42, %10,4) sahibi oldukları görülmektedir. Aynı zamanda katılımcıların %58,5'i spor sektöründe çeşitli statülerde (tam zamanlı %24,1-yarı zamanlı %31,2) çalıştıklarını ifade etmişlerdir.

Tablo 3. Araştırmada kullanılan ölçeklerin güvenirlik analizi sonuçları

Kullanılan Ölçekler	α	İfade
Kişi iş uyumu	,808	4
Kurum imajı	,779	3
Örgütsel Çekicilik	,923	5
İşe Başvurma Niyeti	,921	4
Tanımlılık	,873	2

Araştırma sonuçlarından elde edilen verilere göre Cronbach's Alpha Katsayıları kişi-iş uyumu için $\alpha= ,808$, kurum imajı için $\alpha= ,779$, örgütsel çekicilik için $\alpha= ,923$, işe başvurma niyeti için

$\alpha = ,921$ ve tanınırlık için $\alpha = ,873$ olarak hesaplanmıştır. Bu sonuçlar, uygulanan ölçeklerden elde edilen verilerin güvenilir olduğunu göstermektedir.

Tablo 4. Araştırmada kullanılan ölçeklerin tanımlayıcı istatistikleri

	N	A. Ort.	Standart Sapma	Varyans
Kişi-iş uyumu	407	3,95	,77	,602
Kurumsal imaj	407	3,40	,89	,795
Örgütsel çekicilik	407	3,89	,95	,905
İşe başvurma niyeti	407	3,87	1,00	1,013
Tanımlılık	407	4,11	1,01	1,029

Araştırmaya katılan öğrencilerin verdiği cevaplar ile hesaplanan ortalama değerlerinin 3,40 ile 4,11 arasında değiştiği ve ortalamaların standart sapma değerleri ile ilişkisine göre katılımcıların verdiği cevapların güven aralığının orta yüksek çok yüksek aralığında olduğu görülmektedir. Ayrıca her bir yapı için hesaplanan ortalama varyans değerleri, minimum $< 0,50$ kriterini aşmıştır, bu da her bir yapı tarafından açıklanan varyansın ölçümle açıklanandan daha büyük olduğunu ifadelerin varyans değerlerinin normal dağılım ölçütlerine uygun olduğu görülmektedir. Araştırmada kullanılan ölçeklerin çarpıklık ve basıklık değerleri $\pm 1,96$ değerleri arasında bulunduğunu, bu nedenle verilerin normal dağıldığı ifade edilebilir (MacKenzie vd., 2011; Shaffer vd., 2016).

Doğrulayıcı Faktör Analizi (DFA) Sonuçları

Araştırma kapsamında oluşturulan modelin doğru tanımlanabilmesi için uyum iyiliği indeks değerlerinden elde edilen sonuçların doğrulanması gereklidir. DFA, ölçüm modelini değerlendirmek için, değişkenlerin önceden belirlenmiş herhangi bir bağlantısını temeldeki yapılarla, yani verilerin önerilen modele uyup uymadığını belirlemek için gerçekleştirilmiştir (Hair vd., 2010). Uyum iyiliği indeks değerlerine ait referanslar Tablo 5'te görülmektedir (Bayram vd., 2020). Sonuçlar araştırma modelinde kullanılan değişkenlerin ortaya koyduğu yapının uyum iyiliği değerlerinin analize uygun ve tutarlı olduğunu, kullanılan ölçme araçlarının geçerli ve güvenilir olduğunu göstermektedir (Hu ve Bentler, 1999). Araştırma değişkenlerine dair doğrulayıcı faktör analizi sonuçları Tablo 6'da görülmektedir. Ölçeklere ilişkin uyum iyiliği değerleri incelendiğinde değerlerin mükemmel uyum ve kabul edilebilir uyum referans değerleri arasında hesaplanmıştır.

Tablo 5. Uyum iyiliği indeksleri referans tablosu ve model uyum değerleri

İndeksler	Mükemmel Uyum	Kabul Edilebilir Uyum	Model Uyum Değerleri	
χ^2/df	$,000 \leq \chi^2/df \leq 2$	$2 \leq \chi^2/df \leq 3$	2,195	Kabul Edilebilir Uyum
CFI	$,970 \leq CFI \leq 1,000$	$,950 \leq CFI \leq ,970$,962	Kabul Edilebilir Uyum
GFI	$,950 \leq NFI \leq 1,000$	$,900 \leq NFI \leq ,950$,922	Kabul Edilebilir Uyum
NFI	$,950 \leq NFI \leq 1,000$	$,900 \leq NFI \leq ,950$,933	Kabul Edilebilir Uyum
TLI	$,95 \leq TLI \leq 1,000$	$,900 \leq TLI \leq ,950$,950	Mükemmel Uyum
RMSEA	$,000 \leq RMSEA \leq ,050$	$,050 \leq RMSEA \leq ,080$,072	Kabul Edilebilir Uyum
RMR	$,000 \leq RMR \leq ,050$	$,050 \leq RMR \leq ,080$,064	Kabul Edilebilir Uyum

Kaynak: Bayram vd., (2020).

Tablo 6. Uygulanan ölçeklerin doğrulayıcı faktör analizi sonuçları

	χ^2/df	p	RMSEA	CFI	GFI	NFI	TLI	RMR
Kişi-iş	2,721	0,000	0,053	0,982	0,986	0,978	0,957	0,026
Kurum İmajı	0,987	0,000	0,022	0,997	0,991	0,996	0,989	,012
Örgütsel Çekicilik	2,891	0,000	0,072	0,981	0,971	0,977	0,961	0,024
İşe Başvurma Niyeti	1,514	0,000	0,061	0,984	0,972	0,982	0,952	0,034
Tanımlılık	0,516	0,000	0,015	0,999	0,993	0,946	0,991	0,010

Ölçeklerin doğrulayıcı faktör analizi sonuçları incelendiğinde her bir ölçek için uyum iyiliği referans değerlerine (Tablo 5) uygun aralıklarda bulunduğu, indekslerin çoğunda mükemmel uyum sağlandığı sonuçlarına ulaşıldığı görülmektedir (Tablo 6).

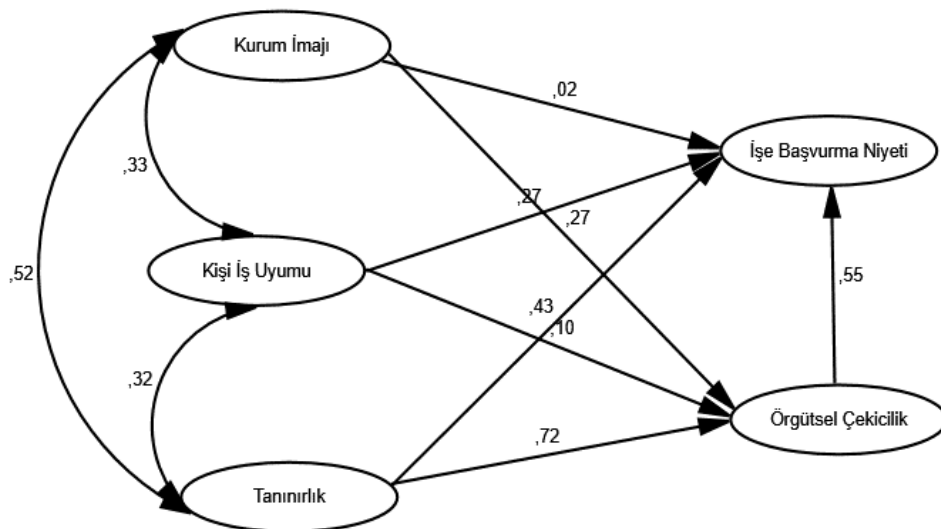
Araştırma modeli test edilmesi

Araştırmada kullanılan değişkenler ile oluşturulan model, kovaryans analizi ve yapısal eşitlik modellemesi kullanılarak test edilmiştir. Yapısal eşitlik modellemesi ve uyum iyiliği istatistikleri, yapısal modelin $\chi^2/df=2,787$, $RMSEA=0,072$, $CFI=0,954$, $GFI=0,903$, $NFI=0,934$, $TLI=0,942$, ve $RMR=0,046$ ile modelin uyum iyiliği referans değerler arasında olduğunu göstermiştir. Buna göre, model, yapılar arasında önerilen doğrudan ve dolaylı bağlantıları test etmek için sağlam temeller sunarak nihai bir tam yapısal model oluşturulmuştur (Şekil 2). Modele ilişkin uyum iyiliği indeks değerleri Tablo 7’de görüldüğü gibidir.

Tablo 7. Araştırma modelinin test sonuçları

	χ^2/df	p	RMSEA	CFI	GFI	NFI	TLI	RMR
Kişi-iş Uyumu	2,787	0,000	0,072	0,954	0,903	0,934	0,942	0,046

Şekil 2: Yapısal Eşitlik Modeli



Yol Analizi Sonuçları

Yukarıdaki şekilde yol analizi sonuçları görülmektedir. Tabloda yer alan kovaryans katsayıları incelendiğinde kurum imajı ile kişi iş uyumu arasında ,33, kurum imajı ile tanımlılık arasında

,52 ve kişi iş uyumu ile tanınırlık arasında ,32 düzeyinde anlamlı ilişkilerin varlığı tespit edilmiştir. Bağımsız değişkenlerin aracı ve bağımlı değişken üzerindeki doğrudan ve dolaylı etkileri aşağıdaki tabloda görüldüğü gibidir.

Tablo 8. Standardize edilmiş etki değerleri

Değişkenler	Tanınırlık		Kişi İş Uyumu		Kurum İmajı	
	Çekicilik	İşe Başvurma Niyeti	Çekicilik	İşe Başvurma Niyeti	Çekicilik	İşe Başvurma Niyeti
Standardize Toplam Etki	,722	,832	,096	,050	,273	,174
Standardize Doğrudan Etki		,435		,000		,024
Standardize Dolaylı Etki		,398		,050		,150

Tablo 8 incelendiğinde tanınırlığın işe başvurma niyeti üzerinde toplam etkisinin ,832 olduğu ve bu etkinin ,398'inin dolaylı etki olduğu tespit edilmiştir. Buradan hareketle tanınırlık ve işe başvurma niyeti arasındaki ilişkide çekiciliğin kısmi aracı rol oynadığı söylenebilir. Kişi iş uyumunun işe başvurma niyeti üzerinde herhangi bir doğrudan etkiye sahip olmadığı, yani iki değişken arasındaki ilişkide çekiciliğin tam aracı rol oynadığı ortaya konulmuştur. Kurum imajının işe başvurma niyeti üzerinde sahip olduğu etkinin büyük bir kısmının (,150) aracı değişken olan çekicilik üzerinden gerçekleştiği görülmektedir. Bu bulgudan hareketle kurum imajı ile işe başvurma niyeti arasındaki ilişkide çekiciliğin kısmi aracı rol oynadığı tespit edilmiştir.

TARTIŞMA VE SONUÇ

Çalışmanın sonuçları yeni yeteneklerin etkin bir şekilde kuruma çekilmesine dair kritik bilgiler sunmaktadır. Araştırmada belirlenen değişkenlerden tanınırlık, kişi-iş uyumu ve kurum imajının işe başvurma niyeti ile orta ve yüksek düzeyde ilişkili olduğu, çekiciliğin ise bu ilişkide aracı değişken olarak olumlu etki oluşturduğu belirlenmiştir.

Tanırlık kurumsal itibarın önemli etkenlerinden biridir. Araştırma uygulanan aracılık testleri sonucunda, tanınırlık ve işe başvurma niyeti arasındaki ilişkide çekiciliğin dolaylı etkiye sahip olduğu ve işe başvurma niyetine dönüştüğü bulunmuş ve buradan hareketle H₁ kabul edilmiştir. Bu bulgudan yola çıkarak tanınırlığın örgüt açısından önemli bir faktör olduğu, kurumsal imajının örgütün sektördeki tanınırlık düzeyini artırdığını (Altun, 2021) ve bu nedenle kurumsal imajın geliştirilmesinde tanınırlık üzerine çalışmaların yapılması gerektiği sonucuna ulaşılabilir. Nugroho ve Liswandi (2018) belirttiği gibi kurumsal itibarın işe başvurma niyeti üzerinde önemli bir etkiye sahip olduğunu bulgusu araştırma sonuçlarımızla örtüşmektedir.

Spor bilimleri alanında eğitim alan öğrenciler genellikle özel yetenek sınavları ile seçilerek bu fakültelerde öğrenim görmeyi hak eden kişiler olarak spor bilimleri alanına karşı çok isteklidirler. Bu nedenle kişi-iş uyumunun yüksek olması beklenmektedir. Öğrenciler sporun

kendisi ve spor sektörüne yönelik olumlu tutum geliştirdikleri düşünülmekte olup sektörde çalışmaya niyetli olabilirler. Çalışanların kendi tutum ve davranışlarıyla uyumlu örgüt yapılarını çekici buldukları görülmüştür (Özcan-Dinç, 2011:131). İş ile kişiliği arasında uyum düzeyi yüksek olan bireylerin işe karşı daha fedakar ve bağlı olacakları düşünüldüğünde spor hizmetlerin yürütüldüğü spor örgütlerinde çalışmak kişi-iş uyumu yüksek bireyler için önemlidir. Bu nedenle araştırmaya konu olan öğrencilerin kişi-iş uyumu düzeyleri önemli bir etken olarak işe başvurularına etkili olacağı düşünülmektedir. Araştırma hipotezlerine göre, kişi-iş uyumunun işe başvurma niyetine doğrudan etkili olmadığı fakat bu ilişkide aracı değişken olan çekiciliğin işe başvurma niyetini düşük düzeyde (,096) etkilediği belirlenmiş, H₂ kısmen kabul edilmiştir.

Psikologlar, bireysel farklılıkların kişisel değerleri etkileyeceğini ve kişisel tercihlere çevrileceğini göstermiştir (Carlini, 2015). İşe başvurma niyetinin kişisel beklenti veya kişilik özelliklerinden kaynakladığı düşünüldüğünde, spor eğitimi almış öğrencilerin GSB'nı tercih etmelerinde kişi-iş uyumunun önemli bir etken olarak belirlemektedir. Özel sektörde yapılan bir araştırmaya göre kişi-iş uyumunun bağ, fedakarlık ve uyum alt boyutlarıyla ifade edilen işe adanmışlık ile pozitif yönlü anlamlı ilişkisi olduğu belirlenmiştir. Öğrencilerin üniversite tercihleri ile ilgili bir araştırma sonucunda çekiciliğin, örgütsel itibar üzerinde etkili olduğu ortaya konulmuştur (Polat vd., 2019). Literatürde örnekleri verilen bu tür araştırmalarda kişi-iş uyumu ile işe başvurma arasında belirlenen pozitif yönlü ilişki araştırmamızın bulguları ile benzerlikler göstermektedir. Bu bulgular işveren için kişi-iş uyumu yüksek olan çalışanların ne derece önemli olduğunu ve bu çalışanların örgüte kazandırılması ile örgütte tutulmasının önemini vurgulamaktadır (Kanbur ve Mazıoğlu, 2020).

Son olarak kurum imajı ile işe başvurma niyeti arasındaki ilişkide çekiciliğin etkili olduğu (,273) ve işe başvurma niyetine dönüştüğü ortaya konulmuştur. Kurum imajının işe başvurma niyeti arasında (0,17) düşük düzeyde ilişki belirlenmiştir. Benzer şekilde Vilkaite-Vaitone ve Lukaite (2019) yaptığı araştırmada kurum imajı ile işe başvurma niyeti arasında pozitif yönlü olumlu bir ilişkili olduğunu belirlemiştir. Akademik kariyer hedefleyen bilim insanları ile yapılan bir araştırmanın sonuçlarında itibar, kurumsal kültür gibi yeni nesil yeteneklerin üniversitelerin çekiciliğini artırdığı (Abell ve Becker, 2021) sonucu araştırma bulgularını destekler niteliktedir. Bu tür özelliklerden en çok araştırılan konulardan biri de kurum imajıdır. Üniversite öğrencileri ile yapılan bir araştırma kurumsal imaj algısının işe başvurma niyetine etkili olduğunu gösteren bulgular kurumsal imajın önemini ortaya koymaktadır (Erçetin ve Büyükgöze, 2017). Sosyal sorumluluk ve kurum kimliğinin kurum imajı ve sadakat üzerinde etkili olduğu çalışmalarda (Sağır, 2016) kurum imajının önemine vurgu yaptığı sonuçlar ortaya çıkarılmıştır. Bu nedenle kurum imajına yönelik algılamaların örgütün çekicilik ve tercih edilirliliğini de pozitif yönde etkileyeceği ifade edilebilir.

Çalışan adaylarının bir örgütü çekici bulmalarına dair nitelendirmeler şeklinde ifade edilebilen örgütsel çekicilik, adayların işe başvurma niyetine yönelik karar sürecinde etkili bir faktördür (Dündar Akçay, 2012). Öğrenciler üzerine yapılan bir araştırmada örgüt imajının örgüt hakkında sahip olunan mevcut bilgilerle ilgili olduğu belirlenmiştir (Gatewood vd., 1993). Bu araştırmada çekiciliğin diğer değişkenlerle ilişkilerde önemli ölçüde etkiye sahip olduğu belirlenmiştir. Bu sonuç Aiman-Smith ve diğerlerinin (2001) üniversite öğrencilerinin iş arama

için en güçlü faktörün çekicilik olduğunu belirlediği araştırma sonuçlarını desteklemektedir. Spor eğitimi almış öğrencilerin mesleğine uygun statüdeki pozisyonlarda çalışma isteğini (Kılıç ve Tabuk, 2022), iş güvencesi sağlayan GSB’de sürdürmenin avantajları ile işe başvurma niyeti artacağı düşünülebilir. Dolayısıyla GSB çekiciliği, işe başvurma niyetinde tam aracı olarak belirlenen bulgunun kurumun sağladığı iş güvencesi ile açıklanabilir. Askeri örgütlere yapılan iş başvurularının incelendiği bir araştırmada çekiciliğin önemi vurgulanmış, iş pozisyonu, örgütsel nitelik algısı, heyecan ve prestij gibi unsurların işe başvurma niyetine olan adayların örgütün çekiciliği ile ilişkili olduğu belirlenmiştir (Lievens vd., 2005). Ayrıca bireylerin yalnızca çekici buldukları örgütlerde çalışmaya yönelik başvuru yaptıklarına dair bulgular, çekiciliğin önemini ortaya koymakla birlikte (Turban ve Keon, 1993), işe başvuru yapacak kişilerin örgütsel çekicilik algısının önemi vurgulanmaktadır (Yorulmaz vd., 2020). Bu bulgulardan hareketle kurum imajı ve tanınırlığın işe başvurma niyetine etkisinde çekicilik önemli bir etken olduğu sonucuna ulaşılabilir.

Personel değerlendirmesi ve seçimi, işverenin algılanan çekiciliğini etkilemektedir (Weinert vd., 2020). Bu nedenle çalışma pozisyonları ve rollere dair yoğun rekabete rağmen, en iyi yetenekleri çekmek ve işe almak (Abell ve Becker, 2021) GSB’nin stratejik çıkarları arasındadır. Örgütler kurumsal kimlik oluşturmak, ifade etmek ve örgüt bağlılığını güçlendirmek, geliştirmek ve paydaş katılımını artırmak için kurumsal sosyal sorumluluk faaliyetleri gerçekleştirirler (Klimkiewicz ve Oltra, 2017). Araştırmaya konu olan öğrencilerin mezuniyet sonrası tercih edecekleri önemli kurumların başında gelen GSB, sporun yaygınlaştırılması amacıyla nitelikli insan kaynağına ulaşmanın avantajlarını kullanmak, daha iyi bir spor hizmetinin sunulması gibi hedeflere ulaşmada kurumsal imaja önem vermesi gerektiği düşünülmektedir. Araştırmalardan elde edilen verilere dayanarak, kurumsal imajın geliştirilmesinde yapılacak çalışmalarda çekicilik algısı ve tanınırlık düzeyine odaklanılması GSB’nin kurumsal yapısını güçlendireceği ve iş başvurularında tercih edilmesini artırıcı olacağı düşünülmektedir.

Öneriler

Araştırma sonuçlarına dayanarak, GSB kurumsal imaj çalışmalarına katkı sağlayacak bazı öneriler sunulmuştur.

- GSB nin gelecekte ihtiyacı olan personelin örgüte kazandırılmasına yönelik kurumsal imaj çalışmaları yapması, nitelikli adayların belirlenmesine katkı sağlayabilir. Bu amaçla üniversitelerde mesleki kariyer günleri ve benzeri programlara katılarak tanınırlık ve çekiciliğini artırabilir.
- Günümüzde birçok üniversite öğrencilerinin mezuniyet sonrası süreçlerini takip etmektedir. Bu amaçla üniversiteler mezunlar ofisi/koordinatörlüğü gibi birimler oluşturmuşlardır. GSB bu birimlerin çalışmalarına katkı sağlayıcı departmanlar oluşturarak yeni projeler geliştirilmesine yönelik çalışmalar yapılabilir.
- Üniversitelerde okutulan kariyer planlama dersleri bir zorunluluk haline gelmiştir. Ders kapsamında hem yerel dinamiklerden hem de ulusal bazda sektörel insan kaynakları yöneticilerinin katılımı sağlanabilir.
- GSB’nin ortaklı protokolleri ile üniversitelerin eğitim-öğretime yönelik niteliklerini geliştirmek adına akreditasyon çalışmalarını hızlandırması ile sektörel gelişime katkı

sağlayacağı düşünülmektedir. Bu nedenle kurumsal imaj çalışmalarının üniversitelerde de araştırılması sektöre katkı sağlayabilir.

- Kurumsal imaj kavramının önemli bir stratejik yönetim unsuru olması, kamu ve özel sektör örgütlerinde önemini ortaya koymak adına karşılaştırmalı çalışmalar yapılabilir.
- Birbirinden çok farklı dinamikler içeren spor federasyonları tercih edilirliliğini artırmak adına çekicilik ve tanınırlığı geliştirici çalışmalar yapılabilir, profesyonel yönetim anlayışına yönelerek rekabet avantajı sağlayabilirler. Bu nedenle spor federasyonları ve benzeri tüm spor örgütlerine yönelik gelitirme çalışmaları yapılabilir.

Araştırmanın Sınırlılıkları

Bu çalışma kurumsal imaj literatürüne katkı sağlasa da birkaç önemli sınırlamaya sahiptir. İlk olarak çalışmanın yapıldığı GSB, spor yönetiminde en üst basamakta bulunan tek yetkili kurumdur. Bu durum onu tekel haline getirmektedir. Özel sektördeki istihdam olanaklarının daha kısıtlı olması, özel sektörün çalışma koşulları, maaş ve diğer özlük haklarından yararlanma gibi şartlar kamu kurumlarının tercih edilmesini önemli ölçüde artırdığı düşünülmektedir. GSB'nın kamu desteği ile ortaya koyduğu bu güçlü yanı alternatifler karşısında bir sınırlama oluşturmaktadır. İkinci olarak, ülkedeki işsizlik oranlarıdır. Spor bilimleri alanında verilen mezun sayısı dikkate alındığında, bu sayıdaki insan kaynağının istihdamı için yeterli sayıda kurumsal yapıya sahip spor örgütü bulunmadığı düşünülmektedir. Bu nedenle öğrencilerin ilk tercihleri arasında GSB bulunmaktadır. Ayrıca spor endüstrisinde kariyer yollarının en başında sektörde oluşturulan network ağlarında bilinen bir kimlik olmak önemlidir. Başka bir ifadeyle tanınan bilinen bir sporcu olmak kariyer elde etmenin önemli koşullarından biridir (Parks vd., 2003). Son olarak bu araştırma GSB dışında başka örgütsel bağlamlara genellenemez. Bu karşın örneklemimizdeki katılımcıların eğitim-öğretim gördüğü üniversite sayısının araştırma evreninin %34'ünü (n=18) kapsıyor olması sonuçların genellenmesini mümkün kılabilir.

Çıkar Çatışması: Çalışma kapsamında herhangi bir kişisel ve finansal çıkar çatışması bulunmamaktadır.

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Etik Kurul İzni ile ilgili Bilgiler

Kurul Adı: T.C. Hitit Üniversitesi Girişimsel Olmayan Araştırmalar Etik Kurulu

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The Effect of Trainers' Pedagogical Competencies on Emotion Regulation: A Study on Young Judo Athletes

Özgür AKTAŐ^{1*}, Mehmet Ferhat KARAOĐLAN², Hüseyin ÜNLÜ³

¹Kilis 7 Aralık University, School of Physical Education and Sport, Kilis.

²Kilis 7 Aralık University, Technical Science Vocational School, Kilis.

³Aksaray University, Faculty of Sport Sciences, Aksaray.

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Abstract

It's known that our relationship with others affect the way we view ourselves. The effects of trainer characteristics on athletes in the sports environment is a very important and common research topic. Therefore, this study was conducted to determine the relationship between the pedagogical competence perceived by the athletes from their trainers and the emotion regulation strategies they use. A total of 107 young judo athletes, 64 male and 43 female with a mean age of 15.85±1.32, participated in the study. "Trainers' Pedagogical Competencies Scale" was used to measure the pedagogical competence perceived by the athletes from their trainers, and the "Emotion Regulation Scale for Athletes" was used to determine which emotion regulation strategies they used. Pearson correlation test was used to determine the relationship between trainer pedagogical competence and emotion regulation, and multiple linear regression analysis (enter method) was used to determine whether trainer pedagogical competence was a significant predictor of emotion regulation strategies. Moderately positive and significant relationships were found between empathy-attention and target-oriented training, which are sub-dimensions of the instructor pedagogical competence scale and cognitive reappraisal and suppression, which is one of the emotion regulation strategies. In addition, empathy and attention were found to significantly predict cognitive reappraisal. Again, it was determined that the variables of prevention of support and solidarity and education for the purpose significantly predicted the suppression strategy. As a result, it can be said that some parameters of the pedagogical competence of the trainer are effective on the emotion regulation strategies preferred by the athletes.

Keywords: Trainer, Suppression, Cognitive reappraisal, Emotion regulation, Pedagogical competence.

Antrenör Pedagojik Yeterliliđin Duygu Düzenleme Üzerindeki Etkisi: Genç Judo Sporcuları Üzerine Bir Arařtırma

Öz

Başkalarıyla olan ilişkilerimizin kendimiz ile ilgili görüşlerimizi etkilediđi bilinmektedir. Spor ortamında da antrenör ait olan özelliklerin sporcu üzerindeki etkileri oldukça önemli ve yaygın bir araştırma konusudur. Bu sebeple sporcuların antrenörlerinden algıladıkları pedagojik yeterlilik ile başvurdukları duygu düzenleme stratejileri arasındaki ilişkiyi saptamak adına mevcut araştırma yürütülmüştür. Arařtırmaya yař ortalamaları 15,85±1,32 olan 64'ü erkek, 43'ü kız olmak üzere toplamda 107 genç judo sporcusu katılmıştır. Sporcuların antrenörlerinden algıladıkları pedagojik yeterliliđi ölçmek için "Antrenör Pedagojik Yeterlik Ölçeđi", hangi duygu düzenleme stratejilerini kullandıklarını belirlemek içinse "Sporcular İçin Duygu Düzenleme Ölçeđi" kullanılmıştır. Antrenör pedagojik yeterlilik ile duygu düzenleme arasındaki ilişkiyi saptamak adına pearson korelasyon testi, antrenör pedagojik yeterliliđin duygu düzenleme stratejilerinin anlamlı bir yordayıcısı olup olmadığını saptamak içinse çoklu doğrusal regresyon analizi (enter yöntemi) kullanılmıştır. Antrenör pedagojik yeterlilik ölçeđi alt boyutlarından olan empati-dikkat ve hedef odaklı antrenman ile duygu düzenleme stratejilerinden olan bilişsel yeniden düzenleme ve bastırma arasında orta düzeyde pozitif yönlü anlamlı ilişkiler tespit edilmiştir. Ayrıca empati ve dikkatin, bilişsel yeniden değerlendirmeyi pozitif yönde anlamlı bir şekilde yordadıđı tespit edilmiştir. Yine destek ve dayanışmanın engellenmesi ile hedef odaklı antrenman deđişkenlerinin bastırma stratejisini anlamlı bir şekilde yordadıđı saptanmıştır. Sonuç olarak antrenörün pedagojik yeterliliđine ait bazı parametrelerin sporcuların tercih ettikleri duygu düzenleme stratejileri üzerinde etkili olduđu söylenebilir.

Anahtar kelimeler: Antrenör, Bastırma, Bilişsel yeniden değerlendirme, Duygu düzenleme, Pedagojik yeterlilik

* **Corresponding Author:** Research Assistant Özgür AKTAŐ, **E-posta:** ozgur.72372@gmail.com

INTRODUCTION

The relationship established between the trainer and the athletes plays an important role in the physical and psychosocial development of the athletes (Gervis & Dunn, 2004; Jowett & Cockerill, 2002; Jowett & Poczwardowski, 2007). Therefore, the relationship established between the trainer and the athlete is crucial and the trainer must inhold some characteristics. According to Walsh (2004), one of the four characteristics that trainers working with young people should possess is being equipped with pedagogical knowledge. The content of pedagogical knowledge here can be listed as organizing learning environments, management, planning, organization, and communication. Again, it was emphasized by Armour (2011) that trainers working with young people should also be effective teachers or, to use a more inclusive term, pedagogues. Zetter (2008), who developed the scale used in the current study, argued on the other hand that the trainer should have pedagogical competency and formulated the trainer's pedagogical competency as follows: Trainers working with youngsters; should empathize with them and establish communication with attention, provide positive feedback and social support, not hinder support or solidarity, provide democratic training climate and coach target-oriented training.

The relationship between the trainer and the athlete is one of the most important topics that researchers examine. As a matter of fact, there are scale development and adaptation studies to measure this relationship (Jowett & Ntoumanis, 2004; Yang & Jowett, 2012). In addition, the relationship between the bond established between the trainer and the athlete and the number of medals won (Jowett, Cockerill, 2003), the leadership of the trainer, and the team's success (Vella et al., 2013) were studied by the researchers. Another dimension of this relationship, the pedagogical aspect was examined by Zetter (2008). Again, the number of studies on the pedagogical aspect of sports is increasing (Armour, 2014; Cronin & Armor, 2018; Harvey et al., 2014; Şirin & Sevilmiş, 2020).

Athletes often use the word "emotion" when they want to describe their athletic performance. Some of these are; "There were ups and downs in our emotions during the match.", "Emotions ran high in the exciting last minutes.", "He was in the action zone and managed to control his emotions at the last moment.", "The emotional chemistry of the team had deteriorated and thus the result was a drop in performance." (Connolly, 2019). When these statements are examined, it is seen that the sports environment offers an ideal natural environment opportunity for the examination of emotions, which are an important part of human life. As a matter of fact, anger, satisfaction, disappointment or joy can be experienced in any sporting event. Besides, it is accepted by athletes, trainers, and practitioners that psychological variables such as emotion are of great importance in athletic performance (Ruiz, 2004). It is even known that athletes should be in the optimal emotional range in order to reflect the desired performance in the arena. One way they reach their optimal emotional range is through emotion regulation. Particularly in the last 20 years, researchers have examined the issue of emotion regulation in sports (Martinent et al., 2015; Stanley et al., 2012; Uphill et al., 2012).

Emotion regulation aims to change the reactions that are expected to emerge after the positive or negative emotions felt by the person. These changes can be listed as reducing, increasing, or maintaining the reaction (Gross, 1999; Richards & Gross, 2000). Although this definition is similar to the concept of coping, they are different from each other. Indeed, while coping

typically involves controlling or reducing negative emotions associated with stress (Kowalski & Crocker, 2001), emotion regulation involves up- and down-regulating both positive and negative emotions (Gross, 1998). It is thought that there are more than 400 strategies used to regulate emotions (Gross, 2002). However, two emotion regulation strategies have received intense attention in the psychology literature. One of them is cognitive reappraisal and the other is suppression (Gross, 2002; Gross & John, 2003). Regulating emotions through cognitive reappraisal, one of these two strategies, means changing the way one thinks about the situation (Gross, 2002; Gross & John, 2003). To explain further with an example; the athlete may try to perceive an upcoming competition as an exciting opportunity rather than a stressful situation. The other strategy, suppression, is the avoidance of expressing emotions (Gross, 2002; Gross & John, 2003). For example, even if athletes feel nervous before an upcoming competition, they can suppress this anxiety and indirectly prevent their opponents watching them from gaining confidence. While suppression strategy is correlated with more negative emotions, reappraisal is correlated with more positive and pleasant emotions (Jones, 2003; Robazza et al., 2022). However, there are also studies detected that the suppression strategy in the sports environment is not correlated with positive or negative emotions. (Uphill et al., 2012) Based on this, it is argued that if athletes can perceive unpleasant emotions as beneficial in sports environments (for example, interpreting anxiety as readiness), it may not be harmful to feel these emotions (Kim & Tamminen, 2022).

In current studies in the literature, there are studies on how the relationship between young athletes, who constitute the sample group, and coaches, affects the athlete and the sports environment. When looked at, it is concluded that the attitudes and behaviors of the coaches are effective in the tendency of young athletes to behaviors that are described as positive (Vella et al., 2013). It is known that the level of trust of the coach in his athletes has an effect on individual success and team success (Hampson & Jowett, 2014). There are also studies on the effects of the coach-athlete relationship on the psychological parameters of the athlete. As a matter of fact, the relationship established between the coach and the athlete; It has been determined that it affects psychological variables such as motivation (Olympiou et al., 2008), burnout (McGee & DeFreese, 2019), pleasure from sports and focus (Stirling & Kerr, 2013). For this reason, in this study, the relationship between the pedagogical competence perceived by the athlete from his trainer and emotion regulation strategies, which is another psychological factor, is included.

Yet studies have shown the importance of emotion regulation for young athletes (Kim & Tamminen, 2022), there is a need to understand what emotion regulation strategies are correlated with important antecedents (the antecedent in this research is the trainer's pedagogical competency), as well as the extent to which they use cognitive reappraisal or suppression strategies. Although there are studies in the literature determining the correlation between the emotional regulation of athletes and self-compassion (Doorley et al., 2022), mindfulness and coping skills (Josefsson et al., 2017), and mental toughness (Mohebi et al., 2017); no research that examines the effects of trainer characteristics, which are of great importance for the athlete, on the emotion regulation skills of the athlete, has been encountered. For these reasons, the current study was conducted to examine the correlation between the pedagogical competency perceived by young judoists from their trainers and the emotion regulation strategies they apply and to test the predictor of a trainer's pedagogical competency on emotion regulation.

METHODS

Research Model

In the present study, the correlational research method is used as the research method. Correlational research is a research that examines the variables thought to be related without the intervention of researchers (Büyüköztürk et al., 2021). A correlational research model is used to test the hypothesis of "variable A predicts variable B." (Fraenkel & Wallen, 2006). The main hypothesis in the current study is "Trainer's pedagogical competency is an important predictor of emotion regulation strategies."

Population and Sample

The population of the study consists of judoists in Gaziantep. Therefore, the simple random sampling method, which is one of the random sampling methods, was used as each sample unit was given an equal probability of being selected in the study. Fraenkel and Wallen (2006) have recommended using random methods as much as possible in correlational research. A total of 107 active judoists, 64 male (59.8%) and 43 female (40.2%), aged between 15 and 18 (15.85 ± 1.32) participated in the study. In addition, the mean age of judoists in the judo branch is 4.82 ± 2.14 , and the mean of training years with their current trainers is 4.51 ± 2.19 .

Data Collection Tools

Personal Information Form: A personal information form was prepared by the researchers to determine the demographic characteristics (age, gender) of the judoists.

Trainers' Pedagogical Competencies Scale: It was developed by Zetter (2008) to determine whether their trainers are pedagogically competent from the point of athletes. The study of adaptation to the Turkish population was conducted by Şirin and Sevilmiş (2020). The scale is a 5-point Likert type and structured as "always (5)", "usually (4)", "sometimes (3)", "rarely (2)" and "never (1)". It consists of 27 questions and 6 sub-dimensions.

Table 1. Cronbach Alpha (α) values of the scale

Sub-Dimensions	Original Scale	Scale Adapted to Turkish	Current Research
1	0,78	0,80	0,79
2	0,72	0,65	0,72
3	0,71	0,65	0,74
4	0,66	0,72	0,70
5	0,65	0,63	0,78
6	0,49	0,62	0,71

1=Empathy and Attention, 2=Hindering Support or Solidarity, 3=Positive Feedback, 4= Social Support, 5=Democratic Training Climate, 6=Target-oriented Training

Emotion Regulation Scale: Originally developed by Gross and John (2003), the scale was adapted into Turkish by Eldeleklioğlu and Eroğlu (2015). It was adapted for athletes by Tingaz and Ekiz (2021). The scale is 7-point Likert type and structured as 1 strongly disagree and 7 strongly agree. It consists of 8 questions and 2 sub-dimensions. Tingaz and Ekiz (2021), who applied the scale to athletes, have emphasized that each dimension should be evaluated within itself and that two sub-dimensions should not be used by adding together due to the theoretical infrastructure of the scale.

Table 2. Cronbach Alpha (a) values of the scale

Sub-Dimensions	Original Scale	Scale Adapted to Turkish	Current Research
1	0,80-0,82	0,73	0,70
2	0,73-0,76	0,65	0,76

1= Cognitive Reappraisal 2= Suppression

Ethical Approval

Prior to the study, ethics committee approval was obtained from Kilis 7 Aralık University Ethics Committee with the decision numbered 2022/23 on 12/20/2022.

Data Collection and Analysis

The questionnaire form prepared on the online platform was sent to the judoists in Gaziantep and they were asked to answer the questions on a voluntary basis. The collected data were transferred to the SPSS 22 program. Then, a normality test was performed to determine whether the data showed a normal distribution (See Table 1). As the skewness and kurtosis values were between -1.5 and +1.5, the scales and their sub-dimensions were determined to show a normal distribution (Tabachnick & Fidell, 2013). Therefore, parametric tests were preferred. Pearson correlation test, which is one of the parametric tests, was used to determine the correlation between a trainer's pedagogical competency and emotion regulation. Multiple linear regression analysis (enter method) was preferred to determine whether a trainer's pedagogical competency is an important predictor of emotion regulation strategies. Prior to testing the models, there should be no multicollinearity problem between the independently determined variables. For this reason, the values expressed as tolerance values should be taken into consideration in addition to the variance inflation factor (VIF) in the constructed model. For all the multicollinearity problems, VIF values should be less than 10 and tolerance values should be greater than 0.10 (Hair et al., 2006). In addition, the Durbin-Watson model shows whether the errors are independent (autocorrelation) (Özdamar, 2002). Therefore, it has been stated that Durbin-Watson values should be close to two, even should be between 1.5 and 2.5 (Öztürk, 2005).

Table 3. Test for normal distribution

Scales	Sub-Dimensions	Skewness	Kurtosis
Trainers' Pedagogical Competencies Scale	Empathy and Attention	-,646	,283
	Hindering Support or Solidarity	-,523	-,823
	Positive Feedback	-,152	-,997
	Social Support	,163	,244
	Democratic Training Climate	-,210	-,513
	Target-oriented Training	-,843	,076
Emotion Regulation Scale	Suppression	-,710	,211
	Cognitive Reappraisal	-,665	,890

RESULTS

Table 4. Descriptive data on scales and sub-dimensions

Variables	Min.	Max.	M	SD
Empathy and Attention	1,17	5,00	3,59	,846
Hindering Support or Solidarity	1,00	4,00	2,68	,780
Positive Feedback	1,67	5,00	3,65	,982
Social Support	1,00	5,00	3,28	,875
Democratic Training Climate	1,00	5,00	3,43	,982
Target-oriented Training	1,00	5,00	3,94	,975
Suppression	1,00	6,50	4,36	1,127
Cognitive Reappraisal	1,25	7,00	4,76	1,084

According to Table 4, while target-oriented training, which is one of the pedagogical criteria of the trainer, has the highest average, hindering support or solidarity, which is another criterion, has the lowest average. The mean of cognitive reappraisal, one of the emotion regulation strategies of young judo athletes, is higher than the suppression strategy.

Table 5. Correlation analysis between variables

	1	2	3	4	5	6	7	8
1	1	-,328**	,457**	,236*	,494**	,571**	,363**	,475**
2		1	-,327**	-,384**	-,288**	-,103	,114	-,260**
3			1	,437**	,439**	,486**	,212*	,323**
4				1	,486**	,179	-,029	,170
5					1	,379**	,179	,259**
6						1	,456**	,317**
7							1	,500**
8								1

*p<.05 **p<.001

1=Empathy and Attention, 2=Hindering Support or Solidarity, 3=Positive Feedback, 4= Social Support, 5=Democratic Training Climate, 6=Target-oriented Training, 7=Suppression, 8= Cognitive Reappraisal

According to Table 5, statistically significant relationships were found between empathy and attention, positive feedback, target-oriented training, which are sub-dimensions of trainers' pedagogical competence, and suppression and cognitive reappraisal, which are sub-dimensions of emotion regulation. In addition, it is seen that the correlation coefficients of the trainers' pedagogical competence sub-dimensions, which are accepted as independent variables in the current study, are below .70.

The relationship between suppression strategy and empathy and attention, positive feedback and target-oriented training is positive and low. The relationship between cognitive reappraisal and empathy and attention, positive feedback, democratic training climate and target-oriented training is positive and low. In addition, the relationship between cognitive reappraisal and hindering support or solidarity is negative and low.

Table 6. Regression analysis

Independent Variables	B	SE	Beta	t	p	VIF	Adjusted R ²
Empathy and Attention	,482	,152	,376	3,173	,002	1,873	,204
Hindering Support or Solidarity	-,146	,138	-,105	-1,056	,293	1,314	
Positive Feedback	,115	,124	,104	,923	,358	1,688	
Social Support	-,006	,134	-,005	-,045	,965	1,551	
Democratic Training Climate	-,021	,124	-,019	-,166	,868	1,676	
Target-oriented Training	,054	,126	,049	,428	,669	1,715	

Dependent variables=Cognitive Reappraisal, R=,500 R²=,250 (Anova: F=5,541 p=.000) Durbin-Watson: 1,839

When Table 6, was examined, it was determined that empathy and attention sub-dimension, which is one of the sub-dimensions of the trainers' pedagogical competence scale, explained cognitive reappraisal ($B=.482$) in a positive way.

Table 7. Regression analysis

Independent Variables	B	SE	Beta	t	p	VIF	Adjusted R ²
Empathy and Attention	,309	,155	,232	1,994	,051	1,873	,232
Hindering Support or Solidarity	,304	,141	,210	2,156	,033	1,314	
Positive Feedback	,049	,127	,043	,390	,698	1,688	
Social Support	-,121	,136	-,094	-,886	,378	1,551	
Democratic Training Climate	,030	,126	,027	,241	,810	1,676	
Target-oriented Training	,382	,129	,331	2,967	,004	1,715	

Dependent variables=Suppression $R=.525$ $R^2=.276$ (Anova: $F=6,342$ $p=.000$), Durbin-Watson: 1,503

When Table 7, was examined, it was determined that hindering support or solidarity and target-oriented training sub-dimensions, which is two of the sub-dimensions of the trainers' pedagogical competence scale, explained suppression in a positive way.

DISCUSSION AND CONCLUSION

In the study, empathy and attention sub-dimensions, which are sub-dimensions of the trainer's pedagogical competency scale, were determined to positively predict the cognitive reappraisal strategy. It was an expected result that an athlete who thought that his trainer was approaching with empathy would turn to the cognitive reappraisal strategy associated with positive emotions. Although there are many definitions of empathy in the literature, it is generally seen to be defined as a dimension of communication and a strong communication skill. In the current study, it can be explained as the state of being understood by the trainers of the athletes' own feelings and thoughts. There are studies that found a positive and significant correlation between empathy and emotion regulation (Lockwood et al., 2014; Olalde-Mathieu et al., 2021). In a study conducted by Lorimer and Jowett (2009), a positive and significant correlation was found between the level of empathy perceived by athletes from their coaches and their satisfaction with training. It has also been determined that the quality relationship between the trainer and the athlete has a mediating role in the correlation between personality and empathy (Jowett et al., 2012). Based on these studies, it is seen that the level of empathy and attention perceived by the athlete from their own trainer is also correlated with other variables and is important. While Thompson et al., (2019) have emphasized that how we understand and react to the emotions of others, that is, empathy can be affected by the regulatory processes (i.e. emotion regulation) used to form the emotions of ourselves and others, there are also studies stating that a lack of empathy in the person can cause emotion regulation disorders (Schipper & Peretmann, 2013) as well. Assuming that the trainer-athlete relationship and the teacher-student relationship are similar, there are also studies in the literature evaluating the effects of teachers' pedagogical competency on students (Afalla & Fabelico, 2020; Hakim, 2015; Marina et al., 2019). When the results of these studies are examined, it was determined that teacher's pedagogical competency is effective on student's learning performance, learning discipline, and motivation. When examined, the results of these studies in the literature and the current study support each other, and empathy and attention, which are one of the trainer's pedagogical competency criteria, are observed to be of great importance for athletes.

The sub-dimension of hindering support or solidarity, which is one of the sub-dimensions of the trainer's pedagogical competency scale, was determined to positively and significantly predict the suppression strategy. Trainers are one of the most important factors for athletes (Horn, 2008; Özyıldırım & Sarı, 2018; Sarı & Bayazıt, 2017). According to Jowett & Shanmugam (2016), the trainer has the task of supporting the athlete as well as energizing, motivating, protecting, encouraging, satisfying, adapting, and relieving. Therefore, it can be expected that athletes who feel that they do not receive support and solidarity from their trainers will tend to the suppression strategy, which is generally associated with negative emotions. As a result of a study conducted by Sarı et al. (2020), it has been determined that the trainer-induced supportive motivational climate is important for the athlete. When the results of two different studies conducted by Amorose and Anderson-Butcher, 2015, and Mageau and Vallerand 2003 were examined, the trainer's autonomy-supportive behaviors were determined to have positive effects on motivation, which is an important determinant of performance and persistence in athletes. The results of these studies and the results of the current study show parallelism and emphasize the importance of the support and solidarity that the athlete perceives from his trainer.

In addition, the target-oriented training sub-dimension was determined to positively predict the suppression strategy. It is thought that the athletes who feel that their trainer coaches target-oriented training strategies use the suppression strategy in a positive way. Athletes who feel that they have trained appropriately and sufficiently may aim to suppress their pre-competition anxiety and not appear anxious, thus preventing their opponents from increasing their confidence. The situation that underlies the anxiety suppression strategy here may be the thought that athletes have performed target-oriented training. In the event that the determined targets are not achieved in time, athletes as well as trainers may face pressure and may have financial worries (Haungen et al., 2023). In order not to encounter such negative situations, the athletes should control their emotions before and during the competition. If the athletes think that they are ready for the competition during the training period, they can restrain their emotions, which are expected to be revealed and defined as negative, due to the suppressing strategy.

According to the research findings, relationships were determined between the pedagogical competence criteria perceived by the athletes and their emotion regulation strategies. Friesen et al., (2017) determined that the athletes who interact with their coaches as they wish are in the most appropriate performance areas in terms of their emotional states. This result expresses the basis and importance of the current research.

In conclusion, the empathy and communication with attention characteristics of the trainer cause the athlete to tend to the cognitive reappraisal strategy, which is one of the emotion regulation strategies. In addition, athletes who think that they do not receive support and solidarity from their trainer and that their trainers coach target-oriented, were determined to tend to the suppression strategy.

Recommendations

The findings of this study are of great importance for researchers working in the field of sports psychology, particularly on the relationship between the trainer and young athlete or the effects of the trainer on the athlete. However, the sample group of the study consists of only judoists. So much so that the relationship between the trainer and the young athlete is of great importance in other branches as well. Consequently, the current study should be repeated in other sports fields to determine to what extent the results obtained are generalizable.

In addition, there is a need to understand what kind of antecedents or results a factor affecting the performance of the athlete, such as emotion regulation, is correlated with. By making the discoveries of these antecedents and results, literature contribution can be provided to optimize the psychological performance of the athlete. Again, although significant predictive results were obtained in the current study, it is thought that the reason for the low rate is due to the sample size and structure. For this reason, it is recommended that future studies be conducted with larger and mixed sample structures.

Conflict of Interest: As the authors of the article, we declare that there is no personal or financial conflict of interest within the scope of the study.

Researchers' Statement of Contribution Rate: Research Desing-ÖA, HÜ; Data Collection-ÖA, FK; Analyzes- ÖA, FK; Preparation of the article, ÖA, FK, HÜ.

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Profesyonel Voleybolcuların Fair Play Algısı

Aylin Özge PEKEL^{1*} 

¹Spor Bilimleri Fakültesi, Gazi Üniversitesi, Ankara, Türkiye

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Öz

Sporcular üzerinde yaratılan başarı baskısı taraftar, medya, politik yapılar, sponsor gelirleri, antrenör gibi dışsal faktörlerle birlikte sporcuları başarının zorunluluğu bu baskıyı arttırmaktadır. Bu bağlamda, profesyonel voleybolcuların fair play kavramına yönelik düşünce ve deneyimleriyle yükledikleri anlamların metaforlar vasıtasıyla ortaya çıkarılması bu çalışmanın amacını oluşturmaktadır. Araştırmaya 2022-2023 sezonunda Türkiye voleybol üst liglerinde profesyonel olarak voleybol oynayan 27 erkek 12 kadın toplamda 39 profesyonel voleybolcu katılmıştır. Araştırmada nitel araştırma yöntemlerinden fenomenoloji (olgu bilim) deseni kullanılmıştır. Verilerin elde edilmesinde iki kısımdan oluşan, araştırmacı ve uzman görüşüne başvurularak oluşturulan bir form kullanılmıştır. İlk kısım, katılımcıların demografik bilgilerini içermekte, ikinci kısım ise fair play kavramına ilişkin voleybolcuların algılarını belirlemek amacıyla "Fair play... gibi/benzer; çünkü..." ifadesini tamamladığı bölümü içermektedir. Araştırmanın verilerinin analizi, içerik analiz tekniği kullanılarak gerçekleştirilmiştir. Analiz süreci, öncelikle 1'den 39'a kadar numaralandırılan metaforların tek tek incelenmesi ve kodlanması, metaforların ifade ettiği anlamlara göre kod listesi arasındaki ilişkilere bakılarak, verilerin anlamlı hale getirilmesi ve en uygun kategorilere ulaştırılması şeklinde gerçekleşmiştir. Sporcuların bakış açıları incelendiğinde oluşturulan metaforların "dürüstlük unsuru olma", "saygı unsuru olma", "inanç unsuru olma", "karakter unsuru olma" ve "yardımlaşma/takım çalışması unsuru" temaları altında toplandığı sonucuna ulaşılmıştır. Sporculuğun ilk yıllarından itibaren verilecek fair play eğitimlerinin yaygınlaştırılması ve olumlu davranışların ödüllendirilerek teşvik edilmesi ve medyanın da bu konu üstünde yoğunlaşarak paylaşımlarda bulunması fair play ruhuna yakışır davranışların yaygınlaşmasına katkı sağlayacağı düşünülmektedir.

Anahtar kelimeler: Fair play, Voleybol, Fenomenoloji, Metafor, Nitel araştırma

Fair Play Perception of Professional Volleyball Players

Abstract

The pressure to succeed created on athletes by external factors such as fans, media, political structures, sponsorships, and coaches increases this pressure of the necessity of success. In this context, the aim of this study is to reveal the meanings attributed to the concept of fair play by professional volleyball players through metaphors. A total of 39 professional volleyball players, 27 men and 12 women who played professionally in the top leagues in Turkey in the 2022-2023 season, participated in the study. Phenomenology design, one of the qualitative research methods, was used in the study. A form consisting of two parts, created by consulting the researcher and experts, was used to obtain the data. The first part includes participants' demographic information, while the second part aims to determine volleyball players' perceptions of fair play by completing the expression "Fair play is like/similar to... because..." The data were analyzed using content analysis technique. The analysis process was carried out by examining and coding the individual metaphors numbered from 1 to 39, looking at the relationships between the metaphors and the code list of the meanings expressed by them, and reaching the most appropriate categories to make the data meaningful. When athletes' perspectives were examined, it was concluded that the created metaphors were grouped under the themes of "being an honesty element," "being a respect element," "being a belief element," "being a character element," and "being a collaboration/teamwork element." It is believed that fair play education to be given from the early years of sports, rewarding positive behaviors, and media focusing on this issue and sharing related content will contribute to the widespread adoption of fair play behavior.

Keywords: Fair play, Volleyball, Phenomenology, Metaphor, Qualitative research

* **Sorumlu Yazar:** Arş. Gör. Dr. Aylin Özge Pekel, **E-mail:** aylinozgesarac@gazi.edu.tr

GİRİŞ

Sporun sosyal beceriler üzerinde etkisi olduğu ve uygun şekilde kullanıldığında rekabeti, iş birliğini, oyun kurallarını, sporla ilgili düzenlemeleri ve amaçlarıyla birlikte eğitimini aldığı branşı öğretebildiği bilinmektedir (Bloom ve Smith, 1996). Spor eğitimi insan deneyiminin bir laboratuvarı olarak da görülebilir (Pennington, 2017). Sporun, antrenman yoluyla katılımcıların deneyimlerine dayalı bir değer sistemi yaratması beklenir. Kişilik gelişimi açısından değerlendirildiğinde, insanların kişiliklerini etkileyen faktörler açısından ne derece önemli olduğu ortaya çıkmaktadır. Spor müsabakaları sporculara rekabet etmeleri ve böylece adil oyun becerilerini sergilemeleri için fırsatlar sağlamalıdır (Molina vd., 2014; Serrano-Durá vd., 2021).

Yarışmalar sıkı rekabet ortamları yaratır. Çoğu zaman rakip takım ya da sporcunun kendi takımı çok zor durumlar içerisinde kalsalar bile yarışma kurallarına uygun bir şekilde davranmaları gerekmektedir. Rakip sporcunun kendisi gibi kazanma amacıyla sahada bulunduğunu unutmadan onu sadece sporcu olarak görmeli ve değer vermesi sporun içinde bulunması gereken unsurlardandır. Spor tarihine bakıldığında hak gözeterek, şövalyece, mertçe, insana yaraşır biçimde yaşamak anlamına gelen fairness kelimesini barındırmakta olduğu görülmektedir. Spor diline 19. yüzyılda girdiği düşünülen fair play kavramının şekillenmesi uzun sürece yayılmıştır (Yıldıran, 1992). Kavramın temelinde insan onuruna yapılan saygıya vurgu yapılsa da eşitlik, disiplin, hak, hoşgörü, sevgi, saygı insanın karakterine saygı insan yaşantısında önemli yeri olan kavramları içinde barındırdığı hüznün, stres bireylerin hayatta mücadelelerinin süre geldiği bir kavram olarak varlığını sürdürmektedir (Pehlivan, 2004). Ama iş profesyonelliğe dönüp spor bir meslek olarak icra edildiğinde istenen bu davranışları uygulamak zor bir durum halini alabiliyor. Mutlak başarı beklentisi ve bu yönde sarf edilen yoğun çaba günümüz performans sporlarında başarıya ulaşmak adına ne pahasına olursa olsun kazanmak gibi diğer daha bencil çıkarlar için ahlaki normlar genellikle göz ardı edilir (Parent ve Fortier, 2018). Sporcular üzerinde yaratılan başarı baskısı taraftar, medya, politik yapılar, sponsor gelirleri, antrenör gibi dışsal faktörlerle birlikte sporcuları başarının zorunluluğu bu baskıyı arttırmaktadır (Yıldıran, 2004).

Profesyonel olarak yapılan spor dallarında fair play, oyun ahlakı gibi değerler önem arz etse de rakibi psikolojik, duygusal ve fiziksel baskı altına almak kazanma şansını yükseltmek adına fair play anlayışından uzaklaşmaya neden olmaktadır (Lumpkin vd., 2003). Ahlaki ilkeler, motive edici oldukları için ahlaki eylemin ve bir eylemi gerçekleştirme niyetinin öncüleridir. Alanda yapılan çalışmalarda ahlaki yeterlilik seviyesi ne kadar yüksekse, ahlaki niyetler üzerindeki olumlu etkinin o kadar büyük olduğunu göstermektedir (Cheung vd., 2001). Sporda fair play, sadece kural bilincine bağlı kalmayıp ahlaki normlar ve sosyo-kültürel normları da içine alan bir kavramdır (Yıldıran, 1992). Bunu akılda tutarak, sporcuların adil oyunu nasıl algıladıklarını ve bunun ne şekilde deneyimlerini etkileyip etkilemediğini bilmek önemli görünmektedir. Bunu belirlemek için benimsediğimiz dünya kavrayışımızla düşünce biçimi ve görme biçimi anlamına gelen metaforlar kullanılmaktadır (Morgan, 2016). Metaforlar, soyut ve karmaşık bilgileri somut deneyimlerle ilişkilendirmede güçlü bir bilişsel araç olmanın yanı sıra, her insanın benzer etkinlikleri farklı anlamlarla doldurabileceği ve aynı etkinliğin farklı kişiler için farklı anlamlar taşıyabileceği gerçeğini de beraberinde getirir (Dutke, 1994; Seippel, 2006; Vosniadou ve Ortony, 1989).

Literatür incelendiğinde sporcular ve hakemler özelinde fair play davranışları üzerine (Güllü ve Şahin, 2018; Kahya, 2020; Pekel vd., 2023; Pepe vd., 2019; Teke, 2018), gençlerin fair play ve sportmenlik davranış düzeyleri bağlamında (Altun ve Güvendi, 2019; Caz ve İkizler, 2019; Gök ve Sarıkol, 2023; Koç ve Seçer, 2018; Sezen-Balçıkanlı vd., 2017) ve sporcularda prososyal ve antisosyal davranışları irdeleyen (Sezen-Balçıkanlı vd., 2019; Sezen-Balçıkanlı ve Sezen, 2019; Sezen-Balçıkanlı ve Yıldırım, 2018) çalışmalar bulunmaktadır. Ancak profesyonel voleybolcular özelinde fair play kavramına yönelik deneyimleri ortaya koyan çalışmalara rastlanmamaktadır. Bu bağlamda profesyonel voleybolcuların fair play kavramına yönelik düşünce ve deneyimleriyle yükledikleri anlamların metaforlar vasıtasıyla ortaya çıkarılması bu çalışmanın amacını oluşturmaktadır.

YÖNTEM

Araştırma Modeli

Bu çalışmada profesyonel voleybolcuların fair play kavramına yönelik düşünce ve deneyimleriyle yükledikleri anlamların metaforlar vasıtasıyla ortaya çıkarılması amacıyla nitel araştırma desenlerinde olgu bilim (fenomenoloji) deseni kullanılmıştır. Anlaşılmayan konuları derinlemesine incelemek için uygun bir yöntem olarak, olgu bilimi kullanılmaktadır. Metaforlar ise olguları sade ve yalın bir şekilde tanımlayarak gerçeği daha iyi anlamamıza yardımcı olmaktadır (Yıldırım ve Şimşek, 2016).

Çalışma Grubu

Çalışma grubu kolay ulaşılabilir örnekleme yoluyla belirlenmiştir. Araştırmaya 2022-2023 sezonunda Türkiye voleybol üst liglerinde profesyonel olarak voleybol oynayan 27 erkek 12 kadın toplamda 39 profesyonel voleybolcu katılmıştır.

Veri Toplama Araçları

Verilerin elde edilmesinde iki kısımdan oluşan, araştırmacı ve uzman görüşüne başvurularak oluşturulan bir form kullanılmıştır. İlk kısım, katılımcıların demografik bilgilerini içermekte, ikinci kısım ise fair play kavramına ilişkin voleybolcuların algılarını belirlemek amacıyla "Fair play... gibi/benzer; çünkü..." ifadesini tamamladıkları bölümü içermektedir. Katılımcılara yeterli zaman verilerek ifadeleri tamamlamaları sağlanmıştır.

Araştırma Yayın Etiği

Araştırmaya ait etik komisyon onayı 18/04/2023 tarihli, 2023-587 araştırma kodlu karar ile Gazi Üniversitesi Etik Komisyonu'ndan alınmıştır.

Verilerin Analizi

Araştırmanın verilerinin analizi, içerik analiz tekniği kullanılarak gerçekleştirilmiştir. Bu teknik, kişilerin ifade ettikleri sözlerin ve yazıların belirli talimatlar doğrultusunda kodlanarak sayısal hale getirilmesi sürecidir (Patton, 2014). Analiz süreci, öncelikle 1'den 39'a kadar numaralandırılan metaforların tek tek incelenmesi ve kodlanmasıyla başlamıştır. Kodlama sırasında, metaforların ifade ettiği anlamlara göre kod listesi arasındaki ilişkilere bakılarak, verilerin anlamlı hale getirilmesi için en uygun kategorilere ulaşılmıştır. Metaforlar, nitel

araştırmalarda sıklıkla kullanıldığı için, verilerin çeşitliliğiyle başa çıkmada kolaylık sağladığı, veriler arasında bağlantı kurulmasına yardımcı olduğu ve verilerin okuyucuya sunulmasında kolaylık sağladığı için tercih edilmektedir (Sadık ve Sarı, 2012). Verilerin geçerlilik ve güvenilirliği sağlamak amacıyla, araştırmacılar verileri ve analizleri araştırmaya katılan kişilerin kontrolüne sunmuş ve ayrıca verilerin ve analizlerin uzman kişilere sunularak yorumlanması için başvurulmuştur (Ekiz, 2009). Ayrıca, araştırma dışından iki uzmanla çalışan araştırmacı, oluşturulan temaları karşılaştırmış ve görüş birliği ve görüş ayrılığı sayılarını hesaplayarak araştırmanın güvenilirliğini değerlendirmiştir. Miles ve Huberman'ın (1994) formülü kullanılarak yapılan hesaplama sonucunda, %93 ve üzeri uyum sağlandığı görülmüştür (Saban, 2008). Araştırmaya ait verilerin çözümlenmesinde Microsoft Excel veri tabanı programı kullanılmıştır. Metaforlar 4 temada toplanmıştır (Tablo 1). Oluşturulan metaforlardan metin içinde örneklere yer verilmiştir.

BULGULAR

Bu bölümde, fair play kavramına ilişkin profesyonel voleybolcuların oluşturduğu metaforlar belirlenerek, ortak özelliklerine göre temalar altında incelenmiştir. Ayrıca, oluşturulan metaforların bazı örnekleri de sunulmuştur. Araştırmaya katılan sporcuların fair play kavramına ilişkin metaforları, kodlar ve temaları Tablo 1'de yer almaktadır.

Tablo 1. Sporcuların “fair play” kavramına yönelik yaptıkları metaforların kavramsal temaları

Kodlar	Kavramsal Temalar
Adalet, babanın yalanı öğretmemesi, berrak bir su, kaliteli sporcu, karakter, ahlak, ayna, hayat, kardeşlik	Dürüstlük unsuru olma
Duruş, erkek kulübüne, saygı göstermek, davranış biçimi, kendinden önce rakibe saygı, rakibe ve hakemlere saygı	Saygı unsuru olma
Vicdanım, maçta kazanmak için her şeyi yapmak, deniz, hasat, tartışma, sınır çizgisi	İnanç unsuru olma
Oyun karakterini bencilliğinden önde tutma, örnek karakter, ego hırslı duyan şeydir, ayna, tarih, insanlık	Karakter unsuru olma
Dostluk, arkadaşlık, yardım	Yardımlaşma/takım çalışması unsuru

Bazı temalar altında aynı kodların olduğu gözlemlenmiştir. Bu kodlardaki metaforlar farklı anlamlar içerdiği için farklı temalarda yer almaktadır (Tablo 1).

Dürüstlük unsuru olarak fair play

Fair play, herhangi bir hile ya da kural dışı davranışın kabul edilemez olduğu, çeşitli hilelere başvurarak rakibini yenmek değil, spor ortamında gerçekleşebilen adil oyun olarak görülmelidir (Covrig, 1996). Bu kategoride profesyonel voleybolcuların fair play kavramı için oluşturdukları metaforların açıklamaların da adalet, babanın yalanı öğretmemesi, berrak bir su, kaliteli sporcu, karakter, ahlak, ayna, hayat, kardeşlik gibi ifadelerle metaforun kaynağa atfedilen özelliklerini açıklamışlardır.

“Fair play babanın yalanı öğretmemesine benzer/gibidir çünkü; en baştan bu öğretilmiştir ve doğru bilinen budur. Sonucu kaybetmekte olsa dürüstlüğün öğrenimidir.” (Sporcu 24)

Saygı unsuru olarak fair play

Fair play kavramının temelinde öncelikli olarak insan onuruna gösterilen saygının varlığına vurgu yapılmaktadır (Pehlivan, 2004). Ayrıca fair play, sporcuların ve oyuncuların hakemlere, antrenörlere, taraftarlara ve diğer kişilere karşı da saygılı olmalarını gerektirir. Bu, diğer insanların da hakkına saygı gösterilmesi ve oyunun herkes için adil bir şekilde oynanması için gereklidir. Bu kategoride profesyonel voleybolcuların fair play kavramı için oluşturdukları metaforların açıklamaların da duruş, erkek kulübüne, saygı göstermek, davranış biçimi, kendinden önce rakibe saygı, rakibe ve hakemlere saygı gibi ifadelerle metaforun kaynağa atfedilen özelliklerini açıklamışlardır.

“Fair play erkek kulübüne benzer/gibidir çünkü; yazılmamış Kuralları ve birbirine gösterilen saygı vardır.” (Sporcu 15)

İnanç unsuru olarak fair play

İnanç, bireylerin veya toplumların dünya ve insanlık hakkındaki görüşlerini ifade eden bir terimdir. İnanç, kişisel bir deneyim veya toplumun ortak deneyimlerinin bir sonucu olarak gelişebilir ve doğruluğu kabul gören düşünceler olduğundan her zaman bilişsel oluşum içerisindedir (Hoffman, 1987). İnanç, insanların yaşamlarına anlam ve amaç katabilir. Bu kategoride profesyonel voleybolcuların fair play kavramı için oluşturdukları metaforların açıklamalarında vicdanım, maçta kazanmak için her şeyi yapmak, deniz, hasat, tartışma, sınır çizgisi gibi ifadelerle metaforun kaynağa atfedilen özelliklerini açıklamışlardır.

“Fair play sınır çizgisine benzer/gibidir çünkü; geçmek sizin ahlak inancınızı sorgulatırken gerektiğinde geçmememiz büyük kayıplara uğramanıza neden olur.” (Sporcu 2)

Karakter unsuru olarak fair play

Bu kategoride profesyonel voleybolcuların fair play kavramı için oluşturdukları metaforların açıklamaların da oyun karakterini bencillikten önde tutma, örnek karakter, ego hırsı duyan şeydir, ayna, tarih, insanlık gibi ifadelerle metaforun kaynağa atfedilen özelliklerini açıklamışlardır. Fair play insanların karakterini yansıtan bir davranış şeklidir ve dürüstlük, saygı ve adalete dayanan davranış biçimidir. Sporcu 17’in oluşturduğu metaforunda da bunu açıkça görmekteyiz.

“Fair play ayna benzer/gibidir çünkü; rakiplerimize olan davranışlarımız bizim karakterimizi yansıtır.” (Sporcu 17)

“Fair play örnek karaktere benzer/gibidir çünkü; karakter örnek bir sporcu olabilmek için bu çok önemlidir ve karşılıklı oynadığım her sporcuda olmalıdır.” (Sporcu 25)

Yardımlaşma/takım çalışması unsuru olarak fair play

Fair play, sporun yanı sıra iş hayatı, eğitim ve sosyal ilişkiler gibi diğer alanlarda da önemlidir. Güven, saygı ve iş birliği gibi değerleri teşvik eder ve toplumun her alanında yardımlaşmayı artırır. Bu kategoride profesyonel voleybolcuların fair play kavramı için oluşturdukları metaforların açıklamaların da dostluk, arkadaşlık, yardım gibi ifadelerle metaforun kaynağa atfedilen özelliklerini açıklamışlardır.

“Fair play dostluk benzer/gibidir çünkü; gerektiğinde fedakârlık ve özveri gerektirir.” (Sporcu 38)

TARTIŞMA VE SONUÇ

Profesyonel voleybolcuları fair play algısını incelediğimiz araştırmamızda kavram algısının kişisel inanç ve etik değerlerine aynı zamanda kültürel arka planlarına bağlı olarak değişebildiğini görmekteyiz. Ancak sporcuların çoğu adil oyun ve spor ahlakına saygı duyarak saha içerisinde de bunu uygularlar. Sosyal karakter değerleri sadakat, kendini adama, fedakârlık, takım çalışması ve iyi vatandaşlığı içerirken, ahlaki değerler dürüstlük, adalet, adil oyun, adalet ve sorumluluğu içermektedir. (Lumpkin ve Stokowski, 2011; Stoll ve Beller, 1993). Olumlu ya da olumsuz, rekabet, katılımcıların bilinçlerini, değerlerini ve inançlarını şekillendirmek için muazzam bir güce sahiptir (Pennington, 2017). Profesyonel voleybolcularla yaptığımız çalışmamızda oluşturulan metaforlarda dürüstlük, rakibe saygı, karakter, inanç ve tutum ayrıca yardımlaşma ve iş birliği olarak fair play algısının benimsendiği görülmüştür.

Tutum, bir kişinin belli bir konu veya nesne hakkında olumlu veya olumsuz duygularının ifadesidir. Fair play tutumu hem spor aktivitelerinde hem de sosyal etkinliklerde olumlu davranış yaratan bir tutumdur. İnsanların adalet, dürüstlük ve sporculuk değerlerine saygı duymaları ve bu değerleri uygulamaları, olumlu rekabet ortamı ve sağlıklı toplum için pozitif etkilediği bu temada oluşturulan metaforlarda gözlemlenmiştir. Alanda yapılan çalışmalarda profesyonellik ve rekabet söz konusu olduğunda olumlu ve olumsuz etkilediğini belirten araştırmalar (Gelfand ve Hartmann, 1982; Kavussanu vd., 2006; Lemyre vd., 2002; Lumpkin vd., 2003; Sezen-Balçıkanlı, 2014) mevcut iken yakın temas içeren takım sporlarında fair playe uymayan davranışların bireysel sporlara nispeten daha fazla görüldüğünü belirtmişlerdir (Bredemeier vd., 1986; Miller ve Jarman, 1988; Sezen ve Yıldırım, 2007; Shields vd., 2007). Araştırma sonuçlarında profesyonel voleybolcular da pozitif rakiple temasın net olarak file ile engellendiği branş olması orta temaslı ya da bireysel sporlara benzetilebileceğinden fair play davranışların pozitif olarak desteklenmesine yardımcı olduğu düşünülmektedir.

Sporun sadece oyun olmadığı aynı zamanda toplumsal bir sorumluluk olduğunu vurgulayan fair play kavramı profesyonel voleybolcular tarafından oluşturulan metaforlarda değer unsuru olarak benimsendiği görülmektedir. Erdemli (2008), sporun kurallar dahilinde mücadele edileceği hem rakibe değer vereceği hem saygı duyacağı etkinlik olarak belirtmiş aksi olduğunda spordan söz etmenin mümkün olmadığını belirtmiştir. Her spor branşında amaç kazanmak olduğu bilinmektedir. Voleybolcular, her zaman kendileri ve takımları için en iyi sonucu elde etmek için çalışırken, aynı zamanda rakiplerine saygı göstermek ve oyun kurallarına uymak için çaba gösterirler. Sporcularda yapılan çalışmalar performans sporlarında rastlanan aşırı kazanma baskısı, maddi kayıplar ile hatırı sayılır kazanımlar gibi etmenler sebebiyle sporcuların fair play kurallarına uymadıkları ve ahlak ilkelerine bağlı kalmadıkları söylenebilir. Performans sporcularının fair play ve ahlaksal davranışlarının yerini “Kazanmak hiçbir şey değildir, tek şeydir” sözüne bıraktığına sıklıkla şahit olmaktayız (Hardaway, 2003). Olumsuz olarak oluşturulan metaforlarda sporcu 37 maçta kazanmak için her şeyi yaparım ben yapmazsam rakip yapacak buna inanırım şeklinde ifadesiyle alan yazında belirtilen rekabete ve zafere yönelik şiddetli bir yönelimin bireyleri hile yapmaya yatkın hale getirdiğini ve aldatmayı kolaylaştırdığını belirtmeleriyle benzerlik göstermektedir (Duda vd., 1991; Sage vd., 2006; Ring ve Kavussanu, 2018).

Sezen ve Yıldırım (2003) profesyonelliğin, kazanma isteğiyle birleşince fair playe uygun davranışların önüne geçtiği, profesyonel sporcularda amatör sporculara göre daha yüksek bir oranda fair play kurallarına aykırı davranışlara rastlandığını belirtmiştir. Oysa başarı denilince fair play çerçevesinde sporun genel ahlak yapısı korunarak başarı düşünülmelidir (Sezen ve Yıldırım, 2007). Profesyonel spor, sürekli istihdam için üretim ve başarının gerekli olduğu bir işdir. Belki de böyle bir ortamda, katılımcıların katılım gösterirken adil ve cömert olmalarını beklemek çok mantıklı olmayabilir. Nezaket ruhuyla kazanmak ve kaybetmek alakasız görünebilir. Tüm branşlar için fair play, oyun ahlak değerleri önemli olduğu bilirse de performans sporunun belirgin özellikleri arasında rakibi psikolojik, duygusal ve fiziksel baskı altına alarak kazanma şansını yükseltmeye dayalıdır (Lumpkin vd., 2003). Sporcular profesyonellik sürecine kadar pek çok kategoride boy gösterir. Bu yetişme sürecinde antrenör, ebeveyn, beden eğitimi öğretmenleri, kulüp yöneticileri gibi sporun birçok paydaşı ile etkileşim içerisinde olurlar. Sporun yaygınlaşması ve olumlu davranışların küçük yaşlardan itibaren bireylere aktarılması fair play kavramının pekiştirilmesi adına yararlı olacaktır. Yapılan çalışmalar göstermiştir ki antrenörlerin ve ebeveynlerin olumlu sosyal davranışları, çeşitli spor disiplinlerinde arzu edilen ve destekleyici davranışların teşvik edilmesini olumlu yönde etkilemektedir (Estrada vd., 2014; Gano-Overway vd., 2005; Lavoie ve Stellino, 2008; Stornes ve Bru, 2002).

Profesyonel voleybolcular ayrıca, oyun sırasında ortaya çıkan herhangi bir haksızlık veya yanlışlığı açıkça ifade etmek ve doğru davranışı teşvik etmek için de sorumluluk hissederler. Bu şekilde, fair playin uygulanması, sadece profesyonel voleybolcular için değil, aynı zamanda tüm sporseverler için de olumlu bir örnek oluşturur. Sporculuğun ilk yıllarından itibaren verilecek fair play eğitimlerinin yaygınlaştırılması ve olumlu davranışların ödüllendirilerek teşvik edilmesi ve medyanın da bu konu üstünde yoğunlaşarak paylaşımlarda bulunması fair play ruhuna yakışır davranışların yaygınlaşmasına katkı sağlayacağı düşünülmektedir.

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Etik Komisyon İzni İle İlgili Bilgiler

Komisyon Adı: Gazi Üniversitesi Etik Komisyonu

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Technical Analysis of Goals Scored in 3 Different European Leagues in The 2020-2021 Football Season

Erhan IŞIKDEMİR^{1*}, Süleyman ÖZKÜRKCÜ^{1*}, Şevket Cihat ÖZER¹

¹Nevşehir Hacı Bektaş Veli University, Faculty of Sport Science, Nevşehir.

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Abstract

The aim of this study is to classify the goals scored in the 2020-2021 football season in Turkish Super League (TSL), English Premier League (EPL), and French League 1 (FL1) according to technical and tactical criteria, and to reveal the differences and similarities between the leagues. The scope of the research consists of a total of 3209 goals scored in 1180 football matches played in 3 different European Leagues in the 2020-2021 season. Each goal was classified according to the minute interval, the area where the attacking move started, the number of touches by the player before scoring, and the goals scored from set pieces. The frequency and percentage distributions of all data were calculated separately for each league. According to the results obtained, the most goals were scored in TSL (f: 1136 goals), while the least goals were scored in EPL (f: 1024 goals). Looking at the distribution of total goals by minute intervals, the most goals were scored in the last quarter of the game in TSL (f:199; 17.5%), EPL (f:166; 16.2%), and FL1 (f:186; 17.7%), while the least goals were scored in the added time of the first half. When looking at the number of touches by the player who scored the goal, it was found that the most goals were scored with one touch. Regarding the direction of the attacking move, it was observed that the rate of goals scored after wing attacks was lower in FL1 than in TSL and EPL, but the number of goals scored from central attacks was higher. According to the results, it is understood that the teams in the leagues have different game structures, which are decisive in determining the goal criteria.

Keyword: Soccer, Goal Scored, Vision Analysis, Technical Analysis

2020-2021 Futbol Sezonunda 3 Farklı Avrupa Liginde Atılan Gollerin Teknik Analizinin Yapılarak İncelenmesi

Öz

Bu çalışmanın amacı da farklı futbol ekolüne sahip olan Türkiye Süper Ligi (TSL), İngiltere Premier Lig (EPL) ve Fransa Lig 1'de (FL1) 2020-2021 futbol sezonunda oynanan tüm müsabakalarda atılan gollerin teknik ve taktik kriterler açısından sınıflandırılarak, ligler arasındaki farklılık ve benzerliklerin ortaya konmasıdır. Araştırmanın kapsamında 2020-2021 Sezonunda 3 farklı Avrupa Liginde oynanan 1180 futbol müsabakasında atılan toplam 3209 gol oluşturmaktadır. Atılan her bir gol, atıldığı dakika aralığı, gol öncesi atağın geliştiği bölge, gol öncesi oyuncunun topa temas sayısı ve duran toplardan kazanılan goller bakımından sınıflandırılmış ve tüm verilere ilişkin frekans ve yüzde dağılımları her bir lig için ayrı ayrı hesaplanmıştır. Elde edilen sonuçlara göre en fazla gol TSL (f: 1136 gol), en az gol ise EPL'de (f: 1024 gol) atılmıştır. Toplam atılan golün dakika bazında dağılımına bakıldığında TSL (f:199; 17.5%), EPL (f:166; 16.2%) ve FL1'de (f:186; 17.7%) en fazla golün oyunun son çeyreklik diliminde atılırken, en az golün ise ilk yarının uzatma dakikalarında atıldığı görülmektedir. Gol öncesi golü atan oyuncunun topa temas sayısı açısından bakıldığında en fazla golün 1 Temas ile atıldığı, atak yönü açısından bakıldığında ise FL1'de atılan kenar hücumları sonrası gol oranının TSL ve EPL'den daha az olduğu ancak merkezden yapılan hücum sonucunda atılan gollerin ise daha fazla olduğu görülmüştür. Sonuçlara göre liglerde yer alan takımların farklı oyun yapılarına sahip olduğu, bunun da sonucu belirleyen gol kriteri üzerinde belirleyici olduğu anlaşılmaktadır.

Anahtar Kelime: Futbol, Gol, Görüntü Analizi, Teknik Analiz

* **Corresponding Author:** Assist. Prof. Erhan-Işıkdemir, **E-mail:** erhanisikdemir20@gmail.com

INTRODUCTION

Performance analysis has an important role in evaluating the technical and tactical components of the performance exhibited by teams in sports with complex structures, such as football (Aranda et al., 2019). It is observed that the analysis of on-field performance in both physical and technical-tactical criteria has become a necessity in national and international sports organizations where the level of competition is at its highest, especially in football (Carling, 2013; González-Rodenas et al., 2020; Modric et al., 2022; Özçilingir & Bozdağın, 2021; Pratas et al., 2016; Tenga et al., 2010). Performance analysis, which is carried out based-on observation or with technological tools within predetermined criteria, contributes to the holistic evaluation technical and tactical behaviors that occur on the field, both as a team and individually (Aranda et al., 2019; González-Ródenas et al., 2020; Gözübüyük & Karaç, 2021; Gürkan et al., 2017; Işıkdemir, 2020) and to determine the emerging advantages and disadvantages (Matos et al., 2021; Mitrotasios et al., 2019).

In football, the determining factor for the outcome is the goal. Tactical approaches in attack are an important determinant for scoring goals. Especially in modern football, the success of a team in scoring goals and the game strategies created for scoring goals are an important key to success (Li & Zhao, 2021). Therefore, it is expected that the coach and the technical team will develop attacking strategies aimed at scoring goals during matches. This is because there is a preparatory process and a finalization phase for each goal scored during a match (Kubayi & Toriola, 2019). For this reason, it is necessary to analyze the tactical elements that emerge before and during a goal in terms of performance.

When the literature is generally reviewed, research focused on indicators that can be called the character of the goal, such as the way the goal is scored, the number of passes before the goal, the period of time the goals are scored, the wing where the goal is scored, and the type of attack leading to the goal, can be seen in the football branch (Hughes & Franks, 2005; Lago-Ballesteros & Lago-Peñas, 2010; Li & Zhao, 2021; Yiannakos & Armatas, 2006; Yolgörmez, 2018). Yiannakos and Armatas (2006) reported in their research conducted for the European Championship that 57.4% of goals were scored in the second half, 42.6% in the first half, 20.3% of total goals were scored in fast breaks, 35.6% in set pieces, and 40.1% were scored as a result of attack organizations, and the most goals from set pieces were scored from corner kicks. In Yolgörmez's (2018) research on the goals scored in the Turkish Super League, it was reported that 35.9% of goals were scored from organized attacks, 57.7% from central attacks, 86.2% from the penalty area, 86.6% from foot shots, and 56.5% were scored with a single touch. In the study conducted by Li and Zhao (2021) on the goals scored in the English Premier League, French Ligue 1, German Bundesliga, Italian Serie-A and Spanish La Liga, they reported that the number of goals scored after a throw-in was highest in Spanish La Liga, the corner kick goal rate was highest in English Premier League, and the highest number of goals resulting from counterattacks was scored in German Bundesliga. They also reported that there was no statistical difference between the leagues in terms of goals scored in the last 15 minutes and goals scored directly after a free-kick.

When examined, it can be seen that goals scored in matches are evaluated according to different criteria. It is observed that the way goals are scored in national and international football organizations is compared in terms of this aspect. These evaluations are thought to facilitate

the evaluation of game systems in terms of attack and defense in different countries and international football organizations. Therefore, evaluating goals scored in matches in terms of technical and tactical criteria can serve as a reference guide for coaches to plan training and matches, both for individual players and for the team, throughout a season (Cerrah & Gürol, 2011; González-Rodenas et al., 2020; Li & Zhao, 2021; Matos et al., 2021; Modric et al., 2022; Özçilingir & Bozdağın, 2021; Wright et al., 2011). However, when looking at the studies conducted, it is seen that there is a lack of studies on the differences in the goal paths between the TSL, which is the top league in our country, and different European leagues. In this context, the goals scored in all matches in the 2020-2021 football season in the TSL, EPL, and FL1, which have three different football schools, were classified in terms of technical criteria, and the differences and similarities between the leagues were aimed to be revealed.

METHODS

Research Model

In the scope of the research, a descriptive investigation method was used to collect data. The descriptive survey model is known as a model that aims to describe data through observation without any external intervention in a situation or event (Arı & Apaydın, 2022).

Sample Group

The universe of the research consisted of 1180 football matches played in three different European Leagues (TSL: 420 match, 1136 goals; EPL: 380 match; 1024 goal; FL1: 380 match, 1049 goal) during the 2020-2021 season, and the sample group consisted of a total of 3209 goals scored in the 1180 matches played in the three leagues.

Ethical Approval

Ethics approvals were obtained from the Non-Interventional Clinical Research Ethics Committee of Nevşehir Hacı Bektaş Veli University (Ethics Committee Document No: 2100125497; Meeting No: 08; Decision No: 2022/88), and all measurements were carried out in accordance with the Helsinki Declaration.

Data Collection

The sample group of the study was obtained from all the data collected from 1180 football matches in 3 different European leagues (TSL, EPL, FL1) during the 2020-2021 season. The video recordings of the goals scored were obtained from the website published in open access by the relevant federation and broadcaster (TSL: <https://www.tff.org/default.aspx?pageID=1529>; EPL: <https://www.premierleague.com/history/season-reviews/363>; FL1: <https://www.ligue1.com/fixtures-results?seasonId=2020-2021&StatsActiveTab=0>; <https://beinsports.com.tr>). The footage was watched by a coach who had received analysis training, and classifications were made based on the observations, recorded simultaneously in Microsoft Excel and paper using observation through the pen-and-paper method. In the first stage, the total number of matches played throughout the season in all leagues recorded, along with the results of the matches, and the number of matches won by home and away teams and the number of draws were determined. In the final stage, all goals scored in the matches were analyzed by watching the footage, and information such as the time interval in which each goal

was scored, the number of times the player had touched the ball before scoring, and the attacking direction were recorded. If the goal was scored from a stationary ball, such as a penalty kick, corner kick, or free kick, it was recorded under the category of set pieces. Goals scored from set pieces were not included in the evaluation of attacking direction. During the evaluation phase, "own goals" were evaluated on behalf of the opposing team. If a team scores an own goal, the goal is registered for the other team based on the criteria.

Data Classification

Interval of the goal scored: It has been done to determine in which time interval the goal was scored during the game. Evaluations were made in eight different sections as "first half and second half; 1-15 min; 16-30 min; 31-45 min; 45+ min; 46-60 min; 61-75 min; 76-90 min; 90+ min".

Number of touches before the goal: It indicates how many times the player who scored the goal touched the ball in the final position before making the goal shot (1 touch, 2 touches, 3 touches, 4+ touches).

Attack direction before the goal: Analysis will be made to determine from which area the attack developed before the goal was scored. The area where the player scored the goal was passed the ball is defined as the area where the attack was developed (Figure 1).

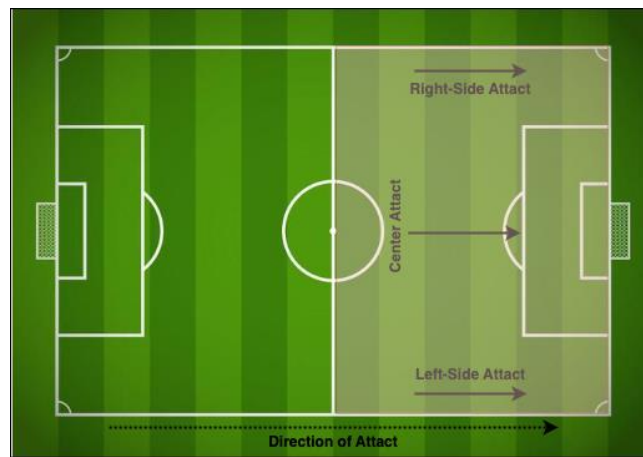


Figure 1. Attack direction before the goal-scored

Reliability Testing

To analyze the reliability of all variables, an intra-observer test was performed using the kappa measure of agreement. The kappa values varied from 0.98 to 1.00, indicating that the agreement was quite strong across all performance measures.

Data Analysis

In the scope of the research, 3209 goals scored in 1180 football matches were classified into various categories. Descriptive statistics were provided for the obtained data, and frequency and percentage distributions were calculated and presented. The Jamovi Project (Version 2.3-Computer Software) analysis program was used for data analysis.

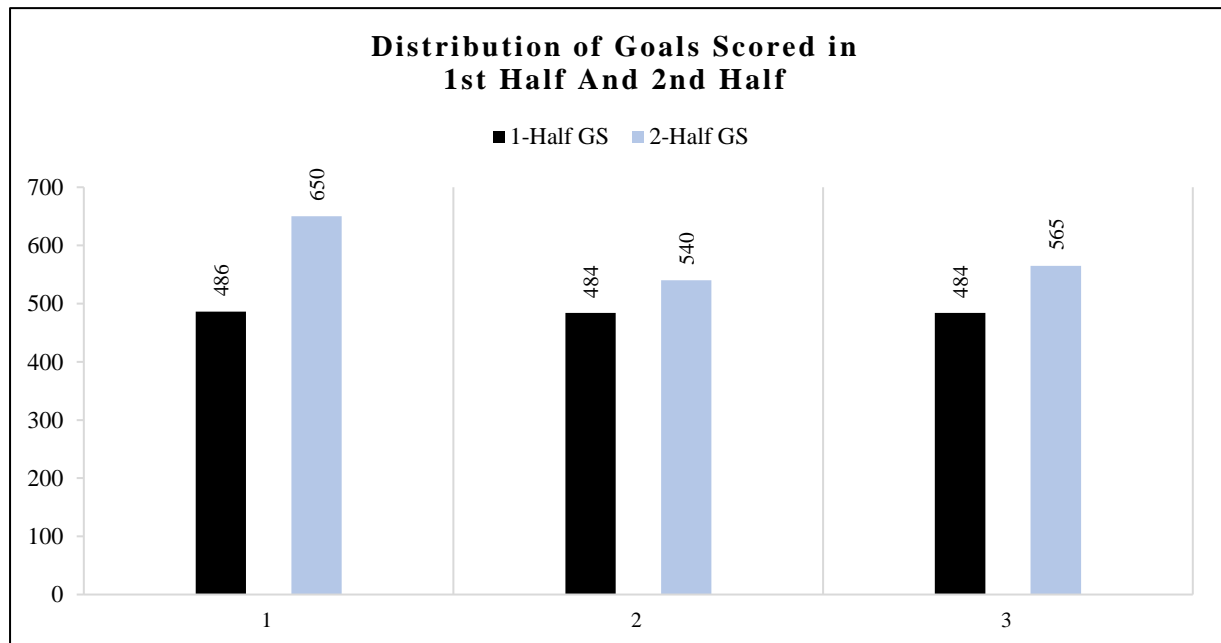
RESULT

This section presents statistics on goals scored during the 2020–2021 season in the TSL, EPL, and FL1.

Table 1. Descriptive statistical results of the TSL, EPL and FL1

	MatchNumber	TotalGS	1-Half GS	%	2-Half GS	%	AvarageGS
TSL	420	1136	486	42,8%	650	57,2%	2,7
EPL	380	1024	484	47,3%	540	52,7%	2,7
FL1	380	1049	484	46,1%	565	53,9%	2,8

TSL: Turkish Super League; **EPL:** English Premier League; **FL1:** French Liegue 1; **MatchNumber:** Number of Played Match; **TotalGS:** Total Number of Goals Scored; **1-Half GS:** Number of Goals Scored in First Half; **2-Half GS:** Number of Goals Scored in Second Half; **AvarageGS:** Average Number of Goals Per Match



Graph 1. Distribution of goals scored in first half and second half in the TSL, EPL and FL1

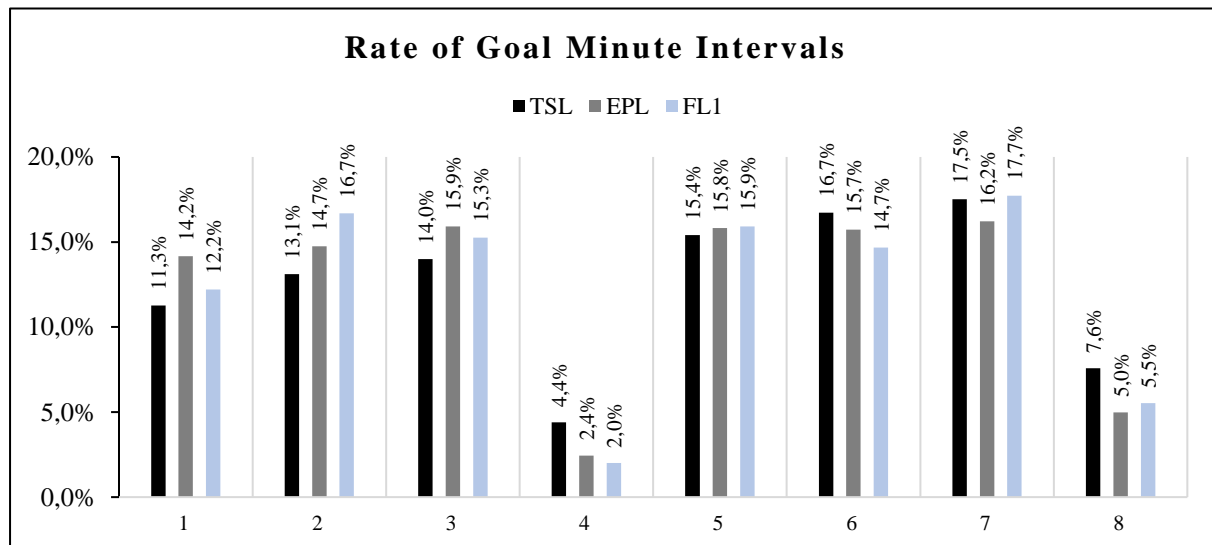
(1) Turkish Super League; (2) English Premier League; (3) French Ligue 1; **1-Half GS:** Number of Goals Scored in First Half; **2-Half GS:** Number of Goals Scored in Second Half

According to Table 1, a total of 1136 goals (100%) were scored in 420 matches (100%) in TSL, 1024 goals (100%) in 380 matches (100%) in EPL, and 1049 goals (100%) in 380 matches (100%) in FL1. In TSL, 42.8% (486 goals) of the total goals were scored in the first half of the matches, while this rate was 47.3% (484 goals) in EPL and 46.1% (484 goals) in FL1. When the goal rates scored in the second halves of the matches are examined, the rates were 57.2% (650 goals) in TSL, 52.7% (540 goals) in EPL, and 53.9% (565 goals) in FL1. Additionally, the average number of goals per match was 2.7 in TSL and EPL, and 2.8 in FL1 (Table 1; Graph 1).

Table 2. Distribution of goals scored in leagues according to minute intervals

LEAGUE	Minute Intervals	N	f	SD	%
TSL	01-15 Min	420	128	0.563	11,3%
	16-30 Min	420	149	0.578	13,1%
	31-45 Min	420	159	0.588	14,0%
	45+ Min	420	50	0.324	4,4%
	46-60 Min	420	175	0.610	15,4%
	61-75 Min	420	190	0.648	16,7%
	76-90 Min	420	199	0.638	17,5%
	90+ Min	420	86	0.427	7,6%
	Total		420	1136	
EPL	01-15 Min	380	145	0.585	14,2%
	16-30 Min	380	151	0.606	14,7%
	31-45 Min	380	163	0.644	15,9%
	45+ Min	380	25	0.259	2,4%
	46-60 Min	380	162	0.643	15,8%
	61-75 Min	380	161	0.639	15,7%
	76-90 Min	380	166	0.684	16,2%
	90+ Min	380	51	0.364	5,0%
	Total		380	1024	
FL1	01-15 Min	380	128	0.541	12,2%
	16-30 Min	380	175	0.647	16,7%
	31-45 Min	380	160	0.626	15,3%
	45+ Min	380	21	0.229	2,0%
	46-60 Min	380	167	0.616	15,9%
	61-75 Min	380	154	0.598	14,7%
	76-90 Min	380	186	0.672	17,7%
	90+ Min	380	58	0.395	5,5%
	Total		380	1049	

f: Frequency; %: Percent; TSL: Turkish Super League; EPL: English Premier League; FL1: French Ligue 1



Graph 2. Percentage distribution of goals scored in leagues according to minute intervals

TSL: Turkish Super League; EPL: English Premier League; FL1: French Ligue 1; (1) 01-15 Min; (2) 16-30 Min; (3) 31-45 Min; (4) 45+ Min; (5) 46-60 Min; (6) 61-70 Min; (7) 71-90 Min; (8) 90+ Min

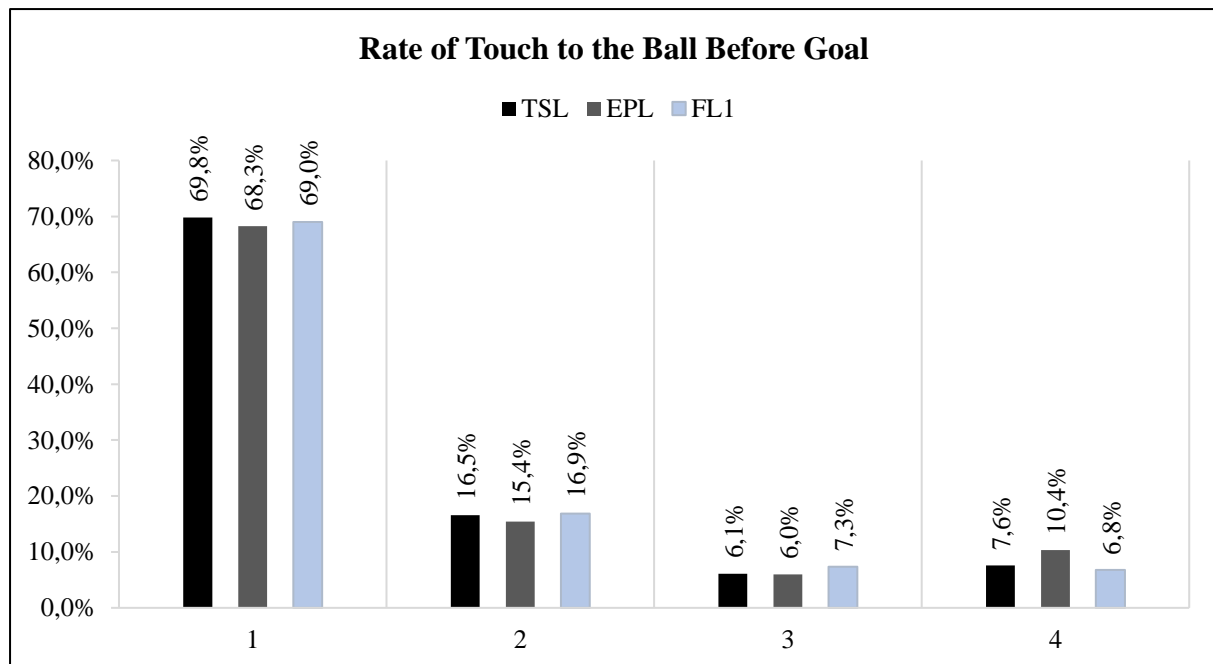
The information about the minute intervals in which goals were scored in all matches played for one season in TSL, EPL, and FL1 is provided in Table 2. According to the results obtained, when the distribution of goals scored in the first halves is examined in TSL, EPL, and FL1, the

ratio of total goals is realized as 42.8% (f = 486 goals), 47.3% (f = 484 goals), and 46.1% (f = 484 goals), respectively. When we look at the second halves, it is seen that these ratios were 57.2% (f = 650 goals), 52.7% (f = 540 goals), and 53.9% (f = 560 goals), respectively. The most frequently scored minute interval in all three leagues is between 76-90 minutes (TSL: f = 199 goals; 17.5%; EPL: f = 166 goals; 16.2%; FL1: f = 186 goals; 17.7%), while the interval with the least goals scored is between 45+ minutes (TSL: f = 50 goals; 4.4%; EPL: f = 25 goals; 2.4%; FL1: f = 21 goals; 2.0%) (Table 2). At the same time, it is observed that 41.8%, 36.9%, and 37.9% of the goals scored in a season in TSL, EPL and FL1, were scored in the last half-hour and the extra time period of the matches respectively (Graph 2).

Table 3. Number of goal scorer's contact with the ball before the goal scored in leagues

League	Number of Touch to the Ball Before Goal	N	f	SD	%
TSL	1T	420	793	1.417	69,8%
	2T	420	188	0.714	16,5%
	3T	420	69	0.408	6,1%
	≥ 4T	420	86	0.464	7,6%
	Total	420	1136		100,0%
EPL	1T	380	699	1.374	68,3%
	2T	380	158	0.738	15,4%
	3T	380	61	0.415	6,0%
	≥ 4T	380	106	0.530	10,4%
	Total	380	1024		100,0%
FL1	1T	380	724	1.338	69,0%
	2T	380	177	0.675	16,9%
	3T	380	77	0.446	7,3%
	≥ 4T	380	71	0.410	6,8%
	Total	380	1049		100,0%

f: Frequency; %: Percent; TSL: Turkish Super League; EPL: English Premier League; FL1: French Ligue 1; 1T: One Touch; 2T: Two Touch; 3T: Three Touches; ≥ 4T: Four and More Touch



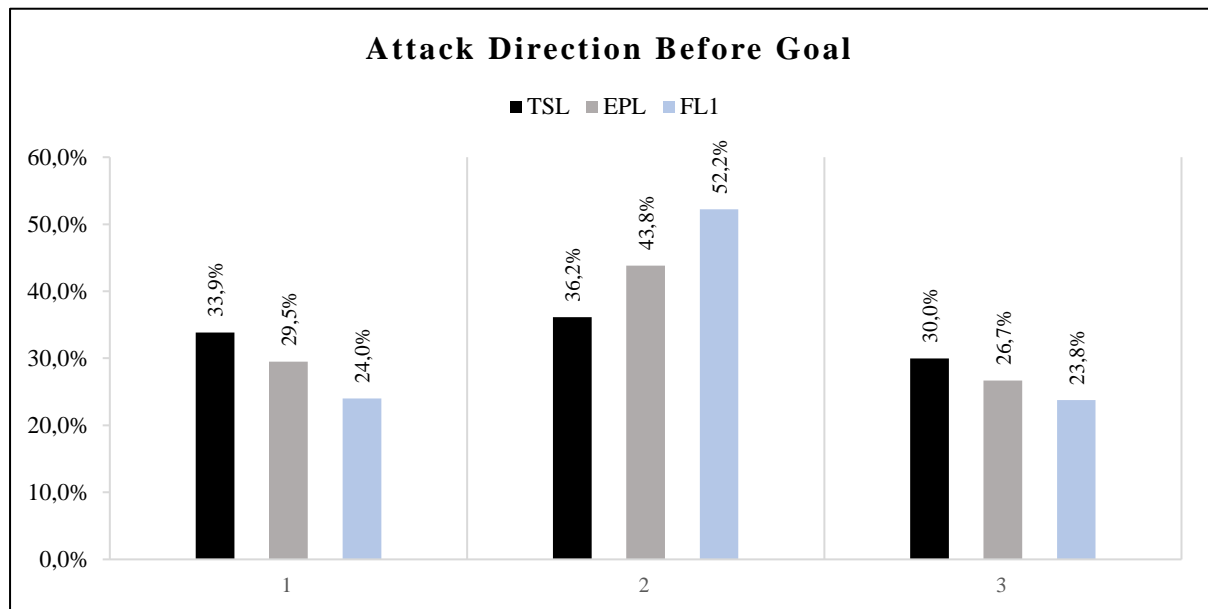
Graph 3. Percentage distribution of goal scorers in leagues according to the number of touch to the ball
TSL: Turkish Super League; EPL: English Premier League; FL1: French Ligue 1; 1 Touch to the Ball Before Goal (1); 2 Touches to the Ball Before Goal (2); 3 Touches to the Ball Before Goal (3); 4 or More Touches to the Ball Before Goal (4)

Table 3 provides information on the number of touches by the goal-scoring player for all matches played in a season in TSL, EPL, and FL1 leagues. According to the results, the number of goals scored with only one touch is higher compared to other variables in TSL, EPL, and FL1 (Table 3). When examining the goals scored, it is seen that 69.8% (f=793 goals), 68.3% (f=699 goals), and 69.0% (f=724 goals) of the total goals scored in TSL, EPL and FL1 with a single touch by the goal-scoring player respectively (Graph 3).

Table 4. Direction of attack before goal in goals scored

League	Direction of Attack Before Goal	N	f	SD	%
TSL	Right Wing Attack	420	280	0.884	33,9%
	Central Attack	420	299	0.945	36,2%
	Left Wing Attack	420	248	0.690	30,0%
	Total	420	827		100,0%
EPL	Right Wing Attack	380	232	0.800	29,5%
	Central Attack	380	345	1.040	43,8%
	Left Wing Attack	380	210	0.769	26,7%
	Total	380	787		100,0%
FL1	Right Wing Attack	380	183	0.713	24,0%
	Central Attack	380	398	0.984	52,2%
	Left Wing Attack	380	181	0.702	23,8%
	Total	380	762		100,0%

f: Frequency; %: Percent; **TSL**: Turkish Super League; **EPL**: English Premier League; **FL1**: French Ligue 1; *Goals scored from set-pieces are not included in the attacking aspect of goals scored.



Graph 4. Percentage distribution according to pre-goal attack direction preference in leagues

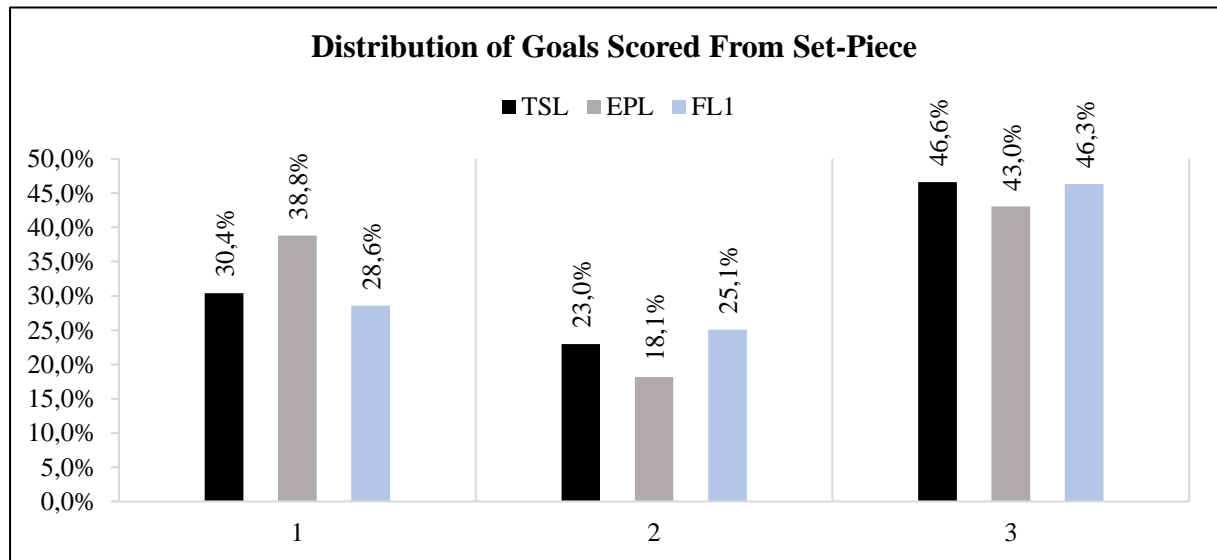
TSL: Turkish Super League; **EPL**: English Premier League; **FL1**: French Ligue 1; (1) Right Wing Attack; (2) Central Attack; (3) Left Wing Attack

Table 4 provides information on the areas where the goal-scoring attacks were developed in all matches played in a season in TSL, EPL, and FL1 leagues. According to the results, the goals scored in TSL, EPL, and FL1 were performed with 36.2%, 43.8%, and 52.2%, respectively, by continuing the attack organization developed in the center (Table 4). However, while 63.8% (f=528 goals) of the total goals scored in TSL (excluding goals scored from set pieces) were scored as a result of right and left flank attacks, this rate was 56% (f=442 goals) in EPL, and this rate was 47.8% (f=364 goals) in FL1 (Graph 4).

Table 5. Goals scored from set-pieces

League	Set Piece Goal Classification	N	f	SD	%
TSL	Corner Kick	420	94	0.456	30,4%
	Free Kick	420	71	0.412	23,0%
	Penalty	420	144	0.579	46,6%
	Total	420	309		100,0%
EPL	Corner Kick	380	92	0.470	38,8%
	Free Kick	380	43	0.356	18,1%
	Penalty	380	102	0.520	43,0%
	Total	380	237		100,0%
FL1	Corner Kick	380	82	0.472	28,6%
	Free Kick	380	72	0.437	25,1%
	Penalty	380	133	0.587	46,3%
	Total	380	287		100,0%

f: Frequency; %: Percent; TSL: Turkish Super League; EPL: English Premier League; FL1: French Ligue 1



Graph 5. Percentage distribution of goals scored from set piece organisations in leagues

TSL: Turkish Super League; EPL: English Premier League; FL1: French Ligue 1; Goals Scored From Corner Kick (1); Goals Scored From Free Kick (2); Goals Scored From Penalty (3)

Table 5 provides information on the goals scored as a result of set-piece organizations in all matches played in a season in TSL, EPL, and FL1 leagues. According to these results, 27.2%, 23.1%, and 27.4% of the total goals scored in TSL, EPL, and FL1, respectively, were scored as a result of set-piece organizations. It was determined that the most goals were scored from penalty kicks in set pieces while the least goals were scored as a result of free kicks. Moreover, the league where the most penalty goals were scored was TSL (f=144; 46.6%), while the league

where the least penalty goals were scored was EPL (f=102 goals; 43%). It was also seen that the most corner kick goals were scored in EPL (f=92 goals; 38.8%), while the least corner kick goals were scored in FL1 (f=82 goals; 28.6%) (Table 5; Graph 5).

DISCUSSION

In this study, the goals scored in the matches played in the 2020-2021 football season in the Turkish Super League (420 matches; 1136 goals), English Premier League (380 matches; 1024 goals), and French Ligue 1 (380 matches; 1049 goals) were examined in terms of the time interval of the goal, the number of touches made before the goal by the player who scored, the attacking direction before the goal, and the variables of the goals scored from set pieces.

According to the findings, the goal ratio scored in the first half of the matches in the Turkish Super League was lower compared to the English Premier League and French Ligue 1, while the goal ratio scored in the second half was higher (Table 1; Graph 1). Armatas et al. (2009) reported that 41.04% of the goals were scored in the first half of the matches and 58.96% in the second half in their study on the Greek Super League (Armatas et al., 2009). Alberti et al. (2010) reported that 55.1% of the goals were scored in the second half and 44.9% in the first half in their study on the English Premier League, French Ligue 1, Italian Serie A, and Spanish La Liga (Alberti et al., 2013). Ertetik and Müniroğlu (2021) examined 107 goals scored in 66 football matches participated in the UEFA football organization and reported that 54.21% of the goals were scored in the second half and 45.79% in the first half (Ertetik & Müniroğlu, 2021). Stafylidis et al., (2022) examined 222 goals scored in 91 matches played in the first half of the 2021-2022 football season of the Greek Football League and reported that 61.71% of the goals (137 goals) were scored in the second half and 38.71% (85 goals) were scored in the first half (Stafylidis et al., 2022). In another study Ağyol and Tanyeri (2022) examined goal scored at Euro 2020 European Football Championship, and reported that 58.4% of the goals were scored in the second half and 36.7% in the first half (Ağyol & Tanyeri, 2022). When looking at the distribution of the goals scored, it is seen that the number of goals scored in the second half is higher compared to the number of goals scored in the first half. It can be thought that more goals scored in the second halves of the competitions may have occurred due to the physical condition and tactical approaches of the teams during the competition.

When looking at the distribution of total goals scored based on minutes, the interval of 76-90 minutes is where the most goals are scored in the Turkish Super League (TSL) in proportion to the total number of goals scored, while the intervals of 45+ minutes and 90+ minutes are where the least goals are scored, according to Table 2 and Graph 2. Similar results were observed in the English Premier League (EPL) and French Ligue 1 (FL1). It can be considered that teams attempt more goals in the final stages of the game, leading to a decrease in defensive security and resulting in these findings. Armatas et al. (2009) reported in their study that in the Greek Super League, 23.30% of the 240 goals were scored in the last 15 minutes of the match (76-90 minutes) (Armatas et al., 2009). Similarly, Alberti et al. (2010) reported in their study that approximately 20% of the 10,885 goals were scored in the last 15 minutes of the match (76-90 minutes). The research findings reported that the leagues with the most goals scored in the 76–90-minute interval were the Spanish La Liga and the English Premier League, while the leagues with the least goals scored were the French Ligue 1 and the Italian Serie A (Alberti et

al., 2013). In a study by Kubayi and Toriola (2019), who examined the goals scored in five FIFA World Cup tournaments (1998-2002-2006-2010-2024), 24.65% of the 795 goals were scored in the last 15 minutes of the matches (76-90 minutes) (Kubayi & Toriola, 2019). However, in another study, Kubayi (2020) reported in his findings on the goals scored in the 2018 World Cup that 17.16% (29 goals) of the 169 goals scored were scored between minutes 46-60 (Kubayi, 2020). Especially in the last 15 minutes of matches, the level of fatigue can cause a decrease in sprint and high-intensity performance components, which can have a negative effect on technical and tactical requirements on the field (Rampinini et al., 2008; Rostgaard et al., 2008). It is thought that the high goal rate in the final stages of matches may be due to the decrease in physical properties.

When looking at the number of touches on the ball by the player who scored the goal during the goal, in the TSL, 69.8% of the total goals were scored with only 1 touch, while in the EPL and FL1, these rates were 68.3% and 69.0% respectively (Table 3; Graph 3). In all three leagues, it is shown that as the number of touches on the ball by the player who scored the goal increase in the goal area, the goal rate decrease This can be evaluated as a result of the simple football understanding brought by the requirement of today's football and the desire to achieve a clear result in the goal area. Çobanoğlu and Terekli (2018) reported in their research findings analyzing the 108 goals scored in the 2016 European Championships that 68.52% (74 goals) of the goals were scored with one touch, 18.52% (20 goals) with two touches, and 12.96% (14 goals) with three or more touches (Çobanoğlu & Terekli, 2018).

When the goals scored from the attacking direction before the goal were examined, it was observed that 63.8% of the total goals in the TSL were scored after right and left side attacks, while in the EPL and FL1, these rates were 56.2% and 47.8%, respectively. The goal rate scored from the center in the FL1 was 4.5% higher than the goal rate scored from the side attacks (Table 4; Graph 4). It can be thought that the attacking style of the game in the TSL is based on side attacks, while in the FL1, it is due to the approach of attacking from the center. In addition, teams' in-game strategies and tactics should also be considered as an important factor. Yavuz and Saygın (2021) reported in their analysis of matches played in the 2020-2021 season in the English Premier League (196 matches), German Bundesliga (65 matches), and Spanish La Liga (50 matches) that in the Premier League, 25.4% (113 goals) of the total goals were scored from the left wing, 46.7% (207 goals) from the center, and 27.9% from right wing attacks, while in the German Bundesliga, these rates were 29.4% (56 goals), 34% (65 goals), and 36.6% (70 goals), and in the Spanish La Liga, these rates were 31.6% (35 goals), 47.7% (53 goals), and 20.7% (23 goals) respectively (Yavuz & Saygın, 2021).

When looking at the total goal rate of goals scored from set pieces (corner kicks, free kicks, and penalties) by Duran, it is seen that the goal rate after corner kicks in TSL is higher compared to FL1 (difference: 1.8%) and lower compared to EPL (difference: 8.4%), at a rate of 30.4%. When looking at the goal rate from free kicks, it is observed that the goal rate in TSL is 4.8% higher than in EPL, while it is 2.1% lower than in FL1. When penalties are examined, the rate of goals scored from penalties in TSL and FL1 is 12.7%, while this rate is 10.0% in EPL (Table 5; Graph 5). The similarities and differences that emerge among the leagues should be considered as a result of the meaning attached to set pieces in teams' tactical understanding of offensive play. Wright et al. (2011) examined 169 goals scored in English Premier League matches and reported that 14% of the goals were scored after free kicks, 7% after corner kicks,

and 5% after penalty kicks (Wright et al., 2011). Cerrah and Gürol (2011) examined 6,726 goals scored in 8 seasons of TSL and reported that 30% (2,028 goals) of the total goals were scored from set pieces, and 38% were from free kicks, 29% from corner kicks, 24% from penalty kicks, and 10% from throw-in organizations (Cerrah & Gürol, 2011).

CONCLUSION

As a result, it is observed that the number of goals scored in the second half of matches played in both national and international league and cup competitions is higher compared to the number of goals scored in the first half. It is also important to note that a significant number of goals are scored in the last 15 minutes of the game, which indicates that physical attributes should be considered by coaches. Additionally, the high percentage of goals scored from set-pieces among total goals scored shows that coaches should develop strategies not only for scoring goals from set-pieces but also for defending against attacking teams. Furthermore, it is observed that the simple style of play brought by modern football leads to fewer touches in the goal area and consequently increases the chances of scoring.

Conflicts of Interest: There is no personal or financial conflict of interest within the scope of the study.

Authors' Contribution: The first author contributed to the study design; the first and second authors analyzed the data; the third author helped with review and editing. All authors revised the manuscript and contributed to the interpretation of the results. All authors have read and approved the final version of the manuscript. A consensus was reached on the order of authors.

Ethical Approval

Committee Name: Nevsehir Hacı Bektas Veli University, Clinical Research Ethics Committee

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The Effect of Dark Chocolate on Oxidative Stress Parameters After High-Intensity Kickboxing Training

Neře AKPINAR KOCAKULAK^{1*}, Mustafa KARAKUŐ², Soner AKKURT³,
Nurgöl ÖZDEMİR¹, Feyzullah KOCA

¹ Izmir Democracy University, Faculty of Health Sciences, İzmir

² Erciyes University, Faculty of Sports Sciences, Kayseri

³ Erciyes University, Faculty of Medicine, Kayseri

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Abstract

In our study, the impact of dark chocolate on oxidant and antioxidant parameters was examined. Dark chocolate intake has increased as a result of its beneficial benefits on human health. Twenty male kickboxers in the study. On the first day blood samples were collected. Then, two groups of 10 people were randomly divided into two groups. Only one of the groups received chocolate. At 18:00 at night, blood samples were collected and stored at -80 °C. To determine oxidant stress; malondialdehyde (MDA), to determine antioxidant capacity; Superoxide dismutase activity (SOD), glutathione peroxidase (GPx) and total antioxidant capacity (TAC) values were measured. After it was determined that the data showed normal distribution, the paired t test was performed. According to the Groups (Control Grup or Chocolate Receiving Group) the changes before and after the training were examined. When examined, it is seen that there is no significant difference in the GPx, MDA and TAC values of the oxidant and antioxidant parameters of the athletes in both groups before and after training. However, a statistically significant change was found in the SOD value of the athletes in the chocolate receiving group before training ($p<0.05$). In control Group, a statistically significant change was observed between "before and after training" in terms of "GPx and TAC" parameters ($p<0.05$). Our results showed that dark chocolate consumed acutely before intense exercise is important in terms of showing that it can prevent the increase of oxidative stress markers.

Keywords: Exercise, Dark chocolate, Oxidative stress, Antioxidant defense, Kick boxing

Yüksek Yoğunluklu Kickboks Antrenmanı Sonrası Bitter Çikolatanın Oksidatif Stres Parametrelerine Etkisi

Öz

Çalışmamızda, insan sağlığı üzerindeki olumlu etkileri nedeniyle tüketimi artan bitter çikolatanın oksidan ve antioksidan parametreler üzerindeki etkisi araştırılmıştır. Çalışmaya, milli takım kampına katılan 20 erkek kick boks sporcusu dahil edilmiştir. Kampın ilk günü tüm sporcuların boy ve kilo ölçümleri ile 10 cc venöz kan örnekleri alındı. Ölçümler alındıktan sonra sporcular, çikolata alan grup (ÇK) ve çikolata almayan kontrol grubu (KG) olmak üzere rastgele 10 kişilik 2 gruba ayrıldı. ÇK grubuna antrenman öncesi sabah saat 09:00'da %80 kakao içeren 40 gram siyah çikolata (SÇ) yedirildi. Tüm sporcular sabah ve öğleden sonra her biri 1 saat süren yüksek yoğunlukta kick boks antrenmanı yaptı. Akşam saat 18:00'de tekrar 10 cc kan örnekleri alınarak santrifüj edildi ve serumları ayrıştırılarak -80 °C'de saklandı. Oksidan stresi belirlemek için; malondialdehit (MDA), antioksidan kapasiteyi belirlemek için; superoksitdismutaz (SOD) aktivitesi, glutatyon peroksidaz (GSPH) ve total antioksidan kapasite (TAK) değerleri spektrofotometrik yöntem ile ölçüldü. Verilerin normal dağılım gösterdiği belirlendikten sonra eşleştirilmiş t testi yapıldı. Gruplara göre (Kontrol Grubu veya Çikolata Alan Grup) eğitim öncesi, sonrası değişimler incelenmiştir. İncelendiğinde her iki gruptaki sporcuların oksidan ve antioksidan parametrelerinin GPx, MDA ve TAC değerlerinde antrenman öncesi ve sonrası anlamlı fark olmadığı görülmektedir. Ancak çikolata alan gruptaki sporcuların antrenman öncesi SOD değerlerinde istatistiksel olarak anlamlı bir değişiklik bulundu ($p<0,05$). Oksidan ve antioksidan belirteçlerdeki değişimler "antrenman öncesi ve sonrası" gruplarda incelenmiştir. Kontrol Grubunda "GPx ve TAC" parametrelerinde "antrenman öncesi ve sonrası" arasında istatistiksel olarak anlamlı değişim gözlemlendi ($p<0.05$). Sonuçlarımız yoğun egzersiz öncesi akut olarak tüketilen bitter çikolatanın oksidatif stres belirteçlerinin yükselmesini engelleyebileceğini göstermiştir.

Anahtar kelimeler: Egzersiz, Siyah çikolata, Oksidatif stres, Antioksidan savunma, Kick boks

*Corresponding Author: Neře AKPINAR KOCAKULAK, E-posta: nese.kocakulak@idu.edu.tr

INTRODUCTION

The interest in kickboxing is increasing worldwide due to its beneficial effects such as personal protection, increasing muscle strength and keeping the body in shape (Zazryn et al., 2003). Kickboxers need a high anaerobic threshold value during the competition, as kickboxing is a high - intensity sports activity, in which strong kicks are made with fast and hard techniques during the competition (Davis et al., 2014; El-Ashker & Nasr, 2012; Smith, 2006). Generally, oxidative phosphorylation is used as the dominant energy source in low-intensity movements in ring sports, while it is stated that ATP-PC (phosphagen system) and glycolysis provide energy for the explosion of defense and offensive movements (Beneke et al., 2004). By products of anaerobic glycolysis, namely H⁺, have detrimental effects on athletic performance therefore, reduction or neutralization of these by-products can improve performance and time to extinction (Chaabène et al., 2014).

In branches where high-level performance is expected such as kickboxing, the recovery process between training significantly affects the performance of the athletes during training and competition. The most important condition of being the winner in ring sports is to be able to train regularly, effectively, and efficiently. Various mechanisms cause the formation of ROS in skeletal muscles in response to intense exercise in sports such as kickboxing. Among them, NADPH oxidase-induced ROS generation can cause changes in the redox state of the muscles, which can lead to contractile muscle dysfunction, accelerated muscle fatigue, longer recovery time, and reduced exercise performance (Powers et al., 2011). Exercise can increase oxygen consumption (VO₂) up to 20 times resting values. In the mitochondria in muscle cells, this means 200 times greater use of oxygen followed by the production of large amounts of ROS (Peternelj & Coombes, 2011). ROS produced in this way can cause oxidative damage to mitochondria and muscle contraction proteins, and subsequently result in direct induction of muscle damage and fatigue after exercise (Peake et al., 2017). Increasing evidence of exercise-induced oxidative damage and impaired athlete performance has spurred extensive research on the evaluation of muscle protection by antioxidant supplementation in exercisers (Pyne et al., 2000).

Many studies have identified the potential antioxidant effect of polyphenols, a large group of natural compounds found in foods and beverages (Banerjee et al., 2003). It has been shown that the use of antioxidant supplements such as cocoa, dark chocolate and ocoa extract can reduce oxidative stress and muscle damage caused by exercise for athletes, as it is a food rich in polyphenols (González-Garrido et al., 2017). Cocoa, which is the main component of chocolate, contains polyphenols as well as important oils such as oleic acid, palmitic acid, stearic acid, cocoa butter (Rusconi et al., 2010). In general, the best characterized biological property of polyphenols is to scavenge ROS or inhibit enzymes involved in ROS production. They also increase natural antioxidant defenses, but do not act as antioxidants (Forte et al., 2016). Loffredo et al., (2016). Elena et al., (2018) studies have shown that dark chocolate, a dietary supplement rich in polyphenols, reduces exercise-induced oxidative stress and biomarkers of muscle injury in professional football players (Elena et al., 2018). The studies of José et al., (2017) on the other hand, showed that cocoa consumption causes a change in the redox state even in the presence of an adverse environment or physical stress factors; therefore,

it has been revealed that cocoa has a protective role and can reduce oxidative damage (José et al.,2017). Increasing evidence suggests that cocoa in the form of cocoa bean extract, chocolate drinks, chocolate bars or dark chocolate blocks has beneficial effects on the cardiovascular system (Pucciarelli, 2013). In addition, dietary flavanols found in natural cocoa powder have gained attention for their potential to reduce oxidative stress and aid muscle recovery after exercise (Mcbrier et al., 2010; Sathyapalan et al., 2010). Dietary recommendations for individuals who exercise intensely, such as in kickboxing, should emphasize a balanced diet or consumption of natural antioxidant-rich foods such as cocoa and chocolate, rather than taking antioxidant supplements. This “nutraceutical strategy” is increasingly recommended as a potentially viable tool to prevent or reduce oxidative stress and muscle damage during intense physical training. In addition to being especially high-energy foods, it is stated that chocolate, cocoa and cocoa products are a rich source of antioxidant, anti-inflammatory and metabolic properties and antioxidant polyphenols with proven health-promoting effects (Magrone et al., 2017).

In this study, the effects of dark chocolate, whose consumption has increased in recent years due to its positive effects on human health, on oxidant stress parameters were investigated. There are limited studies on the effect of dark chocolate on anaerobic exercises that require explosive power. For this reason, it is aimed to reveal the effect of dark chocolate on oxidant and antioxidant parameters that may develop due to high-intensity kickboxing training.

METHOD

Research Model

This research is a study conducted in an experimental design with pre-test post-test paired control group.

Research Groups

Study group was formed from kickboxers in the National Team camp. Kickboxers originated from athletes with comparable physical characteristics and ages. The study included 20 male athletes with mean ages of 22.3 1.4 years, heights of 181.4 1.6 cm, and weights of 78.6 1.8 kg for the chocolate receiving group (RG) and 23.4 1.3 years, heights of 179.6 1.2 cm, and weights of 79.1 1.7 kg (mean SD) for the control group (CG). Those with disability, those who use nutritional support supplements and those who are afraid of giving blood were excluded from the study.

Ethical Approval

Ethics committee approval was obtained for the study from the Ethics Committee Clinical Research of Erciyes University with the number 2017/456. The Declaration of Helsinki was respected in the study. After the necessary information was given to all volunteers during the research process, their written consent was obtained.

Data Collection Tools

Height and weight measurements of all athletes were taken on the first day of the camp. To determine oxidant stress, malondialdehyde (MDA), to determine antioxidant capacity,

Superoxide dismutase activity (SOD), glutathione peroxidase (GPx) and total antioxidant capacity (TAC) values were measured by spectrophotometric method.

Collection of Data

Athletes were randomly divided into 2 groups of 10 people as Chocolate Receiving Group (RG) and Control Group (CG). While the RG group was fed 40 grams of dark chocolate (DC) containing %80 cocoa at 09:00 in the morning before the training, the CG was not given chocolate. Due to the fact that the athletes trained twice daily and because the recommended dosage in the literature was 40 grams, the athletes received this amount of chocolate (Massaro et al., 2019). All the athletes did high-intensity kickboxing training for 1 hour each in the morning and afternoon. No food supplement was given at breakfast, lunch and dinner, except standard food and water. At 18:00 in the evening, 10 cc blood samples were taken again, centrifuged, and the serums were separated and stored at -80 °C. Blood samples were taken by health professionals, kept in the cold and brought to Erciyes University, Sports Medicine laboratory.

Analysis of Data

In calculating the sample size of our study, Power was determined by taking at least 0.80 and Type 1 Error 0.05 for each variable. The Shapiro-Wilk test ($n < 50$) was used to determine whether the means of continuous variables in the study were normally distributed. The Mann-Whitney U test was used to compare the variation between blood samples according to groups (who took chocolate and those who did not). The changes in the blood samples before and after the training were analyzed with the Wilcoxon Test, separately in the groups. The statistical significance level was taken as (α) %5 in the calculations and the SPSS (IBM SPSS for Windows, ver.24) statistical package program was used for the calculations.

RESULTS

The characteristics of the 20 kick box athletes participating in the study were examined and has also been given Table.1.

Table 1. Descriptive statistics of kick boxers

Variables	Chocolate Receiving Group	Control Group
	X±S	X±S
Age	22,3 ± 1,4	23,4 ± 1,3
Height	181,4 ± 1,6	179.6± 1,2
Weight	78,6 ± 1,8	79,1 ± 1,7

When examined Table.1., it was seen that the age of the athletes who were given chocolate was 22.3, height was 181.4 and weight was 78.6, while in the control group, the average age 23.4, and height was 179.6, kilograms was 79.1. The results analyzed with the Whitney-U test has also been given Table.2.

Table 2. Intergroups comparison GPx, MDA, SOD, TAC values of group before and after training

Variables	GROUP								p
	Control Group				Chocolate Receiving				
	Med.	X±S	Min.	Max.	Med.	X±S	Min.	Max.	
GPx(BT)	69,47	68,23±12,28	48,59	85,13	76,43	76,72±20,19	49,46	115,59	,314
GPx(AT)	107,76	97,81±19,97	65,99	116,46	86,00	80,59±22,30	51,20	119,07	,266
MDA (BT)	3,81	5,07±2,34	3,10	8,76	4,87	6,52±4,38	3,10	17,43	,457
MDA (AT)	4,34	4,41±,93	3,45	6,11	4,69	5,30±1,81	3,63	9,12	,288
SOD (BT)	15,09	14,68±1,43	12,50	15,95	12,36	12,59±5,25	4,96	24,70	,039*
SOD (AT)	14,37	15,83±4,74	10,64	25,13	14,80	15,96±4,94	10,35	24,84	,791
TAC (BT)	,51	,50±,06	,43	,57	,50	,49±,07	,35	,57	,560
TAC (AT)	,56	,56±,05	,49	,64	,57	,58±,06	,50	,72	,153

* Mann-Whitney Test, *p<.05 BT(Before Training), AT(After Training)

(MDA BT: malondialdehyde before training ; MDA AT: malondialdehyde after training; SOD BT:superoxide dismutase activity before training , SOD AT:superoxide dismutase activity after training; GPxBT :glutathione peroxidase before training; GPxAT :glutathione peroxidase after trainig ;TAC BT:total antioxidant capacity before training; TAC AT:total antioxidant capacity after training)

In the table above, the comparison results of the blood parameters according to the Groups (Control Grup or Chocolate Receiving Group) are given. Here, the changes before and after the training according to the groups were examined. Table.2. When examined, it is seen that there is no significant difference in the GPx, MDA and TAC values of the oxidant and antioxidant parameters of the athletes in both groups before and after training. However, a statistically significant change was found in the SOD value of the athletes in the chocolate receiving group before training (p<0.05).

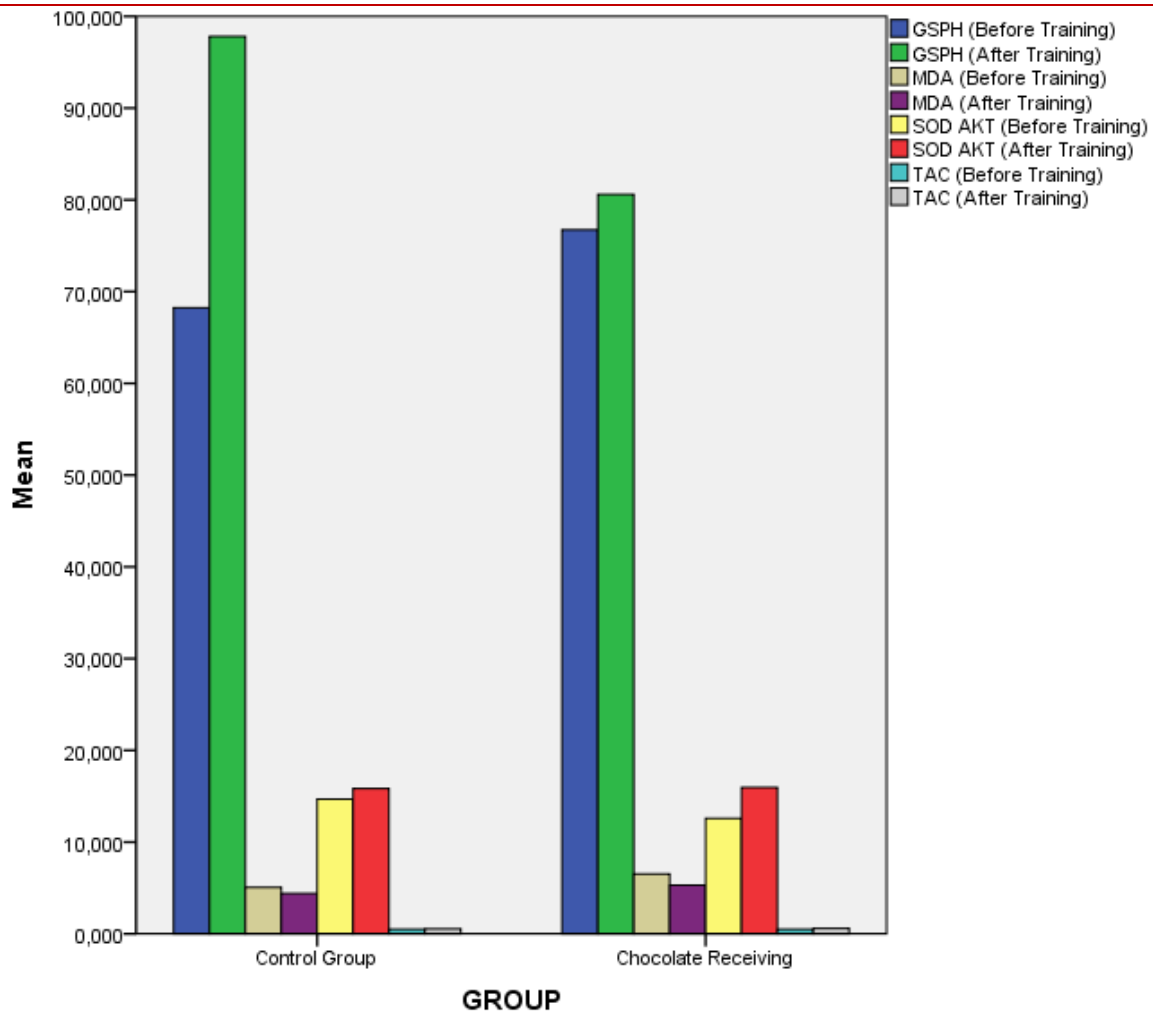
Table 3. In-groups pre-test post -test GPx, MDA, SOD, TAC values of the groups at the before and after training

Variables	GROUP									
	Control Group					Chocolate Receiving				
	Med.	X±S	Min.	Max.	p	Med.	X±S	Min.	Max.	p
GPx(BT)	69,47	68,23±12,28	48,59	85,13		76,43	76,72±20,19	49,46	115,59	,635
GPx(AT)	107,76	97,81±19,97	65,99	116,46	,028*	86,00	80,59±22,30	51,20	119,07	
MDA (BT)	3,81	5,07±2,34	3,10	8,76		4,87	6,52±4,38	3,10	17,43	,953
MDA (AT)	4,34	4,41±,93	3,45	6,11	,612	4,69	5,30±1,81	3,63	9,12	
SOD (BT)	15,09	14,68±1,43	12,50	15,95		12,36	12,59±5,25	4,96	24,70	,173
SOD (AT)	14,37	15,83±4,74	10,64	25,13	,735	14,80	15,96±4,94	10,35	24,84	
TAC (BT)	,51	,50±,06	,43	,57		,50	,49±,07	,35	,57	,028*
TAC (AT)	,56	,56±,05	,49	,64	,046*	,57	,58±,06	,50	,72	

* Wilcoxon Test, *p<.05 BT(Before Training), AT(After Training)

(MDA BT: malondialdehyde before training; MDA AT: malondialdehyde after training; SOD BT:superoxide dismutase activity before training , SOD AT:superoxide dismutase activity after training; GPxBT :glutathione peroxidase before training; GPxAT :glutathione peroxidase after trainig ;TAC BT:total antioxidant capacity before training; TAC AT:total antioxidant capacity after training)

In the table above, the changes in oxidant and antioxidant markers "before and after training" were examined separately in the groups. According to this; In the Control Group, a statistically significant (significant) change was observed between "before and after training" in terms of "GPx and TAC" parameters (p<0.05). Similarly, the difference between "before and after training" was statistically significant in terms of "TAC" parameter in the "chocolate group" (p<0.05)



Graph 1. GPx, MDA, SOD, TAC values of the groups at the before and after training

(MDA BT: malondialdehyde before training ; MDA AT: malondialdehyde after training; SOD BT:superoxide dismutase activity before training , SOD AT:superoxide dismutase activity after training; GPxBT :glutathione peroxidase before training; GPxAT :glutathione peroxidase after training ;TAC BT:total antioxidant capacity before training; TAC AT:total antioxidant capacity after training)

DISCUSSION and CONCLUSION

Recently, there has been a great deal of research interest in the potential beneficial effects of cocoa, due to the potent antioxidant properties of polyphenols, of which cocoa is an abundant source. Polyphenols are amphipathic, exert their antioxidant effects in both lipid and aquatic environments, and act on cellular molecular targets in vivo by various mechanisms. It is stated that dietary antioxidant supplements are effective in reducing the magnitude of exercise-induced oxidative stress. In addition, some studies have reported that dietary antioxidant supplements have no effect on exercise-induced oxidative stress and even have negative effects (Davison et al., 2012).

In this study the effect of dark chocolate on oxidant stress parameters that may develop due to high-intensity kickboxing training was investigated. Allgrove et al. (2011) associated daily consumption of dark chocolate (40 g/day) for 2 weeks with a reduction in exercise-induced oxidative stress (Allgrove et al., 2011). It is frequently emphasized in some studies that the

extent of exercise-induced oxidative stress decreases with dietary antioxidants (Alessio et al., 1997; Davison & Gleeson, 2007). However, in some studies, it is stated that there is no difference, and that antioxidant supplements negatively affect exercise-induced oxidative stress (Nieman et al., 2004). In particular, the effects of short-term acute use and long-term chronic use of dietary antioxidants on oxidative stress and antioxidant defense mechanisms constitute special areas of study and reveal conflicting results. Two weeks of cycling exercise and regular consumption of dark chocolate rich in cocoa polyphenols it should be at the end of sentence have been reported to reduce markers of oxidative stress (Allgrove, 2011). Nieman et al. (2004) emphasized that triathletes using vitamin E for 2 months had higher IL-6 and oxidative stress responses compared to placebo (Nieman et al., 2004). Alessio et al. (1997) showed that acute (1 day) vitamin C supplementation was more effective at blunting exercise-induced oxidative stress compared to a 2-week daily supplementation period (Alessio, Goldfarb and Cao, 1997). It is stated that acute antioxidant supplementation may be more effective because long-term supplementation may cause an adaptive decrease in other (endogenous) antioxidant defenses in vivo (Davison et al., 2007). Another study found that acute pre-exercise dark chocolate consumption increased plasma antioxidant concentrations compared to exercise alone emphasizing that it improved plasma concentrations of antioxidant markers after exercise, thereby reducing oxidative stress (Davison et al., 2012). Superoxide dismutase (SOD) is the first detoxification enzyme in the cell and the strongest antioxidant. It is an important endogenous antioxidant enzyme that acts as a component of the first-line defense system against reactive oxygen species (ROS) (Ighodaro & Akinloe, 2017). It is the main free radical scavenger that can significantly reduce free radical damage in the body. It is an active substance produced by living organisms that can eliminate harmful substances such as free radicals produced during normal oxygen metabolism (Marks, 2014).

The comparison results of the blood parameters according to the Groups (Control Group or Chocolate Receiving Group) the changes before and after the training were examined. Table.2. When examined, it is seen that there is no significant difference in the GPx, MDA and TAC values of the oxidant and antioxidant parameters of the athletes in both groups before and after training. However, a statistically significant change was found in the SOD value of the athletes in the group given chocolate before training ($p < 0.05$). The athletes in our study group are the athletes who take part in a camp period that includes a very intense dual training program that starts at 09:00 in the morning and 18:00 in the evening, which lasts for about an hour. Cavarretta et al. (2018) found an increase in antioxidant levels in elite athletes using dark chocolate after 30 days of dark chocolate intake (Cavarretta et al., 2018). The relationship between exercise and oxidative stress is extremely complex and it is stated that it mainly depends on the frequency, intensity, and duration of the exercise (Cavarretta et al., 2018). Tonkonogi et al. (2000) found that endurance training performed for half an hour a day for 6 weeks did not affect the SOD activities of male and female athletes (Tonkonogi et al., 2000). On the other hand, Fauzi et al. (2007) found a significant increase in SOD enzyme activity immediately after and 24 hours after acute exercise after a 5-week exercise program (Fauzi et al., 2007). It has been shown that regular training eliminates the harmful effects of oxidative stress by increasing the activities of antioxidant enzymes such as superoxide dismutase and glutathione peroxidase.

In many studies, it has been reported that acute exercises of unusual intensity increase lipid peroxidation in untrained groups (Branth, et al., 2009; Fisher-Wellman & Bloomer, 2009;

Spirlandeli et al., 2014). Ookawara et al. (2003) stated that training did not have a significant effect on the MDA level at rest, while acute exercise significantly increased the MDA level even after the training period (Ookawara et al., 2003). However, regular exercises reduce the level of lipid peroxidation. Oztaşan et al. (2004) stated that acute exhaustion exercise applied after 8 weeks of endurance training significantly increased the erythrocyte MDA level in the sedentary group but did not cause a significant change in the training group (Oztasan et al., 2004). It is thought that the contradictions in the results of the study may be due to the fact that each study has different variables such as intensity, sample quality, and exercise type. It is stated that the increase in MDA is due to an increase in the level of oxygen intake rather than short-term ischemia and reperfusion, infiltration of phagocytic cells or an imbalance of calcium homeostasis (Tauler et al., 2006). Studies have generally found that antioxidant supplementation does not increase performance, but improves antioxidant status (Finaud et al., 2006). The age, nutritional and activity status of the people participating in the study may affect the results. Antioxidant restriction has been shown to reduce exercise performance in animals. Compared to animals with adequate vitamin E, the exercise capacity of animals with vitamin E restriction was decreased by 40% (Davies et al., 1982). It was found that six weeks of vitamin E and C supplementation prevented lipid peroxidation caused by endurance exercise but had no effect on inflammatory markers (Mastaloudis et al., 2004). Contrary to these results, there are also studies claiming that 2.5 hours of cycling exercise does not affect oxidative stress markers expressed by F2 - isotroptane levels in adults taking high doses of vitamin E and C supplements in recent years (Lee C-yung & Man-Fan Wan, 2000). It has been shown that acute vitamin C intake has limited effects on immunoendocrine changes during oxidative stress after prolonged exercise (Nieman et al., 2002; Nieman et al., 2004). It is often stated that endurance exercises increase antioxidant capacity. Studies have shown that regular exercises increase antioxidant enzyme activity, while long-term exercises cause an increase in oxidants in skeletal muscles. (Sen et al., 2000). It is emphasized that acute adaptation to exercise is an incomplete adaptation that can easily lead to oxidative damage. Therefore, it is very important to provide the body with adequate rest after exercise to restore balance (Radak et al., 2001).

In our study, when the groups were compared separately in order to see the effects of both exercise and chocolate on oxidant and antioxidant parameters in the athletes who were in the camp period and trained twice a day, it was seen that there was a significant increase in GPx and TAC parameters in the control group after training compared to pre-training. In addition, although we predicted more changes in antioxidant markers in the chocolate group, there was only an increase in TAC values. GPx activity is an important component of glutathione homeostasis. Studies show that regular endurance exercises increase GPx activity in skeletal muscles according to the intensity and duration (Lu et al., 2021). Davison et al., (2012) found that eating 100 g dark chocolate containing 70% cocoa solids to 14 healthy individuals led to high plasma antioxidant capacity and decreased oxidative stress markers 2 hours after cycling exercise for 2.5 hours (max VO₂ 60%). Indicating a significant reduction in oxidative stress markers compared to our study, Davison et al., (2012) conflicts with. This difference may be due to the higher dose of DC and the training programs applied. In another study, it was stated that obese boys who consumed 30 g dark chocolate containing 83% cocoa for 6 weeks had five sessions of 40 min/day jump rope exercise for 6 weeks, and they obtained positive results regarding oxidative stress and health (Moghadam et al., 2021). Fraga et al., (2005)

demonstrated that consumption of 105 g chocolate (containing 168 mg of flavonols) for 14 days reduced oxidative stress markers in football players.

Our study shows that consumption of dark chocolate 2 hours before intense anaerobic exercise shows small increases in antioxidant capacity and a slight decrease in the oxidative stress marker MDA. Regular training eliminates the harmful effects of oxidative stress by increasing the activities of antioxidant enzymes such as superoxide dismutase and glutathione peroxidase. In addition to suppressing the oxidative stress caused by exercise, aerobic training also stimulates antioxidant production. Repeated exercises of sufficient intensity and duration are very important. In our study, the athletes are those who train regularly and apply a very intense training program during the camp period. Therefore, the duration, intensity of the training programs and sample size are important parameters that affect the results. In addition, the high polyphenol content in chocolate, the dose of chocolate, the duration of consumption are important factors that determine the effect on oxidative stress and antioxidant markers. It is unclear whether the changes in this study were due to exercise or to consumption of dark chocolate. Detailed studies on exercise and dark chocolate are needed.

As a result, we would like to state that regular exercise is more effective than dark chocolate in improving antioxidant capacity.

Suggestions

- It is recommended to develop the sample group.
- It is recommended to apply different training programs.
- It is recommended to carry out different studies on the dose and consumption time of the chocolate to be consumed.

Conflicts of Interest: The author/authors of the article do not have any personal or financial conflicts of interest within the scope of the study.

Authors' Contribution: All authors read and approved the final manuscript.

Ethical Approval

Ethics Committee: Ethics Committee Clinical Research of Erciyes University.

Date/Protocol number: 2017/456.

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Evaluation of The Effect of The VAR System on The Matches Played in the 2022 FIFA World Cup and UEFA Women's EURO 2022

Gizem BAŞKAYA^{1*} , Serkan Necati METİN¹ 

¹Bandırma Onyedi Eylül University, Faculty of Sport Sciences, Balıkesir.

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Abstract

Football is one of the most important sports branches in the world that people adopt and show interest in. It has also become an indispensable tool for countries to emphasise their unique cultures and to promote themselves. Based on these points, in football, which has become an industry and a source of commercial income with the passing of time, it has been important to follow the competitions meticulously, to examine every detail, and to minimise the errors to the minimum level. Especially in big organisations, this situation is more prominent. In this regard, the video assistant referee system, which is a product of teamwork, has been developed through digital platforms to assist and support the referee during the match. The aim of this study is to reveal the effect of the VAR system on the matches played in the 2022 FIFA World Cup and UEFA Women's EURO 2022. In the study, 64 matches played in the 2022 FIFA World Cup, 31 matches played in the UEFA Women's EURO 2022 and 95 matches in total were analysed. VAR decisions in the tournaments were evaluated separately on 11 parameters (accuracy of the goal awarded, accuracy of the goal not awarded, goal cancellation, goal awarded, accuracy of the penalty awarded, accuracy of the penalty not awarded, penalty cancellation, penalty awarded, red card awarded, red card cancelled and other). The data were analysed in SPSS 25.0 package program and descriptive statistics, percentage and frequency values were used in the analysis. According to the results obtained, it was determined that VAR had a direct effect on the 2022 World Cup only in some of the group matches; in the UEFA Women's EURO 2022, in some group matches and in the France Netherlands quarter-final match. As a result, it can be said that although the VAR system faced some reactions when it was first used, it contributed to the accuracy and reliability of the decisions made in the match and the tournament or league was shaped in line with the results that the teams deserved.

Keywords: Decision-aid Technology, FIFA, Football, UEFA, VAR System

VAR Sisteminin 2022 FIFA Dünya Kupası ve UEFA Kadınlar Euro 2022'de Oynanan Müsabakalar Üzerindeki Etkisinin Değerlendirilmesi

Öz

Futbol, insanların benimsediği ve ilgi gösterdiği, dünya üzerinde en önemli spor branşlarından biridir. Ülkelerin kendine has kültürlerini ön plana çıkarma ve kendilerini tanıma hususunda da değişilmez bir araç haline gelmiştir. Bu noktalardan hareketle, geçen zamanla beraber bir endüstri haline gelen ve ticari bir gelir kaynağı olan futbolda, müsabakaların titizlikle takip edilmesi, her detayının incelenmesi, hataların en asgari seviyeye indirgenmesi önemli olmuştur. Özellikle büyük organizasyonlarda bu durum daha ön plana çıkmaktadır. Bu hususta, müsabaka sırasında hakeme yardımcı ve destek olması amacıyla dijital platformlar aracılığıyla oluşturulan ve ekip çalışmasının bir ürünü olan video yardımcı hakem sistemi geliştirilmiştir. Bu çalışmanın amacı da VAR sisteminin 2022 FIFA Dünya Kupası ve UEFA Kadınlar Futbol Şampiyonası'nda oynanan müsabakalar üzerindeki etkisini ortaya koymaktır. Araştırmada 2022 FIFA Dünya Kupası'nda oynanan 64; UEFA Kadınlar Futbol Şampiyonası'nda oynanan 31, toplamda 95 müsabaka incelenmiştir. Turnuvalardaki VAR kararları ayrı ayrı 11 parametre (verilen golün doğruluğu, verilmeyen golün doğruluğu, gol iptali, gol verilmesi, verilen penaltının doğruluğu, verilmeyen penaltının doğruluğu, penaltı iptali, penaltı verilmesi, kırmızı kart verilmesi, kırmızı kart iptali ve diğer) özelinde değerlendirilmiştir. Veriler SPSS 25.0 paket programında analiz edilmiş ve analizde tanımlayıcı istatistiklerden yüzde ve frekans değerlerinden yararlanılmıştır. Elde edilen sonuçlara göre, VAR'ın 2022 Dünya Kupası'na sadece grup müsabakalarının bazılarında; 2022 UEFA Kadınlar Futbol Şampiyonası'nda ise, bazı grup müsabakalarında ve Fransa Hollanda çeyrek final müsabakasında doğrudan etkisi olduğu belirlenmiştir. Sonuç olarak, VAR sistemi ilk kullanılmaya başlandığında kısmen tepkilerle karşılaşmış olsa da müsabakada verilen kararların doğruluğu ve güvenilirliği bakımından katkı sağladığı ve takımların hak etmiş olduğu sonuçlar doğrultusunda turnuva veya ligin şekillendiği söylenebilir.

Anahtar Kelimeler: Karar – yardım teknolojisi, FIFA, Futbol, UEFA, VAR sistemi

* Corresponding Author: Assist. Prof. Gizem Başkaya, E-mail: gbaskaya@bandirma.edu.tr

INTRODUCTION

Technological developments in the world in recent years have also manifested itself in sports and its effect has gradually increased (Dyer, 2015; Fouché, 2017). In football, which has the feature of being the most watched sports branch worldwide, technology has been used in many innovative steps in data collection and data interpretation (Tabuk, 2022), and recently it has also shown itself in minimising the errors in referee decisions as much as possible (Çankaya et al., 2020). With the inclusion of digital media technologies in football, the decision-making situation related to challenging and critical positions during the competition has become more comfortable, and clear (Ugondo & Tsokwa, 2019).

Referees, who are responsible for managing a sporting event in accordance with the rules and in a fair manner, are generally seen as responsible for unfavourable results (Catteeuw et al., 2009). This is especially true for football, which is the most financially lucrative sport in the globalised sports world (Scanlon et al., 2022) and one of the most popular sports branches (Manning & Levy, 2006). In particular, the fact that football spectators watching the match outside the stadium can watch the replay of a controversial position causes them to question the decisions of the referees and creates prejudice against the referees (Collins, 2010). In addition, referees' decisions may be influenced by the match atmosphere, the importance of the match, fan pressure and the strength of the teams (Boyko et al., 2007; Dohmen, 2008; Unkelbach & Memmert, 2010). In order to prevent such problems, decision-assistance technology and replay systems, which are used in American football, basketball, rugby and tennis competitions, have come to the forefront for football and are thought to help referees in terms of correct decision-making (Collins & Evans, 2008; Leveaux, 2010). In this context, FIFA has also initiated the Video Assistant Referee, i.e., VAR system (Çankaya et al., 2020). On 1 September 2016, the VAR system was first tested in the friendly match between Italy and France (Kayhan et al., 2020), and was officially used for the first time in the 2017 FIFA Confederations Cup and was officially approved and fully used in the 2018 World Cup (Scanlon et al., 2022).

The VAR application allows the referee or referees to make a decision by replaying the position on the screen placed at the edge of the pitch, in case the referee or referees officiating the match are undecided on any position that may affect the result of the match. In addition, in this system, a different panel of referees in a specially prepared room can follow the competition from many different screens and angles, re-watch the controversial positions and make notifications or warnings to the referee officiating the competition (Çankaya et al., 2020). VAR is activated before the goal, whether there is any violation for the goal to be invalidated, whether there is a clear error in the penalty decisions not awarded or awarded, whether there is a clear error in any dismissal decision other than the yellow card not awarded or awarded, and which player should be penalised when the referee gives a dismissal or caution to the wrong player from the offending team (TFF, 2018). In addition, this system also provides support in terms of whether the ball crossed the goal line and the issuance of card penalties for violations outside the referee's field of vision (Tabuk, 2022).

With the widespread use of the VAR application, which was started to be used to minimise referee errors, the opinions of referees, athletes or fans involved in football towards VAR have been discussed (Caz et al, 2021; Demir & Bektaş, 2022; Ekizoğlu & Akyüz, 2022; Engin &

Çelik, 2019; Erdoğan, 2021; Hamsund & Scelles, 2021; Spitz et al., 2021; Winand et al., 2021), evaluating their attitudes or developing scales (Demir et al., 2022; Kayhan et al., 2020; Tabuk, 2022). When these and similar studies are evaluated together, it can be said that the main criticism of VAR in its implementation phase is the idea that it disrupts the tempo and flow of the game (Dyer, 2015; Svantesson, 2014). However, considering that a referee has to make approximately more than 130 decisions in an international football competition (Helsen et al., 2006) and that any incorrect decision can have financial consequences for the club, players, and managers (Kolbinger & Lames, 2017), the use of VAR can be considered beneficial. In fact, in a study on tennis and other sports, it was stated that applications that may be like VAR were successful (Carboch et al., 2016; Kolbinger & Lames, 2017).

Although there are studies in the literature that are similar to our research, in some of these studies, researchers have made analyses more specific to the leagues in their own countries and evaluated their views on VAR (Carlos et al., 2019; Çankaya et al., 2020; Gürler & Polat, 2021; Han et al., 2020; Meneguete et al., 2022; Ponce-Bordón et al., 2022), while in some others, the time to examine the VAR application and the possibility of making the right decision are emphasised (Errekagorri et al., 2020; Spitz et al., 2021; Zhang et al., 2022). At this point, it is thought that it is important to evaluate the VAR application by taking into consideration big and sound organisations such as the World Cup and European Championships as well as leagues in terms of the reliability and usability of the system. There are few studies on this subject in the literature (Büyüklebi et al., 2022; Kubayi et al., 2021; Zhang et al., 2022). It is thought that it is important to consider both women's and men's national football teams separately, which is an important difference of our study from the existing studies, and that the study will contribute to the literature in this respect. In this direction, the aim of the study is to investigate the effect of VAR decisions on the matches in the 2022 FIFA World Cup and UEFA Women's EURO 2022. In the study, it is tried to examine in detail what the results may be if VAR is not applied, the decisions in the matches where VAR is applied and the results of these decisions.

METHOD

Research Design

Document analysis is a scientific research method that can be defined as the collection, review, questioning and analysis of various documents as the primary source of research data. This method is mostly used in the literature as a complement to other research methods, but it is also used as a stand-alone method (Sak et al., 2021). In document analysis, data are obtained by examining existing records and documents. It involves finding, reading, noting, and evaluating the sources for a specific purpose (Karasar, 2005). In other words, document analysis is a series of processes that take place in the process of examining and evaluating printed and electronic (computer-based and internet-accessible) materials (Bowen, 2009). Retrospective cohort study model, which is one of the subheadings of observational study, was used in the study. Retrospective study model, which is one of the subheadings of observational study, was used in the study. In retrospective studies, the identification or determination of data depends on the information recorded in the past. No addition can be made to the data. The researcher has no control over the data (Çaparlar & Dönmez, 2016).

Universe-Sample

A total of 95 matches (World Cup: 64; Women's Euro: 31) played by a total of 40 countries (World Cup: 24; Women's Euro: 16) were analysed by evaluating the matches in the 2022 FIFA World Cup and UEFA Women's EURO 2022 in terms of different parameters.

Ethical Approval

The ethics committee approval of this study was obtained from Bandırma Onyedi Eylül University Social and Human Sciences Research Ethics Committee with the decision dated 10.03.2023 and numbered 2023-2.

Data Collection

The data of the study were collected through FIFA official website (<https://www.fifa.com/fifaplus/en/home>) and UEFA official website (<https://www.uefa.com/>). VAR decisions in the tournaments were evaluated separately on 11 parameters (accuracy of the goal awarded, accuracy of the goal not awarded, goal cancellation, goal awarded, accuracy of the penalty awarded, accuracy of the penalty not awarded, penalty cancellation, penalty awarded, red card awarded, red card cancelled and other).

Data Analysis

The data were analysed in SPSS 25.0 package program and descriptive statistics; percentage and frequency values were used in the analysis. By showing the numbers and percentages of the data obtained, it was tried to reveal the use of VAR and its effect on the competitions.

RESULTS

Data on the use of the VAR system in the 2022 FIFA World Cup and UEFA Women's EURO 2022 are shown in Table 1.

Table 1. Total number of VARs applied in tournaments

Tournament Name	Played in	Total Number of Matches	Total Number of Applications to VAR
2022 FIFA World Cup	Qatar	64	28
UEFA Women's EURO 2022	England	31	41

The distribution of 69 positions analysed with the VAR system in 2022 FIFA World Cup (28) and UEFA Women's EURO 2022 (41) group and upper round matches is presented in Table 2.

Table 2. Total number of VARs applied in group competitions and upper rounds

Tournament Name	Group Matches	Last 16	Quarter Final	Semi Final	Final	Total
2022 FIFA World Cup	25	2	1	-	-	28
UEFA Women's EURO 2022	33	-	3	3	2	41

The distribution of 69 positions analysed with the VAR system in the competitions played in the 2022 FIFA World Cup (28) and UEFA Women's EURO 2022 (41) is presented in Table 3.

Table 3. Distribution of VAR decisions in tournaments

Tournament	Decisions	Number	%
2022 FIFA World Cup	Accuracy of Goal Awarded	1	%3.6
	Accuracy of the Disallowed Goal	-	-
	Goal Cancellation	7	%25
	Goal Decision	1	%3.6
	Accuracy of the Penalty Awarded	6	%21.4
	Correctness of the Penalty Not Awarded	2	%7.1
	Penalty Awarded	5	%17.8
	Penalty Cancellation	4	%14.3
	Red Card	1	%3.6
	Red Card Cancellation	-	-
	Other	1 (Penalty Decision)	%3.6
	Total	28	%100
UEFA Women's EURO 2022	Accuracy of Goal Awarded	15	%36.6
	Accuracy of the Disallowed Goal	1	%2.4
	Goal Cancellation	6	%14.6
	Goal Decision	1	%2.4
	Accuracy of the Penalty Awarded	3	%7.3
	Correctness of the Penalty Not Awarded	6	%14.6
	Penalty Awarded	6	%14.6
	Penalty Cancellation	2	%4.9
	Red Card	-	-
	Red Card Cancellation	1	%2.4
	Other	-	-
	Total	41	%100

When Table 2 is examined, it is determined that in the FIFA World Cup, with the VAR system, 1 goal given by the referees was decided to be correct, 7 goals were cancelled, 1 goal that was not counted was valid, 1 red card was given, 4 penalty decisions were cancelled, 5 penalty decisions were decided, 6 penalties given by the referees and 2 penalties not given were decided to be correct, 1 penalty was repeated due to rule violations, and a total of 28 decisions were controlled by the VAR system.

In the UEFA Women's EURO 2022, 15 goals awarded by the referees and 1 goal disallowed by the referees were decided to be correct, 6 goals were cancelled, 1 goal that was not counted was valid, 1 red card and 2 penalty decisions were cancelled, 6 penalty decisions were awarded, 3 penalties awarded by the referees and 6 penalties not awarded were decided to be correct, and a total of 41 decisions were checked by the VAR system.

At the end of the 2022 FIFA World Cup group competitions, the rankings in the groups are given in Table 4.

Table 4. 2022 FIFA World Cup group stage country rankings

A	B	C	D
Netherlands	England	Argentina	France
Senegal	USA	Poland	Australia
Ecuador	Iran	Mexico	Tunisia
Qatar	Wales	Saudi Arabia	Denmark
E	F	G	H
Japan	Morocco	Brazil	Portugal
Spain	Croatia	Switzerland	South Korea
Germany	Belgium	Cameroon	Uruguay
Costa Rica	Canada	Serbia	Ghana

At the end of the group competitions, Netherlands, Senegal, England, USA, Argentina, Poland, France, Australia, Japan, Spain, Morocco, Croatia, Brazil, Brazil, Switzerland, Portugal and South Korea qualified for the last 16 (Table 4).

The data showing what kind of differences may occur in the results of the group competitions without VAR application are given in Table 5.

Table 5. VAR decisions in group matches and their impact on the outcome of the match

Matches	Match Result	VAR Decision	Result of the Match Without VAR
Qatar - Ecuador	0-2	Goal cancellation (On the grounds of offside)	0-3
England – Iran	6-2	Penalty given (For foul play)	6-1
Belgium – Canada	1-0	Penalty given in favour of Canada	1-0 (Kanada penaltidan yararlanamadı)
Wales – Iran	0-2	1.Iran goal cancelled (for offside) 2.Wales red card	0-3
Poland – Saudi Arabia	2-0	Penalty given (For foul play)	2-0 (Saudi Arabia failed to capitalise on a penalty)
Belgium – Morocco	0-2	Morocco goal cancellation (On the grounds of offside)	0-3
Spain – Germany	1-1	Germany goal cancellation (On the grounds of offside)	1-2
Cameroon – Serbia	3-3	Cameroon goal decision (No offside)	2-3
Brazil – Switzerland	1-0	Brazil goal cancellation (On the grounds of offside)	2-0
Holland – Qatar	2-0	Netherlands goal cancellation (On the grounds of handball)	3-0
Tunisia – France	1-0	France goal cancellation (On the grounds of offside)	1-1
Croatia – Belgium	0-0	Croatia penalty cancellation (On the grounds of offside)	0-0 (If the penalty had been awarded and Croatia had scored, the score would have changed)
Ghana – Uruguay	0-2	Penalty given (For foul play)	0-2 (Ghana failed to capitalise on a penalty)

When Table 5 is analysed, it is seen that there are 3 matches that can directly affect the result in the absence of VAR. It can be said that the most important of these is the Spain-Germany match. If there was no VAR, Germany would have exited from Group E as the group leader,

while Spain would have failed to qualify for the last 16 round and would have bid farewell to the World Cup. In the Tunisia - France match, France would have emerged as the group leader with 8 points, while Tunisia would have finished the group in third place with 2 points instead of 4. In the Cameroon - Serbia match, if there was no VAR, Serbia would have finished third in the group and Cameroon would have finished fourth.

Without the VAR application, the rankings that would have been formed in the groups at the end of the group matches played in the 2022 FIFA World Cup are given in Table 6.

Table 6. Country rankings at the end of the 2022 FIFA World Cup group stage without VAR

A	B	C	D
Netherlands	England	Argentina	France
Senegal	USA	Poland	Australia
Ecuador	Iran	Mexico	Tunisia
Qatar	Wales	Saudi Arabia	Denmark
E	F	G	H
Germany	Morocco	Brazil	Portugal
Japan	Croatia	Switzerland	South Korea
Spain	Belgium	Serbia	Uruguay
Costa Rica	Canada	Cameroon	Ghana

It is understood that the same teams would have been promoted to the last 16 in Groups A, B, C, D, F, G and H without the VAR application. However, it was seen that Germany, who did not qualify for the last 16 in Group E, would have qualified as the group leader and Spain, who qualified for the last 16 as the group runner-up, would not have exited the group and Japan would have exited the group as the group runner-up, not as the group leader.

The data showing what kind of differences may occur in the results of the second round (last 16) competitions without VAR application are given in Table 7.

Table 7. VAR decisions in the second round (last 16) matches and changes in the result of the match

Match	Match Result	VAR Decision	Result of the Match Without VAR
France – Poland	3-1	1. Penalty decision in favour of Poland (for offside) 2. Repeat penalty in favour of Poland	3-0

Without VAR, there would have been no change in the result of the last 16 matches, only the final score would have changed. The data showing what kind of differences may occur in the results of the quarter-final matches without VAR application are given in Table 8.

Table 8. VAR decisions in the quarter-final matches and the changes they created in the result of the match

Match	Match Result	VAR Decision	Result of the Match Without VAR
England - France	1-2	Penalty decision in favour of England (for a foul)	1-2 (England failed to capitalise on a penalty)

Without VAR, there was no change in the quarter-final match result due to England missing the penalty. In the 2022 FIFA World Cup, VAR decisions were not made in the semi-final and final matches, so they were not tabulated.

UEFA Women's EURO 2022, the rankings in the groups at the end of the group competitions are given in Table 9.

Table 9. UEFA Women's EURO 2022 group stage standings

A	B	C	D
England	Germany	Sweden	France
Australia	Spain	Netherlands	Belgium
Norway	Denmark	Switzerland	Iceland
Northern Ireland	Finland	Portugal	Italy

At the end of the group competitions, England, Australia, Germany, Spain, Sweden, Sweden, Netherlands, France, and Belgium qualified for the quarterfinals (Table 9). The data showing the differences in the results of the group competitions without VAR application are given in Table 10.

Table 10. VAR decisions in group matches and their impact on the outcome of the match

Matches	Match Result	VAR Decision	Result of the Match Without VAR
Norway – Northern Ireland	4-1	Penalty given	3-1
Germany – Denmark	4-0	Goal cancellation (For offside)	5-0
Belgium – Iceland	1-1	Penalty given in favour of Iceland	1-1 (İzlanda penaltidan yararlanamadı)
Sweden – Switzerland	2-1	Penalty awarded cancelled	2-2 (If Switzerland had scored)
Netherlands – Portugal	3-2	1. Penalty given in favour of Portugal. 2. Netherlands - Goal cancelled (for offside)	4-1
France – Belgium	2-1	Penalty given in favour of France	2-1 (France failed to capitalise on a penalty)
Switzerland – Netherlands	1-4	Goal given (Not offside)	1-3
Sweden – Portugal	5-0	Goal cancellation (For offside)	6-0
Iceland – France	1-1	1. Goal cancelled out (France) (for offside) 2. Goal cancelled out (France) (for handball) 3. Penalty given in favour of Iceland	0-3

According to Table 10, the match that would have directly affected the result without the VAR application would have been the Iceland-France match. Without the application, the result of the match would have been 3-0 in favour of France and France national team would have completed the group with 9 points. In the other match, Sweden-Switzerland, if the penalty had not been cancelled and Switzerland had scored the penalty, the ranking in Group C would have changed and Sweden would have dropped to 2nd place with 5 points.

Without the VAR application, the rankings that would have been formed in the groups at the end of the group matches played in the UEFA Women's EURO 2022 are given in Table 11.

Table 11. Country rankings at the end of the UEFA Women's EURO 2022 group competitions without VAR application

Group A	Group B	Group C	Group D
England	Germany	Netherlands	France
Australia	Spain	Sweeden	Belgium
Norway	Denmark	Switzerland	Iceland
Northern Ireland	Finland	Portugal	Italy

Without the VAR application, the same teams would have advanced to the quarterfinals at the end of the group competitions (Table 11). However, the Netherlands national team would have finished 1st in Group C instead of Sweden national team (assuming that Switzerland scored the penalty in the Sweden-Switzerland match) and would have played against Belgium national team in the quarter-final match, not against France national team.

The data showing what kind of differences may occur in the results of the quarter-final matches without VAR application are given in Table 12.

Table 12. VAR decisions in quarter-final matches and changes in the result of the match

Matches	Match Result	VAR Decision	Result of the Match Without VAR
Sweden – Belgium	1-0	Goal cancellation (For offside)	2-0
France – Netherlands	1-0	Penalty given	0-0 (Goes to penalties)

Without the VAR application, at the end of the quarter-final competitions, Sweden would have advanced to the next round, while the winner of the France-Netherlands match would have been determined by penalties. At the end of the penalties, France could have reached the semi-finals again, or the Netherlands national team could have been the winner and matched with the Germany national team in the semi-finals.

DISCUSSION

This study was conducted to evaluate the effect of VAR application on the competitions played in the 2022 FIFA World Cup and UEFA Women's EURO 2022. In the study, the effect of VAR on the match results and what kind of results may occur in the absence of VAR are tried to be revealed. In this context, VAR control was provided 28 times in the 2022 FIFA World Cup and 41 times in the UEFA Women's EURO 2022 (Table 1). It is thought that this situation is due to the presence of more controversial positions or positions that need to be controlled in competitions involving women. In addition, it was observed that 25 of the VAR controls in the 2022 FIFA World Cup were in the group competitions, 2 in the last 16 round and 1 in the quarter-final, while there was no VAR control in the semi-final and final. In the UEFA Women's EURO 2022, it was determined that 33 of the VAR controls were in the group competition, 3 in the quarterfinal, 3 in the semifinal and 1 in the final (Table 2). When the 2022 FIFA World Cup was evaluated in terms of the distribution of VAR decisions, it was found that it was mostly (25%) used for goal cancellation, while in the UEFA Women's EURO 2022, it was mostly (36.6%) used to determine the correctness of the awarded goal (Table 3).

In the 2022 FIFA World Cup, when the effect of VAR decisions on the results of the group matches was evaluated, it was seen that it had an effect on the results of Spain-Germany (Germany goal cancellation), Cameroon-Serbia (Cameroon goal decision) and Tunisia-France (France goal cancellation) matches (Table 5). If VAR had not been applied in the 2022 World Cup, it is understood that the German national team, which did not qualify for the last 16 in Group E, would have advanced as the group leader, and Spain, which reached the last 16 as the group runner-up, would not have exited the group; also Japan would have advanced to the next round as the group runner-up, not the group leader. On the other hand, it was observed that there were 2 VAR decisions in the France-Poland match in the last 16 round, but they did not change the result (Table 7), and in the England-France quarter-final match, there was 1 VAR decision (England penalty decision), but it did not change the result since England could not benefit from the penalty awarded (Table 8). As a result, it can be said that VAR has a direct impact on the 2022 World Cup only in the group competitions.

In the UEFA Women's EURO 2022, when the effect of VAR decisions on the results of the group matches was evaluated, it was seen that VAR intervened in 3 decisions in the Iceland-France match (France 2 goal cancellations, Iceland penalty decision) and this had a direct effect on the match result. Furthermore, in the Sweden-Switzerland match, the penalty awarded in favour of Switzerland was cancelled as a result of the application to VAR and this decision was determined to have influenced the result of the match. Otherwise, assuming that Switzerland had converted the penalty into a goal, the match would have ended in a draw and the Swedish national team would have qualified for the next round as the runner-up, not the leader. In this case, he would not have met the Belgian national team, but the French national team in the quarterfinals. On the other hand, in the France-Netherlands quarterfinal match, if the penalty was not given in favour of France with the VAR application, the match would have ended in a draw and the match would have gone to extra time. Considering all these results, it can be said that VAR had a direct impact on some of the group and quarter-final competitions in the UEFA Women's EURO 2022.

VAR is an example of how it can be used to assist this process in decision-making. This system has had a significant impact on decision-making in professional level football. In 2195 competitions played in 13 countries, it was reported that 9732 checks for potential game-changing events took place in an average time of 22 seconds. The correct decision after VAR intervention was found to be significantly higher than the referee's initial decision, and this accuracy was reported to increase from 92.1% to 98.3% (Spitz et al., 2021).

FIFA also announced that this rate was 99.3% in the 2018 World Cup (BBC, 2022). Looking at similar studies in the literature, it was found that more than 34 goals were disallowed in the first season of the use of the VAR system in the Premier League and offside decisions continued to create a significant controversy (Mather, 2020). Kubayi (2020) reported in his study of the 2018 World Cup that most goals were scored from penalties, which can be attributed to the use of Video Assistant Referees (VARs), which are designed to review video footage of controversial or uncertain decisions and advise the referee if a wrong decision is made. Vergonis et al. (2019) stated in their study that 13 goals (7.6% of total goals) were scored after the use of VAR in the 2018 FIFA World Cup, and the effect of these goals on the outcome of the game was very important. At the end of their study, they reported that VAR had a decisive

effect on goal scoring and that most of the goals scored through VAR (60%) were due to penalty kicks. Although there are studies suggesting that slow motion can make an event appear as if it was previously thought, rather than what it actually was, and can, for example, turn a yellow card foul into a red card (Caruso et al., 2016; Spitz et al., 2018), and that referees may therefore be biased (Caruso et al., 2016; Spitz et al., 2018), VAR technology has created opportunities for a large number of referees and match officials (Ugondo and Tsokwa, 2019) and has also made socio-economic contributions (Tabuk, 2022).

As a result, it can be said that although the VAR system faced some reactions when it was first used, it contributed to the accuracy and reliability of the decisions made in the competition and the tournament or league was shaped in line with the results that the teams deserved.

RECOMMENDATIONS

Studies similar to our study can be continued in the next seasons and tournaments to be organised, and comparisons can be made with respect to previous seasons. In addition, all components of the football community can be informed through such studies that the VAR system is an important application that supports the referee in order to eliminate the uncertainties experienced during the competition in football, and in this way, prejudiced thoughts and negative opinions that may occur on referees and referee decisions can be prevented.

Conflicts of Interest: There is no personal or financial conflict of interest within the scope of the study.

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Ethical Approval

Ethics Committee: Bandırma Onyedi Eylül University Social and Human Sciences Research Ethics Committee

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Determination of Eating Disorders Level and Risk Factors of University Students Studying Sports Education

Günay ESKİCİ^{1*}, Mergül ÇOLAK², Yusuf Kemal ARSLAN³, Hakan YARAR⁴

¹ Faculty of Sport Sciences, Çanakkale Onsekiz Mart University, Çanakkale, Turkey.

² Faculty of Sport Sciences, Erzincan Binali Yıldırım University, Erzincan, Turkey.

³ Faculty of Medicine, Çukurova University, Adana, Turkey.

⁴ Faculty of Sport Sciences, Yozgat Bozok University, Yozgat, Turkey.

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Abstract

Eating disorder has become an increasingly common problem among athletes. This study aims to determine eating disorder levels and risk factors of students studying sports education. This study was carried out on 1773 university students, 1084 (61.1%) of whom are female and 689 (38.9%) male, in the field of sports education in different provinces in Turkey. The information of the participants was collected with an individual information form and an Eating Disorder Examination Questionnaire (EDE-Q). All EDEQ sub-dimension scores and the total score were found to be statistically significantly higher in males than in females ($p < 0.05$) except for the restraint score. It was found that, as BMI (Body Mass Index) value increased, there was a statistically significant increase in all sub-dimensions of EDEQ and EDEQ total score ($p < 0.05$). Eating concern and shape concern scores were found to be statistically higher in those who did not perform physical activities than those who performed physical activities (respectively; $p = 0.030$, $p = 0.004$). An increase in the EDE-Q score indicates an increased risk of eating disorders. It can be said that being a male, having a high BMI, and engaging in strength/power sports increase the risk of eating disorders in individuals who receive sports education.

Keywords: Eating Disorders, EDE-Q, University Students

* Corresponding Author: Assoc. Prof. Günay ESKİCİ, Email: gunayeskici@comu.edu.tr

INTRODUCTION

Eating disorders (EDs) are characterized by abnormal eating habits and defined as cognitive disorders related to food and body weight or having disturbed eating habits in order to lose weight, maintain low body weight, and disorders in the conception of eating (ADA, 2001; Baysal and Bas, 2008). An eating disorder is a psychiatric disorder that can result in death (Fairburn & Harrison, 2003) and is characterized by medical problems such as loss of bone mineral density, physiological stress, and depression (Bar et al., 2016). According to the (DSM-V), Diagnostic and Statistical Manual of Mental Disorders, Eating disorders can be classified under four main headings as Bulimia Nervosa (BN), Binge Eating Disorder (BED), Anorexia Nervosa (AN), and Other Nutrition Eating Disorders Defined (ADA, 2001; Bar et al., 2016; Sleight et al., 2015).

Eating disorders are frequently seen in the 16-20 age range (Alkan et al., 2017). University students are in risk groups in terms of eating disorders in terms of their age, psycho-social and economic status. It is very important to determine the frequency of ED among university students, to take relevant educational and preventive measures, to provide protection, and to provide treatment if the disease has occurred (Galli et al., 2014; Ulaş et al., 2013). Although eating disorders are seen as 5-20 times higher in women compared to men in the general population, it has become widespread among athletes, and surprisingly, their rate of incidence in male athletes has increased (Deering, 2001; Kristjánsdóttir et al., 2019; Taylor et al., 2006; Unalan et al., 2009).

Compared to the general population, athletes are considered to be more perfectionists. However, it is known that perfectionism is associated with bulimic symptoms. Especially people who want to have high standards regarding their body and constantly make self-criticism have more negative assessments of their body shape, and this situation causes more eating disorders. In male athletes who want to improve their appearance with exercise, there is a relationship between self-esteem and a high eating disorder. Contrary to research on female athletes, little is known about the personal and physiological factors that affect eating disorder attitudes and behaviors in male athletes. However, pressures on body weight and shape in sports circles are considered to be among the reasons (Galli et al., 2014).

In women athletes who care about aesthetics (gymnastics, ballet, dance) and endurance athletes, when the energy loss is higher than the energy intake, this results in low energy availability. The wrong practices include food restriction, laxative/enema/diuretic use, and excessive exercise. This has been reported to be a risk factor for the "Female Athlete Triad", especially in women (Cialdella-Kam, 2014; Ghoch et al., 2013; Márquez & Molinero, 2013).

Some of the short-term effects of eating disorders, especially among those engaged in sports, include dehydration due to malnutrition, and a decrease in max.VO₂ and energy insufficiency. In the long term, it is reported to affect the cardiovascular, endocrine, gastrointestinal, nervous, and skeletal systems, and kidneys (Kanpp et al., 2014). Although there are no specific physical examinations and laboratory findings for the diagnosis of eating disorders, various tests are used for evaluation. Patient and family history, physical examination findings, laboratory tests, psychological tests, and forms of assessment of nutritional habits as well as several

questionnaires developed to evaluate eating disorders are available. EAT-26 (Eating Attitudes Test), EDE-Q (Eating Disorder Examination Questionnaire), and EDI (Eating Disorder Inventory) are some of these surveys (Bar et al., 2016; Darcy et al., 2013). The aim of this research was to determine the levels of eating disorders and risk factors among university students in the field of sports education in different provinces of Turkey.

METHOD

Research Model

In this study, which was carried out to determine the eating disorder levels and risks of university students, instant scanning and relational scanning model from the general scanning model was used, the instant scanning approach is aimed to describe the situation as it is within a certain period of time. The relational screening model was used to determine the relationship or degree between two or more variables (Karasar, 2002).

Universe-Sample

This study was carried out on 1773 university students, 1084 females, and 689 males, in the field of sports education in different provinces in Turkey.

Data Collection Tools

Anthropometric Measurements: After measurements of height and body weight, Body Mass Index (BMI-kg/m²) was calculated and categorized according to the criteria of the World Health Organization (WHO) (Fink & Mikesky, 2018).

Eating Disorder Examination Questionnaire (EDE-Q): The EDE-Q developed by Fairburn and Beglin (1994), and the reliability and validity of the Turkish version which was made by Yücel et al. (2011), were used to determine the level of the eating disorder. The scale consists of 28 questions and 4 subscales (restrictions: 1st to 5th questions, eating concerns: 7th, 9th, 19th, 20th, and 21st questions, body shape concerns: 6th, 8th, 10th, 11th, 23rd, 26th, 27th, weight concerns: 28th, 8th, 12th, 22nd, 24th, and 25th questions). In addition to these subscales, there are 6 questions (13, 14, 15, 16, 17, and 18) to determine the level of "binge eating". As a result of the Turkish validity and reliability study, Cronbach's Alpha value was found to be 0.93. In this study, the reliability coefficient of the scale was calculated as 0.91 for the EDE-Q total score. The reliability coefficients were 0.93, 0.89, 0.87, and 0.87 for the subscales related to restriction, eating, body shape, and weight concerns, respectively.

Ethical Approval

This study was approved by the ethics committee of Erzincan Binali Yıldırım University (Date: 22.06.2016, Meeting no: 04/03) and all participants were provided and signed an informed consent form in accordance with "Helsinki Declaration Principles".

Data Collection

Data were collected via a scale form. A personal information form was used to determine the demographic characteristics of the participants, and the Eating Disorder (EDE-Q) scale was used to determine the levels of eating disorders.

Analysis of Data

Statistical analysis was performed using the IBM SPSS ver. 22 package program (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). The results for continuous variables were provided as mean \pm standard deviation and median (minimum-maximum) value. For reliability analysis, Cronbach's α was used to assess the scale's internal consistency normality of distribution for continuous variables was evaluated using the Shapiro-Wilks test. When the normality assumption was not provided the Mann-Whitney U test was used to compare the independent continuous variables between two groups and Kruskal Wallis test was used for three or more groups. As a post-hoc test Dunn's test was used for pairwise comparisons after the Kruskal-Wallis test. Multivariate logistic regression analysis was performed to determine possible risk factors of having a high EDE-Q score. The study group includes only athletes, therefore dependent variable was created based on the median value (<0.95 accepted as low and ≥ 0.95 accepted as high). Thus, based on univariate analysis, any variable significantly related to EDE-Q total score was drawn into the analysis. Gender and age were included in the model as biological factors. A p-value of less than or equal to 0.05 was considered to be statistically significant.

RESULTS

Of the 1773 students who participated in the study, 61.1% were female (age: 21.8 ± 2.7) and 38.9% were male (age: 21.6 ± 2.7). As a result of the responses given to the EDE-Q questions, all EDE-Q sub-dimension scores (except restrain) and total scores were found to be significantly higher in males than in females ($p < 0.05$, Table 1).

Table 1. EDE-Q scores of participants by gender

	Gender		p*
	Female (n=1084)	Male (n=689)	
Restraint	1.36 \pm 1.42 1.0(0.0-6.2)	1.47 \pm 1.46 1.0(0.0-6.0)	0.092
Eating concern	0.91 \pm 1.11 0.4(0.0-5.8)	1.03 \pm 1.14 0.6(0.0-4.8)	0.004*
Shape concern	1.33 \pm 1.26 1.0(0.0-6.0)	1.61 \pm 1.52 1.1(0.0-6.9)	0.002*
Weight concern	1.21 \pm 1.22 1.0(0.0-6.0)	1.43 \pm 1.44 1.0(0.0-6.0)	0.022*
Total score	1.2 \pm 1.11 0.9(0.0-5.5)	1.39 \pm 1.25 1.0(0.0-5.2)	0.013*

*Mann-Whitney U test was used. Results were presented as mean \pm standard deviation, and median (minimum-maximum) value.

According to the BMI assessment, it was determined that 139 participants (3.3% female, 14.9% male) were classified as underweight (BMI; $<18.5 \text{ kg/m}^2$), 1287 participants (71.1% female, 74.9% male) were classified as normal weight (BMI; $18.5\text{-}24.9 \text{ kg/m}^2$), and 347 participants (25.6% female, 10.2% male) were classified as overweight (BMI; $25.0\text{-}24.9 \text{ kg/m}^2$). It was identified that as BMI (Body Mass Index) value increased, there was a statistically significant increase in all EDE-Q sub-dimensions and EDE-Q total score ($p < 0.05$, Table 2).

Table 2. Participants' EDE-Q scores by BMI categories

	Body Mass Index			p*
	Underweight (n=139)	Normal weight (n=1287)	Overweight (n=347)	
Restraint	0.82±1.22 ^{b,c} 0.0(0.0-4.8)	1.36±1.4 ^{a,c} 1.0(0.0-6.2)	1.81±1.54 ^{a,b} 1.6(0.0-6.0)	<0.001
Eating concern	0.62±1.01 ^{b,c} 0.0(0.0-4.4)	0.9±1.08 ^{a,c} 0.4(0.0-5.2)	1.31±1.25 ^{a,b} 1.0(0.0-5.8)	<0.001
Shape concern	0.9±1.08 ^{b,c} 0.5(0.0-4.4)	1.37±1.31 ^{a,c} 1.0(0.0-6.0)	1.91±1.59 ^{a,b} 1.6(0.0-6.9)	<0.001
Weight concern	0.92±1.18 ^{b,c} 0.4(0.0-4.6)	1.24±1.27 ^{a,c} 0.8(0.0-6.0)	1.67±1.45 ^{a,b} 1.4(0.0-6.0)	<0.001
Total score	0.82±1.01 ^{b,c} 0.3(0.0-4.1)	1.22±1.13 ^{a,c} 0.9(0.0-5.3)	1.67±1.28 ^{a,b} 1.6(0.0-5.5)	<0.001

*Kruskal Wallis test was used. Results were presented as mean±standard deviation and median(minimum-maximum) values. Dunn's test was used for pairwise comparisons, superscript refers to statistically significant differences ($p<0.05$) among a: underweight, b: normal weight, and c: overweight groups.

A total of 1323 participants (79.3% female, 67.2% male) were engaged in recreational physical activities on a regular basis, and the mean duration of activities was 3.64 ± 1.52 day/hour and 1.93 ± 0.85 hour/day. Eating concern and shape concern scores were found to be statistically higher in those who did not perform physical activities than those who did (respectively; $p=0.030$, $p=0.004$). The restraint score was higher in those who performed physical activities ($p=0.001$). Weight concern and total scores did not differ according to physical activity status (respectively; $p=0.078$, $p=0.483$, Table 3).

Table 3. EDE-Q scores of participants by their recreational physical activity status

	Physical Activity		p*
	Yes (n=1323)	No (n=450)	
Restraint	1.46±1.45 1.2(0.0-6.0)	1.24±1.4 0.8(0.0-6.2)	0.001*
Eating concern	0.92±1.11 0.4(0.0-5.8)	1.06±1.16 0.6(0.0-5.2)	0.030*
Shape concern	1.37±1.31 1.0(0.0-6.9)	1.66±1.53 1.2(0.0-6.0)	0.004*
Weight concern	1.26±1.28 1.0(0.0-6.0)	1.42±1.41 1.0(0.0-6.0)	0.078
Total score	1.25±1.14 0.9(0.0-5.5)	1.34±1.25 0.9(0.0-5.5)	0.483

*Mann-Whitney U test was used. Results were presented as mean ± standard deviation, median (minimum-maximum) value.

The distribution of professional athlete (n=896) according to their branches is as team sports (n=421, 47.0%), strength/power sports (n=348, 38.8%), and endurance sports (n = 127, 14.2%). Restraint, eating concern, and total scores differ according to sports branches (respectively; $p<0.001$, $p=0.003$, $p=0.008$). Restraint, eating concerns, and total scores were found to be higher in the group of students interested in strength/power sports compared to the students who were engaged in team sports ($p<0.05$). However, shape concern and weight concern scores were similar according to sports branches (respectively; $p=0.566$, $p=0.084$), (Table 4).

Table 4. EDE-Q scores according to the sports branch of the participants

	Team Sports	Sports type		p*
		Endurance Sports	Strength/Power Sports	
Restraint	1.25±1.35 ^c 0.8(0.0-6.0)	1.6±1.56 1.2(0.0-5.6)	1.79±1.54 ^a 11.6(0.0-6.0)	<0.001
Eating concern	0.9±1.12 ^c 0.4(0.0-4.4)	1.09±1.17 0.6(0.0-5.8)	1.1±1.16 ^a 0.6(0.0-5.2)	0.003*
Shape concern	1.37±1.33 1.0(0.0-6.0)	1.55±1.51 1.1(0.0-6.0)	1.44±1.33 1.1(0.0-5.8)	0.566
Weight concern	1.22±1.26 0.8(0.0-5.8)	1.49±1.43 1.4(0.0-6.0)	1.39±1.32 1.0(0.0-5.8)	0.084
Total score	1.18±1.12 ^c 0.8(0.0-5.2)	1.43±1.29 1.1(0.0-5.5)	1.43±1.19 ^a 1.2(0.0-5.3)	0.008*

*Kruskal Wallis test was used. Results were presented as mean ± standard deviation, median(minimum-maximum) value. Dunn's test was used for pairwise comparisons, superscript refers to statistically significant differences ($p < 0.05$) among a: team sports, b: endurance sports, c: strength/power sports groups.

Logistic regression was performed to determine the risk factors of having a high EDE-Q total score. The logistic regression model was statistically significant, $\chi^2(6) = 36.507$, $p < 0.001$. Gender and age were not associated with eating disorders but were not removed from the model because of being biological correction factors. BMI and sport types were significantly related to EDE-Q total score. Being in the normal BMI category makes it 2 times more likely to have a higher EDE-Q compared to being in the underweight group (OR: 2.004; 95% CI: 1.050-3.831). Similarly total score, being in the overweight BMI category makes it 2.3 times more likely to have a higher EDE-Q total score compared to being in the normal group (OR: 2.272; 95% CI: 1.560-3.332). When the EDE-Q score was evaluated according to sports type, the scores of endurance sports and team sports were similar. However, the risk of students who performed strength/power sports having higher EDE-Q scores was 1,5 times more than the students who performed team sports (OR: 1.488; 95% CI: 1.090-2.030), (Table 5).

Table 5. The results of logistic regression analysis for EDE-Q total score

Factors	Regression coefficient	Standard Error	p-value	OR	95% CI for OR	
					Lower	Upper
Gender (Male)	0.174	0.161	0.278	1.190	0.869	1.631
Age	0.030	0.027	0.266	1.030	0.978	1.085
BMI			<0.001			
<i>Normal weight vs underweight</i>	0.696	0.330	0.035	2.004	1.050	3.831
<i>Overweight vs. normal weight</i>	0.822	0.193	0.000	2.272	1.560	3.322
Sports type			0.043			
<i>Endurance sports vs. team sports</i>	0.161	0.223	0.469	1.175	0.759	1.820
<i>Strength/Power sports vs. team sports</i>	0.397	0.159	0.012	1.488	1.090	2.030

BMI: Body mass index, OR: odds ratio, CI: confidence interval.

DISCUSSION AND CONCLUSION

In studies conducted on university students, it has been determined that the eating disorder seen in female students is more than in male students (Kugu et al., 2006; Turan et al., 2015). When evaluated in terms of athletes, the prevalence of eating disorders among those who do sports is higher than among those who do not (Galli et al., 2014; Schwarz et al., 2005). Although it is difficult to give clear figures about athletes, the risk of eating disorders in the general population is higher in women (who do or do not do sports) than men (who do or do not do sports), whereas the prevalence of eating disorders is stated as 0-19% in male athletes and 6-45% in female athletes (Bonci et al., 2008; Bratland-Sanda & Sundgot-Borgen, 2013). In males, the eating disorder behavior score was found to be lower (Darcy et al., 2012; Darcy et al., 2013; Lavender et al., 2010) and it was concluded that body dissatisfaction and irregular eating behavior were higher (Chapman & Woodman, 2016; Lavender et al., 2010). In the study, it was determined that male students had significantly high eating concerns, shape concerns, weight concerns, and total score values except for restraint. This result is thought to be influenced by the branch of sports they study and the fact that male students give more importance to their body image and shape for this reason. The fact that the research group is university students receiving sports education is in parallel with the findings regarding the increase in eating disorders, especially in the group of males who do sports, contrary to the general population, in recent years (Deering, 2001; Kristjánsdóttir et al., 2019; Taylor et al., 2006; Ünalán et al. 2009). The findings of McLester et al., (2014) suggesting that female athletes have a low risk of eating disorders among university students support the findings of our study.

According to the BMI assessment, it was determined that those who were in the normal weight category had EDE-Q total scores 2 times higher than those in the underweight category, and those in the overweight BMI category had EDE-Q total scores 2.3 times higher than those in normal weight BMI category. As the BMI value increased, a statistically significant increase in all sub-dimensions of EDE-Q and EDE-Q total score was identified. Individuals with high body weight were also concerned about restraint, eating, body shape, and weight, and this led to a deterioration in eating behavior and an increase in the total EDE-Q score.

A total of 1323 participants (79.3% female, 67.2% male) stated that they exercised regularly, and the average exercise duration was 3.64 ± 1.52 day/hour and 1.93 ± 0.85 hour/day. Eating concern and shape concern scores were found to be statistically higher in those who did not do physical activity than in those who did. Based on this result, it can be thought that students who do not do physical activity are concerned about the effect of lack of activity on body shape. The finding that the restriction score is higher in those who do physical activity suggests that they maintained body weight control by exercise with limitations in nutrition. Weight concerns and total scores do not differ according to physical activity status.

It is advantageous for the athletes participating in the competitions to have low-fat mass and body weight. This situation provides the ground for athletes to develop occupancy problems with food and eating disorders (Joy et al., 2016). This is more common, especially in sports in the weight category and that gives importance to aesthetic appearance. In the study, restraint, eating concern, and total scores were found to be higher in the students interested in

strength/power sports compared to the students doing team sports. However, shape concern and weight concern scores are similar according to sports branches. While the EDE-Q scores of the individuals participating in endurance and team sports were similar, the risk of having high EDE-Q scores of the participants in the strength/power sports was found to be 1.5 times higher than the athletes in team sports. This result, especially a higher EDE-Q score in male students, can be explained by the fact that male students are interested in strength/power sports, where body shape is important. In their study, Sundgot-Borgen and Torstveit (2014) found that the prevalence of subclinical or clinical eating disorders (EDs) in athletes (13.5%) was significantly higher compared to the control group (4.6%; $p < 0.001$). The prevalence of EDs in male athletes was higher in antigravity sports (22%), ball games (5%), and endurance sports (9%). Among female athletes competing in aesthetic sports, the prevalence of EDs was higher (42%), endurance sports (24%), technical sports (17%), and ball games (16%). Similarly, in a study conducted in 2015, 108 elite German athletes and 108 non-elite athletes were compared, and the rates of eating disorders were found to be 17% in aesthetic sports, 2% in ball sports, and 2% in non-athletes (Thiemann et al., 2015). Schaal et al. (2011), in their study which aimed to determine the prevalence of gender-specific eating disorders among different branches, found that the highest prevalence among females was in endurance and aesthetic branches, whereas in males it was in branches in the weight category (i.e. wrestling and boxing).

Conclusion

An eating disorder is a health problem with increasing incidence day by day and is seen more frequently in the younger generation who gives more importance to body image. Diagnosis and treatment of eating disorders require a multidisciplinary approach. Among athletes, especially in some branches where a lean, muscular body image is important, more frequent, nutritional behavior disorders lead the athlete to eating disorders and this situation may adversely affect the health and performance of the athlete. This study is important because it reflects the risky two-way situation - being both a university student and an athlete. As a result of this study, it can be said that having high BMI values and dealing with strength/power sports increase the risk of developing eating disorders.

Especially in universities where sports are taught as a science, it is very important to give importance to nutrition and to inform students through experts in the field of sports nutrition. It is important for the students who receive sports science education to have proper nutrition knowledge and habits to protect both their own health and those they will train in the future.

Conflict of Interest: There is no financial or personal conflict of interest among the authors of the article within the scope of the study.

Contribution Rate Statement of Researchers: Research Design; GE; MF, YKA, Data Collection- GE; MF, YKA, statistical analysis; GE; MF, YKA, Preparation of the article; GE; MF, YKA, HY

Ethical Approval

Name of the Committee: Erzincan University Ethics Committee

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An Investigation of Relationship Between Digital Game Addiction, Peer Bullying and Sportsmanship Attitudes of Secondary School Pupils

Büşra ÇAKIR¹ , Zekiha HAZAR^{1*} 

¹Ağrı İbrahim Çeçen University, Faculty of Sport Sciences, Ağrı

Research Article

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Abstract

The aim of this study is to investigate the relationship between the concepts of peer bullying and sportsmanship, which are considered as factors related to digital game addiction, which is an important problem for secondary school students. When the relevant literature is reviewed, it is observed that the literature has studies on "addiction to digital games" and "bullying", but studies that deal with the concepts of "digital game addiction, peer bullying, and sportsmanship" are few. This study was designed according to the quantitative research model and a relational screening pattern was applied accordingly. The subjects of this research consist of 1088 students studying in the 2021 to 2022 academic year. The method of "stratified sampling and maximum variation sampling" was applied for selecting suitable subjects. Necessary data were collected through Demographic Information Form, Digital Game Addiction for Children, Peer Bullying Detection, and Sportsmanship Behavior Scales in Physical Training Class. In this study, the SPSS 20.0 Statistical Package Program was used to assess the obtained data. T-test and one-way Analysis of Variance (ANOVA) Tukey Test Statistics and Pearson Correlation and Multiple Regression methods of analysis were used along with descriptive statistical methods for analysing applicable data. As a result of the analyzes made, it was seen that the relationship between the scale scores of the participants was statistically significant. However, it can be said that digital game addiction is an important predictor of peer bullying and so it negatively affects interpersonal social relations in terms of sportsmanship.

Keywords: Digital game, Peer bullying, Sportsmanship, Secondary school, Pupils

Ortaokul Öğrencilerinin Dijital Oyun Bağımlılığı, Akran Zorbalığı ve Sportmenlik Davranışları Arasındaki İlişkinin İncelenmesi

Öz

Bu çalışmanın amacı, ortaokul öğrencileri için önemli bir sorun olan dijital oyun bağımlılığı ile ilgili faktörler olarak değerlendirilen akran zorbalığı ve sportmenlik kavramları arasındaki ilişkiyi incelemektir. Literatür incelendiğinde, dijital oyun bağımlılığı ile akran zorbalığı arasındaki ilişkiyi inceleyen araştırmaların olduğu ancak dijital oyun bağımlılığı, akran zorbalığı ve sportmenlik arasındaki ilişkiyi alan araştırmaların oldukça sınırlı olduğu görülmüştür. Bu çalışma nicel araştırma modeline göre tasarlanmıştır. Buna göre ilişkisel tarama deseni uygulanmıştır. Bu araştırmaya katılan denekler, 2021-2022 eğitim-öğretim yılında öğrenim gören 1088 öğrenciden oluşmaktadır. Uygun deneklerin seçiminde "tabakalı örnekleme ve maksimum çeşitlilik örnekleme" yöntemi uygulanmıştır. Gerekli veriler beden eğitimi dersinde Demografik Bilgi Formu, Çocuklar için Dijital Oyun Bağımlılığı, Akran Zorbalığı Tespiti ve Sportmenlik Davranışı Ölçekleri aracılığıyla toplanmıştır. Bu çalışmada elde edilen verilerin değerlendirilmesinde SPSS 20.0 İstatistik Paket Programı kullanılmıştır. Elde edilen verilerin değerlendirilmesinde SPSS 20.0 istatistik paket programı kullanılmıştır. Normallik sınavına göre, normal dağılım gösteren veriler için parametrik testlerden yararlanılmıştır. Buna göre verilerin analizinde, tanımlayıcı istatistiksel metotlarla birlikte t testi ve tek yönlü varyans analizi (ANOVA) ve Tukey test istatistikleri, Pearson Correlation ve çoklu regresyon analizleri kullanılmıştır. Yapılan analizler sonucunda katılımcıların ölçek puanları arasındaki ilişkinin istatistiksel olarak anlamlı olduğu görülmüştür. Bununla birlikte dijital oyun bağımlılığının akran zorbalığının önemli bir yordayıcısı olduğu ve bu nedenle sportmenlik açısından kişiler arası sosyal ilişkileri olumsuz etkilediği söylenebilir.

Anahtar kelimeler: Dijital oyun, Akran zorbalığı, Sportmenlik, Ortaokul, Çocuk

* Corresponding Author: Zekiha HAZAR, Email: zekihanazar84@gmail.com

INTRODUCTION

The digital games that have been structured and become widespread with the emerging ones are gradually replacing traditional games, and these neoteric games lead to some physical, mental, social, and cognitive troubles unlike traditional games (Akçay and Çolaklar, 2015; Erboy and Akar Vural, 2010; Green and Bavelier, 2003; Horzum, 2011; Torun, 2015). Changing features have revealed the concept of "digital game addiction", which is the exorbitant and uncontrolled use of digital games, particularly in young ones (Irmak and Erdoğan, 2016). The digital game addiction can be identified as the inability of individuals to control their playing habits and continuing to play despite the troubles it causes (Lemmens et al., 2009). It is claimed, therefore, that the addictive type of behavior experienced especially in preschool and school children has a significant impact on attention, success, decline in academics, nutrition, inactivity, excessive weight gain, sleep weights, loneliness, excessive anxiety, aggressive attitudes and social conflicts (Göldağ, 2019; Griffiths, 2005; Irmak and Erdoğan, 2016).

The primary criticism of digital games is the factor of violence and addiction settled in the contents of relevant games. Especially the addiction aspects arising from violent digital games cause many problems in daily life. According to Espelage and Swearer (2003), one of the reasons for the emergence of bullying is the emergence of aggression in digital environments. Çıngı (2018) argues that the best-selling games and even the ones breaking sales records worldwide are taken into consideration, nearly every single second of such games contains blood, broken bones, broken limbs, punctured bodies, cut or severed heads, zombies, terrifying aliens each one different from other, drugs, mafia, fights, arms, thieves, witches, and many other elements of violence.

The transformation of these violence factors in digital games into attitudes acquired by youngsters over time deepens the relevant issue gradually. It has been revealed in many studies that bullying and aggression in individuals through increase in addiction to digital games (Aktaş, 2018; Gentile et al., 2004; Greitemeyer and Mügge, 2014; Güvendi et al., 2019; Gökbulut 2020; Hazar and Ekici, 2021; Karaaslan, 2015; Kılıç 2019; Polman et al., 2008).

Taneri (2020) claims bullying attitudes in children increase due to the increase in digital game addiction. The peer bullying, thus, emerges as a prominent element in shaping social relations, particularly among school-age children. The "peer bullying" was defined by Tatum (1992) as a desire to intentionally harm somebody standing to them and ensure him or her suffer through stress, and he also stressed that this concept was not just a desire, but an unfavorable attitude pattern. Rigby (2020), who emphasizes that the desire to harm another person does not only qualify the person as a bully, claims also that the bullying, use at the end of the sentence, is the continuity of an action the of power imbalance between a bully and victim the aggressor's visibly enjoying his/her such a behaviour, and also the feeling himself/herself as.

The concept of fair play, which can be assumed as the opposite of the concept of bullying, has an important place in structuring interpersonal relations on healthier keystones. The fair-play is, according to Yıldırım (2005), people's creating their own internal structure and shaping their behaviours correctly and regularly by considering other individuals, even during prevailing unfavorable circumstances. In this context, an athlete should never think of exhibiting adverse,

sarcastic, or mischievous attitudes even if he/she will lose a competition. According to Pehlivan (2004), a person who has made fair play a philosophy of life, has adopted this idea not only in sports activities, but also in all areas of life where feasible opportunities exist. Such an individual, also known as a “gentleman” around him/her, does not interfere with the freedoms and rights of people and displays respectful and reassuring behaviors.

In this context, the “bullying and fair-play”, which appear as two different concepts and attitudes, play a decisive role in the social relations of school children. The fundamental aim of schools is to create behavioral alterations in individuals in line with certain targets. One of the target acquisitions that should be included in curriculums applied in schools is to train "decent individuals". Meanwhile, physical training and sports classes are major instruments, in terms of their structural belongings and target achievements, which can instil the spirit of fair play in pupils and thus enable individuals to establish healthy and favorable social relations in all areas of life.

When the relevant literature is reviewed, it is observed that the literature has studies on "addiction to digital games" and "bullying", but studies that deal with the concepts of "digital game addiction, peer bullying, and sportsmanship" are few (Anderson and Carnagey, 2005; Ayas and Horzum, 2014; Aktaş, 2018; Aziz et al., 2021, Aktaş and Bostancı, 2021; Chan and Rabinowitz, 2006; Gentile et al., 2004; Griffiths et al., 2004; Greitemeyer and Kılıç, 2019; Mügge, 2014). It is assumed, that investigating the correlation between the concepts of peer bullying and sportsmanship, which are considered as the factors related to digital game addiction, which is an important trouble for secondary school students, will make significant contributions to the literature.

METHOD

Research Model

This study was designed according to the quantitative research model and a relational screening pattern was applied accordingly.

Study Group

The subjects of this research consist of 1088 students studying in the 2021 to 2022 academic year. As 36 out of 1088 questionnaires were filled incorrectly, they were not included in this research and 1052 of them were evaluated. The method of "stratified sampling and maximum variation sampling" was applied for selecting appropriate subjects.

Data Collection Tool

In this study, necessary data were collected through Demographic Information Form, Digital Game Addiction for Children, Peer Bullying Detection, and Sportsmanship Behavior Scales in Physical Training Class.

Digital Game Addiction Scale for Children (DGASFC): The scale developed by Hazar and Hazar (2017) has twenty-four items, four sub-dimensions, and a five-point Likert structure (1

= Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Totally Agree). The minimum score that can be acquired from the scale is 24 whereas the maximum score is 120. In the grading of scoring, 1-24 Normal, 25-48 Low-risks, 49-72 Risky, 73-96 Dependent, and 97-120 High-level dependent groups. A calculation can be made on the total score of the scale. The Cronbach' Alpha internal consistency coefficient of the scale was determined as .91 as a result of the reliability analysis.

Peer Bullying Detection Scale (PBDS) Adolescent Form: The form was developed by Kutlu and Aydın (2010) for primary and secondary school pupils. The scale has 3 factors (victim, bully, and filler), 19 items, and a 5-point Likert structure (1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Totally Agree). Those showing victim and bully subscales consist of parallel items, including bullying actions in terms of physical, verbal, and aspect. If individuals have higher scores in terms of the total scale and the total scores of the sub-factors, it means that individuals have vigorous behavioral attitudes. The Cronbach' Alpha internal consistency coefficient of the scale was determined as .78 according to he results of the reliability analysis.

Physical Training Class Sportsmanship Behavior Scale (PTCSBS): The scale developed by Koç (2013) consists of 22 items, 2 sub-factors (exhibiting congenial attitudes, avoiding from unfavorable behaviors), and a 5-point Likert structure (1 = Always, 2 = Very often, 3 = Occasionally, 4 = Rarely, 5 = Never). The minimum score acquired from the scale is 22 whereas the maximum score is 110. The second sub-dimension of the scale is scored reversely. Having a higher total score of the scale and the total scores of the sub-factors means that individuals have strong behavioral features. The Cronbach' Alpha internal consistency coefficient of the scale was determined as .87 based upon the reliability analysis.

Ethical Approval

Based on the letter of interest of the Dean of the Faculty of Sports Sciences, Ağrı İbrahim Çeçen Universty "An Investigation on Relationship between Digital Game Addiction, Peer Bullying, and Sportsmanship Attitudes of Secondary School Pupils" by Ağrı İbrahim Çeçen University Scientific Research Ethics Committee, It has been examined by the Scientific Research Ethics Committee of the University of Turkiye and with the decision dated 26.01.2022 and numbered 19. This research was allowed.

Data Analysis

The SPSS 20.0 Statistical Package Program was used to assess the acquired data. According to the normality testing, parametric tests were implemented for the data indicating normal distribution. T-test and one-way Analysis of Variance (ANOVA), Tukey Test Statistics and Pearson Correlation and Multiple Regression methods of analysis were applied along with descriptive statistical methods for analysing applicable data.

FINDINGS

Table 1. Averages of total scores in terms of digital game addiction, sportsmanship, and peer bullying scales

	N	\bar{X}	Min.	Max.
DGASFC Total	1052	49.67	24.00	120.00
PTCSBS Total	1052	83.61	25.00	105.00
PBDS Total	1052	24.24	14.00	70.00
PBDS- Victim	1052	14.63	8.00	40.00
PBDS PBDS- Bully	1052	9.61	6.00	30.00

When Table-1 is examined, it is clearly shown that the mean score of the subjects on the digital game addiction scale is 49.67, the mean score on the sportsmanship behaviour scale is 83.61, the total mean score on the peer bullying scale is 24.24, the mean score on the victim sub-dimension is 14.63, and the mean score on bullying sub-dimension is 49.67. The average score, therefore, is 9.61 as shown.

Table 2. T-Test analysis of participants' total scores of digital game addiction, sportsmanship, and peer bullying in terms of gender variable

Scale	Gender	N	\bar{X}	S	t	p
DGASFC Total	Female	599	45.06	15.30	-9.525	.000
	Male	493	54.89	18.15		
PTCSB Total	Female	599	87.01	13.75	8.071	.000
	Male	493	79.76	15.34		
PBDS Total	Female	599	22.59	8.61	-5.950	.000
	Male	493	26.11	10.57		
PBDS Victim	Female	599	14.04	6.09	-3.11	.002
	Male	493	15.03	7.03		
PBDS Bully	Female	599	8.55	8.61	-7.07	.000
	Male	493	10.81	5.94		

It is observed on Table-2 that the digital game addiction, sportsmanship attitude, peer bullying, victimization, and bullying sub-dimension total scores of the participants differ statistically in terms of the gender variable ($p < 0.05$). It is clearly shown on relevant table that digital game addiction, peer bullying, victimization, and bullying total scores of male subjects are higher than female ones, whereas female participants' scores are higher than males in terms of sportsmanship total scores.

Table 3. Pearson - correlation testing results with regard to total scores of participants' digital game addiction, sportsmanship, and peer bullying

Gender		DGASFC Total	PTCSS Total	PBDS Total	PBDS Victim	PBDS Bully	
Female	DGASFC Total	r	1	-,313	,336	,295	
		p		,000	,000	,000	
	PTCSS Total	r	-,313	1	-,342	-,135	-,484
		p	,000		,000	,001	,000
	PBDS Total	r	,336	-,342	1	,878	,745
		p	,000	,000		,000	,000
	PBDS Victim	r	,295	-,135	,878	1	,334
		p	,000	,001	,000		,000
	PBDS Bully	r	,252	-,484	,745	,334	1
		p	,000	,000	,000	,000	
Male	DGASFC Total	r	1	-,360	,351	,240	
		p		,000	,000	,000	,000
	PTCSS Total	r	-,360	1	-,402	-,183	-,499
		p	,000		,000	,000	,000
	PBDS Total	r	,351	-,402	1	,847	,777
		p	,000	,000		,000	,000
	PBDS Victim	r	,240	-,183	,847	1	,323
		p	,000	,000	,000		,000
	PBDS Bully	r	,341	-,499	,777	,323	1
		p	,000	,000	,000	,000	

It is evidently clear on Table-3 that there is a negative correlation between the total scores of digital game addiction and sportsmanship while a positive and moderate correlation is observed between the total scores of bullying and the total scores of victimizations and bullying. It is evident, that there is a negative and moderately statistically significant relationship between the participants' sportsmanship total scores, bullying total scores, and victimization and bullying sub-dimension scores. It is observed that there is a positive and statistically moderately significant relationship between the total bullying scores of the participants and the sub-dimension scores of victimizations and bullying. The study clearly shows that there is a positive and generally moderate relationship between the victimization and bullying sub-dimension scores of the subjects.

Table 4. Multiple regression results of participants in terms of scale total scores

Variable	Unstandardized Coefficients		Standardized Coefficients	t	p
	B	Std. Error	Beta		
(Constant)	105.395	1.206	-	87.419	.000
Addiction	-1.233	.077	-.436	-16.018	.000
Bullying	-.200	.023	-.232	-8.532	.000
R=.561 ^a R ² = .314 F=240.332 p=0.000					

Dependent Variable: PTCSS

Variable	Unstandardized Coefficients		Standardized Coefficients	t	p
	B	Std. Error	Beta		
(Constant)	2.425	.498	-	4.870	.000
Addiction	.082	.009	.271	9.328	.000
Victimization	.211	.023	.262	9.027	.000
R=.427 ^a R ² = .182 F=116.921 p=0.000					

Dependent Variable: Bully

It is observed on Table-4 above that digital game addiction and peer bullying attitudes of the subjects negatively affect sportsmanship behaviour by 31% ($R^2 = 0.314$), and this effect is statistically significant ($p=0.000$). It is assessed that digital game addiction and victimization behaviors of the subjects assertively affect bullying behaviors by 8% ($R^2 = 0.182$), and this effect is also statistically significant ($p=0.000$).

DISCUSSION AND CONCLUSION

When the analysis results in Table-1 are examined, it is evident that the digital game addiction levels of the subjects fall remained in the range expressed as the risk group (according to the DGASFC scoring reference range, the range of 49-72 points is the risk group and the average score of the participants is 49.67). Therefore, it can be said that the average score of the participants from determining of determining. The sportsmanship behaviour is 83.61, and their sportsmanship level is at quite high. The total mean score of the participants in the adolescent form of identifying bullying is 24.24 (victim + bully), the mean score of the sub-dimension of victimization is 14.63, and the mean score of the bully sub-dimension is 9.61. So, according to these average scores it may be claimed that the relevant scores of subjects are short in all of the dimensions.

When the total scores of the participants on the *Digital Game Addiction Scale for Children* were examined according to the gender variable, it was detected that the average score of male subjects was statistically significantly higher than the average of females ($p < 0.05$). That boys are more interested in computer games than girls, the content of digital games is more for ones, and the halls and internet cafes where games are played are more convenient for male individuals due to cultural impacts and therefore boys can easily enter these areas can be considered the main reasons for such a difference. The reviews accomplished on the literature revealed that similar results have been obtained in many studies on this scheme (Aktaş, 2018; Griffiths and Hunt, 1998; Gökçearslan and Durakoğlu, 2014; Güvendi et al., 2019; Hazar et al., 2020; Horzum 2011; Kars, 2010).

When the total scores of the subjects from the scale of *Adolescent Form for Peer Bullying Identification* and the sub-dimension scores of *Victimizations* and *Bullying* were analysed in terms of the gender variable, it was detected that the averages of male subjects were statistically significantly higher than the averages of female ones ($p < 0.05$). It is assumed that this finding, which was collected from the research findings, may be related to the roles of genders. It can be considered that it is because girls are brought up as submissive and obedient individuals due to social culture requirements, whereas boys are brought up more dominantly in a male-dominated society. Furthermore, the imitation, of some characters in violent digital games played especially by boys can be considered as the reason for adopting aggressive attitudes. It is observed on the studies that the literature has similar results (Gökbulut, 2020; Gökkaya et al., 2018; Karaca 2018; Keskin, 2010; Kılıç, 2019; Özen, 2006; Öztürk et al., 2014).

When the total scores of the subjects collected from the *Physical Training Class Sportsmanship Behavior Scale* were examined in terms of the gender variable, it was found out that the averages of females were statistically significantly higher than the averages of males ($p < 0.05$). It can be claimed as a result of this finding that the females are more obedient and more loyal to the rules in consequence of the way they are brought up by their families and the roles given them by the society. The literature order that there are results that support the findings obtained (Altun and Güvendi, 2019; Çalayır et al., 2017; Ekinci, 2018; Koç and Yeniceri, 2017; Tsai and Fung, 2005).

When the correlation between the variables argued in the study is reviewed, it is clearly shown that a negative relationship exists between the total scores of digital game addiction and sportsmanship for both female and male subjects while a positive and moderate statistically significant relationship is observed between the total scores of bullying and the total scores of both victimization and bullying. It is observed that there is a negative and moderately statistically significant relationship between the subjects' sportsmanship total scores and bullying total scores, and the scores of victimizations and bullying sub-dimension. It is evident that there is a positive and statistically moderately significant relationship between the total bullying scores of the subjects and the sub-dimension scores of victimizations and bullying. It is shown that there is a favorable and statistically moderately significant relationship between the participants' victimization and bullying sub-dimension scores. It can be claimed in compliance with the aforespecified findings that as the digital game addiction levels of the participants increase, the levels of peer bullying also increase, but the level of sportsmanship behaviour decreases. It is observed, furthermore, that the level of peer bullying decreases as

the sportsmanship behaviour levels of the subjects increase. On the other hand, it is a substantial finding that as the level of victimization or being exposed to violence increases, the level of being a bully also increases.

When the multiple regression analysis results regarding the research findings are reviewed accordingly, it is observed that digital game addiction and peer bullying behaviors of subjects negatively affect sportsmanship behaviour by 31% ($R^2 = 0.314$), and this effect is statistically prominent. It is clearly shown that digital game addiction and victimization behaviors of the subjects positively affect bullying attitudes at a rate of 18% ($R^2 = 0.182$), and this effect is statistically noteworthy.

It can be claimed, that digital game addiction is an important predictor of peer bullying and so it negatively affects interpersonal social relations in terms of sportsmanship. Therefore, the fact that this study was designed only in compliance with the quantitative model, can be expressed as an important limitation, and the keystones of trouble can be handled in more detailed aspects in future studies, especially by utilizing the mixed style model of research.

Conflict of Interest: The author(s) of the article does not have any personal or financial conflicts of interest within the scope of the study.

Researchers' Contribution Statement: Authors; Research Design, Data Collection, statistical analysis; Preparation of the article; They contributed together with processes such as BA and ZH.

Ethical Approval

Commite Name: Ağrı İbrahim Çeçen University Scientific Research Ethics Committee

Date: 26.01.2022

Number: 19

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Investigation of the Relationship Between Upper Extremity Neuromuscular Control and Grip Strength with Shooting Accuracy in Elite Handball Players

Selim ASAN^{1*} 

¹Erzurum Technical University, Faculty of Sport Sciences, Erzurum.

Research Article

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Abstract

In sports such as handball, where the overhead throw is commonly used, athletes must be physically fit to fulfill the requirements of the throw. This fitness includes neuromuscular control, muscle strength, power, flexibility, balance, and agility. The purpose of this study was to investigate the relationship between upper extremity neuromuscular control and grip strength with shooting accuracy in elite handball players. The study was conducted with the participation of 26 male handball players with an average age of 20.23 ± 2.47 years, average body weight of 72.34 ± 8.01 kg, average height of 180.5 ± 5.90 cm, average playing experience of 8.65 ± 2.92 years, and average BMI of 22.1 ± 2.13 kg/m². Data collection tools contained a "Personal Information Form," a "Closed Kinetic Chain Upper Extremity Stability Test (CKCUEST)," a "Shooting Accuracy Test," and a "Grip Strength Test." Pearson Correlation Test analyzed the study data from descriptive statistics in the SPSS package program. In all analyses, $p < .05$ was considered statistically significant. According to the study's results, no significant correlation was found between hand grip strength, upper extremity neuromuscular control, and strength with shooting accuracy in handball. A high positive correlation was found between dominant hand strength and non-dominant hand strength. As a result, it was determined that shooting performance is not only related to strength but also closely related to the player's technical skills.

Keywords: Shooting accuracy, Handball, Grip Strength, Closed kinetic chain

Elit Hentbolcularda Üst Ekstremitte Nöromusküler Kontrol ve Kavrama Kuvveti ile Atış İsbeti Arasındaki İlişkinin İncelenmesi

Öz

Baş üstü atışın yaygın olarak kullanıldığı hentbol gibi branşlarda sporcular atışın gerekliliklerini yerine getirebilmek için fiziksel olarak yeterli olmalıdır. Bu yeterlilikler nöromusküler kontrol, kas kuvveti, güç, esneklik, denge, çeviklik gibi parametreleri içermektedir. Bu noktadan hareketle çalışmanın amacı; elit hentbolcularda üst ekstremitte nöromusküler kontrol ve kavrama kuvveti ile atış isbeti arasındaki ilişkiyi incelemektir. Araştırmaya yaş ortalaması 20.23 ± 2.47 yıl, vücut ağırlık ortalaması 72.34 ± 8.01 kg., boy uzunluğu ortalaması 180.5 ± 5.90 cm., spor yaşı ortalaması 8.65 ± 2.92 yıl ve BKİ ortalaması 22.1 ± 2.13 kg/m² olan 26 elit erkek hentbolcu katılmıştır. Araştırmada veri toplama aracı olarak "Kişisel Bilgi Formu," "Kapalı Kinetik Zincir Üst Ekstremitte Stabilite Testi (KKZÜEST)," "Atış İsbeti Testi" ve "Kavrama Kuvveti Testi" kullanılmıştır. Çalışma verileri SPSS paket programında tanımlayıcı istatistiklerden Pearson Korelasyon Testi ile analiz edilmiştir. Tüm analizlerde $p < .05$ istatistiksel olarak anlamlı kabul edilmiştir. Çalışmanın bulgularına göre; hentbolda el kavrama kuvveti, üst ekstremitte nöromusküler kontrol ve kuvveti ile atış isbeti arasında anlamlı bir ilişki tespit edilemedi. Dominant el kuvveti ile nondominant el kuvveti arasında yüksek pozitif ilişki saptandı. Sonuç olarak; atış performansının sadece kuvvet ile ilgili olmadığı oyuncuların teknik yetenekleri ile de yakından ilişkili olduğu tespit edilmiştir.

Anahtar kelimeler: Atış isbeti, Hentbol, Kavrama kuvveti, Kapalı kinetik zincir

* **Corresponding Author:** Assist. Prof. Selim ASAN, **E-mail:** selim.asan@erzurum.edu.tr

INTRODUCTION

Handball is a professional Olympic sport played all around the world. It is a sport that requires mobility and collective thinking, the ability to draw precise and accurate results, the ability to think carefully in a short time, and courage and strong will (Alp et al., 2015). In recent years particularly, what has gained increasing importance in handball is to reach the result with as few passes as possible (Çelikbilek et al., 2011). Handball has become one of the sports branches with the highest number of athletes and fans worldwide. Moreover, it has started playing in many areas, from physical education and sports lessons to sports activities in European countries (Cetin & Ozdol, 2012).

In handball, another critical factor besides the physical features is bio-motor performance. It requires good running speed, reaction timing, and strength to attack as early as possible against the opponent's position, make the defense, pass as quickly as possible, and defend the shot effectively (Karadenizli & Karacabey, 2002). It is well known that strength plays a crucial role in team sports performances. Strength denotes the force of contraction of a muscle. The term is used for muscular endurance, especially in competitions, and stands out as contractility (Özer, 1993). Strength is essential for successful physical activity (Tamer, 1995). Grip strength denotes hand grip strength controlled by many muscle groups in the hands and forearms. The muscles in this area enable activities such as holding or manipulating objects in different situations (Basseyy & Harries, 1993). Research shows a relationship between body and general muscle strength with hand grip strength (Akbal, 1998). In this connection, grip strength also plays a significant role in performing the handball maneuvers required to throw the ball at the right angle in the desired direction. In handball, the upper extremity muscles are the most important ones for shooting. Shoulder, elbow, and wrist joints are critical for accurate shooting (Demirdizen Taşkıran, 2012; Karadenizli & Karacabey, 2002; Pilça, 2017). As a sporting skill requirement, throwing accuracy is one of the critical skills in many team sports. The accuracy and speed of the shots are critical in determining the winning team in handball (Taborsky, 2007).

Scoring a goal is the factor that determines the outcome of the struggle between the two teams. For this reason, the speed and accuracy of the shots are at the forefront. These two factors are interrelated events (Garcia et al., 2013; Kawamura et al., 2016; Müller & Brandes, 2015). It is known that every shot is of great value in a handball game where two teams with similar strengths are matched. In the game, the players try to shoot and avoid interference from the defenders. For this reason, offense players should be able to try various modifications to find the right shot (Kovacs, 2011).

In this case, athletes can apply different movements accurately in the competition with neuromuscular control. Neuromuscular control is the body's dynamic responses to internal and external sensory inputs and irregularities (Özer-Kaya, 2017). Neuromuscular control creates motor responses by providing controlled muscle activity in voluntary movements, unexpected situations, internal and external stimuli (Silfies et al., 2015; Ustasaraç-Camcıoğlu, 2018). The joints connecting successive body parts, such as the shoulder, elbow, and wrist, form a kinetic chain in the upper extremity. Starting from the chest, the kinetic chain extends to the shoulder, elbow, wrist, and fingers. Neuromuscular control is transmitted along the kinetic chain to ensure smooth and controlled movement of each structure (Wu et al., 2005). Weaknesses in

neuromuscular control negatively affect the control of the musculoskeletal system. This may cause impairment in postural control (İnal, 2013; Lepley et al., 2017).

Reasonable neuromuscular control is essential for maintaining ball continuity in competition and applying the proper strength to the ball when shooting. At this point, conscious and unconscious proprioception is involved, providing stability to certain joints and revealing appropriate movement patterns during action. Moreover, sufficient muscle strength and fast reaction time are required for the anticipated movement after an excellent sensory process (Pekmez, 2019). In a handball throw, the hip, trunk, shoulder, arm, forearm and hand produce maximum linear mechanical energy from the beginning to the end of the throwing action. Energy is transferred from the trunk to the shoulder complex, from the shoulder to the arm, from the arm to the forearm, and finally to the hand. When the kinematic chain is examined to observe the ball reaching its maximum speed during a throw, it appears to reach maximum speed first at the shoulder, then at the elbow, at the wrist, and finally at the ball (Wit & Elias, 1998).

Considering this information, it is necessary to identify the active muscles at the time of throwing to increase the shooting efficiency of an athlete. It is seen that planning and training to enable the development of specific active muscles can benefit athletes' performance (Emre, 2022). In the literature, limited studies examine upper extremity, grip strength, and shooting accuracy. From this standpoint, this study aimed to investigate the relationship between upper extremity neuromuscular control and grip strength with shooting accuracy in elite handball players.

METHOD

Research Model

This study employed the correlational survey model from among the quantitative research methods. The correlational survey model is designed to determine whether or not there is a variation between two or more variables or its degree, if any (Karasar, 2011).

Study Sample

The study sample consisted of volunteer male athletes aged between 17 and 26 who played handball in the 2nd League in the 2022/23 season and continued training with at least 3 years of team experience as licensed athletes. The participants participate in technical and tactical training for at least 3 hours 5 days a week and strength training 2 days a week. Exclusion criteria included participants with (a) potential medical issues or a history of ankle, knee, or back pathology that compromised their study participation or performance and (b) any lower or upper extremity surgery or unresolved musculoskeletal disorder in the past 2 years. According to the G*Power analysis, the number of participants required to participate in the study was determined as 26 athletes with a 95% confidence level, 80% difficulty level, and a 5% acceptable margin of error. After all athletes and coaches were informed about the protocol and experimental risks, the participants under the age of 18 were asked to sign an information contract in addition to parental consent so they could participate. Table 1 presents some descriptive data about the participants.

Table 1. Results on the supplementary information about the participants

Variables	N	\bar{X}	S	Min./ Max.
Age (years)	26	20.23	2.47	17-26
Weight (kg)	26	72.34	8.01	61-90
Height (cm)	26	180.5	5.90	168-190
Playing experience (years)	26	8.65	2.92	3-14
BMI (kg/m ²)	26	22.11	2.13	18-27

\bar{X} : Mean, Sd: Standard Deviation, BMI: Body Mass Index, kg: Kilogram, m²: Square meters, Min: Minimum, Max: Maximum, N: Number of Participants

As seen in Table 1, the participants consisted of 26 male handball players with an average age of 20.23 ± 2.47 , an average body weight of 72.34 ± 8.01 kg, an average height of 180.5 ± 5.90 cm, average years of playing experience of 8.65 ± 2.92 , and a mean BMI of 22.1 ± 2.13 kg/m².

Ethical Approval

The necessary official permissions were obtained from the Scientific Research and Publication Ethics Committee of Erzurum Technical University by meeting No 4 and decision No 10, dated 30.03.2023, and the study began in line with publication ethics.

Research Procedure

The participants were tested individually in a single session. First, anthropometric measurements were made. Weight (kg) was measured using a portable scale, and height was measured using a measuring tape. The BMI was calculated by dividing weight (in kilograms) by height in meters squared. The participants performed typical handball warm-up exercises consisting of low-intensity running and general exercises, lateral leg movements, forearm and back arm turns. After the warm-up, the CKCUEST, grip strength and shooting accuracy tests were administered randomly.

Data Collection Tools

The “Personal Information Form,” the “Closed Kinetic Chain Upper Extremity Stability Test (CKCUEST),” and the “Shooting Accuracy Test” were used to collect data in the study.

Personal Information Form

The “Personal Information Form” prepared by the researcher was composed of information aiming to collect descriptive data such as age, height and weight, as well as the total number of years of playing experience of the participants in the study sample.

Closed Kinetic Chain Upper Extremity Stability Test (CKCUEST)

It is a performance test that does not require high technology. It provides quantitative data (score) for an upper extremity task in a closed kinetic chain (CKC) to more effectively examine shoulder endurance and functional capacity in sports or clinical settings. This test evaluates upper extremity strength, endurance, and closed kinetic chain. The test is conducted by counting how many times the subject can touch the supporting hand with the swinging hand, which takes a push-up position for 15 seconds. The two hands’ distance is 91.4 cm (36 inches). After the test is carried out 3 times, the average of the three values is taken as a score. In order to prevent fatigue from high-intensity activity, 45 seconds of rest periods are given between tests, taking into account the 1/3 activity/rest ratio. The test is considered both easy to

administer and understandable (Ellenbecker et al., 2000). The test results were calculated according to the following formulas:

1- *Contact Score*: The total number of contacts in 15 seconds (Ellenbecker et al., 2000; Tucci et al., 2014).

2- *Normalization Score*: It is calculated by dividing a participant's contact score by his/her height (Tucci et al., 2014).

3- *Strength Score*: It is calculated by multiplying the participant's contact score by 68% of the body weight (the percentage corresponding to the weight of the arms, head, and trunk) and dividing by 15 (test time in seconds) (Tucci et al., 2014).



Figure 1. CKCUEST (Silfies., et al. 2015).

Grip Strength Test

A Baseline Hydraulic Hand Dynamometer was used to roughly measure the hand's grip strength. During the measurement, the athlete was seated with the arm close to the body in neutral rotation, the elbow bent at 90°, the forearm rotated in the middle and supported from the seat, and the wrist in the resting position. Athletes completed the test by maintaining this position. The test started with the dominant arm and continued with the non-dominant arm. A rest period of 60 seconds was allowed between the tests repeated 3 times, and the average values of the 3 tests (Fess & Moran, 1981; Gaşior, 2018) were recorded in kilograms (Pizzigalli et al., 2016).

Shooting Accuracy Test

A total of 8 different zones were created by drawing horizontal and vertical lines at a distance of 50 cm from the handball goal posts. The corner throws were given 5 points, the middle sections 3 points, and the section in the middle of the goal post 0 points. The participants were asked to take the balls 11 meters away from the goal post and shoot the goal by jumping from 9 meters. The shots to the designated areas were recorded and the points collected were calculated (Chittibabu, 2014).

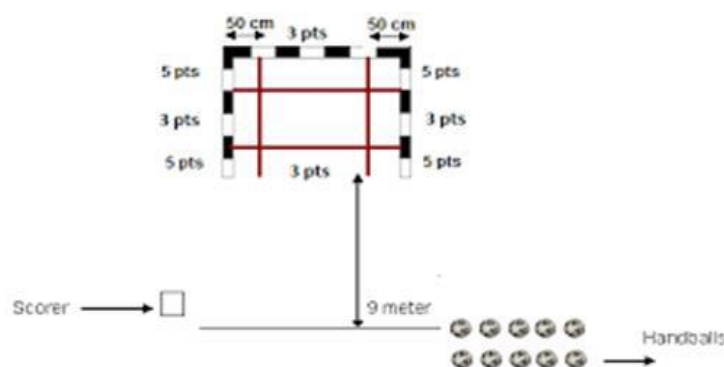


Figure 2. Shooting Accuracy Test (Emre, 2022).

Data Analysis

Skewness and kurtosis tests were applied to the data obtained from the study to determine whether they were normally distributed. The skewness and kurtosis values of the study were determined as Skewness (-.554 and .693), Kurtosis (-.658 and .169). Since skewness and kurtosis values between +1.5 and -1.5 are accepted as a normal distribution (Tabachnick & Fidell, 2007). Therefore, parametric tests were used in the study. The Pearson correlation test was used to determine the relationship between the data obtained from the study, with the significance level being $p < .05$. In this test, the correlations were fixed at the level of $p < .05$ and were interpreted as low if r values were below 0.30, moderate if they were between 0.30- 0.70 and high if they were between 0.70-1.00 (Büyüköztürk et al., 2017). Frequency (n), mean (\bar{X}), standard deviation (S), min (minimum), and max (maximum) values were used as descriptive statistical methods in the evaluation of the data obtained from the study.

RESULTS

Table 2. Participant’s descriptive results on accuracy and grip strength and closed kinetic chain upper extremity stability test

Test Scores	\bar{X}	S	Min./Max.
Contact Score	31.07	3.30	24-35
Normalization Score	17.21	1.76	13-20
Strength Score	102.29	17.97	71-134
Dominant Hand Strength	54.88	7.14	45-70
Non-dominant Hand Strength	49.80	7.93	36-70
Shooting Accuracy Score	33.15	6.37	22-46

Normalization Score= Number of touches /height; Strength Score = Number of touches x 68% of body weight in kg /15.

As shown in Table 2, the average contact score of the participants was 31.07 ± 3.30 , normalization score 17.21 ± 1.76 , strength score 102.29 ± 17.97 , dominant hand score 54.88 ± 7.14 , non-dominant hand score 49.80 ± 7.93 , and shooting accuracy score 33.15 ± 6.37 .

Table 3. Correlation values of the participant’s grip strength and throwing accuracy and closed kinetic chain upper extremity stability test

	CS	NS	SS	DHS	NDHS	SAS
CS	1					
NS	.953**	1				
SS	.781**	.691**	1			
DHS	-.111	-.162	.140	1		
NDHS	-.238	-.261	.041	.829**	1	
SAS	-.031	-.005	.231	.036	.133	1

CS: Contact Score, NS: Normalization Score, SS: Strength Score, DHS: Dominant Hand Strength, NDHS: Non-dominant Hand Strength, SAS: Shooting Accuracy Score

* $p < .05$, ** $p < .01$

When Table 3 is examined, a high level of positive correlation was found between the participants' normalized score and contact score ($r = .953$), between the power score with contact and normalized scores ($r = .781$, $r = .691$ respectively), between non-dominant hand strength and dominant hand strength ($r = .829$), In contrast, no significant difference was found in any parameter with the shooting accuracy score.

DISCUSSION

This study investigated the relationship between upper extremity neuromuscular control and grip strength with shooting accuracy in elite handball players. Upper extremity neuromuscular control transfers strength from the trunk to the wrist (Neumann, 2002; Wu et al., 2005). Therefore, upper extremity neuromuscular control is essential for shooting accuracy in handball. Handball is a sport branch in which fitness and coordinative skills are harmoniously affected (Gündüz et al., 2002; Rannou et al., 2001). It is argued whether technical and tactical skills or muscular strength and power are more essential factors in high-level competitions (Cardoso-Marques and González-Badillo, 2006). In this study, the existence of a relationship between upper extremity and hand grip strength and shooting accuracy and its degree were determined as a hypothesis.

The participant's upper extremity neuromuscular control, strength, and endurance were measured with the CKCUEST. In the study, the participants' average contact scores were compatible with the reference value of CKCUEST performed by Borms and Cools (2018) in male athletes. According to these findings, the literature supported the study's results. The percentage of average shooting accuracy of the participants in the study was determined as 33.15 ± 6.37 . In the relevant literature, a study conducted with national and foreign athletes reported the average foreign athletes' shooting accuracy as 39% (Emre, 2022). Another study conducted with the same test protocol found that 30 handball players scored an average of 27.52 in the shooting accuracy test (Chittibabu, 2014). Moreover, the average shooting score in the Handball Super League was 32.18, while it was an average of 31.20 for those in the 1st league (Emre et al., 2021). It is believed that the results reported in those studies are different because there are individual (functional and structural) and environmental (lighting, ground) restrictions in the training process of the athletes.

In the present study, no significant correlation was found between the upper extremity neuromuscular control and strength of the participants and the shooting accuracy. When the literature is examined, other studies support our findings. Chelly et al. (2010), for example, reported that the shooting accuracy rate of the handball players in the experimental and control groups did not increase due to training because the percentage of shooting accuracy was not based solely on strength. Ürer and Kılınç (2014), on the other hand, concluded that the shooting performances of handball players did not progress at significant levels depending on the plyometric training.

Çetin and Balcı (2015) reported that handball players' upper extremity strength levels did not significantly affect the shooting accuracy percentage. In parallel with our findings, another study revealed that strength training had no impact on the percentage of shooting accuracy (Pilça & Altun, 2019). Similarly, Ersoy (2016) examined the effect of strength training on the 7-meter throwing performance in handball, concluding that strength training did not affect shooting accuracy. In a study by Hermassi et al. (2011), handball players performed strength training for a period of 8 weeks, and a control group of handball players continued the existing training program during the same period. In line with the findings of our study, they reported that there was no statistically significant change in the 9-meter free throw performance between the experimental and control groups and that the 9-meter throw performance could be closely related to the player's technical abilities. In addition, the authors also stated that the fact that

neither the experimental nor the control group players had a special training program to improve their 9-meter throwing performance and technique was a valid factor for this result (Hermassi et al., 2011). The study's results indicated no direct connection between the percentage of handball throwing performance and the level of strength. Besides many factors affecting the skill level in handball, the shooting technique of each player might be different. Similar results reported in the relevant literature support that throwing performance depends on the training method and an athlete's technical skills and cognitive characteristics (Lon, 2014; Loffing & Hagemann, 2014; Marques et al., 2011). As another example, Marques et al., (2011) pointed out that an athlete's cognitive skills are essential to shooting performance.

By contrast, a study by Lust et al., (2009) investigated the effect of mixed training consisting of open and closed kinetic chains and body-centered exercises on baseball players' trunk stabilization and shooting percentage. While there was no difference between the sample groups after a six-week training period, the researchers found that the trunk stability values and shooting performance of the players in the study sample increased compared to those of the control group. It is considered that the difference between the results of the present study and those reported in the literature may be due to the differing shooting accuracy assessment techniques in the games of baseball and handball.

A high positive correlation was found between the participants' dominant and non-dominant hand grip strengths. The relevant literature review shows specific findings supporting the current study's results. Yildirim et al. (2010), for example, stated that hand grip strength and upper extremity strength were related to physical activity. In the studies conducted by İncel et al. (2002) and Gencer et al. (2019), the researchers concluded a significant difference between the grip strengths of the dominant and non-dominant hands in favor of the dominant hand. Based on the results of the relevant literature, it can be argued that the significant differences in favor of the dominant hand according to the extremity dominance may be attributed to the use of the dominant hand in daily activities as well as to the fact that it is used more than the non-dominant hand in training and competitions. Moreover, no significant correlation was found in this study between the hand grip strength of the participants and their shooting accuracy. However, Visnapuu and Jürimae (2007) reported that hand grip strength is essential for shooting in sports. It is a fact that studies conducted in different branches of the literature contradict our findings. In this context, some significant differences were found in studies examining the relationship between basketball players' free throw performance and dominant hand grip strength measurements (Gencer et al., 2019; Kinnunen et al., 2001; Pizzigalli et al., 2016). Nikolay et al., (2005) reported in a study conducted with archery athletes that grip strength positively affected throwing performance in both the body's dominant and non-dominant upper extremities. Another study found that non-dominant limb length and dominant limb grip strength positively impacted shooting performance, yet stabilizing muscles significantly affected it (Develik, 2022). Similarly, another study on climbing performance concluded that arm and hand strength effectively predicted climbing performance (Baláš et al., 2012). Furthermore, a significant relationship was found between ball shooting power and grip strength in water polo players (Ferragut et al., 2011). Nevertheless, there are also studies in the literature on the effect of hand grip strength on performance in other types of sports, with conflicting findings (Bilgic et al., 2016).

CONCLUSION

As a result, no significant relationship was found between hand grip strength, upper extremity neuromuscular control and strength, and shooting accuracy in handball, and it was concluded that shooting performance was not only related to strength. A high positive correlation was found between dominant hand strength and non-dominant hand strength. The most important limitation of this study is that it was conducted with 26 handball players and did not identify causal relationships. To support the relevant literature and to obtain common results, it may be recommended to conduct further studies on other factors affecting the shooting accuracy of handball players.

Conflict of Interest: Any personal and financial conflicts of interest within the scope of the Study not available.

Authors' Contribution: Research design, Data collection, Statistical analysis, Preparation of the article, SA.

Ethical Approval

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Relationship between Sport Science Students' Career Decisions and Academic Motivation

Sultan UYGUN^{1*}, Özden TEPEKÖYLÜ ÖZTÜRK¹

¹Pamukkale University, Faculty of Sport Sciences, Denizli, Türkiye.

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Abstract

This study aimed to analyze the relationship and predictive effect between the career decision of sports science students and their academic motivation. It also assessed whether career decision and academic motivation varied based on gender and department variables, jointly discussing them in the communication processes used in the instructor-student relationship. The study included 252 students, whose 85 were female and 167 were male, studying in faculty of sports sciences. It also used the 'Career Decision Scale', the 'Academic Motivation Scale', and the "Personal Information Form" to collect the study data. Statistical analysis processes consisted of correlation, multiple linear regression, 2x2 MANOVA, and 2x3 MANOVA analyses. The study findings revealed low and moderate relationships between career decisions, academic motivation, and the sub-dimensions of both main scales. In addition, academic motivation was a significant predictor of career decisions, corresponding to a 19% rate. Considering the gender variable, male students were more undecided in making career decisions than female students. Comparisons between departments also indicated that students in the sports management department displayed more indecisiveness about choosing their careers than in other departments. The ability of the students to have extracurricular communication with instructors influenced their career decisions positively, whereas it negatively influenced students' department-switching propensity. However, there were significant differences among the students' academic motivations based on gender, department, communication processes with the instructor, and department-switching propensity. In conclusion, academic motivation is important for students to choose a successful career. Nonetheless, the student-instructor communication mechanisms are equally effective in career decisions.

Keywords: Career decision, Academic motivation, Sports sciences, University student

Spor Bilimleri Öğrencilerinin Kariyer Kararları ile Akademik Güdülenmeleri Arasındaki İlişki

Öz

Bu çalışmanın amacı, spor bilimleri öğrencilerinin kariyer kararı ile akademik güdülenmeleri arasındaki ilişkiyi ve yordayıcı etkiyi incelemektir. Ayrıca kariyer kararı ve akademik güdülenmenin cinsiyet ve bölüm faktörlerine göre farklılaşp farklılaşmadığı da belirlenmiş, her iki değişkende öğretim elemanı-öğrenci ilişkisindeki iletişim süreçleriyle birlikte de ele alınmıştır. Çalışma spor bilimlerin fakültesinde öğrenim gören 85'i kadın 167'si erkek olmak üzere toplam 252 öğrenci üzerinde gerçekleştirilmiştir. Araştırmadaki veriler "Kariyer Kararı Ölçeği", "Akademik Güdülenme Ölçeği" ve "Kişisel Bilgi Formu" yoluyla toplanmıştır. İstatistikî analizlerde korelasyon, çoklu doğrusal regresyon, 2x2 MANOVA, 2x3 MANOVA analiz teknikleri kullanılmıştır. Araştırma bulgularına göre kariyer kararı ve alt boyutları ile akademik güdülenme ve alt boyutları arasında düşük ve orta düzeyde ilişkilerin olduğu tespit edilmiştir. Ayrıca akademik güdülenmenin kariyer kararını %19 oranında açıklayan anlamlı bir yordayıcısı olduğu görülmüştür. Cinsiyetlere göre erkek öğrenciler kadın öğrencilerden kariyerlerinde daha kararsızdır. Bölümler arası karşılařtırmalarda spor yöneticilięi öğrencileri kariyer ile ilgili olarak dięer bölümlere göre daha fazla kararsızlık yaşamaktadır. Öğretim elemanları ile ders dışında iletişim kurabilmek kariyer kararında olumlu, öğrencilerin öğrenim gördüğü bölümü deęiřtirme eğilimi olumsuz etkiye neden olmuřtur. Araştırma kapsamında öğrencilerin akademik güdülenmeleri ise cinsiyet, bölüm, öğretim elemanı ile iletişim süreçleri ve bölümünü deęiřtirme isteęine göre anlamlı farklılıklar göstermiştir. Sonuç olarak; akademik güdülenme öğrencilerin kariyerlerindeki kararlılık durumunda etkili bir faktördür. Ancak öğrenci-öğretim elemanı arasındaki iletişim süreçleri de kariyer kararında etkili olmaktadır.

Anahtar kelimeler: Kariyer kararı, Akademik güdülenme, Spor bilimleri, Üniversite öğrencisi

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Corresponding Author: Sultan Uygun, E-mail: uygunsultan1@gmail.com

INTRODUCTION

The concept of motivation originates from the Latin term "movere," which means "to move." It is an intrinsic state that drives and leads to the revealing of behaviors. Moreover, motivation is a significant element in achieving success (Ertem, 2006). It is also a critical component in attaining the learning process in education and training. Consequently, academic motivation is another domain within motivation and is potentially considered a concept related to various subjects. It is conceivable to express the concept of academic motivation as 'the generation of energy necessary for academic affairs (studies)' (Bozanoğlu, 2004). It is also considered a driving force behind the eagerness of students to learn (Gupta and Mili, 2016). Several studies emphasized motivation as a variable associated with educational attainments, such as regular and active class attendance and satisfaction with educational activities (Vecchione et al., 2014; Zhang et al., 2015). Hence, it is a common belief that motivated and unmotivated students behave differently.

The academically unmotivated students have difficulty concentrating on the lesson and behave more distracted. They also display a focusing problem on the class, leading to the failure to participate satisfactorily. This condition could result in falling behind in lessons, being unable to maintain the consistency required for school attendance, and displaying behavioral alienation from school (Dilekmen and Ada, 2005) since unmotivated students experience feelings of inadequacy and lack of control (Guay et al., 2010). Yet, academically motivated students seem capable of defining their goals and objectives to succeed in school and their courses. Such students attend classes more prepared and eager to participate in the lesson, and they are individuals who are willing to ask questions, display no attention deficit, and concentrate on class materials. They are also subject-focused, self-disciplined, determined, unyielding, and able to cope with difficulties; hence, they make their utmost effort to gain knowledge (Dilekmen and Ada, 2005). Therefore, highly motivated individuals are more successful in accomplishing the necessary tasks during their academic careers (Akbaş and Gizir, 2010). Also, this condition has a favorable impact on academic success and attainment (Dilekmen and Ada, 2005; Guay et al., 2010). Considering the motivation within the context of education, motivated students have reasons and goals to fulfill their duties, are confident in achieving their objectives, and cultivate positive perspectives towards their duties (Hassanzadeh and Amuee, 2001; cited in Amrai et al., 2011). The literature review on the subject revealed that academic motivation and the variables such as academic achievement, problem-solving skills, and school burnout (Aydın and Çekim, 2017; Amrai et al., 2011; Demir and Arı, 2013; Fortier et al., 1995; Seçer, 2015; Yiğitcan-Nayir and Tekmen, 2017) were all studied jointly. Studies also focused on the relationship between self-concept and self-esteem (Bong and Clark, 1999; Ryan et al., 1994). Certain studies also analyzed the relationship between academic self-efficacy and postponement (Aktaş, 2017; Bong, 2004; Cerino, 2014; Malkoç and Kesen-Mutlu, 2018; Schunk, 1991; Terzi et al., 2017; Ünal, 2013). The current study, however, discussed career decision, another variable closely related to students' academic life.

As translated from French into Turkish, the term 'carrière' refers to a 'career' word in Turkish and signifies the meaning of 'expertise and success in a profession,' according to the Turkish Language Association (2019). When conceptualized, however, it corresponds to a process

spanning a substantial amount of time, affecting many areas, from the values of the individuals to the place in which they live, and enclosing responses to questions such as expectations of individuals from life, aspirations, and level of risk tolerance (Akkoç, 2012). According to the theory of Ginzberg et al. (1951), choosing a career is a developmental process that extends from childhood to adulthood rather than an event specific to a moment that occurs merely once in a lifetime. This theory analyzed the professional development process in three periods. Initially, it involves a 'dreaming period (7-12 years)' when children explicitly and distinctly express their career preferences at a young age. Yet, the pleasure principle is crucial in specifying career choices at this age, and children directly indicate their job preferences as they find enjoyable. The second period, however, is the 'trial period (11-18 years),' in which individuals begin to recognize their self-interests, aptitudes, and moral convictions. Finally, the 'realistic period (18-22 years)' stands out as the last period, explicitly differing from others since it is the final one in which individuals should hold their actual choices. Since the level of education required by each profession and the way individuals experience business life differ extensively, this period further comprises three sub-stages in itself. The first sub-stage, the 'searching step,' begins with admission to a university and ends with a narrowing process of personal objectives. The second sub-stage, the 'efflorescing step,' involves individuals' primary selections directly related to choosing their majors, and their choices become more and more definitive. The final sub-stage, the 'decision step,' includes the process where individuals further support their choices about majors by specifying a unique occupation (Kuzgun, 2000). The sample group in this study, which consists of university students, corresponds to the realistic period, which is the final phase in the theory of Ginzberg et al. (1951). Individuals in this age range primarily focus on confining their options and making their final career decisions. Therefore, the concept of 'career decision' has been investigated in this study.

'Career decision' refers to the career choice for an educational or occupational life (Sampson et al., 1999). It also involves self-consciousness, combining professional knowledge, and making choices for the future (Kuzgun, 2003; Brawn et al., 2002; cited in Yusupu, 2015). Individuals must have attained substantial professional maturity to make the best decisions while making a choice (Super, 1957; cited in Kılıç, 2019). However, making a career decision is a complex process, and most people may seek professional assistance, albeit some consider it easy (Gati et al., 1996). The transition from high school to university requires individuals to make critical and stressful decisions during their university years. Hence, it is reasonable to argue that students who enroll in departments that match their interests, preferences, and skills will be more eager to learn, consequently, more successful during this period. Therefore, higher education has a significant role in shaping the future lives of young people.

Throughout their educational careers, individuals may frequently remain undecided and confused while making their career choice. Yet, the condition of compatibility with the individuals' personalities and the requirements of the determined profession makes the decision-making process more complex and challenging (Öztemel, 2012). In this sense, it is essential to reach a level of readiness to choose a profession. Making a career decision without being ready may yield adverse effects in a future life (Çakır, 2004; Yusupu, 2015). For instance, individuals choosing their profession wrongly and unsatisfied with their job typically display poor work efficiency and experience additional issues such as quitting their jobs. As a result, pursuing careers that match their skills and interests is crucial to minimize such adverse impacts

(Yılmaz, 2011). When people choose a profession unfit for them, it reflects poorly on their sense of self. As a result, they may not be content or successful in their career unfitting for their self-concept (Vurucu, 2010). In other words, people are far more likely to be happy at work and succeed in their professions when they choose careers appropriate for their skills and interests. Studies reported that individuals who have positive experiences in the business world are happier in both their work and lives (Özgülven, 1998; cited in Kaya, 2017). The literature review also indicated that university students mostly display indecisiveness about their careers (Mansor and Rashid, 2013). Those students who struggle with career indecision also experience various academic and psychological issues (Liao and Ji, 2015). As considered a variable potentially impacting the overall quality of life, Career decision has also been associated with decision-making difficulties among university students (Bacanlı et al., 2013). Therefore, it is necessary to guide students in their career choice based on their self-characteristics and skills (Çakır, 2004; Yusupu, 2015). A thorough review of national and international literature also revealed that studies on career-oriented subjects mainly focused on difficulties in decision-making (Gati and Saka, 2011; Gati et al., 1996; Kırdök and Harman, 2018; Zhou and Santos, 2007), self-concern (Nalbantoğlu-Yılmaz and Çetin-Gündüz, 2018), self-competence (Ulaş, 2016), potentness (Ulaş-Kılıç, 2018), and self-efficacy (Vela et al., 2018) concepts on the career decisions. There are also analyses associating the concept of 'making conscious career decisions' with various other career parameters, including 'career decision' itself (Dostanic et al., 2021; Lam and Santos, 2018; Thompson et al., 2019). When the studies conducted in the field of sports sciences in recent years are examined, it is seen that career stress (Bozyiğit and Gökbaraz, 2020) and career awareness (Çalı and Doğar, 2021) of sports sciences students and career anxiety (Yaşar and Sunay, 2019) of sports high school students are examined.

The current study assessed 'career decision' jointly with 'academic motivation' from a different angle unlike the literature tried to be summarized above, studying the sports science students by referring to future teachers, trainers, recreation leaders, and sports manager candidates. These professional groups in the field of sports sciences serve and interact closely with individuals of different age ranges. As a building block for healthy generations, raising individual, in essence, and generally social sports awareness is closely related to the professional and personal traits of those working in the sports domains. Considering the justifications above, making a wise career decision and feeling confident about involving in the right profession seem essential for content and successful business life. However, certain occupational groups demand more entrepreneurship than others, and choosing a university to receive a vocational education does not guarantee a successful entrepreneurial life. The same also holds for students who pursue their careers in the field of sports sciences, which is a multidisciplinary field. In this sense, the motivating surroundings students might encounter in their education life will potentially affect their academic success, professional and personal aspirations, sentiments, and ultimately, their career plans. Therefore, this study aimed to evaluate the relationship and predictive effect between the career decision of sports science students and their academic motivation. It also assessed whether career decision and academic motivation differed based on gender and departmental factors, concurrently discussing these variables with the communication patterns in the instructor-student relationship.

METHOD

Research Model

This study utilized a quantitative design in its model. It also attempted to demonstrate the predictive effect by analyzing the relationships between the variables without any interference.

Population and Sample

The study population consisted of 718 students enrolled in a Pamukkale University Sports Sciences Faculty in the 2018–2019 academic year in Türkiye. While creating the study sample, however, 252 students ($\bar{x}_{age}=21.32\pm 2.62$), 85 females, and 167 males were randomly selected as the study sample. When the distribution of the participants according to the classes was examined, there are 89 students in the first grade, 59 students in the second grade, 66 students in the third grade and 38 students in the fourth grade. The distribution according to departments was 49 students from coaching education, 52 students from physical education and sports teaching department, 55 students from recreation department and 96 students from sports management department. The sample size was calculated based on Sekaran (1992) using the permissible sample size chart for a universe selection (cited in Altunışık et al., 2007).

Data Collection Tools

The study used the 'Career Decision Scale (CDS)' developed by Yusupu (2015), the 'Academic Motivation Scale (AMS)' created by Bozanoğlu (2004), and the 'Personal Information Form (PIF)' designed by the researchers to collect the data.

Career Decision Scale (CDS): This scale was developed by Yusupu in 2015 and consisted of 30 items. The response options were based on a 1 to 5 scale. Participants marked the options that were suitable for them on the answer items. (1=completely not suitable for me, 5=completely suitable for me). The highest and lowest scores on the scale were 150 and 30 points, respectively. A high score referred to indecisiveness, whereas a low score denoted decisiveness. The three sub-dimensions of this scale —self-consciousness in career decisions, self-unconsciousness in career decisions, and environmental factors— also included reverse items. For the internal consistency coefficient of the first, second, and third dimensions, the reliability scores calculated for the scale were 0.89 (13 items), 0.85 (11 items), and 0.76 (6 items), respectively. The internal consistency coefficient calculated for the entire scale was 0.91.

Academic Motivation Scale (AMS): As developed by Bozanoğlu (2004), this tool retains 20 items on a scale of 1 to 5 (1=completely not suitable, 5=completely suitable). The scale scores ranged from 20 to 100 points. A high score on the scale denoted a strong level of academic motivation. This scale included a reverse-scored item. It also consisted of three sub-dimensions: self-transcendence, use of knowledge, and exploration. The test-retest analysis on the scale's reliability calculated the correlation between the two measurements as 0.87. Considering the internal consistency coefficient, the Cronbach Alpha values calculated at different times in the same group varied between 0.77 and 0.85, whereas the values calculated in separate groups ranged between 0.77 and 0.86 (Bozanoğlu, 2004).

Personal Information Form (PIF): It comprises queries created by researchers. The query form included ten questions about the age, gender, department, class, academic average, students' departmental preference (satisfaction), department-switching propensity, and years at the university.

Ethical Approval

This research was approved by Pamukkale University Non-Interventional Clinical Research Ethics Committee (Permission no: E-60116787-020-119804) and followed the regulations outlined in the Declaration of Helsinki.

Data Collection

Pamukkale University Faculty of Sport Sciences granted all necessary official permissions before beginning the study. Scheduling a meeting with the faculty members in the Faculty of Sport Sciences made it easier for both parties to choose a suitable time to study. The participant students were explicitly informed with the appropriate explanations prior to the study. Measurement tools, such as scales and forms, were distributed manually, and after the 2-week application period, they were re-collected to gather data from the participants.

Data Analysis

Analysis methods used to evaluate the research data included frequency, arithmetic mean, correlation, multiple linear regression, 2x2 MANOVA, and 2x3 MANOVA. The study also employed skewness and kurtosis (the state of data's normal distribution) values, Mahalanobis distance, and Levene (equality of variances) test outcomes to evaluate whether the data meets the provisions for parametric tests, concluding that the data was normally distributed. It was seen that the skewness and kurtosis values vary between -.878 and .440. Table 1 displays the kurtosis and skewness values of the measurement tools. When performing regression and correlation analysis, the scatter diagram was employed to check whether the relationships between the variables were linear. The study also utilized Box's Test and thus tested the assumption that the covariance matrices of the dependent variables in the MANOVA analysis were identical across the groups. Wilk's Lambda test was used to identify variations in the means of the dependent variables. Within the scope of this study, the Cronbach alpha coefficient was calculated as internal consistency, setting the significance level as 0.05.

Table 1. Kurtosis, skewness, and mean values for total scores and sub-dimensions of career decision scale and academic motivation scale

	N	\bar{x}	Skewness	Kurtosis
Total Career Decision	252	2.25	-.152	-.878
Conscious Career Decision	252	1.97	.440	-.406
Unconscious Career Decision	252	2.57	-.125	-.684
Environmental Factors	252	2.28	.265	-.699
Total Academic Motivation	252	3.71	-.441	.093
Self-Transcendence	252	3.62	-.284	-.159
Use of Information	252	4.06	-.732	.355
Exploration	252	3.50	-.412	.382

RESULTS

Tablo 2. Correlation analysis for the relationship between academic motivation and career decision

n=252	Conscious Career Decision	Unconscious Career Decision	Environmental Factors	Total Career Decision
Self-Transcendence	-.397**	-.097	-.060	-.242**
Use of Information	-.558**	-.238**	-.293**	-.444**
Exploration	-.342**	-.157*	-.135*	-.266**
Total Academic Motivation	-.482**	-.179**	-.173**	-.350**

*p<.05, **<.01

The total score and sub-dimensions of both academic motivation and career decision displayed low and moderate, albeit negative, relationships, according to an analysis of Table 2. Hence, these findings imply that as academic motivation increases, indecisiveness in career decreases. Assessment of the relationship levels also indicated that while the most significant relationship was between the 'use of knowledge' and 'conscious career decision' in the sub-dimensions of academic motivation, the relationship between the 'exploration' sub-dimension of academic motivation and 'environmental factors' sub-dimension of career decision scales was the most insignificant. However, there was no substantial relationship between the 'self-transcendence' sub-dimension of the academic motivation scale and the 'unconscious career decision' and 'environmental factors' sub-dimensions of the career decision scale.

Tablo 3. Results of multiple linear regression analysis for predicting career decision based on the sub-dimensions of academic motivation

Variable	B	Standard Error _B	β	t	p
Fixed	3.808	.215		17.674	.000
Self-Transcendence	.085	.068	.105	1.248	.213
Use of Information	-.459	.073	-.516	-6.249	.000
Exploration	.001	.72	.001	.010	.992

R= .451; R²=.203; Adjusted R²=.194

F(3, 248)=21.109; p=.000

Regression analysis results revealed that only the 'use of information' sub-dimension of academic motivation was a significant predictor of the career decision scale (R=0.451; R²_{adjusted}=0.194; F_(3, 248)=21.109; p=0.000). The specified variable also explained 20% of the total variance in the career decision scale.

Tablo 4. Results from a 3x2 MANOVA to analyze the differences in students' career decisions and academic motivation based on department, class, and gender factors

Source of Variance	Dependent Variable	SS	df	MS	F	p	η^2
1. Department	Career Decision	2.427	3	.809	2.580	.054	.034
	Academic Motivation	1.521	3	.507	1.396	.245	.018
2. Class	Career Decision	.632	3	.211	.672	.570	.009
	Academic Motivation	2.001	3	.667	1.837	.141	.024
3. Gender	Career Decision	1.916	1	1.916	6.108	.014	.027
	Academic Motivation	.857	1	.857	2.359	.126	.010
1X2	Career Decision	4.186	9	.465	1.483	.155	.056
	Academic Motivation	2.705	9	.301	.828	.591	.032
1X3	Career Decision	.375	3	.125	.399	.754	.005
	Academic Motivation	.244	3	.081	.224	.880	.003
2X3	Career Decision	1.105	3	.368	1.175	.320	.016
	Academic Motivation	1.354	3	.451	1.243	.295	.016
Error	Career Decision	69.931	223	.314			
	Academic Motivation	80.986	223	.363			
Total	Career Decision	1368.251	252				
	Academic Motivation	3564.708	252				

The findings of MANOVA analysis indicated a significant difference for least one dependent variable compared to the independent variables. Analyzing the ANOVA table to identify which sub-dimension this difference incurs disclosed that it was the gender factor difference influencing the career decisions of sports science students (Wilks' Lambda= 0.971; F=3.328; p=0.038). Accordingly, 'male students (\bar{x} = 2.31) were explicitly more career-undecided than female students (\bar{x} = 2.06).' Furthermore, interdepartmental comparison proved that students in the sports management department displayed the highest level of indecisiveness than other departments for the career decision scale (Wilks' Lambda= 0.938; F=2.396; p=0.027) ($\bar{x}_{\text{sports management}}$ =2.33; $\bar{x}_{\text{physical education teaching}}$ =2.01; $\bar{x}_{\text{coaching}}$ =2.16; $\bar{x}_{\text{recreation}}$ =2.25). However, the academic motivation scale displayed no significant difference in department, class, and gender variables.

Table 5. Results from a 2x2 MANOVA to analyze the variations in academic motivation and career decisions based on students' departmental preference (satisfaction) and department-switching propensity

Source of Variance	Dependent Variable	SS	df	MS	F	p	η^2
1. Departmental Preference	Career Decision	1.750	2	.875	2.884	.058	.023
	Academic Motivation	.834	2	.417	1.207	.301	.010
2. Department-Switching Propensity	Career Decision	3.447	2	1.723	5.678	.004	.044
	Academic Motivation	1.953	2	.977	2.826	.061	.023
1X2	Career Decision	1.549	2	.775	2.552	.080	.020
	Academic Motivation	1.480	2	.740	2.141	.120	.017
Error	Career Decision	74.360	245	.304			
	Academic Motivation	84.690	245	.346			
Total	Career Decision	1368.251	252				
	Academic Motivation	3564.708	252				

The MANOVA test results revealed statistically significant differences among the variables. Students with department-switching propensity were more undecided in their careers, according to the analysis of the ANOVA table to specify the sub-dimensions from which this difference stemmed (Wilks' Lambda=0.939; F=3.907; p=0.004), (\bar{x}_{yes} =2.55; $\bar{x}_{\text{undecided}}$ =2.60; \bar{x}_{no} =2.06). Considering the independent variables in this table, however, there was no statistically significant difference in the academic motivation scale.

Table 6. 2x2 MANOVA results to assess the differences in career decision and academic motivation based on the student's ability to have extracurricular and active in-class communication

Source of Variance	Dependent Variable	SS	df	MS	F	p	η^2
1. Extracurricular Communication	Career Decision	2.026	2	1.013	3.169	.044	.025
	Academic Motivation	.852	2	.426	1.239	.292	.010
2. Active In-Class Communication	Career Decision	1.694	2	.847	2.650	.073	.021
	Academic Motivation	1.324	2	.662	1.924	.148	.016
1X2	Career Decision	.833	3	.278	.868	.458	.011
	Academic Motivation	.870	3	.290	.843	.472	.010
Error	Career Decision	77.989	244	.320			
	Academic Motivation	83.940	244	.344			
Total	Career Decision	1368.251	252				
	Academic Motivation	3564.708	252				

As presented in Table 6, the MANOVA analysis results yielded no significant differences between the variables. However, the ANOVA table for multiple comparisons with the

Bonferroni correction potentially inferred that students having extracurricular communication with their instructors were more determined in their careers ($\bar{x}_{\text{always}}=2.17$; $\bar{x}_{\text{sometimes}}=2.26$; $\bar{x}_{\text{never}}=2.68$). The change in academic motivation was also statistically insignificant considering the extracurricular and in-class communication mechanisms established by the student with the instructor.

DISCUSSION AND CONCLUSION

This study analyzed the relationship between academic motivation and career decisions among university students to reveal what extent it predicted academic success. The correlation analysis on the relationship between academic motivation and career decision identified low and moderate, albeit negative, relationships between the total scores and sub-dimensions of both scales (a high score refers to higher indecisiveness). It was explicit that the 'use of information,' one of the sub-dimensions of academic motivation, was a significant predictor for career decisions. Yusupu (2015) reported a positive and substantial relationship between academic success and career decisiveness among university students. Yet, the current study found that the 'exploration,' one of the sub-dimensions of academic motivation, was also a significant predictor for career decisions. In a study performed on primary school 8th-grade students, Yayla and Bacanlı (2011) discovered that educational standings and career development levels among students increased simultaneously. Correspondingly, Means et al., (2018) reported that motivation is associated with academic achievement among undergraduate students. In addition to following a purpose in their future life, students' awareness of their self-interests, wishes, and abilities might positively impact their career decisions. Academic motivation also leads to self-assurance and success, and academically motivated students are more inclined to succeed (Çakır, 2004). Choi and Kim (2013) also reported that learning motivation influences academic success favorably and affects students' self-efficacy about making career decisions. Therefore, as motivation rises, indecisiveness in career decisions may lessen. It is also possible to argue that students motivated academically advance in their careers more decisively and progressively.

Analysis of variations in department, class, and gender factors in career decisions and academic motivation scales revealed that gender variables resulted in differences in career decisions among sports science students. Accordingly, female students were more decisive in choosing their careers than male students. Koyuncuoğlu (2021), in his study on university students, found no substantial evidence between gender differences and career decisions according to the mean scores. However, the author further stated that female students displayed higher academic motivation than male students. Bacanlı et al. (2013) also reported similar findings, indicating that female students studying at high school experienced significantly less difficulty in making career decisions than male students. Kusnierz et al., (2020) also reported that women displayed greater motivation for academic success than males. This outcome could mainly result from female students being more aware of their interests, desires, and abilities. In addition, when the statistical information presented about the participation of women and men in business life in the Turkish society in the study of Gürol (2007) is examined, it is also possible to argue that Turkish society has different expectations for male and female university graduates. In this sense, society has lower expectations of women, whereas it puts higher

standards on men in terms of a successful career in business life. As a result, such a societal fact might lead to career indecisiveness among male individuals. Contrary to Kusnierz et al., (2020)'s findings, some literature also indicated that career decisions do not vary based on gender differences (Edwards and Quinter, 2011; Kelly & Colangelo, 1990; Öztemel, 2012; Ulaş, 2016). As Zhou and Santos (2007) stated, there were also contrary findings in the literature, indicating that male students had less difficulty in making career decisions than female students. Joseph et al., (2019) also specified that male students' academic motivation had a higher average value than female students. Considering the interdepartmental comparisons, there was no statistically significant difference in academic motivation among students, whereas their career decisions greatly varied based on the departments enrolled. Students in the sports management department displayed the most career indecisiveness, followed by recreation, coaching, and physical education teaching departments, respectively. The institutions where the graduates from the physical education teaching and coaching departments will employ may be more specific due to their fixed job descriptions. However, the recreation department requires entrepreneurship, and thus it has very different job opportunities in public and private organizations in the sports, tourism, therapy, and community recreation sectors. Therefore, it may be easier for these departments to plan their careers. Yet, the administration of sports clubs, youth and sports directorates, and the private and governmental sectors are the places where sports management departments are employed. Hence, it may give the impression of a limited job market to students studying in this major. It is also necessary to consider the potential that the departments fail to provide sufficient details on their sectoral employment opportunities. Therefore, such reasons might lead students in the sports management department to experience more indecisiveness in their careers. Finally, the classes students attended had no significant difference in both career decisions and academic motivation.

The factors of departmental preference and department-switching propensity resulted in no difference in students' academic motivation; however, the students inclined to change their departments were explicitly more indecisive about their careers. Accordingly, providing more detailed information to students about the departments before their enrolment may positively affect their choices. Demirci (2017) emphasized that when students received support and preferred their university and department based on their attributes, they were satisfied more with the departments in which they enrolled. Therefore, it might be beneficial to administer students by steering them to departments compatible with their unique traits, skills, and preferences (Çakır, 2004; Yusupu, 2015).

The data analysis based on the student's ability to have extracurricular and active in-class communication with their instructors resulted in significant variations between the variables. Accordingly, students who had extracurricular interactions with their teachers tended to be more decisive in their choices. There are numerous in-class and non-class communication mechanisms between students and instructors. For instructors, developing good non-class relationships make their students more focused on in-class studies and teachings. Additionally, taking suggestions, views, guidance, and support from their instructors would positively affect students' career decisions while deciding which major they should pursue based on their attributes during vocational education. The extracurricular interaction and quality of communication with the instructors are critical in this context. Jagadambal and Perumal (2015)

stated that students who have close, supportive, and positive interaction with their teachers potentially achieve more success than students who are unable to communicate adequately and are in confusion. Khan et al., (2017) also expressed that teachers' communication skills play a critical role on students' academic success.

As a result of this study, academic motivation is an important factor affecting the career decisiveness of students. In addition, although student-instructor communication practices are also effective in the career decision, it is reasonable to remark that students who tend to shift their educational department still remain indecisive in choosing their careers. Since each student is motivated by different factors in the learning process, such personal preferences should not be regarded while generating a classroom environment that is encouraging and motivating. Accordingly;

It is recommended that this study be repeated at the high school level to potentially address the factors that negatively affect academic motivation. It is also possible to raise awareness among students and their families about their professions by organizing additional meetings and seminars. Moreover, intensifying advisory practices for student development may also be beneficial. It may be practical to assess the emotional issues that students have experienced throughout their lives to scrutinize what compels them to be indecisive while making their career choices. Further scientific studies can be conducted by addressing different variables affecting students' career decisions. Students who graduated particularly from the sports management department should be informed more and in detail about the employment opportunities in institutions and organizations.

Conflict of Interest: The authors of the article declare that there are no personal and financial conflicts of interest within the content of the study.

Researchers' Contribution Rate Statement: Research Design-ÖTÖ; SU, Data Collection-SU, Statistical Analysis-ÖTÖ; Preparation of the Article, ÖTÖ; SU.

Ethical Approval

Committee Name: Pamukkale University Non-Interventional Clinical Research Ethics Committee

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Investigation of Personal and Social Sports Identities of Elite National Karate Players via Self Identity Chart*

İsmail SANBERK¹, Cenab TÜRKERİ² Burhan PARSAK^{2†}

¹Çukurova University, Faculty of Education, Adana.

²Çukurova University, Faculty of Sport Sciences, Adana.

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Abstract

The aim of this study is to investigate ideal and non-ideal image of six Turkish national players and their cognitive representation of karate players. This study was carried out with six young adult elite karate athletes who were successful in national and international tournaments attending the Department of Physical Education and Sports. The data of this study were collected via repertory grid, a semi-structured interview technique. Self-identity graph of each participant was obtained and analyzed based on repertory grid data. The findings show that all the participants' personal and social sport identities, except one participant, are positive. In the study, it was found that the participants with high self-esteem defined themselves as karate players with positive personal constructs of ideal self and social self. As a result, this study shows that the self-identity graph will provide functional information in revealing -athletes'- sports-related self esteem, personal and social sports identities. This study has carried out about young adult elit karate players in Turkey succeeded at national and international tournament. With Studies which will do in the future, it may be revealed amateur, young and junior karate players' personal and social sport identity via self identity graph.

Keywords: Sport identities, Self-identity graph, Personality, Personal construct, Repertory grid, Karate

Elit Milli Karatecilerin Kişisel ve Sosyal Spor Kimliklerinin Öz-Kimlik Grafiği Aracılığıyla İncelenmesi

Öz

Bu çalışmanın amacı, altı Türk milli oyuncunun ideal ve ideal olmayan imajını ve karate sporcularının bilişsel temsillerini araştırmaktır. Bu çalışma, Beden Eğitimi ve Spor Anabilim dalına devam eden ulusal ve uluslararası turnuvalarda başarılı olmuş altı genç yetişkin elit karate sporcusu ile gerçekleştirilmiştir. Bu çalışmanın verileri yarı yapılandırılmış görüşme tekniği olan repertuar ağı ile toplanmıştır. Her katılımcının öz kimlik grafiği elde edilmiş ve repertuar ağı verilerine dayalı olarak analiz edilmiştir. Bulgular, bir katılımcı hariç tüm katılımcıların kişisel ve sosyal spor kimliklerinin olumlu olduğunu göstermektedir. Araştırmada benlik değeri yüksek olan katılımcıların kendilerini, ideal benliği ve sosyal benliği olumlu kişisel kurgularla karate oyuncusu olarak tanımladıkları bulunmuştur. Sonuç olarak bu çalışma sporcuların sporla ilişkili benlik saygıları, kişisel ve sosyal spor kimliklerinin ortaya konmasında öz-kimlik grafiğinin işlevsel bilgi vereceğini göstermektedir. Bu çalışma Türkiye'de ulusal ve uluslararası turnuvalarda başarı göstermiş olan genç yetişkin elit karateciler üzerinde yürütülmüştür; ileride yapılacak araştırmalarla amatör, minik ve junior karatecilerin kişisel ve sosyal spor kimlikleri öz-kimlik grafiği aracılığıyla ortaya konabilir.

Anahtar kelimeler: Spor kimlikleri, Öz-kimlik grafiği, Kişilik, Kişisel yapı, Repertuar ağı, Karate

* This study has been presented as a oral presentation at 15th International Sport Science Congress.

† **Corresponding Author:** Burhan PARSAK, **Email:** b.parsak@hotmail.com

INTRODUCTION

Athletes who want to improve their sports performance are open to feedback. This feedback can be given from an external perspective such as sports fans, coaches or teammates and more concrete and objective performance measures (such as number of wins, physical power). Another important source of feedback is the athlete's self assessment as an athlete or briefly his personal sports identity. Personal sports identity reflects a person's view of a sport (Hilscher, 2007; Weiß, 1999). Hilscher (2007) defines his personal sport identity as how athletes see themselves in the role of an athlete and the identity of that role. The athlete's thoughts about how his or her personal sport, as well as how others (coach, other athlete, etc.) perceive themselves as an athlete, constitutes their social sport identity (Hilscher, 2003). The personal and social sport identity of an athlete can be determinant on the sportive preparations and performance. Self-identity graphs, which reveal the identity construction processes of individuals and mediate the acquisition of idiographic information in this direction, were developed on the based on Kelly's (1955) personal construct theory. According to Kelly, an individual is like a scientist who constructs builds his own world, formulates and tests expectations and revises expectations when necessary (Winter, 2012). In terms of personal constructivism, experiences and personal constructs are related to the environment. The personal constructs in individuals define the content and limitations of interpretation on the nature and the environment.

An individual's self consists of cognitive representations of real, social and ideal selves. These three sub-identities, considered as central elements, are evaluated based on internal and external elements (competitors or world champions) in a dynamic comparison. The evaluation of one's self brings the self-identity system of that person to the stage. Self-identity graphs that provide information about self-identity system mediate the visualization of the distance between the elements in the form of the RGT. When the distances between the elements are identified, the correlation of the elements is primarily considered (Slater, 1977); then the distance between the elements is redefined in terms of distance to both central elements (in this study, "I as a karate player" and "the karate player I want to be"). For example, the distance coefficient between "I as a karate player" element and "karate player I want to be" can provide valuable information about the individual's self-esteem related to sport. If this distance coefficient is less than 0.68, [sport-related] self-esteem is high, while self-esteem is moderately higher than 0.68 to 1.07, self-esteem is average, and if it is higher than 1.07, self-esteem is low (Bartholomew, 1993).

Self-identity graph is a graph composed of four quarters of all the elements in the form of RGT, with current I on one axis and ideal I on the other. All elements take place away from these two axes and gain meaning (Bartholomew, 1993). As a matter of fact, in Böker's (1999) study, each quarter has a contextual meaning depending on the clockwise interpretation of the graph starting from the quarter circle on the upper left of the graph.

- I. Acceptance Area: Elements located in this quarter, which can also be called symbiotic closeness, bear self and ideal similarity.
- II. Idealization Area: Elements located in this quarter resemble ideal self; but it does not resemble actual self.
- III. Conflict Area: Elements located in this quarter are neither self nor ideal self.

IV. Ambivalence Area: Elements located in this quarter resemble self; but it does not resemble ideal self (Böker, 1999, Böker et al., 2000).

RGT refers to a more specific form of psychological diagnostic tools on the basis of self-identity graph; this diagnostic tool appears to be used in many areas such as medicine, eating behaviors and urban planning (Fromm, 2010). It is also emphasized that RGT can also mediate the acquisition of information about sportive performance, behavior and skills that cannot be provided by standard tests (Barker et al., 2011). When the relevant literature in the field of sport sciences was reviewed, study that athlete identities of the athletes are examined through self-identify graph is not founded. The RGT on which self-identity graph is based is also limited in the number of studies used (Christensen, 2009; Feixas et al., 1989; Gucciardi & Gordon, 2008; Vrljic & Mallet, 2008).

In a study using RGT (Vrljic & Mallet, 2008), how football coaches conceptualize their ability to identify elite soccer players was identified. The inductive analysis of the personal constructs shows that the coaches deal with the ability in four dimensions, physical skills, technical, cognitive-perceptual competences and personality traits. Christensen (2009), in a study of the RGT and the personal skills of 8 Danish football coaches regarding skills, revealed that personality traits are more dominant in terms of coaches. Feixas et al. (1989) evaluated the changes that occurred after the intervention of the coaches in Spanish football team by evaluating the comments of the players in the study of personal football (Kelly, 1955), and concluded that the coach and the athletes agree with each other at the end of the research. Gucciardi and Gordon (2008), in their study with 11 Australian football coaches based on Personal Construct Theory (Kelly, 1955) note that the most important feature that should be in elite football is mental endurance. There is no coincidence that RGT is used in individual combat sports such as karate. In addition, the above-mentioned studies have been conducted based on an external perspective. However, how the elite athletes see themselves in terms of skills can be more important and predominant in terms of self-regulation. Therefore, the fact that there was no study that prioritized this methodological approach and also based on the subjective perspectives of elite characters constituted the basic justification for this work.

Personal constructs that someone uses to describe a certain element can be demonstrated by repertory grid technique (RGT). With this technique, the perception or subjective reality of an individual and a particular object can be investigated. The aim of this study is to examine the six Turkish national karate players, and how they represent themselves in the minds of a hypothetical element, ideal and non-ideal karate through self-identity graphs based on the analysis of repertory grid.

Research Questions

The general aim of this study is to examine the personal constructs of six karate players as athletes. For this purpose, the following questions were asked:

1. How far do the elite karate players locate the element I as a karate player and karate player I want to be?
2. How did the elite players position core and other elements on the self-identity graph?
3. What are the personal constructs that the elite karate players most or least associate with the element I as a karate player?

METHOD

Research Design

This study is an examination of the phenomenological character of elite Karate players aiming to reveal their personal constructs as a karate player with a RGT which is a semi-construct interview technique. The Fenomenology design focuses phenemenons which we are actually aware of but we don't have knowledge deeply about (Yıldırım and Şimşek, 2021). In such studies, it is examined perceptions of individuals, experience, tendency and individuals' aspects of event.

Participants

The participants of this study were six elite karate players majoring in Physical Education and Sports at Cukurova University. The table below shows the gender, age, and national / international success. Nicknames have been given in order not to reveal the identity of the athletes and their names have not been mentioned in the championship or tournament.

Table 1. Participants' gender, age and national/international success

Participant	Gender	Age	Important Achievements
P 1 (Melis)	Female	21	International Karate Championship 3. International Karate Championship 3.
P 2 (Hakan)	Male	22	International Karate Championship 1.
P 3 (Pelin)	Female	21	International Karate Championship 2. International Karate Championship 1. National Karate Championship 2. International Karate Championship 2.
P 4 (Davut)	Male	25	National Karate Championship 3. National Karate Championship 2. National Karate Championship 2. National Karate Championship 3. National Karate Championship 2.
P 5 (Batu)	Male	19	National Karate Championship 3. National Karate Championship 3.
P 6 (Bora)	Male	27	National Karate Championship 3. International Karate Championship 2. National Karate Championship 2.

Ethical Approval

Before beginning to this study, Ethics Committee Approval was obtained from T.C. Cukurova University Faculty of Medicine Non-Invasive Clinical Research Ethics Committee with the decision numbered 128 on 02/12/2022.

Data Collection Methods

Personal Information Form: The athletes were asked about their gender, age, the starting age, duration of being a national sporter, questions regarding whether their families supported and were proud of them. In addition to these questions, which member of the family supported or opposed them, whether their family or family members followed their competition and how they would rate their family members' interest in sports, whether any family member was interested in karate and who guided them into karate, whether the coaches were proud of them, what score they would give (1 very bad – 10 very good), what score their coach would give

them (1 very bad – 10 very good), what score their national coach would give them (1 very bad – 10 very good), and what their national and international ratings were the questions asked.

Repertory grid technique (RGT): With the RGT, it is possible to expose people to implicit information about a certain object, person or event. In the RGT, the two basic elements of the element represent an object, a person or an event; personal constructs, the second essential element, are obtained through the comparison of these elements. In this study, the researchers have identified the elements to be included in the RGT. The first elements is related to the player's current perception of himself as a karate player, the second is the construct of karate player he envisions for himself, and the third is social self I as a karate player. While the good and bad karate player elements I know represent real people, the ideal and non-ideal elements of the karate player are hypothetical elements. The elements are as follows:

1. I as a karate player
2. A karate player I want to be
3. I as a karate player for my coach
4. A good karate player I know
5. A bad karate player I know
6. An ideal karate player for me
7. A non-ideal karate player

Procedure

The data were collected based on face-to-face interview with each athlete. In this semi-structured interview, each of the above was turned upside down on a card and 3 were requested by the participant. The participants were asked to compare these three elements. The participants were asked "Which two elements are alike and differ from each other". It is desirable for an elite athlete to express an adjective or characteristic (personal construct) about similar elements. This process was continued until seven personal constructs were reached, and when the number of elements reached seven, the session was completed. In the last stage, each element is graded 1-5 in terms of the individual pairs of constructs obtained (eg, rapid and slow). In this way, the RGT analysis was conducted. This process took approximately 40-45 minutes.

Data Analysis

This study focused on the distance of each element. The Euclidean measurement geometrically reveals the distance of the objects sought in a space (Bortz & Döring, 2006). All elements involved in a RGT do not have equal weight in terms of the individual; For this reason, I, ideal I and social I elements, which are named as core elements, are more significant than the other elements. In this study, elements such as "I as a karate player", "karate player I want to be" and "I as a karate for my coach" are considered as core elements. The Euclidean distance coefficients between the elements were calculated by Idiogrid Version 2.4 (Grice, 2007).

RESULTS

In this part of the research, the results of the analysis of the data obtained and their interpretations have been given.

Participant 1 (Melis)

Melis is a student of Çukurova University School of Physical Education and Sports and is a female karate national sporter. Melis, aged 21, started karate sport at the age of 15 guided by the physical education teacher in high school. For the past five years, she has been into Turkey's Women National Team. Her family has a twin brother also engaged in karate. Melis expresses what she sees from her most supportive siblings in this sports branch. It was seen that her family rarely followed her own competition and that she assessed their involvement in sports as "neither related nor indifferent". However, she still expresses their support that her family is proud of her and that her family does not object to her involvement in sports.

When asked, Melis states that her coach was not proud of her and that her team coach was evaluating her for 3 out of 10 points. She also stated that the national team coach might have a similar evaluation. When Melis was asked to rate herself as a karate player, she said that the rating was 5 out of 10. Below are the findings related to Melis' repertory grid.

Table 2. Participant 1's euclidean distance coefficient between the elements (Melis)

	I as a Karate player	The Karate player I want to be	I as a karate player for my coach	A good karate player I know	A bad karate player I know	Ideal karate player	Non-ideal karate player
I as a karate player	0.00						
The karate player I want to be	0.46	0.00					
I as a karate player for my coach	0.52	0.75	0.00				
A good karate player I know	0.52	0.25	0.70	0.00			
A bad karate player I know	1.19	1.43	0.73	1.36	0.00		
Ideal karate player	0.56	0.32	0.67	0.20	1.29	0.00	
Non-ideal karate player	1.44	1.66	1.02	1.56	0.49	1.49	0.00

When we look at Table 2, it is seen that the closest positioned element of "I as a karate player" is "karate player" I want to be (Euclidean distance coefficient 0.46). On the other hand, the most distant element was "non-ideal karate player" element with a distance coefficient of 1.44. What is interesting is that Melis has positioned her elements "better than any other karate player I know" and "an ideal karate player in my opinion" is more distant than "karate player I want to be". This finding means that Melis is a good karate player I know and I think it is less likely to reach an ideal karate player image. However, it can be said that Melis has high self-esteem as a karate athlete (0.46). This finding is supported by self-identity graph of Melis (See Figure 1).

Self-Identity Plot for Blank Grid
Indifferent Area Limits = 0.80;1.20.

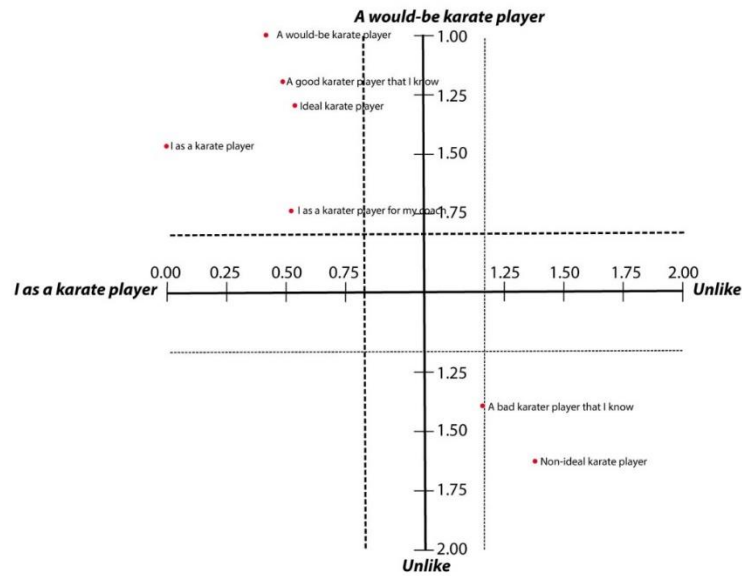


Figure 1. Self-identity graph of participant 1 (Melis)

When Figure 1 is examined, it appears that the elements of "I as a karate player", "an ideal karate player for me", "a good karate player I know", "a karate player I want to be", and "I as a karate player for my coach" are in acceptance area. In fact, this finding suggests that a karate athlete considers himself / herself compatible. In other words, even though there is a difference between the coach's own evaluation and Melis' own evaluation, it seems that there is compatibility between the two in the eyes of Melis. On the other hand, the elements of "a bad karate player I know" and "a non-ideal karate player" are clearly positioned further away by Melis.

As a karate athlete, it has been found that the most recent personal perception of Melis is related to which personal constructs, and that these constructs are clear (.90), target (.83), decent (.74) and ambitious (.71). On the other hand, disciplinary (.61), rapid (.55) and especially strong (.33) personal constructs were found to be weakly correlated by Melis as compared to "I as a karate player" element.

Participant 2 (Hakan)

Hakan is a student of Çukurova University School of Physical Education and Sports and is a male karate national sporter. Hakan is 22 years old and started karate at the age of 7 with the guidance of his father. He has been a sporter in the male national team for the last 5 years. There is a brother in his family engaged in karate. Hakan expresses what he sees from his father who is the most supportive in this sports branch. It was seen that his family mostly followed his own competitions and regarded their involvement in sports as "relevant". He expresses his support from his family and his family is proud of himself. However, his family does not object to his involvement in karate.

When asked, Hakan states that his coach is proud of himself and that his club coach's assessment of himself is 7 out of 10 points. On the other hand, the national team head coach's assessment of him may be nearly same. When Hakan was asked to rate him as a karate player, he said that this rating was 10 out of 10 points. Below are the findings related to Hakan's repertory grid.

Table 3. Participant 2’s euclidean distance coefficient between the elements (Hakan)

	I as a Karate player	The Karate player I want to be	I as a karate player for my coach	A good karate player I know	A bad karate player I know	Ideal karate player	Non-ideal karate player
I as a karate player	0.00						
The karate player I want to be	0.41	0.00					
I as a karate player for my coach	0.41	0.63	0.00				
A good karate player I know	0.37	0.49	0.54	0.00			
A bad karate player I know	1.41	1.39	1.18	1.39	0.00		
Ideal karate player	0.36	0.54	0.41	0.36	1.36	0.00	
Non-ideal karate player	1.44	1.40	1.14	1.47	0.67	1.37	0.00

When Table 3 is examined, it is seen that the elements which are located most proximal to the element "as a karate player" are "ideal karate player" and "a good karate player I know" (Euclidean distance coefficient 0.36 and 0.37). On the other hand, the most distant element was "non-ideal karate player" element with a distance coefficient of 1.44. It has been found that Hakan locates the elements "I am a karate player" and "I am a karate player as a coach" as a "karate player" (Euclidean distance coefficients 0.41). Hakan has located the element of "karate player" I want to be to be more distant from him than the elements of "a good karate player I know" and "ideal karate player". This finding suggests that the elements of "a good karate player" and "ideal karate player" I know are relatively more accessible than "karate player" I want to be. Hakan's self-esteem as a karate athlete can be said to be high (0.41). These findings are supported by the athletic self-identity graph (See Figure 2).

Self-Identity Plot for Blank Grid
Indifferent Area Limits = 0.80;1.20.

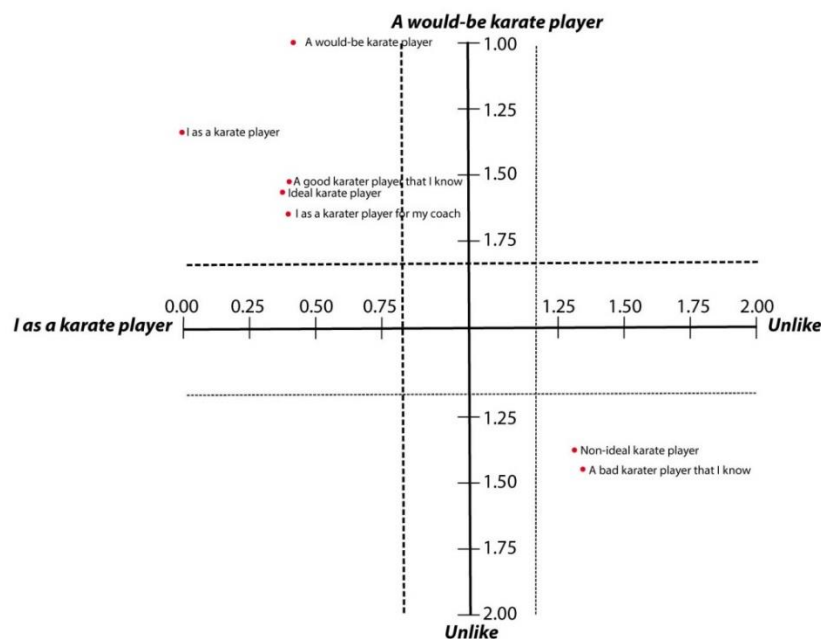


Figure 2. Self-identity graph of participant 2 (Hakan)

When Figure 2 is examined, it appears that the elements of "I am a karate player", "an ideal karate player for me", "a good karate player I know", "a karate player I want to be" and "I as a

karate player for my coach” are in acceptance area. In fact, this finding suggests that a karate athlete considers himself / herself as compatible. On the contrary, it seems that Hakan has located the elements "distant" by a "bad karate player I know" and "a non-ideal karate player".

As a karate athlete, it is observed that the current perception of Hakan related to which personal constructs are most related to fit (.93), persistent (.92), determined (.84), disciplined and regular (.82). Despite not showing a low relationship, Hakan has associated himself with his quick and respectful personalities (0.78) as a karate player.

Participant 3 (Pelin)

Pelin is a student of Çukurova University School of Physical Education and Sports and is a female karate national sporter. Pelin is 21 years old and started karate sport at the age of 11 with the guidance of her mother. She has been a sporter in the women’s national team for the past four years. There is no one in her family involved in karate sports. Pelin states that she does not receive support from her family in this sports branch. It has been seen that her family never followed her own competition and that she assessed their involvement in sports "neither related nor irrelevant". However, she still says her family is proud of her. However, only her father objected to her involvement in karate.

When asked, Pelin states that her coach is not proud of herself and that his club coach's assessment of herself is 5 out of 10 points. However, she said that the national team head coach’s assesment of her may be nearly same. When Pelin was asked to rate herself as a karate player, she said it was 7 out of 10. Below are the findings related to Pelin's repertory grid.

Table 4. Participant 3’s euclidean distance coefficient between the elements (Pelin)

	I as a Karate player	The Karate player I want to be	I as a karate player for my coach	A good karate player I know	A bad karate player I know	Ideal karate player	Non-ideal karate player
I as a karate player	0.00						
The karate player I want to be	0.46	0.00					
I as a karate player for my coach	0.49	0.71	0.00				
A good karate player I know	0.54	0.30	0.70	0.00			
A bad karate player I know	0.98	1.26	0.99	1.31	0.00		
Ideal karate player	0.56	0.39	0.68	0.28	1.13	0.00	
Non-ideal karate player	1.31	1.63	1.29	1.71	0.50	1.55	0.00

When Table 4 is examined, it is seen that the closest positioned element of "I as a karate player" is "karate player" I want to be (Euclidean distance coefficient 0.46). On the other hand, the most distant element was "non-ideal karate player" element with a distance coefficient of 1.31. Pelin located "ideal karate player" and "a good karate player I know" elements more distant than "karate player" I want to be. These findings indicate that Pelin sees the element of "karate player" which she wishes to be a more important target than the elements of "ideal karate player" and "a good karate player I know". Pelin's self-esteem as a karate athlete can be said to be high (0.46). This finding is supported by Pelin's self-identity graph (See Figure 3).

Self-Identity Plot for Blank Grid
Indifferent Area Limits = 0.80;1.20.

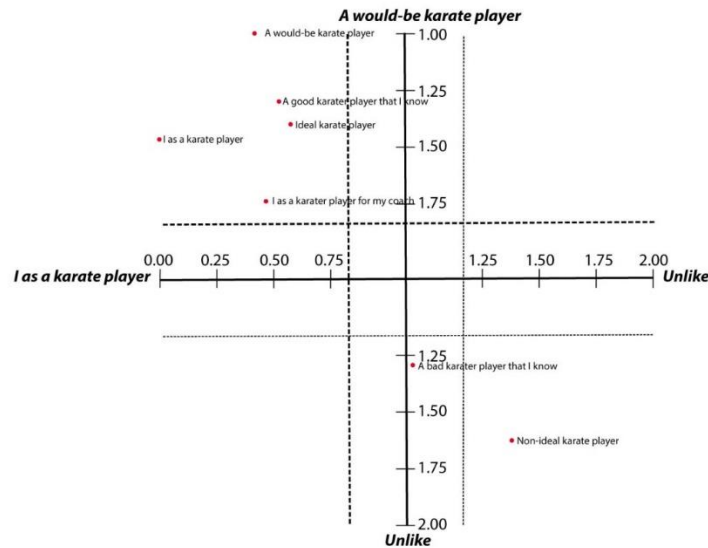


Figure 3. Self-identity graph of participant 3 (Pelin)

When Figure 3 is examined, it appears that the elements of "I as a karate player", "an ideal karate player for me", "a good karate player I know", "a karate player I want to be" and a "I as a karate player for my coach" are acceptance area. Each of the elements of Pelin (the current self, the ideal self, and the social self) are positioned so that they are compatible with each other in the self-identity chart. This finding indicates that Pelin is pleased with herself as a karate player. Pelin located the elements of a "bad karate player I know" and "a non-ideal karate player" in the conflict field. Nevertheless, Pelin located the element of "a bad karate player I know" closer to herself than the previous two.

As a karate athlete, it has been found that this construct is shareholder (.86) when the current perception of Pelin herself is related to which personal constructs are most related. On the contrary, personal constructs of self-development (.63), non-traditional (.55), new experience (.48), continuity (0.40), self-adaptation (0.39) self-element personal structures were correlated relatively weak with element of "I as a karate player" by Pelin.

Participants 4 (Davut)

Davut is a student of Çukurova University School of Physical Education and Sports and is a male karate national sporter. Davut is 25 years old and started to play karate at the age of 5 when his father guided him. He has been a sportman in the male karate national team for the last four years. Her family has a mother and father engaged in karate. Davut expresses that he sees his father as the most supportive in this sport branch. It was seen that his family always followed his own competitions and considered their involvement in karate as "relevant". He expresses his support from his family and his family is proud of himself.

In a question, Davut states that his coach is not proud of himself and that the club coach has 5 out of 10 points in Davut' own evaluation. On the other hand, it was seen that the national team coach expressed 3 points out of 10 points when evaluating himself. When Davut was asked to rate himself as a karate player, he said that it was 6 out of 10. Below are the findings of Davut's repertory grid.

Table 5. Participant 4's euclidean distance coefficient between the elements (Davut)

	I as a Karate player	The Karate player I want to be	I as a karate player for my coach	A good karate player I know	A bad karate player I know	Ideal karate player	Non-ideal karate player
I as a karate player	0.00						
The karate player I want to be	1.07	0.00					
I as a karate player for my coach	0.41	1.19	0.00				
A good karate player I know	0.77	0.41	0.92	0.00			
A bad karate player I know	1.09	1.84	0.88	1.55	0.00		
Ideal karate player	0.60	0.59	0.70	0.34	1.35	0.00	
Non-ideal karate player	0.55	1.40	0.59	1.11	1.00	0.99	0.00

When Table 5 is examined, it is seen that the element which is located most proximal to the element "I as a karate player" is "I as a karate player for my coach" (Euclidean distance coefficient 0.41). On the contrary, the most distant element was the elements of "karate player" and "bad karate player" (Euclidean distance coefficients 1.07 - 1.09 respectively). This finding suggests that Davut saw himself at about equal distance to both elements as a karate player. Likewise, ideal and non-ideal elements of the karate are located at about equal distance to Davut. It can be said that his self-esteem is low owing to Davut's positioning of karate player as I as "karate player" and "the karate player" which I want to be "distant" (the Euclidean distance coefficient between both elements is 1.07). This finding is supported by Davut's self-identity graph (See Figure 4).

Self-Identity Plot for Blank Grid
Indifferent Area Limits = 0.80;1.20.

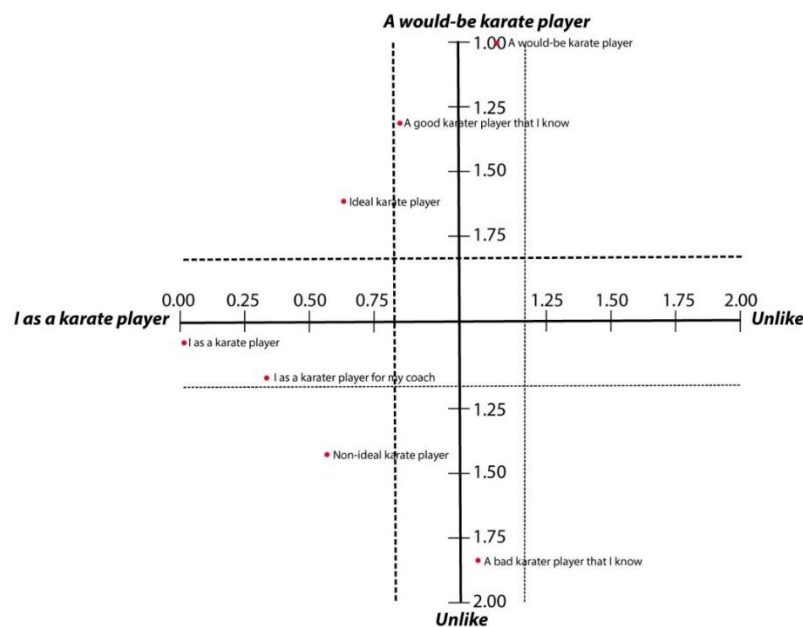


Figure 4. Self-identity graph of participant 4 (Davut)

When Figure 4 is examined, it is seen that the elements of "I as a karate player", "I as a karate player according to the coach" and "non-ideal karate player" are located in the ambivalent space. This finding suggests that Davut applies both positive and negative personal constructs

to these three elements. In fact, it can be said that Davut's ideas about a single ideal and non-ideal karate are clear. All other elements are located in the area of indifference, representing 0.80-1.20. If any element is as long as this distance coefficient expressed to the current and / or ideal elements of I, then that element is positioned in the field of difference (the hyphenated field) on the self-identity graph. It is advisable not to make a clear comment on the elements located in the field of indifference.

As a karate athlete, when looking at which personal constructs Davut's most recent perception of himself is related to, these constructs are classified as awareness (-.78), motivation and dedication (-.45), labor (-41), general dominance (27), modest (0.11), versatile (-0.10) and struggle (-0.01). Unlike the other athletes, Davut seems to associate all these personal things negatively with him (except for being modest). As a matter of fact, Davut 's self - esteem as a karate player is obviously lower than the other participants of this study.

Participants 5 (Batu)

Batu is a student of Çukurova University School of Physical Education and Sports and is a male karate national sporter. Batu is 19 years old and started to play karate at the age of 11 when his teacher of physical education of sport guided him. He has been a sportman in the male karate national team for the last five years. In his family, he has an older sister who is engaged in karate sports. Batu states that he received the most support from his brothers in this sport branch. It was observed that his family mostly followed his own competitions and evaluated their interest in sports as “neither related nor unrelated”. However, he states that he received support from his family and that he was proud of him. He states that relatives oppose karate.

When Batu was asked a question, he states that his coach is proud of himself and that his club coach's assessment of himself is 7 out of 10 points. On the other hand, the national team head coach’s assesment of himself may be nearly same. When asked about Batu's assessment of himself as a karate athlete, he stated that this assessment was 9 out of 10. Below are the findings of Batu's repertory grid.

Table 6. Participant 5’s Euclidean Distance Coefficient between the elements (Batu)

	I as a Karate player	The Karate player I want to be	I as a karate player for my coach	A good karate player I know	A bad karate player I know	karateplayer	Ideal karate player	Non-ideal karate player
I as a karate player	0.00							
The karate player I want to be	0.39	0.00						
I as a karate player for my coach	0.15	0.41	0.00					
A good karate player I know	0.39	0.00	0.41	0.00				
A bad karate player I know	1.29	1.52	1.23	1.52	0.00			
Ideal karate player	0.52	0.61	0.50	0.61	0.97	0.00		
Non-ideal karate player	1.42	1.63	1.36	1.63	0.22	1.07	0.00	

When Table 6 is examined, it is seen that the element which is located most proximal to "I as a karate player" is "I as a karate player" (Euclidean distance coefficient 0.15). On the other hand, the most distant element was "non-ideal karate player" element with a distance

coefficient of 1.42. It is observed that Batu places the elements of "karate player" and "karate player" which I want to be "close to" I as a "karate player" and these elements overlap. He placed the element of "ideal karate player" more distant than the elements of "karate player" I want to be and "a good karate player I know". As a result of this finding, Batu sees being a "karate player" and "a good karate player he wants to be" as a more important target than "ideal karate player". Batu's self-esteem as a karate athlete can be said to be high (0.39). These findings are supported by Batu's self-identity graph (See Figure 5).

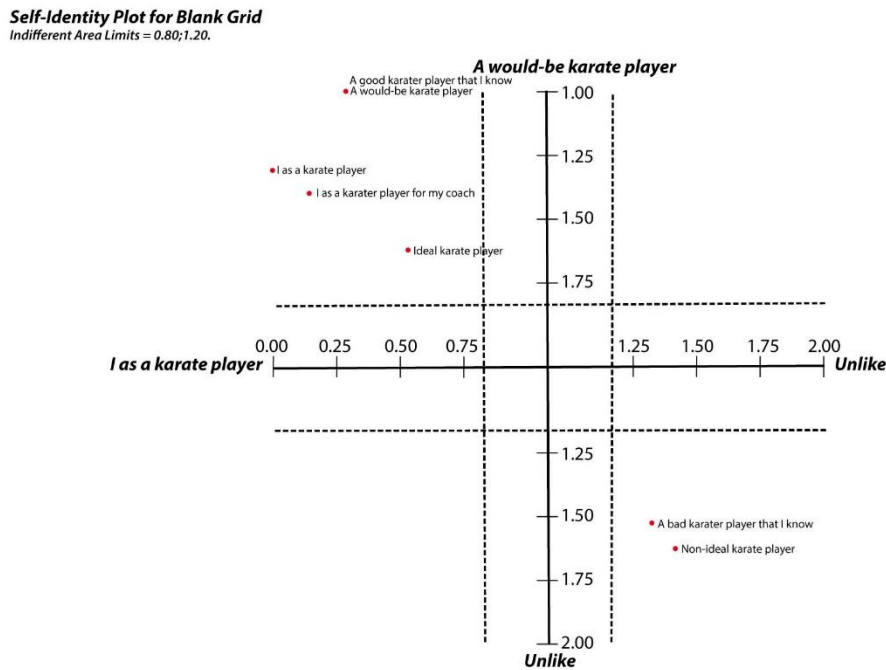


Figure 5. Self-Identity Graph of Participant 5 (Batu)

When Figure 5 is examined, it appears that the elements of "I am a karate player", "an ideal karate player for me", "a good karate player I know", "a karate player I want to be" and "I as a karate player for my coach" are acceptance area. In fact, this finding suggests that a karate athlete considers himself / herself as compatible. Batu matches well with the karate player he likes to be, the good karate player he knows well (0.00). According to this, it can be said that Batu wants to be like a good karate player he knows well. On the contrary, it appears that Batu has placed the elements "a bad karate player I know" and "a non-ideal karate player" quite distant.

As a karate athlete, when looking at which personal constructs Batu's current perception of himself is related to which personal constructs, these constructs are classified as fast and equilibrium (.94), controlled (.92), good technique (.88), explosive (.84) (.80). On the other hand, the focus (.61) has shown that the personal construct is weakly correlated with Batu's element as "I as a karate player".

Participant 6 (Bora)

Bora is a student of Çukurova University School of Physical Education and Sports and is a male karate national sporter. Bora is 27 years old and he was started karete by supporting his family, when he was 4 years old. He has been a sportman in the male karate national team for the last ten years. There is a brother in his family involved in sports. Bora expresses what you see from the most supportive parents, siblings and brothers in this sport branch. It was seen that

his family always followed his own competitions and considered their interest in sport as "relevant". He expresses his support from his family and his family is proud of himself. However, his family does not object to his involvement in karate.

When asked, Bora says that his coach is proud of himself, and his club coach may estimate him 9 out of 10 points. However, he said that the national team head coach may estimate similarly. When Bora was asked to rate himself as a karate player, he said that it was 9 out of 10. Below are the findings related to Bora's repertory grid.

Table 7. Participant 6's Euclidean Distance Coefficient between the elements (Bora)

	I as a Karate player	The Karate player I want to be	I as a karate player for my coach	A good karate player I know	A bad karate player I know	Ideal karate player	Non-ideal karate player
I as a karate player	0.00						
The karate player I want to be	0.21	0.00					
I as a karate player for my coach	0.25	0.39	0.00				
A good karate player I know	0.21	0.00	0.39	0.00			
A bad karate player I know	1.40	1.50	1.25	1.50	0.00		
Ideal karate player	0.21	0.00	0.39	0.00	1.50	0.00	
Non-ideal karate player	1.38	1.48	1.23	1.48	0.26	1.48	0.00

When Table 7 is examined, it can be seen that the element "I as a karate player" It is observed that these three elements are located closest to the "karate player" I want to be, "a good karate player I know" and "ideal karate player" elements (the Euclidean distance coefficient is 0.21). On the other hand, the most distant element was " a bad karate player" I know a distance coefficient of 1.40. As a karate athlete, I can say that Bora's self-esteem is high (the distance coefficient between the elements of the karate I want to be with the element as a karate player is 0.21). This construct is supported by Bora's self-identity graph (See Figure 6).

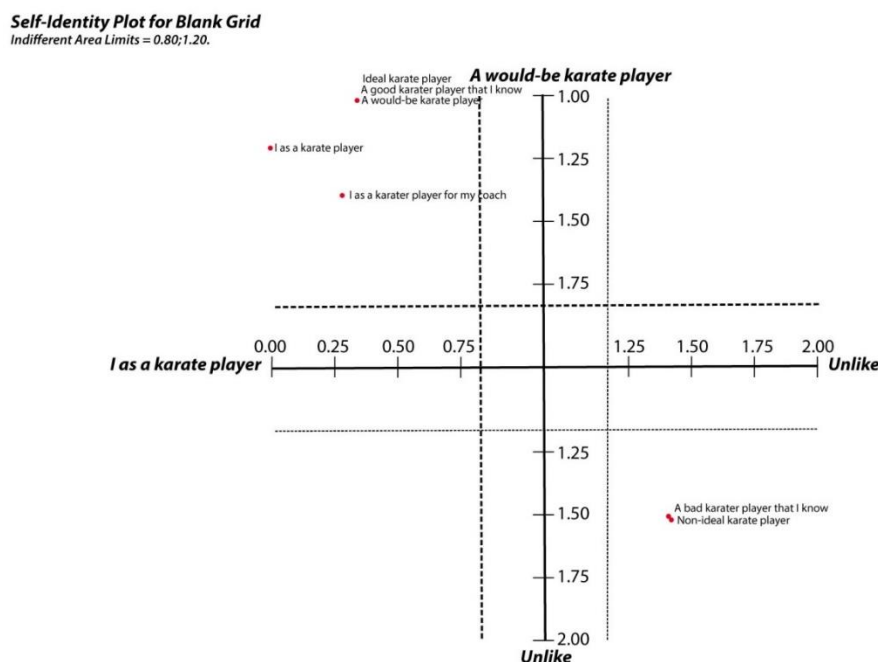


Figure 6. Self-identity graph of participant 6 (Bora)

When Figure 6 is examined, it appears that the elements of "I am a karate player", "an ideal karate player for me", "a good karate player I know", "a karate player I want to be" and "I as a karate player for my coach" are acceptance area. In fact, this finding suggests that a karate athlete considers himself / herself as compatible. Bora matched one of the best karate players he knows, the ideal and the desired karate player elements (0.00). Accordingly, the good karate player he knows about Bora is probably a role model for him. On the contrary, the elements of "a bad karate player I know" and "a non-ideal karate player" are located distant.

As a karate athlete, it was observed that these constructs had the highest level of technical difficulty (.97), self-confidence (.95), gentleman (.94), good performance (.91) and technique (0.87), respectively. The fact that all these personal constructs have a high positive relationship with me as a karate player indicates that this athlete is quite satisfied with himself. As a matter of fact, Bora has a very high self-esteem as a karate player.

DISCUSSION

In this study, the personal and social identities of the six elite national karate players were examined through self-identity graphs. The first finding was that participants were concerned about their self-esteem as a karate player. Expectations were high for elite athletes and having a degree in national / international competitions; self-esteem would be high. As a matter of fact, when examining karate personality, all karate players except one karate player karate player had high self-esteem. Therefore, studies which has done carried out that elit athletes' self-esteem is high (Ludlam et al. 2016; Ouyang et al. 2020). In this study, the self-esteem of the athletes was obtained by calculating the distance between the elements of "I as a karate player" and "karate player" I want to be. Accordingly, the lower the distance coefficient between these two elements, the higher the self-esteem. While the coefficient and the distance between the two elements were the lowest, this was followed by Batu, Hakan and Melis and Pelin with the same distance coefficients. On the other hand, as a karate player, Davut, who sees the elements of the karate player I want to be with the element with a distance coefficient of 1.07, is different from the other athletes and has a low self-esteem as a karate player.

According to Kelly (1955; 1991), who put forward the theory of personal construction, human behavior is based on reality. Although Kelly has rejected radical phenomenology, realism is only what people perceive. The theory of personal construct predicts that people will investigate their own personality within their own world (Feist, 2009). In this study, although Davut was successful, the calculation of the self-esteem associated with sport reveals how individual reality is different from objective reality. Yet, the other participants' self-esteem associated with the sport coincides with the sports achievement they have obtained. The low self-respect of Davut may be related to his self-sufficiency. According to Mills (2001), self-efficacy is a concept associated with one's ability to manage his or her own abilities and the ability to manage the direction of one's actions. Concepts such as behavioral selection, performance, effort against defeat, strategic choice, and objective choice are also expressed under the concept of self-efficacy (Mills, 2001). The personal constructs that Davut uses about himself as a karate player (such as general domination of karate sport, labor, dedication,

motivation and awareness) offer clues about his self-sufficiency. The fact that this athlete negatively associates himself with these personal constructs may have influenced the low self-esteem as a karate player.

The distance coefficients between the elements reveal that both female karate players (Melis and Pelin) see themselves closer to the element of karate player I want to be, a good karate player I know and an ideal karate player element. This finding suggests that a good karate player and an ideal karate player element of their acquaintances are beyond their dreams in terms of both athletes. Disciplined, speed and power that Melis regards as relatively inadequate; Pelin, on the other hand, needs to perceive herself more positively in terms of personal experiences such as new experience, continuity, adaptation and feeling. From the point of view of personal and social sports identities, it is seen that the identities of both female karate are compatible. In other words, the perception of these athletes as a karate player is largely in line with their perception of their coaches.

Bora, who has a higher self-esteem, perceives himself positively in terms of all personal constructs. As a matter of fact, Bora has matched a good karate player, an ideal karate player, and the karate player elements I wanted to be, and located these three elements closer to him. In the same way Batu sees himself positively in terms of all personal constructs except focusing. He is also a good karate player I know and I have matched the elements of the karate I want to be, and located him close to himself. But Batu, unlike Bora, idealizes the ideal image of the karate, and according to Batu, no one around him reflects his ideal karate player profile in his mind.

Batu and Bora's perceptions of themselves and their coaches' perceptions about them from their perspective are largely compatible. As a matter of fact, as a karate player, we calculated the Euclidean distance coefficient between the elements I and I as a karate player by coaching as 0.15 for Batu and 0.25 for Bora. A low value of the distance coefficient between these two elements means that only the personal and social sports identity overlap. However, it cannot be interpreted on the positive or negative nature of self and social outcome by going beyond this value. For such an interpretation to be made, the athlete must associate himself or herself with the personal constructs s/he poses, either positively or negatively. As a matter of fact, both Batu and Bora have positively associated "I as a karate player" and "I as a karate player for my coach". Accordingly, both athletes represent their personal and social sports identity predominantly by positive constructions. The finding of that the athletes who feel emotional trust and gratitude to their trainer have higher self-esteem and the finding is supported by Chen and Huei Wu (2014). That these athletes' sport identities are strong and self- efficacy high has shown paralellisim with findings Cabrita et al. (2014) athletes who have strong their identitiy of sports have higher self-efficacy.

On the contrary, Davut, who is the lowest among the athletes in terms of self-esteem as a karate player, has negatively associated himself with more personal constructs. Davut does not only perceive himself negatively; according to his view, his coach perceives im in this way. For this reason, the distance coefficient between the elements "I as a karate player" and "I as a karate player with coach" showed a value as low as 0.41. This finding suggests that Davut's personal and social sports identity is negative but compatible.

Like other sporter, Hakan's personal and social sports identities are compatible. What is interesting is that this athlete has located himself more distant from the element of "karate player that I would like to be", than the elements of "a good karate player I know" and "an ideal karate player". According to Hakan, this means that element of "The karate player I want to be" is more different from and less achievable element of "Ideal karate player". Hakan has relativized his personal constructs of speed and respect to himself relatively less. The development of these features of Hakan will bring him closer to the good karate player and the ideal karate player elements he knows. In this study, it was observed that five of the six karate charts on which self-identity was drawn were placed in the "I am a karate player, a good karate player and an ideal karate player" acceptance area as a karate player. On the other hand, the elements of the "bad karate player and non-ideal karate player" that we have identified are located in the area of conflict. In particular the core elements (I as a karate player, I as a karate player for my coach) are located relatively close to each other by these athletes. These findings indicate that although these five athletes are thought to be necessary to develop, they are greatly satisfied with themselves. The findings also reveal that the karate players' personal sports identities and social sports identities have a positive meaning. In other words, self-impressions of these athletes are in line with the impressions of others (coaches) on them cyclically. In the study which has done by Weis et al. (1990) has revealed that individuals who have also high self-esteem have high social self and the finding of this study supports this research that shows elite karate players' personal and social identity are high. Moreover, in the research which has been conducted with professional Rugby players has determined that athletes who have high social identity have also high self-efficacy and these athletes contribute much more to success of team. This outcome matches up with finding of this study (Evans et al. 2023).

As an athlete, the fact that these five highly regarded karate players place themselves in the same quarter (acceptance area) as a good karate player and an ideal karate player central element means that they use similar personalities for these elements. On the other hand, a bad karate player I know and a non-ideal karate player are located away from the core elements (in the area of conflict). The reason for this is that the personal constructs used by these five karats are negatively associated with these two elements. As a result, the self-identity graph of these five karate players is compatible with the achievements they have obtained so far and is therefore an expected result. Below is a discussion of Davut's self-identity graph, which is unique and does not reflect his success so far.

Davut has positioned I as a karate player, I as a karate player for my coach, and non-ideal karate player elements in the ambivalence area. Davut's assessment of these elements is both positive and negative. In fact, it can be said that the head of the case for these elements is quite complicated. In the self-identity chart, Davut positioned only the ideal karate player and the good karate player elements I know in the field of acceptance. On the other hand, I was positioned in the field of conflict by a bad karate player phenomenon I know. In Davut's self-identity chart, care should be taken to explain and interpret of all elements outside of the ideal and non-idealized karate. That is why all the other elements except these two elements are located in the field called difference (the area indicated by the hyphenated area on the self-identity graph).

If an element has a distance of 0.8 to 1.2, which is the core element, self or the ideal essence, the element is located in the area of difference (Bartholomew, 1993; Böker at al., 2000). As a matter of fact, Davut saw a bad element of the karate player, which I recognize with core elements (I am a karate player, I am a karate player, according to a coach). If an element is in the field of indifference in the self-identity graph, it means that this element does not resemble or resemble the self-elements (Bartholomew, 1993; Böker at al., 2000); When Davut was five years old, he was started karete sport with supporting his father. Unlike other athletes, both parents of these athletes are karate players. Because his family speak about karete sports during his childhood, he might arouse interest karate sport. There may be a lot of anticipations from Davut, who are followed by their parents in every competition.

CONCLUSIONS AND RECOMMENDATIONS

This study aimed to evaluate the personal and social sports identities of the six elites and the national karate player through the self-identity graph. Analysis of the players' self-identity graph indicates that the personal and social sports identities of all the karate players outside the karate are positive. It has seen that as a karate player, a sporter describes himself as a karate player, ideal self, and as a karate player his social self with positive personal constructs. Moreover, these three core elements were found to be compatible with each other by the athletes. In addition, all of the elite and national karate players except for a karate player have high self-esteem related to sports. In conclusion, this study shows that sports self-esteem related to self-identity graphs will provide functional information in the identification of sports self-esteem, personal and social sports identities.

This study was carried out on young adult karate elites who have demonstrated success in national and international tournaments in Turkey; personal and social sports identities of amateurs and junior karate players can be understood through self-identity graphs. In addition, the development of a karate player over time can be assessed longitudinally through self-identity graphs. Given the functional and practical information that the self-identity graph can provide, it is thought to be beneficial to use this method more widely and in a larger number of studies.

In this study, the subjective perspectives of the karate players were examined; the evaluations of the trainers towards these karate players could also be examined in the same way. Thus, the perceptions of the karate people and their perceptions of others can be examined within the framework of reciprocity. Findings obtained in this study have high internal validity and weak external validity. Findings are therefore limited only to the participants of this study. The research patterns that can be used to make generalizations and the research questions in this study can be answered with future research. Karate player's self-identity graphs are derived from the analysis of repertory grid data, whereas repertory grid data can also be analyzed by hierarchical clustering analysis and basic component analysis. However, since this study is not focused on this, the data obtained are not resolved in terms of these analysis options. In future research, the elements or individual constructs of the karate can be tested by a hierarchical clustering analysis of similarities or groupings. In addition, it can be shown by the basic component analysis that which personal constructs have a greater weight in terms of the karate

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players. Finally, the individual constructs obtained within the scope of this study are not classified, content analysis can be classified under the headings such as physical competence, cognitive competence, personality traits.

Declaration of Conflict Interest

The authors have no conflicts of interest to declare.

Researchers' Contribution Rate Statement: Research Design-İS; CT, Data Collection-BP; CT, Statistical Analysis- İS; BP: Preparation of the Article, İS; CT; BP.

Ethical Approval

Board Name: T.C. Cukurova University Faculty of Medicine Non-Invasive Clinical Research Ethics Committee

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The Prediction of Conscious Awareness in Women's Physical Activity Level and Healthy Living Habits

Öznur AKPINAR¹ , Melek GÜLER^{1*} 

¹Karamanoğlu Mehmetbey University, Faculty of Sport Sciences, Karaman.

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Abstract

Health is not only a state of physical well-being, but also a state of well-being in all aspects, both psychologically and sociologically. It is known that women all over the world lag behind in physical activity level. However, it is not known how much female are aware of this situation. In this respect, it is aimed to reveal the conscious awareness levels of how much women are aware of this situation. A total of 474 female participants from 7 geographical regions throughout Türkiye were included in the research. Personal information form, International Physical Activity Questionnaire-Short Form (IPAQ-SF), and Mindful Awareness Scale (MAS) were used in the research. The data obtained in the research were analyzed in the Jamovi (2.3.21.0) statistical program at a 95% confidence interval and 0.05 significance level. In the analysis of the data, t-test, ANOVA, and Linear Regression analysis were used in independent groups. According to the results of the research, it was determined that the majority of women were married, worked as civil servants, did not consume cigarettes and alcohol, paid attention to healthy nutrition, and used pedometer. It was determined that the majority of woman had a normal body mass index (BMI), their total Metabolic Equivalent (MET) levels were at a good level and their conscious awareness levels were at a moderate level. Total MET scores of females in the Black Sea region were significantly higher than women in the Central Anatolia region ($p < 0.05$). It was concluded that the conscious awareness scores of females did not predict BMI and total MET scores ($p > 0.05$). As a result, it can be said that the healthy living habits of females in Türkiye are at a good level, but this cannot be predicted with the level of conscious awareness.

Keywords: Physical activity, Body mass index, Mindful awareness scale, Woman

Kadınların Fiziksel Aktivite Düzeyi ve Sağlıklı Yaşam Alışkanlıklarında Bilinçli Farkındalığın Yordayıcılığı

Öz

Sağlık sadece fiziksel olarak iyi olma hali değil kişinin psikolojik, sosyolojik açıdan da tüm yönleriyle iyi olma halidir. Tüm dünya genelinde kadınların fiziksel aktivite düzeyinde geride olduğu bilinmektedir. Fakat kadınların bu durumun ne kadar farkında oldukları bilinmemektedir. Bu bakımdan kadınların bilinçli farkındalık düzeylerinin sağlıklı yaşam alışkanlıklarını yordayıcılığını ortaya çıkarmak amaçlanmıştır. Araştırmaya tüm Türkiye geneli 7 coğrafi bölgeden toplamda 474 kadın katılımcı dahil edilmiştir. Araştırmada kişisel bilgi formu, Uluslararası Fiziksel Aktivite Anketi-Kısa Form (IPAQ-SF) ve Bilinçli Farkındalık Ölçeği (BİFÖ) kullanılmıştır. Araştırmada elde edilen veriler Jamovi (2.3.21.0) istatistik programında %95 güven aralığı ve 0,05 anlamlılık düzeyinde analiz edilmiştir. Verilerin analizinde, bağımsız gruplarda t test, ANOVA ve Lineer Regresyon analizi kullanılmıştır. Araştırmanın bulgularına göre kadınların çoğunluğunun evli olduğu, memur olarak çalıştığı, sigara ve alkol tüketmediği, sağlıklı beslenmeye dikkat ettiği ve adımsayar uygulaması kullandığı belirlenmiştir. Kadınların çoğunluğun normal beden kütle indeksine (BKİ) sahip olduğu, toplam Metabolik Eşdeğer (MET) düzeylerinin iyi seviyede ve bilinçli farkındalık düzeylerinin de orta düzeyde olduğu belirlenmiştir. Karadeniz bölgesindeki kadınların toplam MET puanları, İç Anadolu bölgesindeki kadınlara göre anlamlı derecede daha yüksektir ($p < 0,05$). Kadınların bilinçli farkındalık puanlarının, BKİ ve toplam MET puanlarını yordamadığı sonucuna ulaşılmıştır ($p > 0,05$). Sonuç olarak Türkiye'deki kadınların sağlıklı yaşam alışkanlıklarının iyi seviyede olduğu fakat bunun bilinçli farkındalık düzeyi ile öngörülemeyeceği söylenebilir.

Anahtar kelimeler: Fiziksel aktivite, Beden kütle indeksi, Bilinçli farkındalık, Kadın

* **Corresponding Author:** Assist. Prof. Melek GÜLER, **E-mail:** melekglr@kmu.edu.tr

INTRODUCTION

The gradual increase in chronic diseases, which is one of the problems of our age, is one of the public health problems that create health, economic and social burden all over the world. Chronic diseases, especially cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases, cause more than 36 million deaths worldwide every year (General Directorate of Public Health, 2020). In the treatment of chronic diseases, factors such as tobacco and alcohol use, unhealthy diet, and insufficient physical activity, which are behaviorally modifiable risk factors, are emphasized. In its due diligence, the World Health Organization (WHO) announced that 27% of the adults in the world population and more than 80% of individuals under the age of 18 do not meet the physical activity levels recommended by WHO (WHO, 2022). Results based on gender indicate that 23% of men over the age of 18 and 32% of female do not have adequate physical activity levels (WHO, 2016). In addition to the fact that being a woman is seen as a physical activity barrier (Zavala et al., 2022), it is known that there are inequalities between female-male, girls-boys, the old-young, socioeconomically advantaged individuals, and socioeconomically disadvantaged individuals around the world (WHO, 2022).

Studies conducted to determine the level of physical activity based on gender also show that women have lower levels of physical activity than men (Beck et al., 2022; Mielke et al., 2018; Vieira et al., 2022; Zenu et al., 2023). When we look at the distribution of physical activity level in our country by gender, according to the "Chronic Diseases Risk Factors Research 2011" research, it was reported that 77% of males and 87% of female in Türkiye do not do enough physical activity (Women's Sports Foundation, 2016). Studies to determine the level of physical activity in the Turkish sample (Kayantaş et al., 2022; Yüce and Muz, 2021) draw attention to the conclusion that females have lower physical activity levels than males. Cultural and societal factors, social norms, expectations, safety concerns, opportunities, accessibility, as well as females' body image are among the barriers to physical activity (Dédélé et al., 2022; Mann and Hacker, 2022). It is important in promoting physical activity by identifying physical, social, environmental, and personal factors related to women's participation in physical activity (Ainsworth et al., 2003).

Controlled processes such as physical activity are slow and occur within 'conscious awareness' (Maltagliati et al., 2022). Awareness, which is a psychological factor, is defined as an 'a psychological state that allows thoughts, feelings, and behaviors to emerge by adapting to the moment without focusing on the past or future' (Lynn et al., 2022). The concept that advocates 'to pay attention to and realize the benefits of the moment lived in a certain middle direction by avoiding judgments as much as possible' is defined as conscious awareness (mindfulness) (Kabat-Zinn, 2012). In addition to the existence of many different factors in conscious awareness, it is known that the effect of attention and stimuli is one of the most important factors (Aktepe and Tolan, 2020). Physical activity and conscious awareness are complementary elements, and higher awareness of individuals is associated with higher levels of physical activity (Tajima et al., 2022).

In this context, in this reserach, it is aimed to determine the relationship between women's conscious awereness level and healthy living habits.

Based on these objectives, the following hypotheses were determined:

What are the demographic characteristics and healthy living habits of women in Türkiye?

1. What are the BMI, total MET, and MAS values of females in Türkiye?
2. Do females' BMI, total MET, and MAS scores differ in terms of demographic information and healthy living habits?
3. Are females' MAS scores a significant predictor of BMI and total MET scores?

METHOD

Research Model

Relational screening model, one of the general scanning models, was used in the research. The relational screening model is defined as "all the processes that define a past or present situation as it exists and applied for the development of learning or desired behavior" (Bahtiyar and Can, 2017).

Population and Sampling

The research group consists of females over the age of 18 living in 7 geographical regions of Türkiye. While determining the sample number, the formula ($n = \frac{Nt^2pq}{d^2(d-1)+t^2pq}$) was used (n: sample size, N: population size, t: significance level (1,96), p: the probability of occurrence (0.5), q: the probability of not occurrence (0.5), and d: margin of error (0.05)). When the number of females in the Turkish sample (36.189,124) is substituted in the formula, the result shows that 384 participants will be sufficient.

In the research, 473 female participants were reached. The participants' mean was ($M=35.0$, $SD=10.4$), weight was ($M=65.4$, $SD=11.8$), average was ($M=164.2$, $SD=6.5$), and sleep duration was ($M=7.4$, $SD=1.2$). According to the MET classification, 15.8% (n:75) of the participants are inactive, 40.3% (n:191) are active and 43.7% (n:207) are a very active class.

Ethical Approval

This research was conducted by the Scientific Research and Publication Ethics Committee of Karamanoglu Mehmetbey University of the Republic of Türkiye (Date: 24.05.2023, Number: E-75732670-020-130080) after the numbered decision letter has been received, the Helsinki Declaration it was conducted in an appropriate manner.

Data Collection Tools

In the research, a demographic information questionnaire, International Physical Activity Questionnaire-Short Form (IPAQ-SF), and The Mindful Awareness Scale (MAS) were used. The data were collected from the participants via 'Google Form' in the virtual environment.

Personal Information Questionnaire: In the questionnaire created by the researchers, there are questions about the demographic information of the participants, age, height, weight, marital status, chronic disease status, working status and healthy lifestyle habits, sleep duration, smoking consumption, alcohol consumption, nutritional status, sports status, and pedometer using.

International Physical Activity Questionnaire Short Form (IPAQ-SF): A questionnaire was designed by the Austrian researcher Doctor Michael Booth in 1996 to determine the health and physical activity levels of individuals in the community in a valid and reliable way (Booth, 2000). The International Physical Activity Group developed the IPAQ based on this survey. The Turkish validity and reliability of the questionnaire were carried out by Öztürk in 2005 (Öztürk, 2005). IPAQ is used in two ways, short and long. In this research, a short form consisting of 7 questions was used. The 7 questions in the questionnaire were prepared to determine the duration of walking, moderate and high-intensity activities, and sitting times of individuals in daily life, based on days and hours. The answers given to the questionnaire determine the metabolic equivalent (ME-min) amounts of individuals in minutes as physical activity duration (minutes) and frequency (days). After the MET values of individuals, weighted physical activity is calculated as 8.0 MET, moderate physical activity: 4.0 MET, low physical activity: 3.3 MET, and walking: 1.5 MET. According to the MET scores, the physical activity level of the individuals is divided into groups as inactive (<600 MET min/week), minimum active (>600-3000 MET min/week), and always active (>3000 MET min/week) (Sağlam et al. ., 2010).

The Mindful Awareness Scale (MAS): The scale was developed by Brown and Ryan to evaluate awareness and focus on momentary experiences in daily life (Brown & Ryan, 2003). The scale is a one-dimensional scale consisting of 15 questions in a 6-point Likert type (always (6), often (5), sometimes (4), rarely (3), seldom (2), almost never (1)). The scale is evaluated over the total score, and the highest score that can be obtained from the scale is 90, and the minimum score is 15. As the scores obtained from the scale increase, the level of mindfulness also increases. The Turkish validity and reliability research of the scale was conducted in 2011 on university students (Özyeşil et al., 2011). After the validity and reliability research of the scale, Cronbach alpha coefficient was determined as 0.80. In this research, the Cronbach's alpha coefficient of the scale was determined as 0.86. The scale has been used in many studies with different participant groups (Güler and Usluca, 2021; İmroğlu et al., 2021; Özyıldırım, 2021; Söner and Kartol, 2022). Confirmatory factor analysis (CFA) was performed to test the construct validity of the scale in this research. According to the CFA results, the fact that the Root Mean Square Error of Approximation (RMSEA) value (0.038) is less than 3 means a perfect fit (Kline, 2011). According to the results of the analysis, it was determined that the scale had a single-factor structure and the standard regression coefficients ranged between 0.39 and 0.77. In this case, none of the 15 items in the scale were discarded and all of them were used in the analysis.

Data Analysis

By looking at the skewness and kurtosis values, it was decided whether the data had a normal distribution or not.

Table 1. Results of normality analysis of the data

	BMI	Total MET	Mindful Awareness Scale
Skewness	0.74	1.13	-0.01
Kurtosis	0.69	0.94	-0.07

When Table 1 was examined, it was decided that the data were between (-1.5, +1.5) and were within the normal distribution limits (Tabachnick & Fidell, 1996). Frequency (N), percentage (%), mean (\bar{X}), and standard deviation (SD) were used in the descriptive analysis of the data.

In the research, t-test and ANOVA test analysis were used in independent groups. Linear Regression analysis was used in the predictive analysis. All analysis were performed at the 0.05 significance level and 95% confidence interval in the Jamovi (2.3.21.0) statistical program.

RESULTS

The following results were reached in this research, which investigated the factors related to the mediating role of conscious awareness in women's physical activity level. Demographic information of the participants is presented below (Table 2).

Table 2. Demographic characteristics of the participants

Variables	Group	N	%
Marital Satus	Married	290	61.3
	Single	183	38.7
Professional Status	Officer	237	50.1
	Self-Employed	54	11.4
	Housewife	182	38.5
Smoking Status	Yes	147	31.1
	No	326	68.9
Alcohol Use Status	Yes	109	23.0
	No	364	77.0
Chronic Disease Status	Yes	69	14.6
	No	404	85.4
Healthy Eating Status	Yes	334	70.6
	No	139	29.4
Using Pedometer	Yes	265	56.0
	No	208	44.0

When Table 2 is examined, it is seen that the majority of the participants are married (61.3%), the majority of them work as civil servants (50.1%), the majority of them do not smoke (68.9%), and do not use alcohol (77%). It is seen that the majority of the participants do not have a chronic disease (85.4%), pay attention to a healthy diet (70.6%), and most of them use pedometers (56%). Participation rates according to the regions of the participants are presented below (Figure 1).

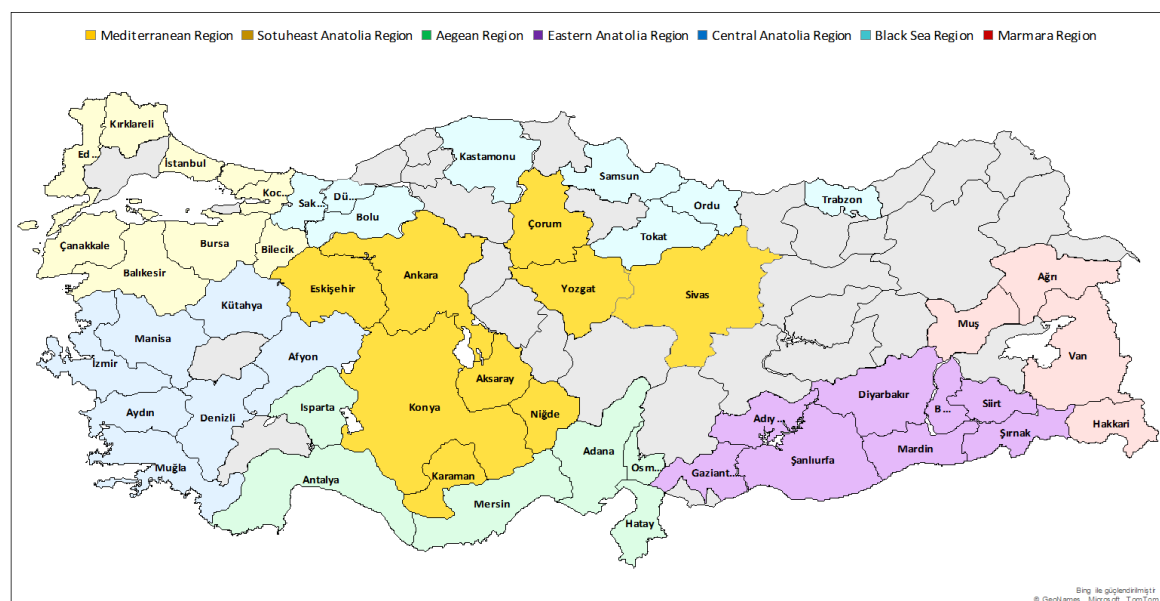


Figure 1. Provinces where the participants live

When Figure 1 is examined, the ranking of the regions where the participants live according to the map of Türkiye; Central Anatolia (45.9%), Marmara (23.3%), Aegean (8.5%), Mediterranean (8.0%), Black Sea (6.7%), South East Anatolia (6.5%) and Eastern Anatolia (1.1%) region. The average scores of the participants' BMI, total MET, and MAS are presented below (Table 3). Female participants from all regions participated in the research, only participants from gray-colored provinces could not be reached. The mean analysis of the participants according to BMI, total MET and MAS are presented below (Table 3).

Table 3. Participants' BMI, total MET and MAS mean

Variables	N	\bar{X}	SD
Body Mass Index (kg/m ²)	473	24.1	4.0
Total MET (minute)	473	1615.6	1016.2
Mindful Awareness Scale (Point)	473	59.4	59
Mindul Awareness Scale (Item)	473	3.74	0.81

When Table 3 is examined, the average BMI score of the participants ($M=24.2$, $SD=4.2$) is in the normal weight class, the total MET average ($M=1650.2$, $SD=1168.9$) is in the very active group, and the conscious awareness scale mean score is ($M=56.2$, $SD=12.1$). The analysis of the participants according to BMI, total MET and MAS, and independent variables is presented below (Table 4).

Table 4. Participants' BMI, total MET, and MAS t-test results

	Variables	Group	N	$\bar{X} \pm SD$	t	p	Cohen's d	Dif.
BMI	Marital Status	1.Married	290	25.3± 3.9	8.2	<.000***	0.78	1 > 2
		2.Single	183	22.4±3.3				
	Alcohol Use Status	1.Yes	109	22.6±3.1	-4.8	<.000***	0.53	2 > 1
		2.No	364	24.6±4.1				
	Chronic Disease	1.Yes	69	25.6±3.9	3.3	.001**	0.43	1 > 2
2.No		404	23.9±3.9					
Healthy Eating	1.Yes	334	23.8±3.6	-3.3	.001**	0.33	2 > 1	
	2.No	139	25.1±4.7					
Total MET	Marital Status	1.Married	290	1448.3± 925.5	-4.6	<.000***	0.43	2 > 1
		2.Single	183	1880.7±1096.7				
	Alcohol Use Status	1.Yes	109	1855.4±1079.9	2.8	<.000***	0.31	1 > 2
		2.No	364	1543.8±986.6				
Using Pedometer	1.Yes	265	1798.1±1021.4	4.5	<.000***	0.42	1 > 2	
	2.No	208	1382.9±962.9					
MAS	Smoking Status	1.Yes	147	57.3±11.9	-3.1	.002**	0.30	2 > 1
		2.No	326	53.6±12.0				
	Alcohol Use Status	1.Yes	109	51.8±10.4	-4.4	<.000***	0.48	2 > 1
		2.No	364	57.5±12.3				
Healthy Eating	1.Yes	334	57.2±11.7	2.9	.004**	0.29	1 > 2	
	2.No	139	53.6±12.8					

p<0.01, *p<0.001, Dif: difference

According to Table 4, the mean BMI of the participants who were married, consumed alcohol, had a chronic disease, and did not pay attention to a healthy diet was significantly higher ($p<0.05$). The total MET averages of the participants who were single, consuming alcohol, and using pedometer were significantly higher ($p<0.05$). The mean of conscious awareness of the participants who do not consume cigarettes and alcohol and those who pay attention to a healthy diet is significantly higher ($p<0.05$). The analysis of the participants' BMI and total MET scores according to the region and occupational groups they live in is presented below (Table 5).

Table 5. ANOVA results of the participants' BMI, total MET, and MAS scores

Regions	Sum of Squares	df	Mean of Squares	F	p
BMI	232.41	6	38.735	2.5	.02
	7207.59	466	15.467		
Total MET	1.90	6	3.16	3.14	.005**
	4.69	466	1.00		
MAS	902.4	6	150.4	1.03	.4
	68166.6	466	146.28		
Profession					
BMI	12.61	2	6.30	0.40	.67
	7427.4	470	15.80		
Total MET	131670	2	65835	0.06	.94
	4.8732	470	1.0368		
MAS	47.733	2	23.866	0.16	.85
	69021.307	470	146.854		

** $p < 0.01$, *df*: degrees of freedom

When Table 5 is examined, there is a statistically significant difference in total MET scores by regions ($F_{6,466}=3.14$, $p < 0.01$). There was no significant difference in the BMI and MAS scores of the participants according to the regions and occupational groups ($p > 0.05$). Post hoc results of total MET scores by region are presented below (Table 6).

Table 6. Post hoc results of total MET scores by region

Regions	N	Total MET $\bar{X} \pm SD$	df	Mean Difference	t	p	Difference (Tukey)
1. Central Anatolia Region	217	1432.5±943.1	466	-625.1	-3.3	.02*	3>1
2. Marmara Region	110	1673.4±968.9					
3. Black Sea Region	32	2057.6±1137.2					
4. Mediterranean Region	38	1831.4±1190.6					
5. Aegean Region	40	1871.1±1127.8					
6. Southeast Anatolia Region	31	1583.7±974.9					
7. Eastern Anatolia Region	5	1974.6±919.4					

* $p < 0.5$, *df*: degree of freedom

When Table 6 is examined, there is a significant difference between the Central Anatolia and Black Sea regions according to the post hoc results of the total MET scores ($p < 0.05$). Accordingly, the total MET averages of the participants living in the Black Sea region were significantly higher than the participants living in the Central Anatolia region ($t = -3.3$, $p < 0.05$). The predictive analysis of the participants' BMI and total MET scores, as well as their MAS scores, are presented below (Table 7).

Table 7. Results of linear regression analysis with BMI and total MET scores of the participants

Model 1	Estimate	Standard Error	Confidence Interval	t	p
BMI	25.404049	0.866593	23.70 – 27.11	29.31	<.000***
MAS	-0.022429	0.015088	-0.05 – 0.01	-1.49	.14
Model 2					
Total MET	1447.4438	222.1951	1010.83 – 1884.1	6.51	<.000***
MAS	2.9942	3.8685	-4.61 – 0.77	0.77	.44
<i>Model 1: $R^2 = 0.01$, $F = 2.21$, $p = 0.14$</i>			<i>Model 2: $R^2 = 0.01$, $F = 0.60$, $p = 0.44$</i>		

When Table 7 is examined, the regression models (Model 1: $F=2.21$, $p=0.14$), (Model 2: $F=0.60$, $p=0.44$) were not statistically significant ($p>0.05$). According to this result, conscious awareness scores do not predict BMI and total MET scores.

DISCUSSION

In this research, the predictor of healthy living habits of females' conscious awareness level was investigated. For this purpose, the differences and predictors between females' physical activity level, body mass index and conscious awareness level, and healthy living habits were analyzed. As a result of the research, it was determined that the majority of females living in 7 different regions in Türkiye were married, worked as civil servants, and did not use cigarettes or alcohol. In addition, it was determined that the majority of females did not have a chronic disease, they paid attention to healthy nutrition, and the majority of them used pedometers.

It is known that housewives have more free time and working women's have less free time, so they have less healthy lifestyles (Kırtepe, 2015). In a research conducted in Türkiye, it was determined that the majority of females who come to the public education center are housewives and do not consume alcohol or cigarettes (Önemli, 2020). In another research, it was determined that the amount of the cigarette consumption among women in Aydın province was 19.2% (Köksal, 2021). In a research conducted in Adıyaman, it was determined that the majority of females were married and housewives, the majority of them did not consume cigarettes and alcohol, and the majority of them did not have a chronic disease (Şahin, 2018). In this research, although the number of housewives is less, it can be said that the majority of females in the sample generally do not consume cigarettes and alcohol, pay attention to healthy nutrition and use pedometers, which means that they pay attention to healthy living habits.

In addition to this result, the average BMI of the participants in this research who are married ($MD=25.3$, $SD=3.9$), who consume alcohol ($MD=22.4$, $SD=3.3$), who have chronic diseases ($MD=25.6$, $SD=3.9$), and who do not pay attention to a healthy diet ($MD=23.8$, $SD=3.6$) is higher. Among the physical activity barriers, the health status of individuals has an important place (Uçar, 2019). In a research investigating the causes of physical activity barriers in individuals with chronic diseases, it was found that 'feeling tired' and 'time constraints' had the highest rates (Souza et al., 2022). In this research, it is an expected result that females with chronic diseases have lower total MET levels ($MD=1493.5$, $SD=943.6$) and higher BMI ($MD=25.6$, $SD=3.9$) values. Another result is that the total MET averages of single females, those who consume alcohol, and those who use pedometers are significantly higher. As a result of a research that included 327,789 participants from 104 countries around the world, it was determined that the occupational and domestic activities of daily life were associated with the amount of moderate and vigorous physical activity, while it was seen that the least relationship was recreational sports areas (Strain et al., 2020). This result assumes that females who are working or housewives do not differ in achieving moderate and vigorous physical activity levels. However, studies on marital status in Türkiye contain different results. According to the results of a research conducted in the sample of Türkiye, the marital status of females does not constitute an obstacle to their physical activity levels (Önemli, 2020). A research has shown that single females have a higher frequency of physical activity compared to married ones (Şahin, 2018). In a recent research, it was seen that single females have more free time than

married females and they adopt more quality-of-life behaviors related to them in this period (Safi, 2023). In a qualitative research, 'lack of time' emerged as the biggest physical activity barrier in desk-bound individuals (Safi et al., 2022). In this research, it can be thought that the single females have lower BMI and higher total MET levels, even if they are working, they allocate their free time outside of work to healthy living habits.

The average conscious awareness of the participants who do not consume cigarettes and alcohol and those who pay attention to a healthy diet is significantly higher. Today, the number of applied clinical studies in developing conscious awareness in females is increasing (Bilgiç and Gürkan, 2021). In an experimental research using online exercises, it was found that the level of conscious awareness of females increased significantly (Özyıldırım, 2021). However, in this research, the current conscious awareness was determined. As expected, it was concluded that those who adopted healthy living habits had a higher level of conscious awareness. This result may have been effective in that more than half of the females in the sample group worked as civil servants in the public sector; because this result means that the education level of females is at least an associate degree and undergraduate graduation. It is known that, as the education level of females increases, they pay attention to healthy nutrition, and their participation in physical activity increases (Bülbül, 2014). In a research conducted with women working in the public sector, it was seen that females were within the normal BMI limits and the probability of healthy lifestyle behaviors increased as the education level of women increased (Ceviz, 2008). In studies conducted in the public sector, it was determined that the conscious awareness scores of female university staff ($M=61.65$, $SD=10.55$) and nurses ($M=63.98$, $SD=12.41$) were at moderate levels (Aşık and Albayrak, 2021; Atalay, 2020). These results show similarities with the conscious awareness score averages of the women in this research. In addition, almost everyone today has smartphones and applications that increase the level of physical activity on these phones (Atalay et al., 2022), and the majority of females in this research sample also use pedometer applications. It can be thought that the pedometer application may also have an indirect effect on the level of conscious awareness, but studies in this area are needed to make definite conclusions about it.

Another result of the research is that there is a statistically significant difference in total MET scores according to the regions. Accordingly, the total MET averages of the participants living in the Black Sea region are significantly higher than the participants living in the Central Anatolia region. In the framework of the 'Global Action Plan for the Prevention and Control of Non-Communicable Diseases 2013-2020' by the World Health Organization, the target of a 10% reduction in the prevalence of insufficient physical activity is included (WHO, 2013). In Türkiye, on the other hand, in the 11th Development Plan, there are articles on measures to raise public awareness and awareness of the society 'education, public service advertisements, campaigns for healthy lifestyles, healthy eating, and active living habits' and 'improving health literacy among women (11th Development Plan, 2019). In a research conducted on 4205 adults in 34 provinces in 7 different geographical regions in Türkiye, it was seen that 56% of the population was in the obese class. According to the regions, the obesity prevalence of females in the Aegean and Marmara regions was lower than the females in Central Anatolia, Southeast Anatolia, and Black Sea regions, and the prevalence of obesity decreased as the education level of females increased (İşeri and Arslan, 2009). In this research, the region with the highest BMI values of females in 46 provinces living in all geographical regions was the Central Anatolia

region, but a significant difference was found only in the Black Sea region. More studies are needed in this area to explain the reasons for this result because it has been observed that the number of studies that included geographical regions as much as the majority of province-based studies in the literature is limited.

The final result of the research is that conscious awareness scores do not predict BMI and total MET scores. Understanding the psychological factors that support or hinder the increase in physical activity level of females is important in increasing physical activity (Lynn et al., 2022). It can be said that conscious awareness includes mental and psychological processes that affect daily life and affects people's behavior (Zümbül, 2021). In a research conducted on females in Gümüşhane, a difference was found between the increase in females' recreation awareness and BMI values (Bebek, 2020). In a research conducted throughout Türkiye, a total of 401 individuals living in 7 different geographical regions reported that even if they had information about the ingredients of foods, they did not take this into account and considered unconscious fast food consumption as an obstacle in the prevention of obesity (Gökşen and Kümüşler, 2020). As with this result, there are situations that individuals prefer even though they are aware of it. One of them may be conscious awareness. It was found that the moderate level of conscious awareness of the women in this research sample did not predict the physical activity level and BMI values. Studies in the literature are mostly focused on conscious awareness and stress, anxiety, psychological resilience, mental well-being, etc. It is intended for psychological research and experimental applications. It can be said that this research can contribute to future studies in terms of being a predictor of the current level of conscious awareness, current physical activity, and BMI values.

CONCLUSION

As a result, it can be said that the physical activity levels and healthy living habits of females living in different provinces in Türkiye are at a good level. It can be said that females' conscious awareness levels do not predict physical activity and BMI values.

Limitations of Research

The research has some limitations. The first of these is that although the provinces representing each geographical region were reached in the research, more participants were included in the research, especially from the Central Anatolia and Marmara regions. Another limitation is that the data used in the research were obtained through questionnaires and scales. Although the data collection tools used in the research were the most frequently used scale and questionnaire in the literature, different results could have been obtained through physical measurements.

Suggestions

- It can be recommended to include studies that are practical and cover all geographical regions in future studies.
- It can be recommended that randomized and controlled experimental studies should be carried out by including all provinces in all geographical regions in future studies.
- The research can also be carried out in different groups, for example, the elderly, people with disabilities and those with chronic diseases.

Conflicts of Interest: There is no financial and personal conflict of interest within the scope of the research.

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Ethical Approval

Ethics Committee: Karamanoğlu Mehmetbey University Scientific Research and Publication Ethics Committee

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Peer Teaching Model in Gymnastic Education

Sinem YÜRÜK¹ , Mehmet ASMA^{2*} 

¹Ege University, Sport Sciences Faculty, İzmir.

²Manisa Celal Bayar University, Sport Sciences Faculty, Manisa.

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Abstract

The aim of this study is to investigate the effect of peer teaching model in gymnastics education, which is one of the main sports branches and in which the participants are involved in studies with their peer groups. The research was carried out in a quasi-experimental design with pretest-posttest control group. The research was carried out in Akhisargücü Sports Club in Manisa. A total of 29 children aged 7-9, (Experimental=15, Control=14), voluntarily participated in the study. Participants do not have any previous gymnastics experience. Random sampling method was used to determine the groups, and which would be the control or experimental group. To assess social skills, Social Skills Assessment Scale (SSAS) developed by Akçamete and Avcıođlu (2005) was scored by each participant's primary school teachers. Observation forms prepared by the researchers were used to evaluate movement skills. Measurements were taken twice before and after 8 weeks of practice. Mann Whitney U test was used to compare the experimental and control groups data, Wilcoxon Signed Rank was used in the pre-test-post-test difference comparisons of the groups. According to the analysis results, in terms of social skills, the difference scores of the peer education were found to be statistically significant ($p < .050$) while the difference scores of the control group were statistically insignificant ($p > .050$). According to the results of the analysis of movement development specific to gymnastic, significant difference was found in both groups ($p < .050$). As a result, it has been seen that both the peer teaching model and the traditional method support movement development in gymnastics education. In addition, it has been found that the peer teaching model in gymnastic education improves social skills more than traditional teaching.

Keywords: Peer teaching model, Social development, Movement development, Gymnastic

Cimnastik Eđitiminde Akran Öğretimi Modeli

Öz

Bu arařtırmanın amacı, temel spor branřlarından biri olan ve katılımcıların akran grupları ile birlikte çalıřmalara dahil oldukları cimnastik eđitiminde akran öğretimi modelinin çocukların sosyal geliřimlerine ve cimnastiđe özgü hareketlerdeki geliřimlerine etkisini incelemektir. Arařtırma öntest-sontest kontrol gruplu yarı deneysel desende yürütölmüřtür. Arařtırma Manisa ilinde bulunan Akhisargücü Spor Kulübünde gerçekteřtirilmiřtir. Arařtırmaya 7-9 yař arası toplam 29 çocuk (deney=15, kontrol=14) gönüllü olarak katılmıřtır. Katılımcılar daha önce herhangi bir cimnastik deneyimine sahip deđillerdir. Grupların oluřturulmasında, kontrol ve deney gruplarının belirlenmesinde rastgele örnekleme yöntemi kullanılmıřtır. Sosyal becerileri deđerlendirmek için, Akçamete ve Avcıođlu (2005) tarafından geliřtirilen Sosyal Beceri Deđerlendirme Ölçeđi (SBDÖ), her katılımcının ilkokul öğretmeni tarafından puanlanmıřtır. Hareket becerilerinde ise arařtırmacılar tarafından hazırlanan gözlem formları kullanılmıřtır. Ölçümler, 8 haftalık uygulama öncesinde ve sonrasında test tekrar test yöntemi ile alınmıřtır. Deney ve kontrol grubu verilerinin karřılařtırılmasında Mann Whitney U testi, grupların ön test-son test fark karřılařtırmalarında ise Wilcoxon iřaretili sıralar testi kullanılmıřtır. Analiz sonuçlarına göre, sosyal beceriler açısından akran öğretimi modeli fark puanları istatistiksel olarak anlamlı bulunurken ($p < .050$), kontrol grubunun fark puanları istatistiksel olarak anlamsız bulunmuřtur ($p > .050$). Cimnastiđe özgü hareket geliřimi analiz sonuçlarına göre, her iki grupta da anlamlı fark bulunmuřtur ($p < .050$). Sonuç olarak, cimnastik eđitiminde hem akran öğretimi modelinin hem de geleneksel yöntemin hareket geliřimini desteklediđi görölmüřtür. Ancak, cimnastik eđitiminde akran öğretimi modelinin geleneksel öğretime göre sosyal becerileri daha fazla geliřtirdiđi tespit edilmiřtir.

Anahtar kelimeler: Akran Öğretimi modeli, Sosyal geliřim, Hareket geliřimi, Cimnastik

* Corresponding Author: Sinem Yürük, E-mail: sinem.yuruk@ege.edu.tr

INTRODUCTION

The existence of widely accepted international standards in Physical Education and Sports (PES) is not effective in achieving the targeted learning outcomes of the participants. Teaching models are an important factor that should be considered in order for the programs to comply with the standards (Metzler, 2011). There are many teaching model to be used in physical education (Direct instruction, Personalized system for instruction, Cooperative learning, Sport education, Inquiry teaching, Tactical games, Peer teaching and teaching personal and social responsibility) or any sportive activity for students to achieve the intended goals, and it is very important for qualified teachers to know them and put them into practice (Metzler, 2017; Mirzeoğlu, 2017). NASPE (2022, National Standards for Physical Education), recommends developing and implementing a student-centered coaching philosophy for PES educators. According to NASPE standards, it has been reported to the educators that they should focus on all the participants in the process and give priority to the practices for all development areas instead of the philosophy of winning at any cost. It has been stated that different skills such as obeying the rules, regulating their own emotions and cooperating with the others can be developed through sports activities in children. However, in terms of social development, which is also the subject of this research, peer interaction is one of the most important issues to be considered due to the social structure of PES (Melikoğlu, 2020; Pacholika & Nedelova, 2019).

Gymnastics, which is the oldest and universal educational tool, is an effective basic branch in all areas of development by providing the opportunity to cooperate and socialize with small group activities while improving physical fitness (Kleinman, 2009). Due to its disciplined focus, it is thought that gymnastics does not have a enjoyable feature like other sports (Güneş & Çoknaz, 2010). For this reason, it is stated that the lesson should be purposeful, lively and active in order to be effective (Pallett, 2014). Except for Direct Instruction, Personalized System for Instruction, Cooperative Learning, Sport Education, Inquiry Teaching, Tactical Games and Teaching Personal and Social Responsibility, among the models mentioned by Metzler (2005), especially the Peer teaching model is formed by the combination of many teaching strategies. In this context, the peer teaching model, which is one of the eight models defined by Metzler (2005) for PES, can be used in gymnastics education in order to increase the socialization of the participants with student-focused activities. Because Peer Teaching allows students to take a more active role in the learning process, establish a collaborative relationship with their peers, and engage in more peer interaction (Wang, 2016). Unlike traditional direct teaching, there is both cognitive and social interaction between the teacher and the learner in peer teaching (Li, 2023). Peer teaching has been formed by the combination of many teaching strategies. The focus of this model is that students help their peers learn (Mirzeoğlu, 2017). In peer teaching, the students take on two different roles as a learner and a teacher. The development area priority for the teacher student is cognitive, affective-social and psychomotor learning. In terms of learner, this order is in the form of psychomotor, cognitive and emotional-social development (Atlı, 2017). In this scenario, children will have the opportunity to develop their movement skills when they are in the learner position, and their knowledge and skills when they are in the teacher position. At the same time, they will socialize by communicating and experiencing solidarity and cooperation while helping each other learn in the group.

In the literature, in general, activities such as sports, physical activity or games are used in mentally handicapped (Özdemir et al., 2018), attention deficit and hyperactivity disorder (Makunina et al., 2020), hearing impaired children (Barimani et al., 2018). Although there are studies stating that there are positive contributions in terms of social skills in children with social adaptation problems (Garaigordobil, 2008), no study has been found on the examination of social development in the branch of gymnastics, where physical activity is at a intense. When the relevant literature is examined, it is seen that there are studies in which some teaching models such as cooperation (Güneş & Çoknaz, 2010), multiple intelligences (İlhan et al., 2005), sports education model (Koyuncuoğlu, 2015) and jigsaw learning are used. However, no study was found in which the peer teaching model was examined in gymnastics education and evaluated in terms of both psychomotor and social development. Due to the limited number of studies on gymnastics training, which is a basic branch in the field of PES, in the literature, we think that this study will be useful for the literature in terms of increasing the quality of education and increasing the output value, by incorporating a model-based approach into the process. Therefore, the aim of the study was determined as the examination of the effect of the peer teaching model in basic gymnastics education on the social development of children and the development of movement skills specific to gymnastics.

METHOD

Research Design

This research is in the semi-experimental design with pretest-posttest control group. This pattern is a powerful design that provides statistical contribution to the researcher by examining the effect of the applied procedure on the dependent variable and allows the interpretation of the findings (Büyüköztürk, 2016).

Study Group

The study group of this research consists of a total of 29 children (Experimental: 15, Control: 14) between the ages of 7-9 who started gymnastics activities at the same time and worked with the same trainer at the Akhisargücü Sports Club in the Akhisar district of Manisa. None of the children participate in any sport other than gymnastics. Random sampling method was used to determine the groups, and which would be the control or experimental group.

Ethical Approval

At the beginning of the study, research approval was obtained from the Health Sciences Ethics Committee of Manisa Celal Bayar University Faculty of Medicine, with the decision number 20.478.486/1336, dated 11/05/2022. This study complies with the Declaration of Helsinki. The study follows the "Council of Higher Education Scientific Research and Publication Ethics Directive" in terms of scientific, ethical, and citation requirements. In addition, consent was obtained from the parents of the child participants.

Data Collection Tools

Social Skills Assessment Scale (SSAS): SSAS developed by Akçamete and Avcioğlu (2005) and whose validity and reliability study was conducted for 7-12 age groups, was used to evaluate the social skills of the study group. The scale consists of 12 subscales and 69 items, all of which contain positive statements. The sub-dimensions of the scale are as follows: basic social skills (e.g. substance: listens when others speak), basic speaking skills (e.g. substance: initiates speech), advanced speaking skills (e.g. substance: adjusts the tone of voice when speaking), relationship initiation skills (e.g. substance: introduces herself/himself to the first people she/he meets), ability to maintain relationships (e.g. substance: apologizes when hurting someone), group-work skills (e.g. substance: participates in group activities), emotional skills (e.g. substance: expresses opinions that differ from others), self-control skills (e.g. substance: avoids disturbing others), skills to cope with aggressive behavior (e.g. item: defends himself against accusations), ability to accept consequences (e.g. item: responds calmly when unsuccessful), instructive skills (e.g. item: asks questions when necessary), and cognitive skills (e.g. item solves a problem). According to the reliability results, the Cronbach Alpha value of the Social Skills Assessment Scale (SSAS) was calculated as .98 (Akçamete & Avcioğlu, 2005). For this study, this value was determined as .94.

Movement Skill Scoring Charts: To assess movement skills, using the observation forms prepared by the researcher, basic movements specific to gymnastics, forward roll, backward roll, cartwheel and handstand forward roll were scored individually for each participant by 2 different gymnastics trainers and the total score of 4 movements were calculated. Observation forms were prepared by writing down all the features of each movement that should be considered during the application (Özer & Soslu, 2020). In Table 1, there is an example scoring chart containing the information according to which criteria the cartwheel technique is scored.

Data Collection

The research was carried out in Akhisargücü Sports Club in Akhisar district of Manisa. Parents of the children were informed about the study and their written consent was obtained. The Social Skills Assessment Scale (SSAS) was filled by the children's classroom teachers. Basic movement skills were scored by the 2 different gymnastics coaches. One of the scoring coaches has 8 years and the other has 6 years of experience. The coaches made the scoring independently of each other and the average score of the two coaches was included in the analysis. After 8 weeks of practice, the measurements were taken again with the same method for the post-test data. Inter-rater agreement statistics were applied separately for the pre-test and post-test.

Table 1. Example cartwheel scoring chart


	POINTS TO BE CONSIDERED IN EVALUATION CRITERIA	SCORING				
		1 (unsuccessful)	2 (low level)	3 (intermediate level)	4 (mid-high level)	5 (high level)
Initial phase of movement	Feet closed, body straight, head up, arms open at shoulder level					
Implementation phase of the movement	Lean forward with standing leg in arms up position					
	Stretching the rear foot back and placing the hands one by one at the level of the front foot					
	Clear display of straddle position in the air					
The final stage of the movement	Landing of the feet on the ground one by one at the linear level of the hands body upright, head up, arms open at shoulder level position					
TOTAL SCORE:						

Table 2 shows the work plan created for the experimental group based on peer teaching.

Table 2. 8-week experimental group program to be taught with peer teaching model

Unit	Gymnastics
Age Group	7-9
Days	Saturday-Sunday
Duration	1 hour
Number of students	Experimental group n:15
Location	Akhisargücü Sports Hall Gymnastics Lesson Area
Number of students teaching	7 student per lesson (each student will pair up and teach each other)
Selection of students who teach their friend	Students will be released to match in the peer teaching model process. At lesson, one of the students in the group of pairs will teach and control the movement to a student friend, and then the learner will teach it to his friend. In the 8-week training program, each student will assume the roles of learner and teacher.
Course contents to be taught with peer teaching model	<p>1st week: Basic gymnastics poses (front stances, bench stances, glider, bridge, athlete sitting, eagle stance, long sitting, open-legged sitting, etc.).</p> <p>2nd week: Basic warm-up exercises and animal imitations in gymnastics (runs, leg-raising walks, galops, bear walks, rabbit, injured rabbit, crab, worm, snake, etc.).</p> <p>3rd week: Basic balance stances in gymnastics (forward balance, side balance, glider, vertical hold, 90 degrees front leg hold, etc.)</p> <p>Week 4: Flexibility poses in gymnastics (spagat, bridge, long sitting forward folding, waist stretch, vertical, etc.)</p> <p>Week 5: Types of forward and backward rolls (open leg forward roll, straight leg forward roll, open leg backward roll, straight leg backward roll, etc.)</p> <p>Week 6: Handstand and basic movements through handstand (handstand, handstand forward roll, cartwheel etc.)</p> <p>Week 7: Aerobic gymnastics basic steps (jumping jack, knee lift, skip, jog, kick, lunge, march).</p> <p>8th week: Repetition of movements in which the development of movement skills will be observed (forward roll, backward roll, cartwheel, handstand forward roll).</p>
Implementation and assessment	<p>The 8-week program was created with 2 raters and gymnastics trainers, and detailed information about the model was given to the gymnastics trainer, who will teach with the peer-teaching model. The gymnastics coaches of the children participating in the study applied the peer teaching model. The experience of the gymnastics coach in this branch is noted as 8 years.</p> <p>Before each peer teaching model course content, the gymnastics trainer will explain to the students the points to be considered in the procedures to be done according to the topic of the week. At the end of the lesson, the movement of each group will be checked and an evaluation will be made.</p>

The similar program was applied to the control group with the traditional method for 8 weeks without using the peer teaching model.

Analysis of Data

Mann Whitney U test was used in the comparisons of the experimental and control groups, Wilcoxon Signed Rank test was used in the pre-test-post-test difference comparisons of the groups, and Cohen's Kappa test and correlation was used in the comparison of the raters. IBM SPSS 22 data analysis program was used in data analysis.

FINDINGS

Table 3. Mann Whitney-u test results including the analysis of the social skills assessment scale pre-test scores taken from the groups.

Group	N	Mean Rank	Sum of Ranks	U	p
Experimental	15	15.37	230.50	99.500	.810
Control	14	14.61	204.50		

In the Mann Whitney-U test performed to analyze whether there was a significant difference between the pretest SSES total scores of the experimental and control groups, the difference was not found to be significant ($p > .05$).

Table 4. Mann Whitney-u test results including the analysis of the gymnastic movement skills pre-test scores taken from the groups.

Group	N	Mean Rank	Sum of Ranks	U	p
Experimental	15	14.20	213.00	93.000	.600
Control	14	15.86	222.00		

As a result of the Mann Whitney-U test performed to compare the gymnastic movement skills pretest total scores of the experimental and control groups, it was determined that the difference was not significant ($p > .05$).

Table 5. Pretest-posttest scoring compatibility of the raters.

Test	Raters	Kappa	p
Pretest	R1-R2	.662	.000
Posttest	R1-R2	.686	.000

R1: rater 1, R2: rater 2

According to the statistical results of the scoring of 2 different gymnastic coaches (experts) through the observation forms, the kappa value of the pre-tests was .662 ($p < .05$), and the kappa value of the post-tests was .686 ($p < .05$). In terms of inter observer agreement, values between .61 and .80 mean that there is sufficient agreement between the raters (Landis & Koch, 1977).

Table 6. Correlation of raters' pretest scores of all participants.

	R1 (pretest)	R2 (pretest)
R1 (posttest) Pearson Correlation	1	.956
p		.000
N	29	29

According to Table 6, it is seen that the pre-test scores of the raters have a significant ($p < .05$) and high level ($r: .956$) relationship with each other. Therefore, it can be said that the scores given by the raters to the participants' pre-tests are compatible with each other.

Table 7. Correlation of raters' posttest scores of all participants

	R1 (posttest)	R2 (posttest)
R1 (posttest) Pearson Correlation	1	.938
P		.000
N	29	29

According to Table 7, it is seen that the pretest scores of the raters have a significant ($p < .05$) and high level ($r: .936$) relationship with each other. Therefore, it can be said that the scores given by the raters to the participants' posttests are compatible with each other.

Table 8. Wilcoxon test results including the analysis of the pretest-posttest total scores of the experimental group social skills assessment scale.

	N	Rank averages	Rank totals	Z	p
Negative rank	2 ^a	5.50	11.00	-2.785	.005
Positive rank	13 ^b	8.38	109.00		
Equal	0 ^c				
Total	15				

In the analysis applied to compare the Social Skills Evaluation Scale pretest-posttest total scores of the experimental group in which peer teaching was applied, it was found that the difference between the two tests was statistically significant ($p < .050$).

Table 9. Wilcoxon test results of the control group's social skills assessment scale pretest-posttest total scores

	N	Mean Rank	Sum of Ranks	Z	p
Negative rank	6 ^a	3.67	22.00	-1.915	.055
Positive rank	8 ^b	10.38	83.00		
Equal	0 ^c				
Total	14				

In the analysis applied to compare the Social Skills Assessment Scale pretest-posttest total scores of the control group who received gymnastics training without peer teaching, it was found that the difference between the two tests was not statistically significant ($p > .050$).

Table 10. Wilcoxon test results of the experimental group's gymnastic movement skills pretest-posttest total scores

	N	Mean Rank	Sum of Ranks	Z	p
Negative rank	1 ^a	1.00	1.00	-3.235	.001
Positive rank	13 ^b	8.00	104.00		
Equal	1 ^c				
Total	15				

As a result of the Wilcoxon test conducted regarding the difference between the pretest-posttest total scores of gymnastic movement skills of the experimental group to which peer teaching was applied, the difference was found to be significant ($p < .050$).

Table 11. Wilcoxon test results of the control group's gymnastic movement skills pretest-posttest total scores

	N	Mean Rank	Sum of Ranks	Z	p
Negative rank	1 ^a	2.00	2.00	-3.170	.002
Positive rank	13 ^b	7.92	103.00		
Equal	0 ^c				
Total	14				

As a result of the Wilcoxon test for the difference between the gymnastic movement skills pretest-posttest total scores of the control group who received traditional gymnastics training, the difference was found to be significant ($p < ,050$).

DISCUSSION

When the pre-test and post-test of the Social Skills Assessment Scale obtained were compared, no statistically significant difference was observed in terms of the scores of the control group in the study. However, in terms of social skill development, it was observed that the post-test scores of the experimental group were significantly higher than the pre-test scores. It is mentioned in the literature that PES activities can be used to develop children's social skills and to support their development processes especially at an early age (Özyürek et al., 2015; Yıldız, 2019). Based on the effect of sports on socialization, Zurc (2012) stated that physical activity has a significant effect on children's social skill levels, Er et al. (1999) found that there were significant differences in the social development of all children and adolescents who voluntarily participated in the summer swimming course, Aksoy (2020) stated that physical activities had a positive effect on their socialization skills. Rombot (2017) stated that traditional games, which can be among the sportive activities, also affected the social skills and developed children's gross motor skills. In addition, there are studies proving that sportive activities also provide benefits in terms of social development in disadvantaged groups (İlhan, 2008; İlkim, Tanır & Özdemir, 2018; Şahin & Şahin, 2020; Yılmaz & Şahin 2022). Studies in the literature support the importance of sports in terms of social development.

Regarding the effect of peer teaching on socialization, Esentürk (2019) states that the peer-mediated adapted physical activity program applied to children receiving inclusive education has an intense effect on social development. Yarımkaaya (2018) states that the participation of individuals with moderate intellectual disability in the peer-mediated adapted physical activity program has a positive effect on their socialization levels. Padilla et al., (2020) stated that the peer teaching learning model has a positive effect on social skills. Sevim's (2019) research results supports the peer teaching model, which we predict can have a positive effect on social development in this study, stating that participation in sports activities improves peer support positively. Madou and Iserbyt (2018) stated that the peer learning process is suitable as a teaching model in swimming classes because non-swimmers can be included in the course content to a large extent thanks to this model; Seenan et al., (2016) stated that peer education helps to increase skills and confidence in communication and teamwork. It can be said that these results are since peer teaching improves social relations. Ozbal and Eski (2019) examined peer teaching separately as a teaching and learning outcome. They found that teachers improve their teaching and communication skills, and learners communicate more easily while improving their skills. In the study of Comfort & McMahon (2014); it has been reported that sports science students are more successful when they are taught by their peers in practical activities. In addition, in the studies of Alegre-Ansuategui and Moliner-Miravet (2017) with secondary school students and Mellado et al., (2017) investigating peer teaching with university students, it was stated that students' social skills improved. Based on these findings, it is possible to say that sports lead to positive social development. In his study, Toplu (2022), no significant difference was found between the social skill levels of preschool children and

their interactive peer relationships. It is thought that this result may be since peer relations in preschool children need more support. Studies in the literature generally support the results of this study by stating that peer-supported teaching can provide positive contributions in terms of social development.

Another main finding of the study is that the difference between the total scores of both groups in the pretest-posttest results of gymnastic movement skills was found to be significant. Both the experimental group, to which peer instruction was applied, and the control group, which received training with the traditional method without applying the model, both showed significant improvement in gymnastics-specific movement skills. Looking at the contribution of peer teaching to the literature in sportive activities, Damghanian et al., (2019) noted that the peer teaching model improved the average physical activity scores of girls, Cui et al. (2012) noted a promising intervention in reducing sedentary behaviors in adolescents in China. Also, Lieberman et al. (2000) found that deaf students and peer educators increased their physical activity intensity after the start of peer education. Ayvazo and Ward (2009) stated that there was an increase in the number of correct attempts in all of the students, while Johnson and Ward (2001) stated that the children performed fewer total trials but performed more correct trials.

When the literature examining the relationship between peer teaching and motor skills is examined; in the studies of Chatoupis (2015), Ernst and Byra (1998), the motor skill performance of the students improved, Padillah et al. (2020) that the model has a positive effect on volleyball game performance. Iserbyt et al., (2011) found that the model achieves motor goals as well as a teacher-centered format in tennis. Ward et al., (1998) also stated that in volleyball, students performed more movement exercises and were more successful. Palmizal and Octadinata (2019) stated that the peer teaching model influenced learning on the forearm pass results of seventh grade male students in volleyball. In addition, Asngari and Sumaryanto (2019) reported that peer-like social interactions can help students' differing psychomotor performances in their study. In contrast, Chen et al. (2017) reported that peer support does not directly affect physical activity, but indirectly through self-efficacy or enjoyment. In their study, Mirzeoğlu et al. (2014) did not find a significant difference in the level of students' achievement of volleyball-specific skills in the peer teaching group. It is thought that these results may be due to the differences in the educational content applied in the studies, the total application times, and the variables such as the participation status of the students. In addition, Juliantine et al. (2017) stated that the peer teaching model in volleyball affects students' self-confidence and teamwork, but the cooperative learning model affects them more. When compared with the literature findings in general terms, it is understood that the findings obtained from the research are consistent with the literature (Aksoy, 2020; Esentürk, 2019; Padilla et al., 2020; Rombot, 2017; Seenan et al., 2016; Sevim, 2019; Zurc, 2012). However, the limitations of the study; the fact that only 29 children between the ages of 7-9 who participated in gymnastics activities were included, that no other model with which the peer teaching model could be compared was used, can be listed as the fact that the families may have filled in the social skills assessment scale incorrectly.

CONCLUSION AND RECOMMENDATIONS

In the study, it was found that the peer teaching model used in basic gymnastics education had positive effects on social development and the development of gymnastics-specific movement skills in children. In addition, it has been determined that peer teaching creates more meaningful and effective results than the traditional method in terms of social development. This study has a unique quality and constitutes an infrastructure for future studies, since there is not much work in the literature on gymnastics training, which is a basic sport branch, and a model-based approach is included in the process. Although the study group is limited to children between the ages of 7-9 and gymnastics, it is suggested that for future research, model-based experimental studies can be carried out in different samples, in different branches, for longer periods, and comparisons can be made by using different models as a Direct Instruction, Personalized System for Instruction, Cooperative Learning, Sport Education, Inquiry Teaching, Tactical Games and Teaching Personal and Social Responsibility except Peer Teaching in PES lessons or sportive activities.

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Intervention with Physical Activity and Dietary Adolescent Obese Individuals with A-typical Autism

Gülşen KARATAY¹, Hulusi ALP^{2*}

¹Süleyman Demirel University, Health Sciences Institute, Exercise and Sport Sciences, Isparta.

²Süleyman Demirel University, Faculty of Sport Sciences, Department of Physical Education and Sports, Isparta.

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Abstract

The aim of this study is to reveal the effect and importance of physical activity and diet program in adolescence obese individuals with A-typical autism. One of the single-subject research models, the single-start multiple probe model was used. The population of the study consists of children with A-typical autism between the ages of nine (9) and fourteen (14) living in Isparta. The sample of the study consisted of one (1) child who voluntarily agreed to participate in the study. The study lasted for a total of seventeen (17) weeks, including the first week of pre-measurements and the implementation of an adapted physical activity and diet program for sixteen (16) weeks. As a data collection tool, the child's weight measurement was recorded with tanita before each study. The data obtained at the end of the application were analyzed by showing them on the graph. Since the number of participants participating in the study was one (1), the data obtained in the seventeen (17) week period were converted into points in accordance with the scale protocol and turned into a line chart to reveal the change that occurred. At the end of the research, no change was observed in body weight without applying physical activity and diet program to the participant in the first week. With the physical activity and diet program applied to the participant for sixteen (16) weeks, a decrease of five (5) kilograms in the participant's body weight was detected. Factors such as the frequency of physical activity of the participant, dietary habits, awareness of parents, socio-economic status, and psycho-social are thought to be effective in this decrease in body weight.

Keywords: Autism, Diet, Physical activity, Obesity

Ergenlik Dönemi A-tipik Otizmlı Obez Bireylere Fiziksel Aktivite ve Diyetle Müdahale

Öz

Bu çalışmanın amacı, ergenlik dönemi A-tipik otizmlı obez bireylere fiziksel aktivite ve diyet programı ile müdahalenin etkisini ve önemini ortaya koyabilmektir. Tek denekli araştırma modellerinden, tekli başlangıç çoklu yoklama modeli kullanılmıştır. Araştırmanın evrenini, Isparta ilinde yaşayan, dokuz (9) ile on dört (14) yaş aralığındaki A-tipik otizmlı çocuklar oluşturmaktadır. Araştırmanın örneklemini ise, arařtırmaya gönüllü olarak katılmayı kabul eden bir (1) çocuk oluşturmuştur. Arařtırma ön ölçümlerin alındığı ilk hafta ve on altı (16) hafta uyarlanmış fiziksel aktivite ve diyet programının uygulanması olmak üzere toplamda on yedi (17) hafta sürmüştür. Veri toplama aracı olarak çocuğun kilo ölçümü her çalışma öncesinde tanita ile ölçülerek kaydedilmiştir. Uygulama sonunda elde edilen veriler, grafik üzerinde gösterilerek analiz edilmiştir. Arařtırmaya katılan katılımcı sayısının bir (1) olması nedeniyle on yedi (17) haftalık süreçte elde edilen veriler ölçek protokolüne uygun şekilde nokta puana dönüřtürülerek, meydana gelen deęişimi ortaya koymak için çizgi grafięe dönüřtürülmüřtür. Arařtırma sonunda, katılımcıya ilk hafta fiziksel aktivite ve diyet programı uygulanmadan vücut ağırlığında bir deęişiklik tespit edilmemiřtir. Katılımcıya on altı (16) hafta boyunca uygulanan fiziksel aktivite ve diyet programı ile katılımcının vücut ağırlığında beř (5) kilogram azalma tespit edilmiřtir. Katılımcının vücut ağırlığında beř (5) kilogramlık azalmada katılımcının fiziksel aktivite sıklığı, beslenme alışkanlıkları, ebeveynlerin farkındalığı, sosyo-ekonomik düzey ve psiko-sosyal gibi faktörlerin etkili olduęu düşünölmektedir.

Anahtar kelimeler: Diyet, Fiziksel aktivite, Obezite, Otizm

* Corresponding Author: Gülşen KARATAY, E-mail: dtygulsenkaratay@gmail.com

INTRODUCTION

Autism spectrum disorder (ASD) is a pervasive developmental disorder that affects many areas such as motor, psycho-motor, sensory and cognitive development, and has limited repetitive behavior patterns, deficiencies in social interaction and communication skills with others, and shows its symptoms in the first three years from birth and after, continues throughout life and has genetic basis (Aydın & Özgen, 2018; Durmuş et al., 2021; Sansi & Nalbant, 2019; Ünal & Uçar, 2017; Yıldırım, 2019). Pervasive developmental disorders are classified under five headings. These are autism, A-typical autism, asperger's syndrome, childhood fragmentation disorder, and rett's syndrome (Arslan & İnce, 2015; Kavlak, 2019). A-typical autism is also known as pervasive developmental disorder not otherwise specified. It is a diagnostic term used for individuals who begin to show symptoms after the age of three, or for whom observed symptoms are insufficient for diagnosis. A-typical autism is characterized by difficulties in communication skills, social interaction with others, obsessive behavior, attachment, and weakness in motor skills (Arslan & İnce, 2015; Kavlak, 2019; Yıldırım, 2019).

In individuals with ASD, deficiencies in motor skills are frequently observed at an early age (preschool). Individuals with ASD experience inadequacies in movement skills such as balance and coordination, walking, swimming, dancing, jumping rope, and playing ball (Elaltunkara, 2017; Sansi & Nalbant, 2019). Adolescent individuals with autism spectrum disorder have poor motor skills, including social and behavioral limitations, difficulties with motor coordination and balance, which makes it challenging for them to engage in physical activities and participate in them sufficiently compared to their typically developing peers (Dhaliwal et al., 2019; Durmuş et al., 2021; Khader, 2017; Srinivasan et al., 2014).

Reduced physical activity levels, prolonged screen time habits, and increased irregular eating habits in adolescents with autism spectrum disorder (ASD) can lead to many health problems, such as low bone density, overweight, and obesity (Dahlgren et al., 2021; Doreswamy et al., 2020; Gehricke et al., 2020). Compared to typically developing adolescents, adolescents with autism spectrum disorder have a %49 higher risk of obesity (Helsel et al., 2023). Obesity is associated with long-term physical and psychosocial consequences, including diabetes, insulin resistance, increased risk of cardiovascular disease, and depression. It can also have negative effects on physical, sensory, and social functioning, as well as academic performance (Dhaliwal et al., 2019; Srinivasan et al., 2014).

Physical activity practices play an important role in improving the symptoms and skill deficiencies associated with autism spectrum disorder. It has been found that physical activity helps to alleviate social, behavioral, cognitive, and motor impairments of autism in adolescent individuals, as well as contributes to academic performance. Additionally, such activities are suggested to contribute to the development of social and motor skills, improving balance, coordination, speed, and flexibility, and helping to prevent health problems such as obesity (Durmuş et al., 2021; Gehricke et al., 2020; Khader, 2017; Sansi & Nalbant, 2019).

Stereotypic sensory and motor behaviors seen in children with autism, difficulties related to oral motor skills such as chewing and swallowing, gastrointestinal problems, and physiological factors that directly or indirectly affect behavioral and nutritional problems can be defined. Children with neuro-developmental disorders such as autism and autism spectrum disorders

have more nutritional problems than healthy children. The most common nutritional problem is food selectivity, followed by food refusal and rapid eating (Doreswamy et al., 2020; Riccio, 2022; Tekkeli, 2021). Avoidance of various foods due to the texture or taste of the food, sensitivity to any food, changes in dietary habits are frequently encountered in children with autism (Arefilaleh, 2021; Çıtar, 2019; Dhaliwal et al., 2019). As a result of these issues, inadequate and imbalanced intake of nutrients, negative effects on the balance of vitamins and minerals such as iron deficiency and inadequate calcium intake, malnutrition, weakening of bones, and consumption of high-sugar and high-fat foods also increase the risk of obesity (Tekkeli, 2021). In addition to nutritional problems, gastrointestinal problems such as chronic constipation, diarrhea, and abdominal pain are also common in most children with autism spectrum disorder. Various nutritional and dietary therapy studies have shown benefits in treating these underlying conditions (Adams et al., 2018; Sanctuary et al., 2019).

There are many dietary treatment options that have been tried and are currently being tried in nutritional and dietary therapies. Some of these treatments include the gluten-free, casein-free diet, the Feingold diet, the ketogenic diet, the elimination allergy diet which eliminates basic allergenic foods, and the supplementation of vitamins, minerals, omega-3, and probiotics. (Döndüren, 2021; Kaynar & Yılmaz, 2020; Yıldırım, 2019). When considering the results obtained from scientific studies, it is seen that physical activity and diet are important for individuals with autism spectrum disorder throughout their lives. The aim of this study is to reveal the effect and importance of physical activity and diet program in adolescence obese individuals with A-typical autism.

METHODS

Research Model

A single-subject research design using a single-case multiple-baseline design was employed. The first step in single-subject designs is to collect and record baseline data (Karasar 2019; Özdamar, 2003; Sarı, 2015; Şata 2020).

Population and Sample

The population of the study consists of atypical autism children between the ages of nine (9) and fourteen (14) living in Isparta province. The sample of the study consists of one (1) child who volunteered to participate in the study. Written consent was obtained from the child's family to perform adapted physical activities and implement a diet program according to the child's needs.

Ethical Approval

Ethics committee approval was received for this study from Süleyman Demirel University Faculty of Medicine Clinical Research Ethics Committee (E- 87432950.50.99-298104, Date:05.07.2022).

Data Collection

The 'Tanita' brand measurement tool was used as the data collection tool for measuring the participant's weight." The weight of the participant was measured using a Tanita scale and recorded during the first week of the study before the diet and physical activity program was given. From the second week onwards, the diet and physical activity program was implemented, and the participant's weight was measured using the Tanita scale before starting the weekly physical activity program. The study lasted a total of seventeen (17) weeks, including the first week when the initial measurements were taken, and sixteen (16) weeks of implementation of the adapted physical activity and diet program.

Implemented Physical Activity and Diet Program

The participant was given an 1800-calorie diet program in the first week of starting the program. When preparing the diet program, information was obtained from the participant's parent regarding the participant's eating habits, the meals served at the school cafeteria, and mealtimes, and a personalized diet program was given to the participant based on their needs. The sample program provided below is a one-day example program. The program was revised and updated based on the participant's weight monitoring and discussions with their parent, and the process continued.

Table 1. 1800 calorie diet program

Breakfast:

1 glass of milk
2 walnuts
Tomato and cucumber
Omlette made from 2 eggs
5 olives
2 slices of white cheese
1 slice of whole wheat bread

Mid-morning Snack: Ten almonds+ One serving of fruit

Lunch:

4 pieces of meatballs
3 tablespoons of rice/pasta
1 glass of buttermilk
2 slices of whole wheat bread
Salad

Afternoon Snack: A cup of yellow chickpeas+ A tablespoon of raisins

Dinner:

1 bowl of soup
6-7 tablespoons of vegetable dish
5 tablespoons of rice/pasta
4 tablespoons of yogurt
1 slice of whole wheat bread
Salad

Evening Snack: One serving of fruit+ A glass of milk

(The changes in the listed foods were explained to the parent and modified according to the participant's preference. For example: Three tablespoon of rice: A slice of bread).

Table 2. Example of a physical activity program

First Week
Ten minutes walk (2 kilometers speed on the treadmill)
Warm up moves (stretching) (5 minutes)
2*20 minutes light pace walking (3.5 kilometres speed on the treadmill)
Stretching movements (5 minutes)

Data Analysis

At the end of the intervention, the data obtained were analyzed by presenting them on a graph. Since there was only one (1) participant in the study, the data obtained over the seventeen (17) week period were converted from a scale protocol to a point score and then transformed into a line graph to demonstrate the changes that occurred (Özdamar, 2003).

RESULTS

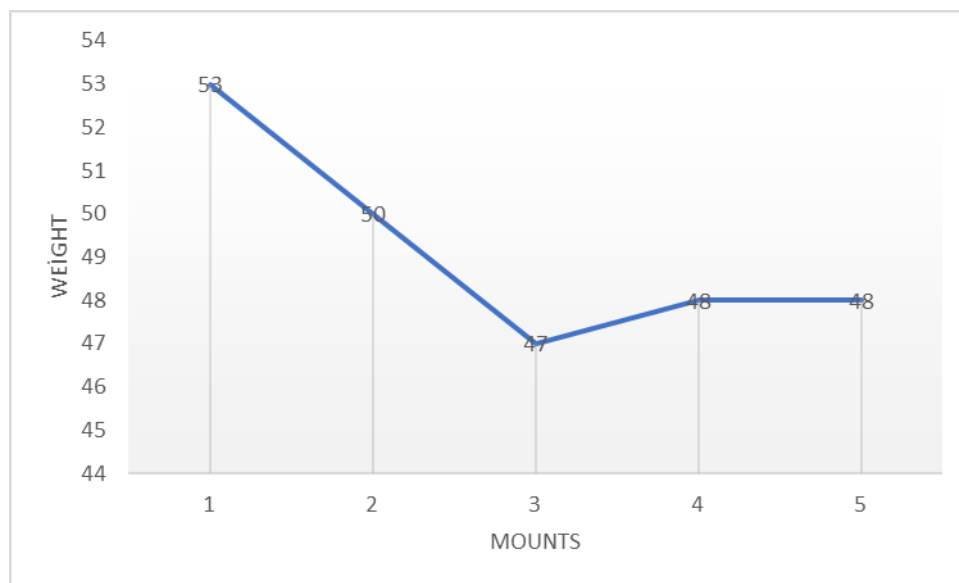


Figure 1. Line graph showing the weekly changes in weight values of the participant.

Looking at Figure 1, significant changes in weight fluctuations of the participant are observed week by week in the research.

DISCUSSION

In this section, the effect of physical activity and diet intervention on adolescents with atypical autism and obesity was investigated and discussed in relation to relevant literature.

When examining Figure 1, a significant change in the participant's weight by weeks can be observed with a five (5) kilograms decrease in body weight due to the physical activity and diet program applied for seventeen (17) weeks. It can be said that factors such as the limited physical activity of the participant to only one (1) day, resistance to abandoning routine eating habits, parental awareness, socio-economic level, and psychosocial factors are planted in the five (5) kilograms weight loss of the individual. Cürebal et al., (2012) state that many issues such as the socio-demographic characteristics of the family, the structural characteristics of the

child, the psychiatric conditions of the parents, and mother-child communication are related to changes in the child's eating habits (Girli et al., 2015).

It can be said that the participant's eating habits were a major factor in their weight loss. In this study, it was observed that not only the participant's eating habits but also the family's eating habits, meal patterns, and lifestyles could affect the participant's nutrition. As the participant had a large family, it was learned from interviews with the mother that she could not always adhere to the special diet program for the child and that the family's meals were organized differently than for the child. As a result, it was found that there were deviations from the mealtimes in the program and that the participant could not consume some of the foods on the diet list at times. Kırçali et al., (2022) conducted a study on *eating behaviors, obesity status, and nutrition-related problems experienced by families of children with autism spectrum disorder (ASD)*. They found that the majority of children with ASD had at least one food they could not consume, and that their nutrition was often influenced by their household. Aponte and Romanczyk (2016) conducted a study to *assessment of feeding problems in children with autism spectrum disorder* and found that the feeding behaviors of siblings affected children with ASD. They noted that if siblings did not like certain foods, children with ASD also refused to eat those foods. It is thought that these situations, as in the case of the participant, also lead to high levels of food selectivity in children with autism spectrum disorder. Limited studies conducted in Turkey confirm that children diagnosed with ASD exhibit food selectivity and refusal behaviors due to this condition (Meral, 2017). Girli et al. (2015), conducted a study to *evaluate the nutritional status of children with autism spectrum disorder* and reported that some of the children with autism are inclined to reject certain foods and new foods. Kaynar and Yılmaz (2020), conducted a study to *determine the nutritional status of children with autism spectrum disorder* and found that a large majority of children between the ages of 7-14 had at least one eating problem, and the most common eating problem was refusing to try new foods. Bandini et al., (2010) conducted a study on *food selectivity in children with autism spectrum disorders and typically developing children*. They stated that children diagnosed with autism exhibited more selective eating compared to typically developing children, which supports the idea presented in the study.

In this study, it was observed that the participant was reluctant to consume beneficial foods such as meat, yogurt, chicken, fish, and vegetables, while preferring packaged foods, pizza, excessive amounts of bread, and rice pilaf. It is thought that this situation may have slowed down the weight loss of the participants. In the study *evaluation of the nutritional status and eating behaviors of children with autism* by Önal (2017), parents stated that most of their children with autism constantly desire to consume unhealthy, high-calorie foods such as chocolate, snacks, chips, and pasta. The same study revealed that the foods the children did not want to consume at all were vegetables, cheese, legumes, and fish. This situation is believed to have potentially slowed down weight loss in the participants. Kaynar and Yılmaz (2020) have reported in their previous study, which was mentioned earlier, that children hardly consume essential foods such as milk, yogurt, red meat, fish, and green leafy vegetables. According to Şengüzel et al. (2020), in their study on *the effect of eating habits and nutrition status on children with autism spectrum disorder*, children were reported to be selective in their consumption of vegetables, fruits, milk, yogurt, and cheese foods. In their study, Raspini et al. (2020) examined *dietary patterns and weight status in Italian preschoolers with autism spectrum disorder and typically developing children*. They found that children with autism spectrum disorders consumed higher amounts of simple sugars and processed foods and lower amounts of proteins, vegetables, and fruits compared to typically developing children. The literature and this study highlight that children with autism spectrum disorder tend to crave and

consume unhealthy foods that are high in sugar and fat, while showing reluctance to consume healthy foods that should be part of their daily diet. These findings can be considered as one of the reasons why children with autism spectrum disorder are prone to obesity.

Another factor that affects weight loss is physical activity. Since the participant was able to engage in physical activity only once a week due to various reasons (such as school hours), it can be said that limiting physical activity to one day has affected the individual's weight loss below the expected values. Despite all these limitations, it has been found that the adapted physical activity and diet program was effective in the participant's weight loss. The physical activity was found to provide physical benefits and contribute to some motor skills such as balance, strength, etc. to the participant. McCoy vd., (2016) conducted a study *comparison of obesity, physical activity, and sedentary behaviors between adolescents with autism spectrum disorders and without*. They found that adolescents with autism spectrum disorder had lower levels of physical activity and higher rates of obesity compared to the other group. In the study *the efficacy of a 9-month treadmill walking program on the exercise capacity and weight reduction for adolescents with severe autism*, Pitetti et al., (2007) reported that a 9-month treadmill walking program resulted in increased walking speed, frequency, and calorie expenditure, as well as decreased body mass index (BMI) in severely obese adolescents with autism. In a study titled *physical activity, dietary habits and overall health in overweight and obese children and youth with intellectual disability or autism*, Hinckson et al., (2013) examined the effects of a physical activity program on nutrition habits and overall health in children and youth with intellectual disabilities or autism. They found an increase in walking distance and a decrease in body mass index and waist circumference. However, they noted that exercise education alone was insufficient in reducing body fat percentage and should be combined with a diet program. Arslan and İnce (2015) conducted a study on *the effects of a 12-week exercise program on gross motor skills in children with atypical autism*. The study found that exercise increased muscle strength in children and had a positive effect on running speed and agility parameters. This supports the literature and parallels the findings of the study. In their study titled *socialization effect of physical activity in students who need special education* İlkim et al. (2018), determined that a 16-week physical activity program positively influenced the socialization of students who need special education. Zhao and Chen (2018), conducted a study to examine the impact of a structured physical activity program on social interaction and communication in children with autism. In their research, they found that a 12-week structured physical activity program positively influenced social interaction and communication skills, rapid response and expressive frequency in children with autism. Yarımkaaya and İlhan (2020), determined in their study that physical activity had positive effects on communication deficits in children with autism.

Köksal and Erciyes (2021) conducted a study on *the assessment of psychosocial problems in families of children diagnosed with autism*. The study revealed that parents, especially mothers, felt weak, unhappy, guilty, helpless, and lonely in terms of their mental health. Similarly, Bendixen et al., (2011) conducted a study *effect of a father-based in-home intervention on perceived stress and family dynamics in parents of children with autism*. They found that there were differences in stress and coping between mothers and fathers, with mothers being more stressed and prone to depression. However, they also found that mothers were more accustomed to the challenges of raising a child with autism due to their role in caregiving and having more frequent contact with the child. In the study *evaluation of the problems and psychological status of families with autistic children* by Top (2009), it was suggested that the

integration of family members was not fully achieved, supporting the results of Köksal and Erciyes (2021). The study also found that the psychosocial status of the participant's parent (mother) influenced their approach due to the disintegrated family structure.

The participant's socioeconomic status is considered as another factor that affects their compliance with the diet and physical activity program. It has been observed that economic reasons are effective in the procurement of some foods in the diet program and the frequency of participation in the physical activity program. İlkım et al., (2021), conducted a study titled evaluation of sports awareness of parents of individuals with autism participating in sports clubs where they suggested that the participation of individuals with autism in sports clubs is influenced by the gender, educational background, personal engagement in sports and interest in sports of their parents. In their study on the experiences of families raising children with autism, Khiavi et al., (2021) stated that the first problem parents brought up was financial issues. In parallel, Yassıbaş (2015) in his study, *in-depth look at the life experiences of parents with children with autism spectrum disorder*, found that half of the participants expressed difficulties in meeting the needs arising from their children's ASD. Similarly, Akkuş et al. (2020), in their study *living with autism spectrum disorder: Experiences of families*, reported that the financial burden created by the interventions required after the diagnosis of ASD and the economic difficulties caused by this situation were expressed by the majority of the participants in their study. Acharya and Sharma (2021) conducted a study on the *lived experiences of mothers raising children with autism in chitwan district, Nepal*, and found that mothers faced economic difficulties in providing regular follow-up, treatment, therapy, and play materials for their children. They pointed out that the lifestyle of the participants and their parents could be influenced by socio-economic factors, supporting the idea that socio-economic factors can affect the lifestyle of the participants and their parents.

CONCLUSION

In conclusion, in the intervention study with physical activity and diet program for atypical autistic obese individuals in adolescence, it has been found that a personalized physical activity and diet program based on individual needs is effective in weight loss. Indeed, considering the benefits of physical activity and healthy eating, it can be said that balanced nutrition and regular and sufficient physical activity can help prevent various health problems, especially obesity, improve social and motor skills, and contribute to physical fitness. It can be emphasized that parents also play a major role in ensuring the individual's nutrition and participation in physical activity.

Suggestions

- Parents should be sufficiently informed about healthy eating and physical activity by experts.
- Considering the socio-economic conditions of parents, a personalized diet program should be prepared by a specialist based on the needs of individuals with autism.
- Low-cost, non-specialized physical activity programs that can be fun for individuals with autism can be prepared to ensure their active participation in physical activity.
- Providing socio-economic and psychosocial support to parents is believed to improve both the quality of life of individuals with autism and their parents.

- It has been found that sufficient resources and studies cannot be accessed when scanning the literature on atypical autism. Contribution to the literature can be made with a wider and more comprehensive study.

Research Limitations

In this study, a single-subject research model was used. In the single-subject research model, a small number of samples can be used. Therefore, the number of samples was limited to one person. In the single-subject research model, since the sample size is not suitable for the presentation of the findings with a table, the representation of the findings is reflected in line graphs.

Conflict of Interest: There are no personal or financial conflicts of interest among the authors regarding the scope of the study.

Authors' Contribution: Study Design; HA, GK –Data Collection; GK –Statistical analysis; HA –Manuscript Preparation; GK, HA.

Ethical Approval

Ethics Committee: Süleyman Demirel University Faculty of Medicine Clinical Research Ethics Committee

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Decision/Protocol number: E- 87432956-050.99-298104

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Investigation of the Relationship Between the Levels of Leisure Time Satisfaction and Passion in Sports Who Exercise Individuals Fitness

Gökhan DOKUZOĞLU¹ , İsa SAĐIROĐLU^{2*} , Ali ÇEVİK³ 

¹Ministry of National Education, Aydın.

²Trakya University, Kırkpınar Faculty of Sports Sciences, Edirne.

³Kilis 7 Aralık University, School of Physical Education and Sport, Kilis.

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Abstract

This study aimed to reveal the relationship between the leisure satisfaction levels of individuals who do fitness exercises and their passion levels in sports. The study group of the research consisted of individuals who did fitness exercises in Aydın in 2023. 259 individuals voluntarily participated in the study. In the study, demographic information was used as a data collection tool in the first part, and in the second part, the "Passion in Sport Scale" developed by Sigmundsson et al., (2020) and adapted into Turkish by Özdayı et al., (2021), and the "Leisure Time Satisfaction Scale" developed by Beard and Ragheb (1980) and adapted into Turkish by Gökçe and Orhan (2011) were used. In statistical terms, frequency analysis, reliability coefficient calculations, pearson correlation analysis, simple regression analysis, t test and anova analysis were performed. There was a statistically significant difference ($p<0.05$) between the variables of leisure satisfaction and weekly exercise duration and sports experience of the participants, and a statistically significant difference was detected between passion in sports and age, weekly exercise time and sports experience variables ($p<0.05$). It has been concluded that individuals who do fitness exercises have a significant and positive effect on their leisure satisfaction.

Keywords: Sport, Leisure time, Satisfaction, Passion.

Fitness Egzersizi Yapan Bireylerin Serbest Zaman Doyum Düzeyleri ile Sporda Tutku Düzeyleri Arasındaki İlişkinin İncelenmesi

Öz

Bu çalışmada amaç, fitness egzersizi yapan bireylerin serbest zaman doyum düzeyleri ile sporda tutku düzeyleri arasındaki ilişkiyi ortaya koymaktır. Araştırmanın çalışma grubunu, 2023 yılında Aydın ili Nazilli ilçesinde fitness egzersizi yapan bireyler oluşturmuştur. Araştırmaya 259 birey gönüllü olarak katılmıştır. Araştırmada veri toplama aracı olarak birinci bölümde demografik bilgiler, ikinci bölümde Sigmundsson ve diğerleri (2020) tarafından geliştirilen ve Türkçe geçerlilik güvenilirliğini Özdayı ve diğerleri (2021) tarafından yapılan "Sporda Tutku Ölçeği" ile Beard ve Ragheb (1980) tarafından geliştirilen, Türkçe geçerlilik güvenilirliği Gökçe ve Orhan (2011) tarafından yapılan "Serbest Zaman Doyum Ölçeği" kullanılmıştır. İstatistiksel açıdan, frekans analizi, güvenilirlik katsayısı hesaplamaları, pearson korelasyon analizi, basit regresyon analizleri, t testi ve anova analizi yapılmıştır. Katılımcıların serbest zaman doyumunu ile haftalık egzersiz süresi ve spor geçmişi değişkenlerinde istatistiksel olarak anlamlı farklılık olduğu ($p<0.05$); sporda tutku ile yaş, haftalık egzersiz yapma süresi ve spor geçmişi değişkenleri arasında istatistiksel olarak anlamlı farklılık olduğu sonucuna ulaşılmıştır ($p<0.05$). Fitness egzersizi yapan bireylerin sporda tutku durumlarının serbest zaman doyumunu üzerinde anlamlı ve pozitif yönde etkisinin olduğu sonucuna ulaşılmıştır.

Anahtar Kelimeler: Spor, Serbest zaman, Doyum, Tutku.

* **Corresponding Author:** Assoc. Prof. İsa Sađırođlu, **E-mail:** isasagiroglu@trakya.edu.tr

INTRODUCTION

In today's western societies, 'fit body' has taken its place as a symbol of strong status and body fitness for both men and women. Fitness centres are also the service areas where individuals have been going to have a fit body in recent years. Fitness centres, which are one of the most important centres of the sports and health sector in Turkey as in the whole world, draw attention as one of the important service areas (Yildiz et al., 2016). There are 2555 fitness centres in Turkey (Yildiz et al., 2021). Fitness exercise is a non-competitive exercise that aims to regulate physical form using different tools (Kayhan et al., 2021). In addition, fitness exercises are among the efforts people make to protect their mental health (Pulur & Gedik, 2021). In addition, people who do fitness exercises continuously and regularly can achieve their goals by motivating themselves (Riseth et al., 2022). In addition, people's performance in sports or exercise activities is affected by many factors. There are both physical and psychological factors that increase or decrease the performance of the individual. In general, the factors that increase the physical capacity of the individual consist of factors such as the training capacity of the individual, sleep patterns, loading, etc., while one of the factors such as motivation, intrinsic motivation, and desire to achieve, which affect psychologically is passion.

Passion is defined as an intense desire or enthusiasm that enables the individual to take action (Sigmundsson et al., 2020). Peterson and Seligman (2004) defined passion as the tendency to devote a lot of time and energy to activities that a person likes and considers important, which enables the person to reach a goal with enthusiasm and power. In this respect, passion can be understood as the energy source that motivates the athlete to maintain commitment and perseverance in any sport (Kovacsik et al., 2020). Passion generally contributes positively to emotion. In other words, the effort, time, and determination to work to achieve success can be explained by passion (Özdayı et al., 2021).

According to Vallerand, passion consists of two dimensions: Compatible passion and obsessive passion (Vallerand et al., 2003). Harmonious passion is a state of emotion that occurs when the person willingly chooses the activity without external factors and the level of liking the activity creates a motivating force for continuity (Stenseng et al., 2011). Obsessive passion occurs when participation in the activity is controlled and internalised and the process is performed due to intrinsic or extrinsic pressures (Vallerand & Miquelon, 2007). Many factors play a role in the formation of a passion for sports. One of these factors is the individual's leisure activities. The fact that both passion and leisure activities are processes that the individual controls with his/her own will plays an important role in the relationship between passion in sports and leisure.

“Leisure is the remaining time period of the work or other activities that an individual has to keep living” (Eskiler et al., 2019). Leisure time is defined as an experience that motivates the individual and is independent of work or other compulsory activities (Leitner & Leitner, 2004). Leisure satisfaction, on the other hand, appears as the positive satisfaction that individuals obtain as a result of their participation in leisure activities (Karlı et al., 2008).

When the literature was examined, although there were many studies on passion in sports and leisure satisfaction, there were no studies examining the relationship between leisure satisfaction and passion in sports. It is thought that our study will contribute to the field by

revealing the levels of passion in sports and passion in sports levels of individuals doing individual fitness exercises.

This study was conducted to reveal the relationship between the leisure satisfaction levels of fitness exercisers and their passion levels in sports. In this part of the study, information about the method was given.

METHOD

Research Model

This research aimed to determine the relationship between fitness participant's leisure satisfaction levels and sports passion levels by using a relational screening model as part of the screening model. The relational screening model was aiming to determine the presence and/or level of change between two or more variables and to specify the relationships between the variables (Büyüköztürk et al., 2014; Karasar, 2015).

Study Group

The study group consisted of 259 individuals, 82 women and 177 men, who did fitness exercises in the Nazilli district of Aydın province in 2023. Simple random sampling method was used in the study.

Data Collection Tools

The questionnaire used to collect the relevant data in the study consisted of three parts. In the first part; demographic information, in the second part; Passion in Sport Scale and in the third part; Leisure Satisfaction Scale were used.

Passion Scale in Sport: The scale, which was developed by Sigmundsson et al., (2020) to measure the participants' level of passion in sport and adapted into Turkish by Özdayı et al. (2021), consisted of 8 items and a single factor. The scale had a 5-point Likert scale ranging from (1) 'Strongly disagree' to (5) 'Strongly agree'. As a result of the Turkish adaptation study, the internal consistency coefficient was calculated as 0.92.

Leisure Satisfaction Scale: The scale, which was developed by Beard and Ragheb (1980) to determine the level of leisure satisfaction of the participants and adapted into Turkish by Gökçe and Orhan (2011), consisted of 24 items and six sub-dimensions. Questions 1-4 of the scale constitute the psychological sub-dimension, questions 5-8 the educational dimension, questions 9-12 the social sub-dimension, questions 13-16 the relaxation dimension, questions 17-20 the Physiological sub-dimension and questions 21-24 the aesthetic sub-dimension. The scale had a 5-point Likert-type rating from (1) Rarely True to (5) Almost Always True. In the Turkish validity and reliability study, the Cronbach Alpha internal consistency coefficient of the scale was in the range of .76 to .80 and the total scale was calculated as .90.

Ethical Approval

This research was conducted by Aydın Adnan Menderes University Institute of Social and Humanities Sciences by providing the necessary permissions with the decision dated 21/03/2023 and numbered 31906847/050.04-08.

Data Collection

The data collection tools of the research were delivered to the participants via Google Drive. Volunteerism was taken as a basis for the participants to fill in the data collection tools. A total of 259 participants were included in the study.

Data Analysis

The data were analysed in SPSS 25.0 package programme. The reliability of the measurement tool was determined with Cronbach alpha. The normal distribution of the data was decided by analysing the kurtosis and skewness coefficients and it was seen that these values were between +2 and -2 and the data were suitable for normal distribution (George & Mallery, 2003). Kalaycı (2010) stated that the kurtosis and skewness coefficients should be between -3 and +3 for the data to be suitable for normal distribution. The relationship between the leisure satisfaction levels of fitness exercisers and their level of passion in sports was determined by the Pearson correlation test. Then, a simple regression analysis was applied to examine the effects. Moreover, frequency analysis and MANOVA analysis were performed statistically. The analyses were performed according to a 95% confidence interval.

RESULTS

Table 1. Demographic Variables

Variables	f	%	
Age	25 years old and younger	99	38.2
	26-30 years old	65	25.1
	31-35 years old	54	20.8
	36 years old and older	41	15.8
Gender	Female	82	31.7
	Male	177	68.3
Weekly exercise frequency	2 days and below	44	17.0
	3-4 days	129	49.8
	5-6 days	70	27.0
	Everyday	16	6.2
Sport experience	1 years and less	24	9.3
	2-4 years	39	15.0
	5-7 years	64	24.7
	8-10 years	28	10.8
	11 years and more	104	40.2
Total	259	100	

The highest rates among the categorical variables of the data obtained in Table 1 were; participants aged 25 years and younger in the age variable (%=38,2), male participants in the gender variable (%=68,3), participants who do sports 3-4 days in the weekly exercise frequency variable (49,8%) and participants with a sports experience of 11 years or more in the sports experience variable (%=40,2).

Table 2. Descriptive values related to scales

Dimension	Cronbach alpha	\bar{x}	SD	Kurtosis	Skewness
Psychological	.753	3.50	.75	-.412	.228
Educational	.865	3.71	.80	-.406	.108
Social	.847	3.71	.79	-.484	-.006
Physiological	.912	4.05	.78	-.923	1.147
Relaxation	.853	3.58	.86	-.475	.034
Aesthetic	.877	3.72	.76	-.166	-.270
LS	.943	3.71	.63	-.371	.309
Passion	.775	4.11	.53	-.727	1.516

LS= Leisure Satisfaction

In Table 2, it was seen that the participants' leisure satisfaction levels were high, and the variable with the highest mean was the physiological dimension ($\bar{x}= 4,05$). At the same time, it was seen that the participants had high levels of passion in sports ($\bar{x}= 4,11$).

Table 3. Pearson correlation analysis results between participants' passion in sport and leisure satisfaction

Dimension		1	2	3	4	5	6	7	8
1- Psychological	r	1							
	p	-							
2- Educational	r	.681**	1						
	p	.000	-						
3- Socil	r	.540**	.676**	1					
	p	.000	.000	-					
4- Physiological	r	.558**	.556**	.567**	1				
	p	.000	.000	.000	-				
5- Relaxation	r	.495**	.528**	.453**	.560**	1			
	p	.000	.000	.000	.000	-			
6- Aesthetic	r	.511**	.543**	.560**	.588**	.474**	1		
	p	.000	.000	.000	.000	.000	-		
7- LS	r	.791**	.838**	.798**	.805**	.749**	.770**	1	
	p	.000	.000	.000	.000	.000	.000	-	
8- Passion	r	.403**	.420**	.370**	.356**	.396**	.388**	.491**	1
	p	.000	.000	.000	.000	.000	.000	.000	-

p<0.05*

Table 3 showed there was a moderately significant and positive relationship between passion in sport and psychological leisure satisfaction (r=0.403), a moderately significant and positive relationship with educational (r=0.420), and a moderately significant and positive relationship with social (r=0.370). Moreover, there was a moderately significant and positive relationship with social (r=0.370).

Table 4. Results of simple regression analysis to analyse the effect of participants' level of passion in sport on leisure satisfaction

Independent Variable	Dependent Variable	R2	F	B	t	p	Durbin Watson
Constant Passion	Psychological	.162	49.802	1.178	3.540	.000	2.130
				.566	7.057	.000	
Constant Passion	Educational	.173	54.963	1.111	3.135	.002	2.151
				.633	7.414	.000	
Constant Passion	Social	.133	40.701	1.445	4.026	.000	2.148
				.552	6.380	.000	
Constant Passion	Physiological	.124	37.390	1.899	5.341	.000	2.013
				.524	6.115	.000	
Constant Passion	Relaxation	.153	47.709	.939	2.432	.016	1.912
				.643	6.907	.000	
Constant Passion	Aesthetic	.147	45.505	1.435	4.194	.000	1.945
				.556	6.746	.000	
Constant Passion	LS	.238	81.775	1.335	5.023	.000	2.094
				.579	9.043	.000	

LS=Leisure Satisfaction

In Table 4, a simple regression analysis was performed to explain the effect of passion in sports on leisure satisfaction. In the models established, it was seen that passion in sports had a significant effect on leisure satisfaction and its sub-dimensions in all variables ($p < 0.05$).

While the effect of passion in sports on psychological satisfaction in leisure satisfaction was explained at 16.2%, a 1 unit increase in passion in sports caused a significant and 0.566 increase ($\beta = .566$) in leisure satisfaction on psychology. While 17.3% of the effect of passion in sport on educational satisfaction in leisure satisfaction was explained, a 1 unit increase in passion in sport caused a significant and 0.633 increase ($\beta = .633$) in educational satisfaction in leisure satisfaction. While the effect of passion in sport on social satisfaction in leisure satisfaction was explained at 13.3%, a 1 unit increase in passion in sport caused a significant 0.552 increase ($\beta = .552$) in the social sub-dimension in leisure satisfaction. While the effect of passion in sports on physiological satisfaction in leisure time satisfaction was explained at 12.4%, a 1 unit increase in passion in sports caused a significant 0,524 increase ($\beta = ,524$) in physiological satisfaction in leisure satisfaction. While the effect of passion in sport on relaxation in leisure satisfaction was explained at 15.3%, a 1-unit increase in passion in sport caused a significant 0,643 increase ($\beta = ,643$) in the relaxation sub-dimension of leisure satisfaction.

Table 5. Anova analysis results of leisure satisfaction and passion in sport by age variable

Dimension	Age	N	\bar{X}	SD	F	p
Psychological	25 years old and younger	99	3.48	.77	.377	.770
	26-30 years old	65	3.54	.68		
	31-35 years old	54	3.43	.77		
	36 years old and older	41	3.58	.78		
Educational	25 years old and younger	99	3.76	.82	1.321	.268
	26-30 years old	65	3.82	.80		
	31-35 years old	54	3.55	.80		
	36 years old and older	41	3.65	.76		
Social	25 years old and younger	99	3.78	.80	1.175	.320
	26-30 years old	65	3.78	.77		
	31-35 years old	54	3.57	.80		
	36 years old and older	41	3.61	.79		
Physiological	25 years old and younger	99	4.07	.78	.129	.943
	26-30 years old	65	4.00	.87		
	31-35 years old	54	4.06	.70		
	36 years old and older	41	4.07	.75		

* $p < 0.05$

Table 5. Anova Analysis Results of Leisure Satisfaction and Passion in Sport according to Age Variable (continued)

Dimension	Yaş	N	\bar{X}	SD	F	P	Bonferonni
Relaxation	25 years old and younger	99	3.69	.86	1.120	.342	-
	26-30 years old	65	3.55	.88			
	31-35 years old	54	3.43	.83			
	36 years old and older	41	3.55	.88			
Aesthetic	25 years old and younger	99	3.64	.79	1.895	.131	-
	26-30 years old	65	3.91	.75			
	31-35 years old	54	3.64	.73			
	36 years old and older	41	3.73	.73			
LS	25 years old and younger	99	3.74	.63	.649	.584	-
	26-30 years old	65	3.77	.63			
	31-35 years old	54	3.61	.60			
	36 years old and older	41	3.70	.64			
Passion	25 years old and younger	99	4.23	.42	3.399	.018	1>3
	26-30 years old	65	4.11	.53			
	31-35 years old	54	3.98	.59			
	36 years old and older	41	4.00	.64			

* $p < 0.05$

In Table 5, as a result of the ANOVA analysis between the participants' leisure satisfaction and passion in sports and the age variable, a statistically significant difference was only detected in the passion in sports variable ($p<0.05$). In the Bonferonni test applied to determine from which group the difference originated, it was concluded that the level of passion in sports of the participants aged 25 and younger was higher than the participants aged 31-35.

Table 6. Independent sample t-test results of leisure satisfaction and passion in sport according to gender variable

Dimension	Gender	n	\bar{X}	SD	t	p
Psychological	Female	82	3.46	.71	-.542	.588
	Male	177	3.52	.76		
Educational	Female	82	3.71	.75	-.025	.980
	Male	177	3.71	.83		
Social	Female	82	3.71	.79	-.038	.969
	Male	177	3.71	.80		
Physiological	Female	82	4.13	.70	1.088	.278
	Male	177	4.01	.82		
Relaxation	Female	82	3.44	.86	-1.807	.072
	Male	177	3.65	.86		
Aesthetic	Female	82	3.85	.78	1.933	.054
	Male	177	3.66	.75		
LS	Female	82	3.72	.58	.082	.935
	Male	177	3.71	.65		
Passion	Female	82	4.04	.55	-1.490	.137
	Male	177	4.14	.52		

* $p<0.05$

In Table 6, no statistically significant difference was detected in any variable as a result of the t-test between the participants' leisure satisfaction and passion in sports and gender variable ($p>0.05$).

Table 7. Anova analysis results of leisure satisfaction and passion in sport according to weekly exercise duration variable

Dimensions	Weekly leisure	N	\bar{X}	SD	F	p	Bonferonni
Psychological	¹ 2 days and below	44	3.25	.61	4.754	.003	4>1,2
	² 3-4 days	129	3.49	.74			
	³ 5-6 days	70	3.56	.78			
	⁴ Everyday	16	4.04	.73			
Educational	¹ 2 days and below	44	3.34	.71	6.553	.000	2,4>1 4>3
	² 3-4 days	129	3.76	.77			
	³ 5-6 days	70	3.71	.87			
	⁴ Everyday	16	4.31	.62			
Social	¹ 2 days and below	44	3.40	.85	3.502	.016	2,4>1
	² 3-4 days	129	3.79	.69			
	³ 5-6 days	70	3.69	.84			
	⁴ Everyday	16	4.03	1.02			
Physiological	¹ 2 days and below	44	3.73	.76	6.859	.000	3,4>1
	² 3-4 days	129	4.03	.76			
	³ 5-6 days	70	4.13	.79			
	⁴ Everyday	16	4.71	.45			

* $p<0.05$

Tablo 7. Anova analysis results of leisure satisfaction and passion in sport according to weekly exercise duration variable (continued)

Dimensions	Weekly leisure	N	\bar{X}	SD	F	P	Bonferonni
Relaxation	¹ 2 days and below	44	2.99	.75	13.423	.000	2,3,4>1
	² 3-4 days	129	3.59	.83			
	³ 5-6 days	70	3.77	.80			
	⁴ Everyday	16	4.32	.80			
Aesthetic	¹ 2 days and below	44	3.31	.73	7.871	.000	2,3,4>1
	² 3-4 days	129	3.76	.72			
	³ 5-6 days	70	3.78	.74			
	⁴ Everyday	16	4.28	.86			
LS	¹ 2 days and below	44	3.34	.56	10.919	.000	2,3,4>1
	² 3-4 days	129	3.74	.59			
	³ 5-6 days	70	3.77	.64			
	⁴ Everyday	16	4.28	.50			
Passion	¹ 2 days and below	44	3.82	.49	11.514	.000	3,4>1
	² 3-4 days	129	4.05	.56			
	³ 5-6 days	70	4.33	.38			
	⁴ Everyday	16	4.39	.46			

* p<0.05

Table 7 showed a statistically significant difference between leisure satisfaction and all sub-dimensions of leisure satisfaction and passion in sport, as well as passion in sport (p<0.05) as a result of the ANOVA analysis between the participants' leisure satisfaction and passion in sport and the weekly leisure. As a result of the Bonferonni test applied to determine from which group the difference originated, it was revealed that the psychological satisfaction levels of the participants who do sports every day in the psychological satisfaction sub-dimension were higher than the participants who do sports 2 days or less and 3-4 days a week.

In the educational satisfaction sub-dimension, the educational satisfaction levels of the participants who do sports 3-4 days a week and every day were higher than the participants who do sports 2 days a week or less, and the educational satisfaction levels of the participants who do sports every day were higher than the participants who do sports 5-6 days a week.

In the social satisfaction dimension, the social satisfaction levels of the participants who do sports 3-4 days a week and every day were higher than the participants who do sports 2 days a week or less. In the physiological satisfaction dimension, the physiological satisfaction levels of the participants who do sports 5-6 days a week and every day were higher than the participants who do sports 2 days a week or less.

In the dimension of relaxation, it was revealed that the relaxation satisfaction levels of the participants who did sports 3-4 days, 5-6 days and every day a week were higher than the participants who did sports 2 days a week or less, and the relaxation satisfaction levels of the participants who did sports every day were higher than the participants who did sports 3-4 days a week. In the aesthetic satisfaction dimension, it was found that the aesthetic sub-dimension levels of the participants who did sports 3-4 days, 5-6 days and every day a week were higher than the participants who did sports 2 days a week or less.

In the total score of leisure satisfaction, it was revealed that the satisfaction levels of the participants who did sports 3-4 days, 5-6 days and every day per week were higher than the participants who did sports 2 days or less per week and the satisfaction levels of the participants who did sports every day were higher than the participants who did sports 5-6 days per week.

In the variable of passion in sports, the satisfaction levels of the participants who did sports 5-6 days a week and every day were higher than the participants who did sports 2 days a week or

less, and the satisfaction levels of the participants who did sports every day were higher than the participants who did sports 3-4 days a week.

Table 8. Anova analysis results of leisure satisfaction and passion in sport according to sport experience variables

Dimensions	Experience	N	\bar{X}	Sd	F	p	Bonferonni
Psychological	¹ 1 years and less	24	3.32	.89	4.027	.003	5>3
	² 2-4 years	39	3.50	.62			
	³ 5-7 years	64	3.24	.83			
	⁴ 8-10 years	28	3.59	.75			
	⁵ 11 years and more	104	3.68	.65			
Educational	¹ 1 years and less	24	3.43	.84	2.647	.054	-
	² 2-4 years	39	3.71	.69			
	³ 5-7 years	64	3.52	.84			
	⁴ 8-10 years	28	3.84	.91			
	⁵ 11 years and more	104	3.85	.75			
Social	¹ 1 years and less	24	3.40	.93	1.724	.145	-
	² 2-4 years	39	3.85	.72			
	³ 5-7 years	64	3.65	.77			
	⁴ 8-10 years	28	3.61	.87			
	⁵ 11 years and more	104	3.80	.77			
Physiological	¹ 1 years and less	24	3.54	1.05	3.699	.006	4,5>1
	² 2-4 years	39	4.02	.69			
	³ 5-7 years	64	4.00	.81			
	⁴ 8-10 years	28	4.18	.76			
	⁵ 11 years and more	104	4.18	.69			
Relaxation	¹ 1 years and less	24	2.90	.94	5.826	.000	3,4,5>1
	² 2-4 years	39	3.44	.90			
	³ 5-7 years	64	3.58	.78			
	⁴ 8-10 years	28	3.91	.73			
	⁵ 11 years and more	104	3.70	.84			
Aesthetic	¹ 1 years and less	24	3.32	.96	2.018	.092	-
	² 2-4 years	39	3.80	.71			
	³ 5-7 years	64	3.72	.67			
	⁴ 8-10 years	28	3.85	.72			
	⁵ 11 years and more	104	3.75	.78			
LS	¹ 1 years and less	24	3.32	.73	3.982	.004	4,5>1
	² 2-4 years	39	3.72	.53			
	³ 5-7 years	64	3.62	.63			
	⁴ 8-10 years	28	3.83	.62			
	⁵ 11 years and more	104	3.83	.60			
Passion	¹ 1 years and less	24	3.79	.59	3.720	.006	3,5>1
	² 2-4 years	39	3.97	.48			
	³ 5-7 years	64	4.15	.50			
	⁴ 8-10 years	28	4.20	.54			
	⁵ 11 years and more	104	4.19	.52			

* p<0.05

In Table 8, as a result of the ANOVA analysis between the participants' leisure satisfaction and the sports experience variable, a statistically significant difference between psychological satisfaction, physiological satisfaction, relaxation, scale total score and passion in sports and sports experience variable (p<0.05). As a result of the Bonferonni test applied to determine from which group the difference originated, it was found that the psychological satisfaction levels of the participants with a sports experience of 11 years or more in the psychological satisfaction sub-dimension were higher than the participants with a sports experience of 5-7 years; in the physiological satisfaction sub-dimension, the physiological satisfaction levels of the participants with a sports experience of 8-10 years and 11 years or more were higher than the participants with a sports experience of 1 year or less; In the relaxation dimension, the relaxation levels of the participants with 5-7 years, 8-10 years and 11 years and above sports experience were higher than the participants with 1 year and below sports experience; in the

total score of leisure satisfaction. Moreover, the leisure satisfaction levels of the participants with 8-10 years and 11 years and above sports experience were higher than the participants with 1 year and below sports experience; in the level of passion in sports, the relaxation levels of the participants with 5-7 years and 11 years and above sports experience were higher than the participants with 1 year and below sports experience.

DISCUSSION AND CONCLUSION

This study aimed to reveal the relationship between leisure satisfaction levels and passion in sports levels of individual fitness exercisers. When the literature on fitness exercise and the fitness sector is examined; Lichtenstein et al., (2017) conducted a study on a total of 577 people exercising in fitness centers. They found the average age of the participants to be 26.7. Başaran et al., (2019) examined exercise addiction, happiness and life satisfaction of fitness center members in terms of personal characteristics. As a result of the study, while there was no statistically significant difference between age and happiness, they found a statistically significant difference between age and exercise and life satisfaction. According to age; As a result of the analysis carried out in order to determine from which age group the difference between exercise and life satisfaction originates; they stated that the exercise addiction of people in the 18-25 age group is higher than the 36-45 age group and 46-55 age group. Yetiş et al., (2019) conducted a study to determine the motivation levels of individuals exercising in fitness centers. As a result of the research, they found a significant difference between the age variable and the scale of motivation in sports, except for the dimension of identification. In the sub-dimension of motivation with stimulus and external regulation of the participants, they stated that the motivation scores of people in the 29-39 age group were higher than those in the 18-28 age group. Güzel et al., (2020) carried out a study to examine the impact of motivational factors that influence recreational exercise participation on fitness center participants. They found a significant difference between the study's age variable and all the subdimensions of the exercise motivation survey. Participants aged 17 to 25 were found to have higher mean scores for exercise motivation in terms of health, competitiveness, body and appearance, social and entertainment, and skill development compared to other age groups, while participants aged 36 and over had the lowest average scores.

When the levels of passion in sports and leisure satisfaction of the participants in terms of age variable were analysed, no significant difference was found in the sub-dimensions of the leisure satisfaction scale except the passion in sport scale. There were many studies supporting this result of our research. Sicilia et al., (2018) investigated exercise motivational regulations and exercise addiction: the mediating role of passion. They revealed the presence of a significant relationship between the passion scale and age. Kovacsik et al., (2019) investigated the role of passion in exercise addiction, exercise volume and exercise intensity in long-term exercisers. As a result; they found that there was a significant difference between the passion scale and age. Besides, De Jonge et al., (2020) examined the regulatory role of running passion in mental recovery and running-related injuries in recreational runners. As a result of the study, they stated a significant difference between the age variable and the passion scale. Lichtenstein et al., (2020) conducted a research edition, on obsessive passion and nutritional supplement use in fitness centre participants. At the end of the study, they stated that there was a significant

difference between the passion scale and the age variable. Gu et al., (2022) examined the relationships between adaptability, passion and mental toughness in Chinese team sports athletes. As a result, they found a significant difference between the age variable of the athletes and the passion scale in sports. Çakır (2017) found that there was no significant difference between all sub-dimensions of the leisure satisfaction scale and the age variable. However, De La Vega et al., (2016) investigated exercise addiction in athletes and leisure-time athletes: the regulatory role of passion. At the end of the research, they did not find a significant difference between the age variable of athletes and leisure-time athletes and the passion scale. Bae (2022) investigated the happiness levels and leisure life satisfaction levels of individuals for participation in sports and leisure activities. A significant difference was found between the age variable of the study and the leisure satisfaction scale. In particular, it was stated that participants in their 20s had higher leisure satisfaction than those in their 10s and 60s, and those in their 30s, 40s and over 70s had higher leisure satisfaction than those in their 60s. These results do not match the results of our study. The reason for the significant difference between the age variable and the leisure satisfaction scale may be thought to be due to the variability of the group and activity type in which the study was applied.

Başaran et al., (2019) found a statistical difference between the gender variable and life satisfaction of the members of the fitness center. They found that there was no gender-related difference between happiness and exercise addiction. While exercise addiction is higher in men than in women, life satisfaction is higher in women than in men. They stated that their happiness levels were at the same level. Riseth et al., (2019) conducted a study on people who are members of long-term fitness centers. Among the reasons women and men practice fitness, they concluded that health benefits and physical appearance are the main reasons. Bahçıvan (2020) investigated the relationship between exercise addiction, life satisfaction and mental endurance levels of individuals exercising in fitness centers. The study found that there was a statistically significant difference between participants' gender-based exercise dependency in all subdimensional scores, and accordingly, the average scores of male participants in all lower dimensions were higher than those of female participants. Bueno-Antequera et al., (2020) conducted a study examine that the relationship between exercise addiction and health outcomes in exercise bike practitioners in fitness centers. As a result of the study, they found that men are at greater risk of high-exercise addiction than women. Güzel et al., (2020) found that the fundamental effect on all sub-dimensions of the exercise motivation survey with the gender variable was significant. They found that the mean scores of men were higher than the mean scores of women.

In terms of gender variables, no significant difference was found in the sub-dimensions of the passion in sport scale and leisure satisfaction scale when the participants' passions in sport and leisure satisfaction levels were examined. Some studies were in parallel with the result of our study. De La Vega et al., (2016) investigated exercise addiction in athletes and leisure-time athletes: the regulatory role of passion. At the end of the research, they could not detect a significant difference between the gender variable of athletes and leisure-time athletes and the passion scale. Kovacsik et al., (2019) investigated the role of passion in exercise addiction, exercise volume and exercise intensity in long-term exercisers. As a result, they found that there was no significant difference between the passion scale and gender. Lichtenstein et al., (2020) researched exercise addiction, obsessive passion, and nutritional supplement use in

fitness centre participants. At the end of the study, they stated that there was no significant difference between the passion scale and the gender variable. De Jonge et al., (2020) examined the regulatory role of running passion in mental recovery and running-related injuries in recreational runners. As a result of the study, they stated that there was no significant difference between the age variable and the passion scale. Tian et al., (2020) investigated the role of leisure satisfaction in serious leisure and subjective well-being in Chinese marathon runners. In the study, they did not find a significant difference between leisure satisfaction and gender variable. Yoo (2022) investigated the effect of attitude towards leisure on the level of satisfaction and happiness in leisure activities in Korean carers. While there was no significant difference between male and female groups, it was found that attitude towards leisure had a strong effect on the level of satisfaction and happiness in leisure activities. Bae (2022) conducted a study on the happiness levels and leisure life satisfaction levels of individuals for participation in sports and leisure activities and stated that there was no significant difference between gender variables and leisure satisfaction. Contrary to these results, some studies disagree with our study. Szabo et al., (2022), in their study on the dimensions of passion and their relationship with the risk of exercise addiction, found a weak relationship between the gender variable and the passion scale. Gu et al., (2022) examined the relationships between adaptability, passion, and mental toughness in Chinese team sports athletes. As a result, they stated that there was a significant difference between the gender variable of the athletes and the passion scale in sports. Çakır (2017) found that there was a significant difference between all sub-dimensions of the leisure satisfaction scale and gender variable and that female participants experienced a higher level of leisure satisfaction than male participants. Doğan et al., (2019) found a significant difference only between the relaxation sub-dimension of leisure satisfaction and gender in their study. Ahn and Song (2021) conducted a study on the differences between leisure activity models for adults in leisure satisfaction. As a result of the study, they stated that there was a significant difference between the gender variable and the leisure satisfaction scale. They also stated that males had higher levels of leisure satisfaction than females. Regarding this result of our study, it can be thought that the gender factor was not important in determining the passion and leisure satisfaction levels of individuals in sports and that people's orientation towards sports and leisure activities varies according to their needs.

In their study, Lichtenstein et al., (2017) found that most individuals who exercise in fitness centers participate in 8-11 hours of fitness exercise a week. They also found that a higher risk of exercise addiction was associated with more weekly exercise duration. They stated that 80.6% of those with a high risk of addiction exercise 8 hours or more per week. Bahçivan (2020) found that there was a statistically significant difference in the weekly exercise frequency variable of the participants and in all sub-dimension scores of exercise addiction. He stated that in all sub-dimensions, those who exercise 4-6 times a week and every day of the week have a higher average score than those who exercise 1-3 times a week. In their study, Bueno-Antequera et al., (2020) found that there is a highly significant relationship between the weekly training hours variable of female cycling practitioners and the exercise addiction scale.

When the passion in sports and leisure satisfaction levels of the participants were analysed in terms of weekly exercise time, a significant difference was found in the sub-dimensions of passion in sports scale and leisure satisfaction scale. There were studies in the literature in parallel to the result of our research. Sicilia et al., (2018) investigated the mediating role of

passion in exercise motivation regulations and exercise addiction. They found a significant relationship between the passion scale and exercise duration. Kovacsik et al., (2019) investigated the role of passion in exercise addiction, exercise volume and exercise intensity in long-term exercisers. As a result, they found that there was a strongly significant difference between the passion scale and exercise duration. Lichtenstein et al., (2020) researched exercise addiction, obsessive passion and dietary supplement use in fitness centre participants. At the end of the study, they stated that there was a significant difference between the passion scale and exercise duration. In the study conducted by Çakır (2017), it was reported that there was a significant difference between all sub-dimensions of the leisure satisfaction scale and the weekly duration of participation in leisure activities. In particular, the scores of those who participate in leisure activities between 1-5 hours were higher than the others. Özgür (2021) found a positive and low significant relationship between the weekly exercise duration variable and the relaxation sub-dimension of leisure time. On the other hand, De La Vega et al., (2016) investigated exercise addiction in athletes and leisure athletes: the regulatory role of passion. At the end of the research, they stated that there was no significant difference between the weekly exercise time variable and the passion scale of athletes and leisure-time athletes. Szabo et al. (2022), in their study on the dimensions of passion and their relationship with the risk of exercise addiction, found that there was a weak relationship between the weekly exercise amount variable and the passion scale. Kwon et al., (2021) examined the effect of leisure facilitation and specialisation in recreation on the leisure satisfaction of outdoor sports participants. In the study, they found that participants with 1 hour or less in terms of activity duration were higher. This result of our study can be interpreted as weekly exercise duration is an important variable in terms of passion in sports and leisure time satisfaction level.

In their study, Yetiş et al., (2019) found no difference in the sub-dimensions of identification and unmotivation between the variable of the number of years of doing sports of individuals participating in fitness exercises and the scale of motivation in sports, while they found significant differences in other sub-dimensions. In the sub-dimensions of knowing and achieving, those who do sports for 4-6 years get higher scores than those who do sports for 1-3 years; In the sub-dimensions of external regulation and introjection, they found that those who do sports for 4 years or more achieve higher scores than those who do sports for 1-3 years. In their study, Riseth et al., (2019) found that people who exercised in fitness centers had more experience over a period of 2 to 5 years. Güzel et al., (2020) stated that the exercise duration variable and the main effect of the exercise motivation survey on all sub-dimensions except the "competition" sub-dimension were significant. It was found that the participants who participated in the exercise for 24 months or more had higher mean scores for the "body and external appearance" and "physical development" sub-dimensions; Participants who attended in the "health" sub-dimension between 6 and 12 months had the highest average score; In the "social and entertainment" sub-dimension, they found that participants who participated less than 1 month had it. Hazar and Özpolat (2023), in their study, examined the social appearance anxiety, life satisfaction and exercise addiction levels of fitness individuals according to some variables. They found that there was a positive and statistically significant relationship between the participants' duration of doing sports and their exercise addiction.

When the passion in sport and leisure satisfaction levels of the participants in terms of sports experience were examined, a significant difference was found in the total score of the passion

in sport scale and leisure satisfaction scale and in the psychological, physiological and relaxation sub-dimensions. There were similar study results to the results of our research. Konter et al. (2020), in their study examining the relationship between passion and courage in experienced male football players, found that football players with more experience had higher levels of passion. In a study conducted by Özgür (2021), a low positive relationship was found between the year of exercise variable and the aesthetic and physiological sub-dimensions of leisure. Kwon et al. (2021), in their study on the effect of facilitating leisure and specialisation in recreation on leisure satisfaction of outdoor sports participants, found that those with a sports experience of 1-3 years tended to participate in leisure time activities. From this result of our research, it can be concluded that the fact that the sports experience based on long years was important in affecting the passion and leisure satisfaction levels of individuals in sports.

As a result, it was concluded that passion in sport has a significant and positive effect on the leisure satisfaction of fitness exercisers.

SUGGESTIONS

By changing the sample group, the relationship between passion in sports and leisure satisfaction can be analysed. The relationships between the groups can be compared by adding occupational characteristics to the demographic information.

Conflict of Interest: There was no personal or financial conflict of interest in the study.

Declaration of Contribution Ratio of Researchers: Research Desing-GD, A; Data Collection- GD, İS; Analyzes-GD; Preparation of the article- İS, GD, A.

Ethical Approval

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The Investigation of the Effect of 8-Week Walking Football Activity on Life Satisfaction and Heart Rate Variability in Elderly Men

Ülküm ERDOĞAN YÜCE^{1*} , Özcan SAYGIN² 

¹Muğla Sıtkı Koçman University, Health Sciences Institute, Muğla.

²Muğla Sıtkı Koçman University, Sports Science Faculty, Muğla.

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Abstract

The aim of the study was to examine the effect of walking football applied to elderly male sedentary individuals on life satisfaction and heart rate variability. 22 male volunteers whose physical activity level was determined by International Physical Activity Questionnaire (IPAQ) were included to this study. Volunteers were divided into 11 exercise groups and 11 control groups by random sampling. While the control group had no activity participation, the exercise group performed a 20-minute warm-up, they played 60 minutes of walking football, and they performed a 10-minute cool down. This was done 2 days a week across an 8-week period. In the study, the Life Satisfaction Scale (LSS) was used in the exercise and control groups, Heart Rate (HR), Heart Rate Variability (HRV), heart-mind coherence, maximum heart-mind coherence measurements were applied with the Heartmath-Inner Balance device. "Paired t test" was used for analyzing pretest-posttest differences in variables while "Independent t test" was used for analyzing differences between the groups. Findings show that there was a significant difference between the exercise group's HRV, heart-mind coherence, maximum heart-mind coherence, and pre-post test measurements of the LSS results ($p < 0.05$), although there was no significant difference in the HR variable ($p > 0.05$). No significant difference was found between the pre-test and post-tests mean comparison of all variables of the control group ($p > 0.05$). According to the results, it can be concluded that walking football has a positive effect on life satisfaction, HRV, heart-mind coherence, and maximum heart-mind coherence in older adults.

Keywords: Senior adult, Heart rate variability, Life satisfaction, Walking football

İleri Yaş Erkeklerde 8 Haftalık Yürüyüş Futbolu Etkinliğinin Yaşam Doymu ve Kalp Atım Hızı Değişkenliği Üzerine Etkisinin İncelenmesi

Öz

Bu çalışmanın amacı, ileri yaş erkek sedanter bireylere uygulanan yürüyüş futbolunun, yaşam doymu ve kalp atım hızı değişkenliğine etkisini incelemektir. Çalışmaya Uluslararası Fiziksel Aktivite Düzeyi Anketi (UFAA) uygulanarak, fiziksel inaktivitesi tespit edilen gönüllü 22 erkek katılmıştır. Tesadüfi örneklem yolu ile seçilmiş inaktif olduğu tespit edilen gönüllülerin, 11'i kontrol, 11'i deney grubu olacak şekilde ayrılmıştır. Deney grubuna 8 hafta boyunca, haftada 2 gün 20 dk., ısınma, 60 dakika yürüyüş futbolu ve 10 dakika soğuma olacak şekilde 90 dakika uygulanan etkinlik, kontrol grubuna uygulanmamıştır. Araştırmaya deney ve kontrol grubuna Yaşam Doymu Ölçeği (YDÖ) uygulatarak başlanmıştır. Heartmath-Inner Balance cihazı ile Kalp Atım Hızı (KAH), Kalp Atım Hızı Değişkenliği (KAHD), kalp-zihin uyum, maksimum kalp-zihin uyum ölçümleri gerçekleştirilmiştir. Çalışmanın analizinde çalışma öncesi ve sonrası farkın olup olmadığı grup içi "Paired t testi"; gruplar arası farkın olup olmadığı ise "Independent t testi" kullanılarak belirlenmiştir. Analiz bulgularına göre, deney grubunun KAHD, kalp-zihin uyum, maksimum kalp-zihin uyum, YDÖ sonuçları ön-son test ölçümleri arasında anlamlı bir farklılık görülürken ($p < 0,05$), KAH değişkeninde, anlamlı bir farklılık olmadığı görülmüştür ($p > 0,05$). Kontrol grubu tüm değişkenlerinin ön-son test karşılaştırmasında ise anlamlı bir farka rastlanmamıştır ($p > 0,05$). Sonuç olarak, yürüyüş futbolunun, ileri yaş yetişkinlerde yaşam doymu, KAHD, kalp-zihin uyum, maksimum kalp-zihin uyuma olumlu etki ettiği söylenebilir.

Anahtar Kelimeler: İleri yaş yetişkin, Kalp atım hızı değişkenliği, Yaşam doymu, Yürüyüş futbolu

* **Corresponding Author:** Ülküm ERDOĞAN YÜCE, **E-mail:** ulkumyuce34@gmail.com

INTRODUCTION

It is a fact that life expectancy increases with the advancement of technology and the innovations of science in the field of health. As life expectancy increases, it becomes important for individuals to lead a more comfortable life and to continue their daily lives in a healthy and active manner. Advancing age not only causes physical disabilities but also can cause non-communicable diseases in the organism (World Health Organization, 2012). At the same time, many metabolic changes occur with the aging process (Zorba & Saygın, 2009). Environmental factors and individual differences also play an important role in this period (World Health Organization, 2012). The increase in the elderly population, especially in our country, creates a need for research on this age group.

WHO (World Health Organization) defines the age scale as middle age between the ages of 45-64, old age between the ages of 65-74, very old age between the ages of 75-89, while the age of 90 and over is considered as advanced old age. Physical activity is important and necessary for increasing functionality, prolonging life expectancy and maintaining a comfortable and peaceful life at these ages (Loadman, 2019). In addition, there are studies on the effect of exercise on balance and fear of falling to increase quality of life (İrez, 2014). It is thought that walking football, which includes physical activity that older adults can tolerate and whose foundations were laid in England, started to be implemented rapidly in Europe and Australia, is also beneficial in terms of group movement, well-being and socialization (Loadman, 2019). Walking football is an emerging modified sport gaining recognition globally (Corepal et al., 2020). Walking football is a type of football which was first introduced in the UK in 1932 for players aged 65+. It was aimed at both providing greater exercise and social communication opportunities. Nowadays, it is rapidly gaining worldwide popularity, particularly in Europe and Australia (Strijcker & Calder, 2017).

It is an activity that can be performed by people who, regardless of gender, have more physical difficulties due to advanced age. It can be played on an indoor or outdoor field and it has a smaller size than a football field. In walking football, participants are only allowed to walk throughout the match and one foot is always in contact with the ground. In order to avoid injuries during this sport, no physical contact or interference is allowed between the players and the ball must not be above head height. The intensity of this sport depends on the duration of each match session and the age of the volunteers (Zainudin et al., 2021).

According to the "Rating of Perceived Exertion scale" (RPE), which is determined by the intensity of the exercise applied in walking soccer, which is determined according to the degree of strain of the body, it is an aerobic exercise that will speed up the breathing of each participant without impairing their speech and make them sweat after 10 minutes.

Adults over 55 are less likely to participate in exercise, despite research suggesting that older adults gain health benefits when participating in physical activity. There have only been a few studies done that focus on the long-term maintenance of activity participation in older adults, particularly in "adapted sports" such as walking football. It is predicted that individuals with chronic diseases and disabilities can also benefit from this sport and get rid of inactivity (Reddy et al., 2017). The literature shows that exercise and physical activity have a positive

effect on increasing the living standards of the individual physically, physiologically and psychologically (Özdil & Aktaş, 2016).

Our study examined the effect of walking football applied to elderly sedentary male individuals in our country on life satisfaction and heart rate variability. This study will contribute to the literature considering that there is no activity that has been applied before in our country, the number of scientific studies in this field, and the increase in the physical activity levels of older adults, and the support it will provide in psychological terms as well as physical benefits.

METHOD

Research Model

The study was applied to the exercise group as 20 minute warm-ups, 60 minutes walking football and 10-minute cool down exercises, two days a week across an 8-week period. Participants were made physically ready by having warm-up exercises before the study. Two teams of five athletes all played during ten minute periods with 5 minute rests. In the study, the exercise intensity was decided according to the "Rating of Perceived Exertion Scale" (RPE). In the walking football event, within the rules, care has been taken to ensure that the ball does not exceed the height of the athlete's heads, one of their feet is always in contact with the ground, they are not close to each other so they do not interfere with each other, and they are only allowed to walk. While paying attention to following the rules, it was also important for the older adults to enjoy playing the game. At the end of the activity, stretching exercises were done and it was completed with breathing exercises. While the experimental group was exercising, no activity was performed by the control group.

Research Groups

The 22 individuals who were determined to be inactive and took the Physical Activity Level Questionnaire (IPAQ) participated in the study voluntarily. The volunteers selected by random sampling were divided into two groups, 11 in the control group and 11 in the experimental group. The necessary information was given to the participants and their permission was obtained.

Ethical Approval

Muğla Sıtkı Koçman University Medical and Health Sciences Ethics Committee-2 (Sports-Health), Decision number: 2022/110.

Data Collection Tools

International Physical Activity Questionnaire (Short form-IPAQ) is a measurement tool used to determine the physical activity levels and inactivity status of adults. The international validity and reliability study of the questionnaire was carried out by Craig et al., (2003). Öztürk et al., (2005) performed the Turkish validity and reliability study as a criterion in IPAQ-S, it is important to do physical activities for at least 10 minutes at a time. In this

survey, duration of vigorous physical activity, duration of moderate physical activity, duration of walking and sitting during one day across the last 7 days were questioned. According to this Questionnaire, the total weekly physical activity level (MET/hour/week) is classified as low ($x \leq 600$ MET-minutes/week), medium and high ($x \geq 600-3000$ MET-minutes/week (Craig et al., 2003).

Life Satisfaction Scale (LSS): This scale was developed by Neugarten et al., in 1961 in order to understand the perspective of elderly individuals in various aspects of life and how they perceive themselves and their environment (Neugarten et al., 1961). It is easy to use, it consists of 20 short, practical and single-point scale questions. The answers received by using the "yes" or "no" options in the statements were evaluated over 20 points. A high score was interpreted as a high life satisfaction. While each item reflects a score of "1" in the life satisfaction scale, some of the statements (3, 5, 7, 10, 14, 17, 18, 20) should be answered with "no". The adaptation of the scale in Turkey, internal reliability, content and construct validity studies were carried out by Karataş (1988). The reliability coefficient of the scale was determined as .93 (Özer & Özsoy-Karabulut, 2003).

Inner Balance (Heart Mathematics and Mind Coherence device): The "Inner Balance" Heart Mathematics and Mind Coherence device used in the research was used for heart rate (HR), heart rate variability (HRV), heart-mind and maximum heart-mind coherence measurements. This device, which gives feedback to the person about their body systems, is important in terms of teaching the individual how to change these systems later (Moss & Andrasik, 2008). This technology was invented to increase emotional well-being. It offers the opportunity to control heart rate variability for psychological adjustment.

It conveys information about the coherence and situation between the mind, emotions and body with scientific data. This device is used for measuring how our emotional state affects the nervous system and heart rhythm. It is known that this device, which is used on athletes in the field of sports and has an effect on increasing performance, is also recommended by psychologists in terms of being fit in the stress and intensity of daily life (HeartMath Institute, n.d.).

Collection of Data

In order to obtain the physical activity levels of individuals before starting the study, IPAQ-short form was used, after determining physical activity levels, a total of 22 participants were selected randomly from inactive participants. They divided into experimental (11) and control groups (11). As a pre-post test, HR, HRV, heart-mind coherence and maximum heart-mind coherence measurements, the Life Satisfaction Scale (LSS) and the "Inner Balance" Heart Mathematics and Mind Matching device measurements were taken and recorded.

Analysis of Data

SPSS (version 20) program was used in the analysis of the data. The Shapiro-Wilk test was applied to determine whether the data showed a normal distribution. Independent t-test analysis was used for intergroup comparison and paired t-tests were used for pre-post-test comparisons. $p < 0.05$ was accepted as statistically significant.

RESULTS

The mean age, LSS, HR, heart-mind coherence, maximum heart-mind coherence pre-test and post-test results of the exercise and control groups are presented in the tables below.

Table 1. Demographic information of the participants

Age	N	M ± SD
Experimental Group	11	68.18 ± 8.40
Control Group	11	67,64 ± 5,14

According to Table 1, the mean age of the exercise group is 68.18 ± 8.40 , and the control group is 67.64 ± 5.14 .

Table 2. Normal distribution analysis (Shapiro-wilk test) results of experimental and control groups

Variables	Groups	Statistics	N	p
HR (min)	Experimental	0,915	11	,278
	Control	0,972	11	,908
Heart-Mind Coherence (ms)	Experimental	0,919	11	,314
	Control	0,951	11	,651
Max. Heart-Mind Coherence(ms)	Experimental	0,891	11	,143
	Control	0,928	11	,395
LSS	Experimental	0,938	11	,502
	Control	0,930	11	,409

According to Table 2, it is seen that the variables show normal distribution of Shapiro-Wilk test results of the experiment and control groups.

Table 3. Experiment and control groups pre-test independent t-test results

Variables	Experimental Group		Control Group		
	M ±SD	N	M ± SD	t	p
HR (min)	70,27±9,44	11	71,72±6,82	-,414	,683
Heart-Mind Coherence (ms)	1,30±0,70	11	1,03±0,38	2,96	,275
Max. Heart-Mind Coherence (ms)	3,88±1,21	11	3,26±0,88	1,36	0,18
LSS	14,50±1,44	11	14,36 ±2,20	,686	,500

*p<0.05, **p<0.01

In Table 3, it was found that there is no significant difference between the pre-test independent t-test results of the participants in the experiment and control groups, HR, heart-mind coherence, maximum heart-mind coherence, and LSS pre-test measurements ($p>0.05$).

Table 4. Experimental group pre-post test paired t-test results

Variables	Pre-test (M±SD)	N	Post-test (M±SD)	t	p
HR (min)	70,27±9,44	11	69,90±9,14	,098	,924
Heart-Mind Coherence (ms)	1,30±0,70	11	2,20±0,815	-3,57	,005**
Max. Heart-Mind Coherence(ms)	3,88±1,21	11	5,03±1,90	-4,26	,002**
LSS	14,90±1,44	11	18,90 ±1,04	-9,38	,000**

*p<0.05, **p<0.01

In Table 4, a significant difference was found between the pre-test and post-test results of heart-mind coherence, maximum heart-mind coherence, life satisfaction scale means scores of the participants in the experimental group ($p<0.01$). No significant difference was found between the HR pre and post-test mean scores of the exercise group ($p>0.05$).

Table 5. Pre-post test paired t-test results of control group

Variables	Pre-test (M±SD)	N	Post-test (M±SD)	t	p
HR (min)	71,72±6,82	11	72,18±7,83	,-219	,831
Heart-Mind Coherence (ms)	1,03±0,38	11	1,260±0,67	-1,11	,290
Max. Heart-Mind Coherence (ms)	3,26±0,88	11	3,32 ±1,03	,-294	,775
LSS	14,36±2,20	11	15,27±1,55	-1,24	,242

According to the paired t-test results in Table 5, it is seen that there is no significant difference between the pre-test and post-test mean scores of the participants in the experimental and control groups in terms of HR, heart-mind coherence, maximum heart-mind coherence, life satisfaction scale ($p>0.05$).

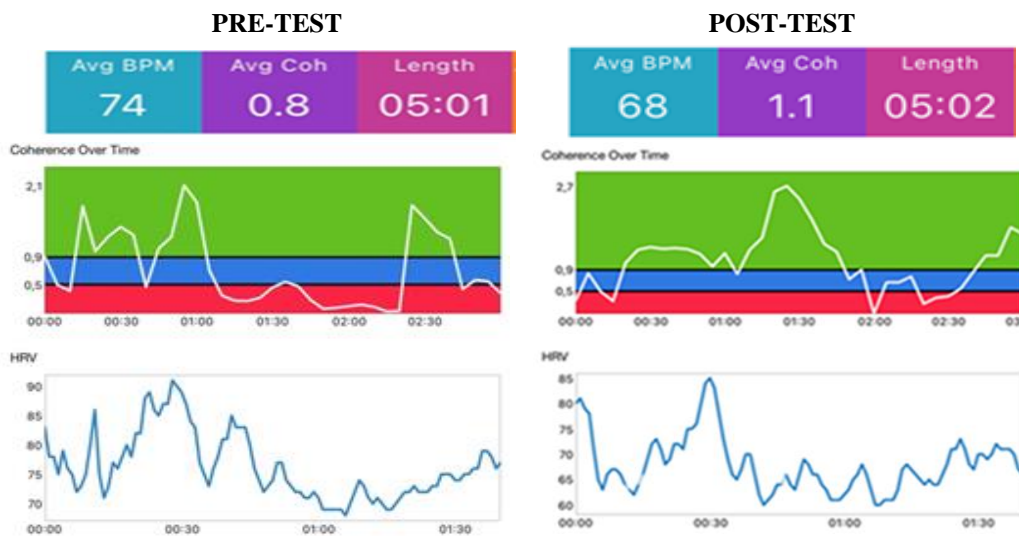


Figure 1. Figure view of the control group pre-post test HRV, Heart-Mind Coherence (Avg. Coherence), Maximum Heart-Mind Coherence (Coherence Over Time) measurements

It was observed that there was no significant change in the pre-post test HRV measurement results of the control group participants presented in Figure 1. In the pre-test, heart-mind coherence changed from 0.8 ms to 1.1 ms, and maximum heart-mind coherence changed from 2.1 ms to 2.7 ms, and it was seen that these results were not statistically significant. In addition, it was seen that there was no difference between the pre-post test in the HRV graphical view, and the ups and downs continued in the post test as inconsistent and sharp lines.

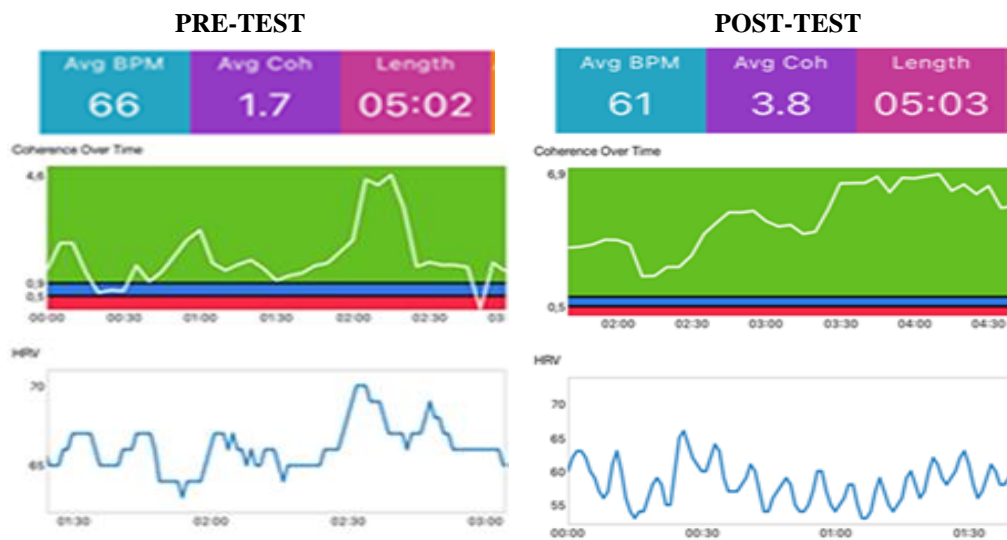


Figure 2. Figure view of the experimental group pre-post test HRV, Heart-Mind Coherence (Avg.Coherence), Maximum Heart-Mind Coherence (Coherence Over Time) measurements

A statistically significant change was found as a result of the pre-post test HRV measurement of the participants in the experimental group presented in Figure 2. In the pre-test measurement, hearth-mind coherence changed from 1.7 ms to 3.8 ms, maximum hearth-mind coherence changed from 4.5 ms to 6.9 ms, and it was concluded that these results were statistically significant. In addition, a significant change was observed between the pre-post-test in the HRV graphical view, and it was observed that there were soft and harmonious ups and downs, unlike the pre-test.

DISCUSSION and CONCLUSION

It is very important for older adults to be able to continue exercising, despite losing their mental and physical strength as a natural result of aging. Especially today, with the prolongation of life expectancy, having a healthy body and mind has become valuable. It is thought that walking football played by older adults for the first time, has positive effects on life satisfaction and physiological measurements that give feedback about the autonomic nervous system.

According to the results of the study, no significant difference was found between the experimental and control groups in HR, pre-post test results ($p>0.05$). While the HR value in the experimental group was 71.72 min/s in the pre-test, the post-test measurement differed as 69.90 min/sec. A significant difference was observed between the pre-post test of the experimental group in terms of heart-mind coherence and maximum heart-mind coherence ($p<0.01$). These results indicate consistency in the increase in the heart-mind coherence with the walking football practice of the experimental group participants. No significant difference was found between the control group and the pre-post test. As a matter of fact, while the mean heart-mind coherence score of the control group was 1.03 ms in the pre-test and 1.26 ms in the post-test, the value of the experimental group, which was 1.30 ms before the study, increased to 2.20 ms after the walking football study protocol. Likewise, the pre-test result,

which was 3.88 in the experimental group for the maximum heart-mind coherence measurement, increased to 5.03 ms after in the post-test. The value that was 3.26 ms in the control group resulted in 3.32 ms in the post-test. Unlike the pre-test measurement of the HRV shown in the graph, a more balanced and consistent situation is observed in the post-test measurement of the experiment group participants. A sharp and inconsistent graphic image is observed in the HRV post-test measurement of the control group participants, and there is no change between the pre-post-test. As a result of the Life Satisfaction Scale (LSS) applied to the participants, the pre-test value of the experimental group participants was 14.90 points and the post-test value was 18.90 points, showing a statistically significant difference ($p < 0.01$). While this situation was expressed as 14.36 points in the pre-test and 15.27 points in the post-test in the control group, there was no statistically significant difference ($p > 0.05$). This result suggests that the study protocol increased the life satisfaction of the experimental group participants.

The fact that elderly individuals frequently remember the negative moments they experienced in the past and feel anxious and regretful prevents them from enjoying the present time, and this reduces their level of life satisfaction (Lehr, 1994). Akandere (2003) determined that there was a significant increase in life satisfaction for the elderly living in nursing homes after physical activity was performed. In addition, in a study they conducted on nursing home residents, Zorba et al., (2004) concluded that the elderly who engage in regular physical activity have positive improvements in physical fitness and some physiological values. For this reason, it is necessary to increase the exercise programs that the elderly can participate in to both enjoy and get rid of inactivity, so that they will be more comfortable in daily life and their quality of life will improve. Kankaya and Karadakovan (2017) stated that if elderly individuals can easily do daily activities such as walking, climbing stairs and moving from one place to another it increases their life satisfaction and well-being. Saygın (2015), who applied a six-month walking exercise program to elderly individuals three times a week, concluded that long-term walking exercises increased the physical functions of elderly individuals.

In the study conducted by Aydıner-Boylu and Günay (2017), in which the effect of daily living activities on the life satisfaction and quality of life of elderly individuals is the subject, life satisfaction was found to be high in the elderly who can do their daily work independently. This means that individuals can continue their lives happily as long as they do not experience any physical restrictions. The elderly should be supported to carry out their daily work and to live without any physical loss with the physical activities recommended to them. Many studies in this area have concluded that the relationship between physical activity and life satisfaction is high, in a positive sense, in parallel with our study. Cho and Cheon (2023) stated in their study that participating in exercise or physical activity has a positive effect on the life satisfaction levels of older adults.

Elderly individuals are more prone to experiencing loneliness and social isolation (Akdemir, 2003) because a person who has worked hard for many years in his business life sees himself in an unplanned, unscheduled and void after retirement. This naturally affects the joy of life negatively. Walking football can be an important opportunity for this age group in terms of

sharing together, increasing the motivation to participate in sports, and some participants doing the sport they have done in the past.

Having the opportunity to play for a longer period of time by complying with certain rules with this activity will reinforce team friendship and create a more social elderly profile. In addition, it is thought that coming together through this study will make them feel better both physically and psychologically. In their study, Reddy et al., (2017) concluded that walking soccer can be a low-impact but original, enjoyable and moderately demanding form of exercise that can be sustainable for older adults, providing the active participation of older players. In addition, McEwan et al., (2019) stated that it is a cost-effective, feasible physical activity for men aged 50 and over, as a result of their study with overweight, inactive, and hypertensive elderly people in which they practiced walking football for 8 weeks. Barbosa et al., (2021) who practice walking soccer in middle-aged and elderly men with Type 2 diabetes stated that this study may have the potential to be effective in improving glycemic control and cardiovascular risk factor. In their study emphasizing the health benefits of walking football, Arnold et al., (2015) found a decrease in whole body mass, increase in lean body mass and decrease in body mass index after the 12-week program.

In the walking football study protocol, which we limited to male individuals only for 8 weeks, two days a week, we determined a significant difference in HRV, heart-mind coherence and achieving high life satisfaction results with maximum heart-mind coherence shows that walking football is beneficial for older adults. White et al., (2021) stated in their study that walking football does not limit them in any way, in terms of skill or knowledge deficiencies in elderly individuals who do not have any football experience. This seems to be important in terms of making it easier for older adults to adapt to a new activity. It is thought that our study is important in terms of introducing and disseminating walking football, which is frequently practiced in Europe, in our country, and being an option that will contribute to the movement of male and female older adults.

As a result, it is seen that walking football has a positive effect on life satisfaction, HRV, heart-mind coherence, maximum heart-mind coherence in older adults. It is thought that the findings obtained from the study will contribute significantly to the research in terms of increasing the physical activity programs to be applied to older adults. This research was carried out within certain limitations. For future studies, it may be recommended to organize more comprehensive studies using different measuring devices and scales, as well as arranging elderly female or male-female participants.

Conflicts of Interest: The authors of the article had no personal or financial conflicts of interest within the scope of the study.

Authors' Contribution: Research Design- ÜEY, ÖS Data Collection- ÜEY Statistical analysis- ÜEY Article preparation- ÜEY, ÖS

Ethical Approval

Ethics Committee: Muğla Sıtkı Koçman University Medical and Health Sciences Ethics Committee 2 Sports-Health Decision

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Protocol number: 110

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Evaluation of Research Quality in Systematic Reviews Specific to Exercise and Sport Sciences: Adapting TESTEX Criteria to Turkish

Hüseyin Şahin UYSAL^{1*} , Ahmet Yavuz KARAFİL¹ , Oğuzhan DALKIRAN¹ ,
Seda Nur UYSAL² , Sezgin KORKMAZ¹ 

¹ Burdur Mehmet Akif Ersoy University, Faculty of Sports Sciences, Burdur.

² Burdur Mehmet Akif Ersoy University, Institute of Educational Sciences, Burdur.

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Abstract

This study aims to adapt the TESTEX scale, which is preferred by researchers who make systematic reviews in the field of exercise and sports, into Turkish in a valid and reliable way. The study was carried out according to the observational research design, which is one of the quantitative research methods, and the study group consisted of five independent language experts and five researchers. The following procedures were carried out for the adaptation of the TESTEX scale to Turkish: (i) Consistency among independent language experts, (ii) Content validity of the TESTEX scale, (iii) Language validity of the TESTEX scale, (iv) Inter-rater reliability, (v) Inter-rater consistency. For statistical analysis of these procedures, Kendall-W agreement coefficient, content validity ratio, content validity index (CVI), Pearson correlation coefficient (r), Fisher's effect size index (z), intra-class correlation coefficient (ICC), and Bland Altman analyses were carried out. Study results showed that the TESTEX scale was adapted to Turkish as valid and reliable. In conclusion, the Turkish version of the TESTEX scale may be preferred to evaluate the methodological quality of research articles in systematic reviews. In addition, researchers can benefit from the quality criteria in the scale to improve the methodological quality of their studies.

Keywords: Systematic review, Meta-analysis, Sport science, Exercise and sport, Training

Egzersiz ve Spor Bilimlerine Özgü Sistemik Derlemelerde Araştırma Kalitesinin Değerlendirilmesi: TESTEX Kriterlerinin Türkçeye Uyarlanması

Öz

Bu çalışma, egzersiz ve spor alanında sistemik derleme yapan araştırmacıların tercih ettiği TESTEX ölçeğini Türkçe'ye geçerli ve güvenilir olarak uyarlamayı amaçlamaktadır. Çalışma, nicel araştırma yöntemlerinden gözlemsel araştırma desenine göre gerçekleştirilmiş olup, çalışma grubunu beş bağımsız dil profesyoneli ve beş araştırmacı oluşturmuştur. TESTEX ölçeğinin Türkçe'ye uyarlanması için takip eden işlemler gerçekleştirilmiştir; (i) Bağımsız dil profesyonelleri arasındaki uyum, (ii) TESTEX ölçeğinin kapsam geçerliği, (iii) TESTEX ölçeğinin dil geçerliği, (iv) Değerlendiriciler arası güvenilirlik, (v) Değerlendiriciler arası uyum. Bu işlemlerin istatistiksel analizi için Kendall-W uyum katsayısı, kapsam geçerlik oranı, kapsam geçerlik indeksi (CVI), Pearson korelasyon katsayısı (r), Fisher'z etki büyüklüğü indeksi (z), sınıf-İçi korelasyon katsayısı (ICC) ve Bland Altman analizleri gerçekleştirilmiştir. Çalışma sonuçları, TESTEX ölçeğinin Türkçe'ye geçerli ve güvenilir olarak uyarlandığını göstermiştir. Sonuç olarak, sistemik derlemelerde araştırma makalelerinin metodolojik kalitesini değerlendirmek için TESTEX ölçeğinin Türkçe formu tercih edilebilir. Ayrıca araştırmacılar, çalışmalarının metodolojik kalitesini artırmak için ölçekte yer alan kalite kriterlerinden faydalanabilir.

Anahtar kelimeler: Sistemik derleme, Meta analiz, Spor bilimi, Egzersiz ve spor, Antrenman

* **Corresponding Author:** Research Assistant Hüseyin Şahin UYSAL, **E-mail:** hsuysal@mehmetakif.edu.tr

INTRODUCTION

Exercise and sports science is a field of study that explores the connection between individuals and physical activities, considering physical, social, and cognitive aspects. Researchers have interpreted this field of science in various ways (Bishop, 2008; Haff et al., 2010; Hoffman, 2002). Hoffman (2002) argues that sports science draws on multiple disciplines, including physiology, biochemistry, biomechanics, nutrition, and endocrinology, to improve athletic performance. In another definition, sports science refers to the scientific principles that guide sports practices in order to increase athlete performance (Bishop, 2008). On the other hand, while it is stated that there are slight differences between exercise science and sports science, sports science is reported as a specialized component of exercise science (Haff et al., 2010). Since exercise and sports science are multidisciplinary, the experiences obtained from various disciplines constitute the research scope of exercise and sports science.

With the advancement of technology, knowledge in exercise and sports science has increased through social media and the internet. However, researchers have stated that these developments could have negative aspects, leading to biased or false knowledge on social media and the internet (Meel and Vishwakarma, 2020). While this situation limits researchers who aim to achieve valid and reliable knowledge, it highlights the significance of the scientific evidence pyramid. The pyramid of scientific evidence gives clues to researchers about the certainty of the evidence of a research method. Researchers stated that case reports and expert opinions have the lowest reliability and validity in scientific knowledge. They also claimed that the most reliable and valid scientific knowledge is found in systematic review and meta-analysis studies (Murad et al., 2016). Exercise and sports-specific systematic review studies are increasing rapidly, and researchers have conducted these studies to produce highly reliable and valid scientific knowledge (Juhl and Lund, 2018).

A systematic review is a research methodology that involves the application of protocols to identify, select, and critically evaluate relevant research articles to address a specific research problem. Therefore, the quality of research articles can significantly affect the quality and validity of a systematic review (Acosta et al., 2020). Researchers have developed various methodological quality assessment tools for different scientific fields to increase the reliability and validity of systematic reviews (Maher et al., 2003; O'Brien et al., 2014). Methodological quality assessment tools are used to assess the reporting and overall quality of research. While the Physiotherapy Evidence Database (PEDro) scale is widely used to evaluate the methodological quality of the research articles in systematic reviews in the field of exercise and sports science, the researchers have realized that the quality criteria in the PEDro scale may not be exactly unique aspects of this field due to certain limitations (Smart et al., 2015). Therefore, researchers developed the Tool for the Assessment of Study Quality and Reporting in Exercise (TESTEX) scale to evaluate the methodological quality of research articles that is specific to the field of exercise and sports science (Smart et al., 2015).

The TESTEX scale consists of 12 quality criteria to evaluate the methodological quality of research articles and an evaluation is evaluated over a total of 15 points (Smart et al., 2015). In addition, the TESTEX scale includes 5 points for study quality and 10 points for reporting

quality (Smart et al., 2015). This scale includes various criteria on sample selection, intervention process, and training protocols, and researchers stated that the TESTEX scale has a very high level of reliability for assessing methodological quality (ICC = 0.96, 95% confidence interval [CI] = 0.89–0.98, $p < 0.001$) (Smart et al., 2015). While a reference score for the methodological quality level was not reported in the current study (Smart et al., 2015), the following reference scores were used to express the quality level in another study; < 4 points “poor quality,” 4-7 points “moderate quality,” 8-11 “good quality” and > 11 points “excellent quality” (Davies et al., 2021).

Checklists are not generally preferred to increase reporting quality in exercise and sports sciences studies (Abt et al., 2022). Therefore, there is a particular need to evaluate the methodological quality of research in systematic reviews (Abt et al., 2022; Bishop, 2008; Rico-González et al., 2021). Although many systematic reviews and meta-analysis studies have been carried out in the field of exercise and sports sciences in Turkey, it can be claimed that the methodological quality of studies is ignored.

This study aims to adapt the TESTEX scale into Turkish, which is used in exercise and sport-specific systematic reviews. This study is significant for researchers who make systematic reviews in the Turkish language to use methodological quality assessment tools. Moreover, this study may increase knowledge and interest in systematic review studies. To our knowledge, the TESTEX scale will be adapted to a language other than English for the first time. As a result of the analysis, we assumed that the TESTEX scale would be adapted to Turkish in a reliable and valid way.

METHODS

Study Design

In this study, the observational research design, one of the quantitative research methods, was preferred to adapt the TESTEX scale to Turkish (Büyüköztürk et al., 2022). The observational research design is used to determine the characteristics of a variable (Büyüköztürk et al., 2022). This study aimed to determine the validity and reliability of the TESTEX scale between its original form and its Turkish version. While the study was designed according to previous study protocols (Hür et al., 2022; Tekindal et al., 2021), the study protocol was pre-registered on the Open Science Framework (OSF) (DOI: <https://doi.org/10.17605/OSF.IO/73F86>). All documents used during the study are provided open-access via OSF (<https://osf.io/e6kuh/>, accessed date: 3.04.2023).

Data Collection Tool

In this study, the TESTEX scale was used as a data collection tool, and the scale was formed from a total of 12 quality criteria (Smart et al., 2015). While the scale includes two separate sections, namely the quality of study and the quality of reporting, nine items are evaluated over “1 point”, two items “2 points,” and one item “3 points” (Smart et al., 2015). In this study, the TESTEX scale was used to evaluate the methodological quality of individual studies. The researchers assessed the studies obtained through the Web of Science (WOS) database.

Ethical Approval

Ethics committee approval of the study was obtained by the Ethics Committee of Burdur Mehmet Akif Ersoy University Non-invasive at the meeting held on 01.03.2023 with meeting number 2023/23 with the decision number GO 2023/122.

Research Procedure

The data collection process of this study started with the permission of the researchers who developed the TESTEX scale (OSF). The quality criteria in the TESTEX scale were independently translated into Turkish by three researchers with high-level English reading skills. The translated TESTEX scale was checked by language experts who live abroad, use English as a daily conversational language, or prove that they had a good command of the English language. After the feedback was received, the Turkish form of the scale was revised by three researchers. After the revision, the Turkish form of the TESTEX scale was translated into English by another language experts who is fluent in both languages, and the Turkish translation of the scale was evaluated by five independent language experts.

In the second stage of the data collection process, the methodological quality of studies was evaluated by two independent researchers with the TESTEX scale adapted to Turkish. It was decided to evaluate 20 studies with the TESTEX scale (Tekindal et al., 2021), and the studies were determined through the WOS database. The search was carried out with the following search criteria according to the expertise of the researchers; (i) containing at least one of the keywords plyometric training, complex training, contrast training, and HIIT training in the title of the article, (ii) being scanned in the category of sports science, (iii) written in the English language, (iv) double-blind peer-reviewed research articles. As a result of the search, 329 studies were found according to the specified criteria and exported in Excel format. The Research Randomizer software tool was used to avoid selection bias and ensure randomization throughout the screening (Urbaniak G. C. and Plous S. Research Randomizer Version 4.0; <https://www.randomizer.org/>, accessed date: 31.03.2023). Studies identified with WOS are included to be evaluated with the forms of the TESTEX scale in this study. The exported Excel file and detailed information on the randomization processes are provided access via OSF (<https://osf.io/e6kuh/>, accessed date: 3.04.2023).

The 20 studies included in the study were evaluated by two independent researchers with the Turkish and English forms of the TESTEX scale, and the evaluation results were used to analyse the study. Detailed information about the flow chart of the study is given in Figure 1.

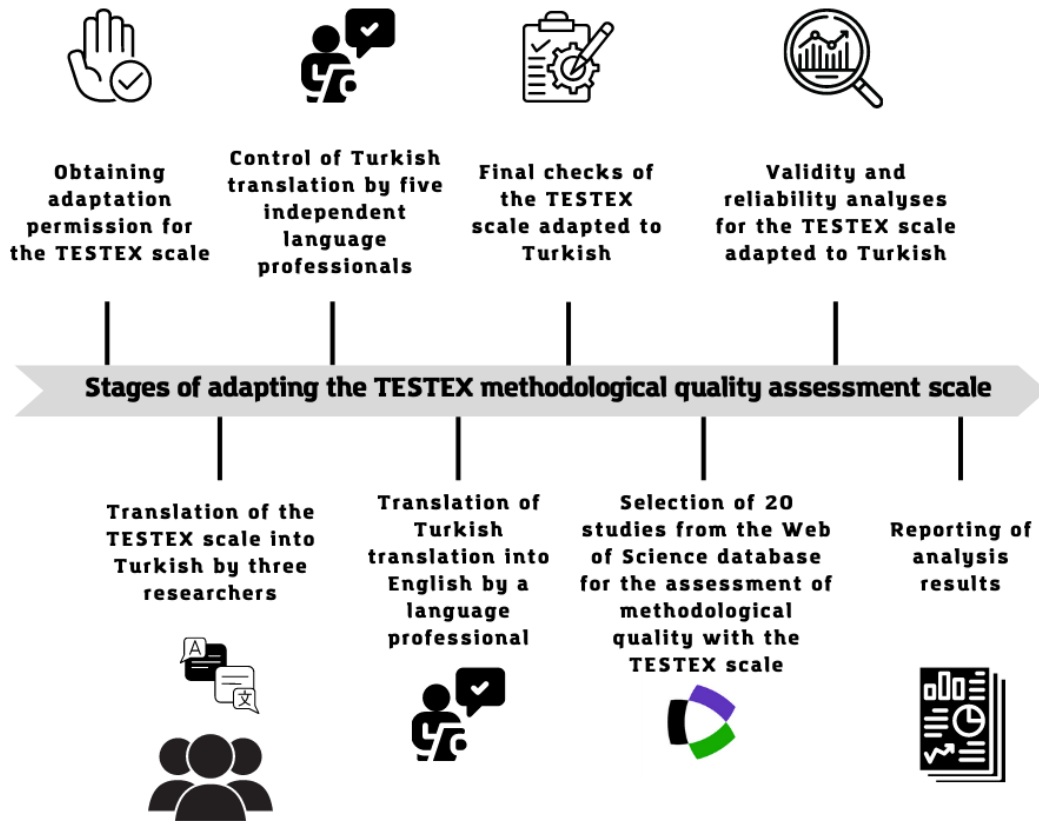


Figure 1. The stages of adapting the TESTEX methodological quality assessment scale into the Turkish

Statistical Analysis

The normality distributions of the analysed data were checked with skewness and kurtosis values, and the analysis results were reported with descriptive statistics (arithmetic mean \pm standard deviation) or 95% confidence intervals.

The content validity ratio (CVR) and content validity index (CVI) were used to evaluate the content validity of the translated TESTEX scale (Yeşilyurt and Çapraz, 2018). The CVR and CVI values of the quality criteria were calculated according to the following formulas (Yeşilyurt and Çapraz, 2018);

$$CVR = \frac{\text{Number of experts who said "suitable" to the translation of quality criteria}}{\text{Total number of expert} / 2} - 1$$

$$CVI = \frac{\sum CVR \text{ sum of quality criteria}}{\text{Total number of quality criteria}}$$

Language experts scored each quality criterion according to the following references, and CVR - CVI values were calculated; appropriate (3 points), suited but minor corrections required (2 points), the translation should be removed and rewritten (1 point) (Yeşilyurt and Çapraz, 2018). The obtained CVI value was compared with the content validity criterion reported by Lawshe (Lawshe, 1975). Quality criteria with a CVI value equal to or higher than 0.99 were assumed

to have content validity (Lawshe, 1975). On the other hand, the consistency between the scores of the language experts was analysed with the Kendall-W agreement coefficient.

Language validity was checked according to the scores given by two researchers who evaluated the TESTEX scale in Turkish and English, and validity was assessed with Pearson correlation coefficient analysis. The effect size of the validity was calculated by converting the obtained correlation coefficient to the Fisher z value. The Fisher z effect size was interpreted according to the following reference value: trivial (<0.10), small (0.10–0.29), moderate (0.30–0.49), large (0.50–0.69), very large (0.70–0.89), nearly perfect (>0.90) (Hopkins et al., 2009).

On the other hand, the inter-coder reliability between two researchers who evaluated 20 studies with the TESTEX scale was assessed according to the inter-class correlation coefficient (ICC two-way random absolute agreement), and the specified reference values and the level of reliability were reported (Koo and Li, 2016); poor (>0.50), moderate (>0.50-0.75), good (0.75-0.90), and excellent (0.90-1). Finally, the consistency between the two researchers who made the methodological quality assessment with the TESTEX scale was evaluated according to the Bland Altman graph, and the results were reported visually.

While the R version 4.1.0 (R Core Team) software was preferred for this study's statistical analysis, the statistical significance level was accepted as $\alpha = 0.05$ in all analyses. Detailed information about the statistical analysis made throughout the study is given in Table 1.

Table 1. Statistical analysis summary of the study

Assessment	Aim	Analysis
Checking translation evaluations by five independent language experts	Consistency between independent language experts	Kendall-W agreement coefficient analysis
Conformity of translated quality criteria according to independent language experts	Content validity	Content validity ratio Content validity index
Evaluation of 20 studies by two researchers with the Turkish and English forms of the TESTEX scale	Language validity	Pearson correlation coefficient (r) analysis Fisher's z effect size
Checking the similarity of the quality assessment scores given by the independent two researchers	Inter-rater reliability	Inter-class correlation coefficient (ICC) analysis
Checking the consistency between the quality assessment scores given by the two researchers	Consistency between evaluators	Bland Altman graph

Not. TESTEX: Tool for the assessment of study quality and reporting in exercise; ICC: Inter-class correlation coefficient; r: Pearson correlation coefficient.

RESULTS

The content validity of the TESTEX scale, which was translated into Turkish according to the evaluations made by five independent language experts, was analysed according to the CVR and CVI values. After the initial assessments by independent language experts, it was understood that the Turkish translation of the first, tenth, and eleventh quality criteria needed revision. After the change, five independent language experts re-evaluated the Turkish translation of the TESTEX scale. As a result, it was determined that the Turkish translation of the TESTEX scale provided content validity (CVI = 1). On the other hand, the scores given by five independent language experts to Turkish translations for quality criteria were analysed with the Kendall-W coefficient of agreement and revealed moderate agreement between independent language experts. In addition, no statistically significant difference was found between the scores given by language experts to Turkish translations (Kendall's $W = 0.26$; $p = 0.19$).

Two independent researchers evaluated 20 studies on the subject with the Turkish and English versions of the TESTEX scale, and it was found that there was an excellent correlation between the assessments made in different languages ($r = 0.99$, 95% CI = 0.98 – 0.99, $z = 2.64$, $p = 0.00$). Detailed information on language validity is given in Figure 2.

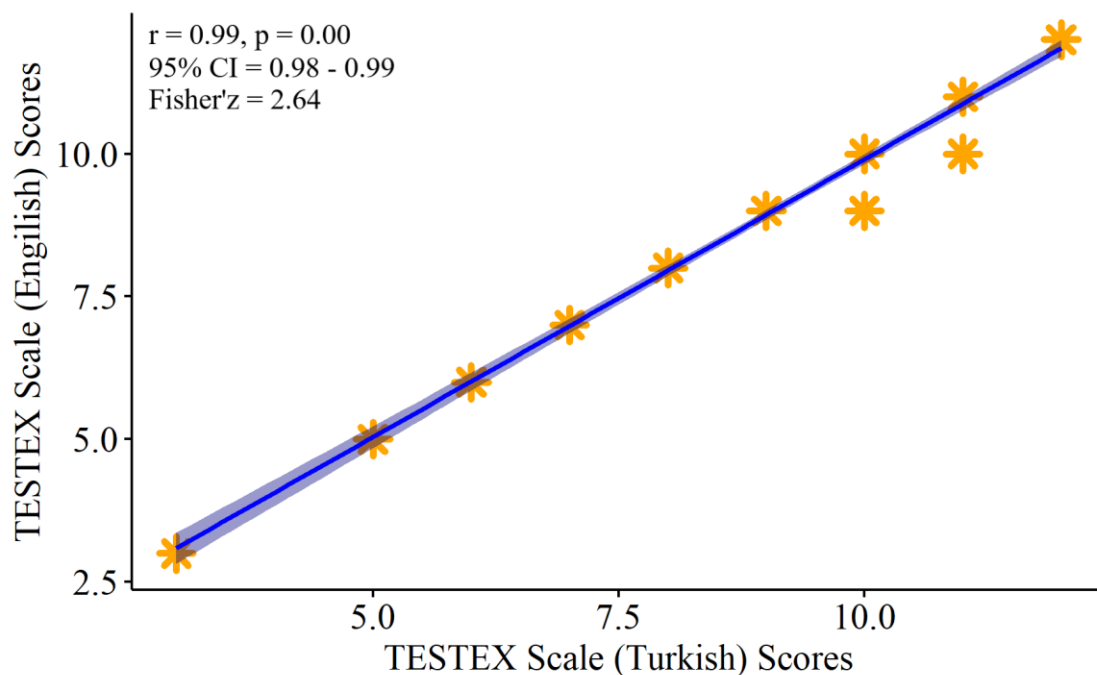


Figure 2. Language validity results of the TESTEX methodological quality assessment scale

In addition to the language validity, the consistency of the scores given by the two independent researchers to the research articles' quality was evaluated with the inter-class correlation coefficient, and the results showed an excellent level of reliability between the evaluators (ICC = 0.99, 95% CI = 0.98 – 1, $p = 0.00$). Finally, the mean bias between the scores given by the evaluators to the research articles' quality was examined with the Bland-Altman graph, and it was determined that there was a minimal bias between the two evaluators (Mean bias = -0.40 ± 1.17). The detailed analysis results for the consistency between evaluators are given in Figure 3.

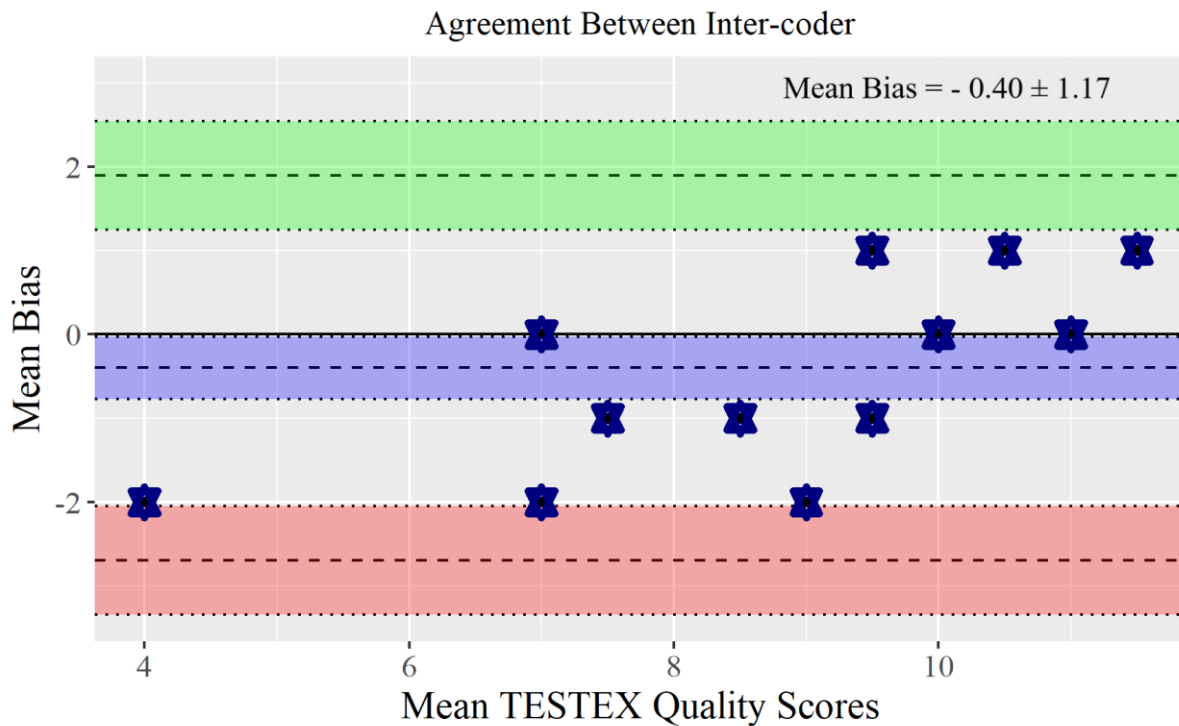


Figure 3. Results of consistency between evaluators using the TESTEX methodological quality assessment scale

DISCUSSION AND CONCLUSION

This study aimed to adapt the TESTEX methodological quality assessment scale into Turkish to evaluate the methodological quality of research articles in the field of exercise and sports. The study results showed that the TESTEX scale was adapted into Turkish as valid (CVI = 1; Kendall's W = 0.26; $p = 0.19$; $r = 0.99$, 95% CI = 0.98 – 0.99, $z = 2.64$, $p = 0.00$), and reliable (ICC = 0.99, 95% CI = 0.98 – 1, $p = 0.00$; Mean bias = -0.40 ± 1.17). Although there was a moderate level of agreement among independent language professionals, the results were statistically insignificant. The concept of statistical power can explain these results. When the research hypothesis cannot be tested with sufficient observations, statistically non-significant results may occur (Abt et al., 2020). The fact that only five independent language professionals participated in this study may not have provided a sufficient number of observations to test the hypothesis. Previous studies reported statistically insignificant results in the Kendall W agreement coefficient due to a similar reason (Çalışkan and Çınar, 2012; Hür et al., 2020). These results were attributed to the limited number of evaluators involved in the study. One of the results that needs to be explained is the standard deviation, which is observed to be high in mean bias values. Considering that evaluators assess out of 15 points, a standard deviation of 1.17 points may not significantly impact the methodological quality of research articles. Therefore, although the average bias and standard deviation obtained may appear high, they may be insignificant when evaluating the results in practice.

Many factors can influence the methodological and reporting quality of research articles in the field of exercise and sport (Abt et al., 2022; Bishop, 2008; Rico-González et al., 2021; Sainani and Chamari, 2022). Therefore, many researchers have recommended various methods to

improve the methodological quality of research articles (Abt et al., 2022; Bishop, 2008). In addition, researchers have claimed that studies designed according to various quality criteria can provide a better interpretation of sports performance (Bishop, 2008; Sainani and Chamari, 2022). While the TESTEX scale can be used as the methodological quality assessment tool in systematic reviews, it can also provide important clues to researchers who will conduct research in the field of exercise and sports to improve the quality of their studies. The TESTEX scale is divided into two sections, each containing 12 quality criteria for evaluating the quality of research articles (Smart et al., 2015). The Turkish version of the TESTEX methodological quality assessment scale is presented in Table 2.

While the TESTEX scale includes five quality criteria in the study quality section, these criteria offer researchers valuable insights into selecting sample groups and assessing their performance. Eligibility criteria express the requirement that participants should have similar characteristics. In addition, it has been stated that eligibility criteria are a prerequisite for the success of experimental studies (Su et al., 2023). Researchers realized that accurately determining eligibility criteria is crucial for predicting study results (Su et al., 2023). The second criterion in the "study quality" section highlights that sample groups should be distributed through randomization, and these randomization methods also need to be clearly stated. Randomization can be defined as the process of randomly assigning participants to either the experimental or control group in a research study (Alferes, 2012). Various randomization methods can be used for this purpose (Alferes, 2012). If a study fails to perform the necessary randomization, it may result in selection bias, harming its internal validity (Alferes, 2012; Berger et al., 2021). As the third criterion, concealing the group allocation from the participants may be necessary for improving the research articles' quality. Participants' learning of their group allocation may affect the reliability of the research intervention (Schulz, 2001; Sil et al., 2019). Therefore, researchers stated that allocation concealment helps to minimize selection bias in randomized controlled experiments (Kahan et al., 2015; Schulz, 2001; Sil et al., 2019). Similarly, independent researchers can provide support in evaluating of primary outcome measures. If the researchers who conducted the study evaluate the intervention results or are aware of the group allocations, it may lead to selection bias. Therefore, the reliability of the study may be negatively affected (Sil et al., 2019; Smart et al., 2015). Finally, the fact that the experimental and control groups had similar performance criteria in the pre-test is significant in terms of demonstrating the effectiveness of the intervention in the post-test. If the randomization of the groups is successful and the sample groups are similar in the pretest, researchers may argue that the observed outcomes between groups are due to the intervention rather than differences in baseline characteristics (de Boer et al., 2015; Elkins, 2015).

The TESTEX scale comprises seven distinct reporting criteria, in addition to the study quality criteria. Reporting criteria focus on the significance details presented in a study's method and conclusion sections. These criteria cover participation rates in research interventions and testing, application, and writing of statistical analyses, monitoring of experimental and control groups, and providing details about these groups. A long interval of time may be necessary to observe the effects of interventions on various motor skills (Smart et al., 2015). However, participants may withdraw from research or cannot attend intervention sessions for various

reasons (Smart et al., 2015). Therefore, researchers stated that the percentage of participants who attend all intervention sessions should be reported, and their dependence on intervention sessions should aim for at least 85% (Smart et al., 2015).

On the other hand, researchers have argued that if the participants leave of a study for various reasons, their data should still be included in the analysis (Williams et al., 1999). This analysis method referred to as “intent-to-treat” in the literature. Intent-to-treat (ITT) analysis is a statistical method in which all randomized participants are included in the statistical analysis (Williams et al., 1999). According to this method, participants are analysed based on the group they were initially assigned, regardless of which treatment or intervention (McCoy, 2017; Williams et al., 1999). The ITT method emphasizes that even if a participants left of the research for various reasons, their data should still be included in the analysis. However, researchers have also stated that this method has advantages and disadvantages (McCoy, 2017). Inter-group comparisons are necessary to reveal the intervention effect in a study (Marusteri and Bacarea, 2010). Reporting criteria should include performing hypothesis tests and presenting these tests with point estimation and variability measures such as arithmetic mean \pm standard deviation, as a methodological quality criterion (Smart et al., 2015). Finally, researchers have recommended that the method section includes information about the specific activities carried out by experimental and control groups performed during the intervention to be reported in the method section (Smart et al., 2015).

Researchers conducting systematic reviews in exercise and sports may prefer to use the TESTEX scale to evaluate the methodological quality of research articles. Furthermore, researchers who want to improve the methodological quality of their studies can use the quality criteria of the TESTEX scale to design their studies. To assign points to the eligibility criteria, which is the first criterion in the evaluation phase, evaluators can explore the participants (or universe/sample) paragraph of the method section. In this section, authors typically provide details about the participants. If the authors have clearly stated the characteristics of the participants (in tabular form if possible), 1 point can be given to this criterion. For group randomization, the participants (or universe/sample) paragraph of the method section can be reviewed. The authors may include details about the randomization process in the research model (or Experimental Approach to the Problem) paragraph of the method section. If the authors clarify that group allocation was randomized, evaluators may assign a score of 1 to this criterion. The third and fifth criteria, which involve concealing the group allocation from participants and researchers, cannot be applied in our field for various reasons, or the authors may not have clearly expressed the implementation procedures. Therefore, evaluators assign 0 points to these criteria in numerous systematic reviews (Cuthbert et al., 2020; Vasconcelos et al., 2020). Suppose the authors clearly state that the group allocation is concealed from participants or evaluators. In this scenario, evaluators may allocate 1 point to the third criterion (concealment to participants) and 1 point to the fifth criterion (concealment to authors). The fourth criterion, the similarity of the research groups in the pre-test, can be evaluated by analysing the first paragraph of the results section. Authors may provide details of the pre-test results of the groups in the first paragraph of the results section to demonstrate the statistical differences between the groups as a result of the intervention. In this section, the authors typically indicate that the groups were similar in the pre-test by stating, "No significant

differences were found in the baseline...". If the authors have not given details about the pre-test in this section, the tables in the results section can be used as a secondary option for the evaluation. If the evaluators can determine that the groups are similar in the pre-test, in written or tabular form, 1 point can be given for the fourth criterion. The sixth criterion is the quality criterion and the TESTEX scale gets the highest score for it. In this criterion, the authors should provide the exercise participation rates for both the experimental and control groups. Additionally, the authors should indicate whether any adverse events, such as injuries or illnesses, occurred during the intervention and provide information on the source of these events. Finally, the authors should indicate the percentage or number of participants who completed the intervention process. When scoring this criterion, evaluators can explore the method section's participants (or universe/sample) paragraph to obtain knowledge about adverse events.

On the other hand, the first paragraph of the results section can be examined to check the intervention dependency ratio. In some cases, the authors can also present the number of participants included in the pre-test and post-test with the tables in the results section. Evaluators may award 1 point to this criterion if an adverse event is reported. If information about the adherence rates to the exercise and intervention process can be obtained in this criterion, assessment can be made for the sixth criterion out of 3 points. To evaluate the seventh criterion, the number of participants included in the pre-test and in the post-test can be examined. If the number of participants included in the pre-test and post-test is the same, or if the data of the participants who left the research are included in the analysis, 1 point can be given for the seventh criterion. The results section for the eighth and ninth criteria should be explored. If inter-group comparisons are reported with more than one outcome criterion in a study, 2 points can be given to the eighth criterion. On the other hand, if the research results are reported together with the arithmetic mean and standard deviation values, then it can be evaluated as 1 point for the ninth criterion. The training program (or research procedure) paragraph of the method section can be examined for other quality criteria. If the authors reported the activity of the control group during the study, 1 point could be awarded to the tenth criterion. Evaluators may assign 1 point to the eleventh criterion if there has been a change in training load (scope, intensity, intensity, frequency) at least once during the intervention period. Finally, if the authors clearly stated the intervention group's training program (table as possible), evaluators can make a 1-point assessment for the twelfth criterion.

As a result, researchers can use the Turkish version of the TESTEX scale as valid and reliable in their systematic reviews. Expressed suggestions can be considered when evaluating the TESTEX scale. In addition, researchers who want to improve the methodological quality of studies can examine the quality criteria of the TESTEX scale.

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Table 2. Turkish version of the TESTEX methodological quality assessment scale

Kriter	Açıklama	Puanlama
Çalışma kalitesi		
1 – Belirtilen uygunluk kriterleri	Uygunluk kriterleri belirlenmeli, yerine getirilmeli ve tüm katılımcılar için spesifik tanısal test değerleri sağlanmalıdır.	1 Puan – uygunluk kriterleri açıkça belirtilmiş ve yerine getirilmişse
2 – Belirtilen randomizasyon	Denekleri tedavi gruplarına ayırmak için kullanılan yöntemin tanımlanması sağlanmalıdır.	1 Puan – yöntemler açıklanırsa ve bunlar gerçekten randomize ise (örneğin bozuk para atma, rastgele üretilen sayıların sırası)
3 – Ayırmayı gizleme	Grup ayırımının gizlenip gizlenmediği belirtilmelidir; yani bir deneğin araştırmaya dahil edilmeye uygun olup olmadığı belirtilmeli ve denek hangi gruba ayrıldığından haberdar olmamalıdır (bu karar verildiğinde).	1 Puan – grup ayırımı çalışmaya dahil edilmeye uygun deneklerden gizlenmişse (örn. randomizasyondan önce onay vermelidir)
4 – Başlangıçta benzer gruplar	Randomize edilen tüm katılımcıların başlangıç verileri sunulmalıdır. Tedavi grupları arasında tedavi edilen durumun ciddiyetinin ölçülmesinde anlamlı bir fark olmamalıdır.	1 Puan – temel veriler grup ayırımına göre ayrılır, sunulur ve hiçbir fark görünmezse
Tüm katılımcıların körlenmesi	Bu madde puanlanmadı.	Puan yok
Tüm terapistlerin (eğiticilerin) kör edilmesi	Bu madde puanlanmadı.	Puan yok
5 – Değerlendiricinin körleştirilmesi (en az bir önemli çıktı için)	Denekleri ve/veya terapistleri körlemek her zaman mümkün değildir; Bununla birlikte, değerlendiricilerin körlenmesi uygundur. Birincil çıktı ölçütlerinin değerlendiricileri deneklerin müdahale tahsisine körlenmiş ise, bu açıkça belirtilmelidir.	1 Puan - en az bir değerlendiricinin olduğu ifade edilmişse 1 birincil çıktı ölçüsü grup tahsisine körlenmişse
Çalışmanın raporlaması		
6 – Deneklerin %85 'inde değerlendirilen çıktı ölçümleri	Her iki grupta da çalışmayı tamamlayan deneklerin yüzdesi bildirilmelidir. Her müdahale grubu için herhangi bir olumsuz olay (ciddi tıbbi olaylar, ölümler, hastaneye yatışlar vb.) rapor edilmelidir. Çalışmadan çekilmeyen egzersiz deneklerinin tamamladıkları egzersiz seanslarının yüzdesi bildirilmelidir.	Puan yok – çalışmadan çekilmeler >%15 ise 1 Puan – çalışmaya bağlılık >%85 ise 1 Puan – olumsuz olaylar bildirilirse 1 Puan – egzersize katılım bildirilirse Toplam Olası Skor- 3 puan
7 – Müdahale amacına uygunluk analizi	Bir denek çalışmadan geri çekildiğinde, bu analiz, çıktı ölçütlerinin her biri için elde edilen son değerlerin müdahale sonrası değer olarak kullanılması veya temel değerinin son değer olarak kullanılmasıyla gerçekleştirilir. Bu analiz, çalışmayı tamamlayanların verilerine ve yapılan analizlere eklenmelidir.	1 Puan – çıktılar üzerinde müdahale amacına uygunluk analizi yapıldıysa
8 – Rapor edilen gruplar arası istatistiksel karşılaştırmalar	Egzersiz ve karşılaştırma (kontrol) grubunun birincil ve en az bir ikincil çıktı için karşılaştırılması yapılmalıdır.	1 Puan – ilgili birincil çıktı ölçüsü için gruplar arası istatistiksel karşılaştırmalar rapor edilirse 1 Puan – en az bir ikincil çıktı ölçümü için gruplar arası istatistiksel karşılaştırmalar rapor edilirse Toplam Olası Skor - 2 puan
9 – Rapor edilen tüm çıktı ölçümleri için nokta tahminleri ve değişkenlik ölçümleri	Nokta tahminleri tüm çıktılar için sağlanmalıdır, aksi takdirde bu yanlı çıktı raporlaması olarak kabul edilebilir.	1 Puan – tüm sonuçlar nokta tahminleriyle raporlanırsa
10 – Kontrol gruplarında aktivite izleme	Kontrol grubundaki denekler müdahale grubuna geçerse gruplar arasındaki farklılıklar azalabilir. Deneklerin üçte biri bunu yaparken, bu etkinin ölçülebilmesi ve sayısallaştırılması için egzersiz günlüğü veya aktivite izleme gibi bazı önlemlerin sağlanması gerekir.	1 Puan – kontrol grubundaki deneklerden fiziksel aktivite seviyelerini bildirmeleri istenirse ve veriler sunulursa
11 – Sabit sürdürülen bağlı egzersiz şiddeti	Egzersiz şiddeti birçok kişi tarafından adaptasyon için en iyi uyarıcı olarak kabul edilir. Denekler belirli bir şiddet ile bir egzersiz programına başladıktan sonra o egzersiz programına uyum sağlamaya başlarlar. Çalışma süresi boyunca bağlı şiddet, egzersize uyum sağlayanlarda düşecektir. Bu yüzden egzersiz kapasitesinin periyodik olarak değerlendirilmesi ve egzersiz şiddetinin sabit kalması için egzersiz şiddetinin güncellenmesi (veya uyum sağlayanlarda güncellenmesi) gerekir.	1 Puan – Bağlı şiddeti sabit tutmak için egzersiz yükü güncellenirse
12 – Egzersiz yoğunluğu ve enerji tüketimi	Egzersiz parametreleri; seans, program süresi, seans sıklığı, egzersiz antrenman şiddeti ve yöntemi olarak açık bir şekilde raporlanmalıdır.	1 Puan – egzersiz yoğunluğu ve enerji tüketimi hesaplanabilirse
Olası toplam		15 puan

The Gateway to Nature from the Virtual: A Netnographic Study on Camping Virtual Communities

Gözde YETİM^{1*} 

¹Muř Alparslan University, Faculty of Sport Sciences, Muř.

Research Article

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Abstract

Since camping is a concept that shares common features with extraordinary emotional experiences such as social interaction, self-renewal and relaxation in relation to nature, it is a very popular recreational activity today. The aim of this study is to examine the behaviors, attitudes and camping experiences of individuals who are members of camping virtual communities in Turkey. For this purpose, netnography method was used in the study. Netnography is a special approach that allows ethnographic research on the Internet. During the data collection process, the most actively used forum and Facebook pages related to camping were examined. According to the findings of this study, five main categories as "search for knowledge", "technical information", "recommendations", "dangers" and "camp diaries" and seven subcategories as "beginners", "campsite rush", "getting into a sleeping bag", "cold related issues", "fighting insects", "experience" and "pleasure" are reported. In line with the emerging categories, it is seen that individuals who are members of camping virtual communities share information and experience with each other on many camp-related issues, as well as make recommendations.

Keywords: Camping, Netnography, Virtual communities, Recreational activities

Sanaldan Doęaya Açılan Kapı: Kampçılık Sanal Toplulukları Üzerine Netnografik Bir Çalışma

Öz

Kampçılık, doğa ile ilişkili olarak sosyal etkileşim, kendini yenileme, rahatlama gibi olaęanüstü duygusal deneyimlerle ortak özellikleri paylaşan bir kavram olması sebebiyle günümüzde oldukça popüler bir rekreatif aktivite olarak yer almaktadır. Bu çalışmanın amacı, Türkiye’de kampçılık sanal topluluklarına üye olan bireylerin kampçılıęa yönelik davranışları, tutumları ve kamp deneyimlerini incelemektir. Bu amaç doğrultusunda çalışmada, netnografi yöntemi kullanılmıştır. Netnografi, internet üzerinde etnografik araştırma yapmaya olanak tanıyan özel bir yaklaşımdır. Veri toplama sürecinde, kampçılık ile ilgili en aktif olarak kullanılan forum ve Facebook sayfaları incelenmiştir. Araştırma sonucunda incelenen veriler ışığında, “bilgi arayışı”, “teknik bilgiler”, “tavsiyeler”, “tehlikeler” ve “kamp günlükleri” olarak beş ana ve “yeni başlayanlar”, “kamp alanı telaşı”, “uyku tulumuna giriş”, “üşüme sorunsalı”, “haşere ile mücadele”, “deneyim” ve “haz” olarak yedi alt kategori ortaya çıkmıştır. Ortaya çıkan kategoriler doğrultusunda, kampçılık sanal topluluklarına üye olan bireylerin, birbirleri ile kamp ile ilgili birçok konuda bilgi ve deneyim paylaşımının yanı sıra tavsiyelerde de buldukları görülmektedir.

Anahtar kelimeler: Kampçılık, Netnografi, Sanal topluluklar, Rekreatif aktiviteler

* **Corresponding Author:** Assist. Prof. Gözde YETİM, **E-mail:** g.yetim@alparslan.edu.tr

INTRODUCTION

In the leisure time left over from the work that individuals do in order to maintain their lives, the activities they participate physically, emotionally and socially related to nature in open or closed areas, actively or passively, in urban or rural, individually or as a group for the purpose of relaxation, entertainment, sightseeing, health, socialization, excitement and gaining different experiences are stated as recreation (Karaküçük, 2014; Yüksek et al., 2012). Amongst the outdoor recreational activities one of the most popular applied one is camping. Camping, which is closely related to nature, shares common features with extraordinary emotional experiences such as social interaction, self-renewal and relaxation (Triantafillidou & Siomkos, 2013) and is a very popular recreational activity today. It can be either exercised in connection with another activity or done discretely at camp sites, seaside or many other places (Kalkan, 2017). In this perspective, camping can be considered as a recreational activity, which can be done in open areas and in all seasons of the year, through that individuals can interact with the natural environment (Cordes & İbrahim, 1999; İslamoğlu et al., 2014). Therefore, camping activities enables to build a generous bound between people and the natural environment. Besides, camping activities provide some advantages such as physical and mental healing, reducing stress and social adaptation of an individual. To get more knowledge about the experiences gained during camping and the meanings associated with them can help to acquire wide-ranging benefits and improve the human and nature relationship potentially (Hassell et al., 2015). Camping experience is a significant recreational activity in terms of providing physical possibilities, offering proximity or access opportunity to a natural, human and cultural environment, creating specific emotional and internal values to its participants. The interaction between these three elements also forms a camping experience (Heerden, 2010). As in many other recreational sports, camping activity has its own unique rules. Camping which is a kind of sports that teaches to live in nature without giving any harm, is also the first step for other outdoor sports. It is necessary to learn the basics such as how to live in nature, how to eat, how to maintain the health, how to meet sanitary needs and etc., how to protect oneself against various problems that may come from nature (Çetinkaya, 2008).

In this perspective, virtual communities related to camping are unique platforms that provide extensive information on many topics related to individuals' camping experiences, potential dangers they may encounter, camping equipment, etc. Rheingold (1993) defines virtual communities as “social aggregations that emerge from the internet when enough people carry on those public discussions long enough, with sufficient, human feeling, to form webs of personal relationships in cyberspace”.

With the rapid growth of virtual communities on the internet, the question of what encourages members to participate in virtual communities, interact with each other and what makes virtual communities more vibrant by sharing has attracted the attention of many researchers for a long time (Bagozzi & Dholakia, 2002; Betzing et al., 2020; Grabher & Ibert, 2017; Hagel & Armstrong 1997; Huang et al., 2019; Koh et al., 2007; Parks, 2011; Rolls et al., 2016; Wellman & Gulia, 1999). Just like in the camping virtual communities, the common points that people have allowed them to come together in a virtual environment, as well. The facts that people have special interests and tastes, exist as social beings that associate with others and the necessity of similar performing the transactions based on change, carried out in the physical

environment, in a virtual environment too play a significant role in the emergence of virtual communities (Uzkurt & Özmen, 2006). Furthermore, Hagel and Armstrong (1997) classify communities, mostly according to the purposes for which they are organized, as well. According to this classification, it is stated that there are four types of communities namely common interest communities, experience sharing affair communities, fantasy communities and exchange communities that business exchanges take place. Besides, Uzkurt and Özmen (2006) as well define virtual communities in six types as function/information sharing communities, interest communities, fantasy communities, relationship communities and discussion communities based on the classification made by Hagel and Armstrong (1997).

Thanks to the developing internet technologies, people having similar interests can exchange and discuss information about any subject and interact with each other through visual and audio posts through social networking sites. These people can share information by creating different types of virtual communities on the internet, as well as meet in the common consumption area. These groups known as consuming producers move to a position of conveying and producing knowledge beyond being conscious consumers (Doğaner, 2017).

Campers are in interaction by sharing their experiences, knowledge and curiosities about camping through virtual platforms. Thus, it can be inferred that they feel the need to socialize and share knowledge with other people of similar interests by moving an activity that is essentially intertwined with nature such as camping to the virtual environment as well. Accordingly, the aim of this study is to determine the behaviour, attitudes and experiences of individuals who are members of virtual camping communities in Turkey through camping by netnography method through their sharing in the sites they are members of. Once the relevant literature is examined, although there are national and international studies on camping, the absence of research that approaches the experiences of campers by netnography method makes this study an important contribution to the literature.

METHODS

Research Model

To better understand the camping experience, we adopt a qualitative research approach, when there is a need for a deeper description and explanation of a multi-faceted phenomenon. A qualitative design can improve our understanding and provide a more meaningful analysis of all components of the camping experience. In this study, netnography method is used in order to determine the behaviour, attitude and experiences of the campers.

Netnography is a special approach that enables ethnographic research on the internet and based on the collection of individuals' reviews containing detailed information about their experiences published on the Internet. This particular approach emerges as a qualitative and interpretive research methodology by adapting ethnographic techniques that are known to be traditional, in studies if social media and especially in virtual communities (Kozinets, 2015). This qualitative method is designed specially to investigate the consumer behaviour of cultures and virtual communities present on the internet (Kozinets, 1998). Compared to other qualitative research techniques, the distinctive value of netnography is that it excels at telling the subject,

and understanding complex social phenomena, and assists the researcher in developing themes from the consumers' points of view (Rageh et al., 2013). Another distinguishing value of netnography is faster, simpler, and less expensive than traditional ethnography and more naturalistic, objective, and unobtrusive than focus groups or interviews (Kozinets, 2002; Wu & Pearce, 2014).

Netnography refers to the online research method that enables the study of virtual communities and cultures that are created through computer mediated social interaction (Bowler, 2010). It enables the researcher to collect data without attracting attention, to access consumer discussions by examining processes and behaviour patterns through observing their interaction or participating in public online forums (Nelson & Otnes, 2005). By means of netnography, it becomes possible to analyse the customer needs, tendencies, behaviours and effects by using open source available in the virtual communities (Kozinets, 2002).

Data Collection and Sample

In accordance with the purpose of the research, virtual communities where campers can comfortably express their behaviours and attitudes are reached through Google, a popular search engine on the internet. Access to virtual communities is achieved by searching keywords for virtual camping communities on Google search engine. During the data collection phase of the research, five basic criteria proposed by Kozinets (2002) for data collection on the internet are used: (1) matching the community with the research question, (2) having high sharing traffic, (3) having a bulky number of messages, (4) having affluent data content, (5) having rich interaction amongst virtual community members. In this study, by becoming a member of five forum pages and five Facebook groups with the richest content and where users interact with each other the most are surveyed regarding these five basic criteria put forward by Kozinets (2002). The data has been collected between September 2021 and January 2022.

Ethical Approval

The ethics committee decision was taken from Mus Alparslan University, The Scientific Research and Publication Ethics Committee and Ethics Committee Permission was obtained (Document date and number: 14.01.2021-923).

Data Analysis

There are two important elements in data collection with the netnography method. The first element is data that researchers directly copy the posts that the virtual community members share through computer mediated communication, the second one is the data they observe regarding virtual communities and their members, their interactions with each other and the commentary posts about the content. Within the guideline of these two elements, the process for collecting and analysing data within the scope of the research took place in five phases; (1) Finding the most active virtual communities that is appropriate to the scope of the research. (2) Becoming a member of the virtual communities to focus on. (3) Examining the posts that members share about the subject. (4) Compiling the data analysed under certain categories and subcategories. (5) Interpreting the resulting categories and subcategories. This study adopted a manual approach to analyse the data. This approach is seen as effective when the dataset is reasonable in size, can be organised quite readily and the researchers are very familiar with the context (Kozinets, 2010). These criteria applied to the present case material. An established

qualitative data analytic process was adopted (Berge, 2007). First, the user generated quotes were identified and checked; second, codes were analytically developed and inductively identified from the data and applied to the content; later, codes were transformed into main and subcategories; after that, all materials were sorted by those categories. Next, by identifying similar phrases, patterns, relationships, commonalities or disparities, the sorted materials were examined to isolate meaningful patterns and processes. Finally, the identified patterns were considered in the light of previous research theories, and a summary made. The coding of main and subcategories was cross checked by two qualitative research experts, with an average agreement of assigning the categorical labels of 98%.

Validity or credibility concerns come to the fore in qualitative research. For the validity of the study, the researcher collected and analyzed the subjective data created by the participants in the field with an unbiased approach. It is stated that for validity in qualitative research, the researcher must exhibit an unbiased attitude (Yıldırım & Şimşek, 2018). In this research, no comments were made in order not to affect the communication of the community members in the natural flow. In addition, the comments of the users in the findings section were presented directly.

FINDINGS

As a result of the data obtained from the virtual camping communities examined within the scope of the research, five main and seven subcategories have emerged. Main categories emerged are named as "search for knowledge", "technical information", "recommendations", "dangers" and "camp diaries" and the subcategories that are emerged related to the main ones are named as "beginners", "campsite rush", "getting in the sleeping bag", "cold related issues", "fighting insects", "experience" and "pleasure". The main and subcategories emerged in the research are given in Table 1.

Table 1. Main and subcategories emerged in the research

Main categories	Subcategories
Search for Knowledge	Beginners
	Campsite rush
Technical Information	Getting in the sleeping bag
Recommendations	Cold related issues
	Fighting Insects
Dangers	
Camp Diaries	Experience
	Pleasure

Search for Knowledge

Adventure lovers who are committed to camping search for knowledge on various subjects by becoming members of virtual camping communities. Especially, besides individuals with no experience of camping, others with experience also search for answers to their questions in these platforms. Hence, according to the posts shared in virtual communities, this category is studied under two subcategories as "beginners", "campsite rush".

Beginners

It is observed that individuals with no experience of camping are also seen in these virtual communities. Although they don't have any knowledge on this subject, by taking part in these platforms, they aim to experience camping with the knowledge they would gain. Hence, it cannot be ignored how important the interaction in these virtual communities is for beginners. Here are a few examples that could be evaluated in this category in accordance with the posts shared:

"Hello guys, I've been obsessed with camping for a while, I am looking forward like crazy, but I have no previous experience, no knowledge, there is no one around me who does it. So, this will be a general question, what should I make use of? For this, I am looking for good guidance, which I need primarily for shopping: it can be a site, a book, or a podcast."

"Hello there; first of all, I would like to express that I have no experience and I will buy a tent for the first time. I would like to ask you for your tent brand model advice, which I can use in the high plateaus of the Eastern Black Sea region between April and September, one that is rain-resistant. My budget is in the range of 600-850 TL. Thank you in advance for your help."

"It would be great if there are places that you know, which are not too difficult to get there. Saroz is actually not that close, but I can also get advice from you. In the meantime, I have never had a camping experience, but I don't think I will have trouble with food or fire, I should be starting somewhere."

Campsite rush

Members of the virtual camping communities interact with each other about campsite options. They try to identify the area they will camp by taking the thoughts of other people who have previously experienced certain campsites. Furthermore, it is seen that those who are satisfied with the campsites they have previously experienced share information about them on these platforms. Here are a few examples to be evaluated under this category;

"I'll be leaving tomorrow. I would be glad if you could tell us about the camping areas on the route or in Kas, which has washbasin shower, etc... And the ones that you were satisfied with; as I will decide according to your experience. Thank you very much in advance."

"We as three friends, will rent a car for two days from Istanbul. We want to escape somewhere for two days. Are there any places you know about? If there is a sea or a lake, it would be also very grate to plunge. We are looking for a quiet and free place; a place where a campfire or something like that won't cause a problem."

"Stop by the skirts of the Kızlarsivrisi. From Büyüksöğle village near Elmalı, take the dirt road leading to Kızlarsivrisi. You can make great observations there as the air is drier at height and there is no light source that causes light pollution around."

"Is there anyone who can recommend a place that we can reach without a transportation from Istanbul and reach with a relatively short walk? Last year, we camped in Uludağ, in February again. Transportation to Uludağ from Istanbul was quite easy. However, this year we want to go somewhere different. I'll be happy if you can help."

Technical Information

Members especially share theoretical information on water disinfection with each other on these platforms. In this technical information, information such as how many minutes and how the water should be boiled is tried to be explained by showing a scientific basis. Here are a few examples of the posts shared:

"My suggestion would be to boil water for one minute at sea level for water disinfection and boil it for an additional minute for every 1,000 feet (305 meters) above sea level."

"There are various ways to disinfect water. You can disinfect the water with many methods; however, the Centre for Disease Prevention and Control (CDC) recommend boiling it as the best method. The CDC believes that none of the methods other than boiling are 100% effective in killing all disease-causing agents. The CDC also recommends filtering the boiled water. It takes approximately one kilogram of wood to boil 1 liter of water."

"As the water gets warmer, there is a point where it starts turning into a gas. This is known as the boiling point. At sea level, when the water reaches 100 °C, its temperature no longer rises and it begins to turn into steam completely. At altitudes above 2000 meters (6,562 feet), boiling for an additional 3 minutes is recommended by the Centre for Disease Prevention and Control (CDC) to keep the water hot enough to terminate all risky microorganisms."

Recommendations

Individuals who are members of virtual camping communities advise each other on various topics. Among these recommendations, how to get in the sleeping bag, and what kind of clothes should be worn or not in a sleeping bag take an important place. They include that there is a cold related issues regardless of the season and what should be done on that matter. In addition, they also provide some recommendations on insects which are very common especially in some regions depending on the location of the camping area. Therefore, this category is divided into three subcategories such as getting in the sleeping bag, cold related issues and fighting insects.

Getting in the sleeping bag

Things to do when getting in the sleeping bag is one of the important issues that campers should pay particular attention. Members who have experienced camping before share their recommendations on this issue with other members. Among these recommendations, especially warming the body with some exercise, and then choosing the right outfit before entering the sleeping bag are important. As a general opinion, although it is thought that thick clothes should be worn inside the sleeping bag during night, but it is perceived that the right thing to do should be wearing thin clothes after warming the body. A few examples of this issue in the posts:

"In my opinion, your first mistake is your clothes when getting in the sleeping bag. Since sleeping bags are materials that protect the person from the cold by keeping your body temperature, getting in the sleeping bag with thick clothes causes the stagnant air trapped in the bag to warm up much later and thus it makes you feel cold. Therefore, and in my opinion, the right thing is to dress as thin as possible before getting into a sleeping bag. In your example, I think it would be more accurate if you only got into the sleeping bag with bottom/top underwear."

"If you crush the tent area and build a 25-30 cm high snow wall around it after you set up your tent, it will greatly protect you from the wind blowing outside at night. Therefore, you will be less cold. If you haven't done this, I suggest you try it next time."

"I usually sleep in a sleeping bag with my light clothes, and I put my clothes under me in the bag. When you wake up in the morning, your clothes are both dry and warm."

"The best thing is to move around enough to warm up and get undressed before the body cools down and to get in the sleeping bag with your liner underwear. Drinking something hot just before going to sleep also helps a lot. In my sleeping bag, when something thick is on me, I also feel cold. There should be some space in a sleeping bag so that hot stagnant air forms and warms up the person. In other words, once you get into a bag with thick clothes on, the clothes themselves are cold and they prevent the reflection of body heat into the sleeping bag."

Cold related issues

Campers experience a cold related issues regardless of the season. This issue is thought to be important in order to enjoy the camping and avoid various health problems. Therefore, members provide advise each other on what clothes and materials they should use in order not to get cold during the camping and where they can get these materials. A few examples that can be evaluated under this category:

"Summer or winter, I take my roller, Thermarest Ridgerest model mat (in my opinion, those are one of the best foam mats ever) with me and lay it under the inflatable mat. I get a pleasant insulation and comfort. If you have just gone out to that occasion with an inflatable or foam mat that its r value needs further confirmation, this can surely cause you to feel cold."

"My guess is Uludağ is between -10 and -14 at night. You will get very cold with Makalu magnum. I don't think a second foam mat under would be of enough benefit to keep you from getting cold. I have never used the other product you mentioned, so I cannot comment on it. But my advice is to go with a sturdier sleeping bag that might be borrowed as well."

"Unfortunately, chill is an integral part of winter camps. I have a thick goose feather coat, I recommend it to you as well. There is also goose feather vest. It helps one to keep warm inside. And my last humble recommendation is Tnf and Keen snow boots."

They have Thinsulate filling in. Also, their sole is made of felt. It makes a substantial difference. In other words, with a goose feather + sturdy boots + sturdy gloves and a quality balaclava, those colds become bearable."

"Based on the recommendation and the reviews on the site, I bought this tent for 460 TL (with a coupon it came down to 390 TL) from AliExpress. Price performance is very good. I also had the chance to use it in rainy weather. It is a very beautiful and light tent. I do recommend it."

Fighting Insects

For campers, it is important to pay attention to the insects in the region, especially when choosing campsites. As this situation can be annoying most of the time, it is seen that campers on virtual platforms warn each other and offer various advices on protection from insects. Here are a few examples of the posts on this subject:

"Make sure you take a good fly repellent product with you. Especially around Pokut and Sal, there are very small flies like plunder and they do hurt a lot. Also, make sure to have a poncho or a really good raincoat with you. And keep in mind that the meadow ground will be wet for almost 24 hours."

"Remember, lakes are rich in mosquitoes in hot seasons."

"I once camped on the beach in Çanakkale. Mosquitoes were getting into human nostrils, and ears. It is something nothing else; especially on the European side, there is a significant mosquito problem."

Dangers

According to the posts of individuals who are members of the virtual camping communities, it is seen that the major problems they may face in the camping areas is the wild animals. Besides, they should also pay attention to the situations unique to nature such as lightning strikes. Failure to take precautions against such dangers can have serious consequences. Therefore, individuals share their knowledge with other group members such as how to take precautions and what should be considered when they come across with some wild animals. Here are a few examples to be examined under this category:

"Attention, rain is something else, thunder is completely different. Do not risk it, if it is very dark as if it will rain heavily, or it is stormy or started to lightning, etc., Do not mount it under a single tree under a big tree. You can go in better weather conditions."

"You are in the middle of the wildlife. I'm talking about wolf, boar, jackal, bear, and all kinds of reptiles. They can be very dangerous."

"In order to avoid boars, it is absolutely necessary not to consume food near the tent or throw the leftovers around the tent if you have already. You also have to keep making noise so that the boar doesn't come there as there are people."

"Perhaps wolves are considered as more dangerous animals. Because wolves rarely roam alone, generally they are in packs. The greatest fear of humans is to come across a pack of wolves with perhaps 12-15 in quantity. The recommendation for this is to keep the fire burning all night long. Wolves are very afraid of fire. This way, you can defend yourself and your campsite."

"The rain got lighter, but I didn't want to get out before sunrise. Meanwhile, a bear bellow broke while I was pondering about these. While trying to guess the distance, the animal bellowed again ... It was bellowing every 20-30 seconds. I cannot comprehend the distance, but let me guess it was some 300 or 1000 meters at most. And the voice was echoing as there was a mountain. This time I was more scared than the first. The nearest highway is at a distance of 8-10 km by the bird flight. No cell phone service around."

"At the last camp, something came next to the tent, it growled, but it was not a dog or jackal growl. He had a loud voice. As far as I know the boar doesn't growl. A bear comes to one's mind."

"This summer, in a very irrelevant place, in a forest campsite, near Bolu Koroğlu, a scorpion came out from under the tent at a cool altitude that can be considered as quite high."

Camp Diaries

It is observed that individuals who are members of virtual camping communities share knowledge with each other about their experiences such as how they spend their time in the campsite, which campsites they prefer, and how they torch a fire. In line with the posts made, this category is studied under two subcategories as experience and pleasure.

Experience

In virtual camping communities, it is frequent that one comes across with posts about the various experiences of campers. These posts include topics such as the beautiful landscapes they see, the materials they use, the route they choose, storytelling about a day spent in the camp. Here are a few examples from this category:

"Feeling cold, I woke up at 6 am in a Makalu Magnum (comfort -2) sleeping bag, at +2 degrees (according to Google weather). Under the sleeping bag there is the Ridgerest Solar mat (r value 3.5). In 15 days, there will be a one-night activity in Uludağ. I decided to think about something so that I would not get cold there too, and that I could sleep well at night."

"I have been to İgneada twice, but always in the summer. Those are the places with truly magnificent nature. Last summer, we spent a night in a tent in Begendik, very close to the Bulgarian border (border flags in Bulgaria can be seen), next to the beach. For some reason, I hadn't thought of going in winter. It was good. I will consider this with my daughter. We also went to Kiyıköy. We sailed both rivers by boat. There were

campers along the stream, and we envied them (we couldn't camp because of my wife). That's why this place is more attractive than Igneada."

"I decided to torch a fire right away, both to warm up and to protect against wild animals. I had plenty of kindling with me, those little round candles, petroleum jelly cotton, and so on. I lined a row of wood on the snow 2 meters away from the tent. I put a candle on it and lit it, put some kindling on top of it, and on top of it I arranged relatively dry, easily broken branches that I had collected from the lower parts of the trees in a form of an Indian tent. I put thicker branches around it. The aim was to keep the first fire long and let the wet branches dry and catch fire. It worked, I just managed to torch the fire the first time."

"We spent the Saturday preparing firewood, enjoying the hammock, cooking and eating, drinking something hot and visiting the immediate surroundings. We made tea from the leaves of fir trees, but it must be because of the type of the tree, that it was not like a pine leaf. It had no aroma, as if we were literally drinking only hot water. We tried again by crushing the leaves and boiling them for a long time, but again it didn't work."

Pleasure

In the virtual communities studied, it is noteworthy that campers make posts about the pleasure they get along with their camping experiences. The excitement of the scenery in the camping environment, torching a fire, watching the stars is revealed in the posts they made. Here are a few examples in this category:

"We woke up in the morning with our hearts fluttering in a wonderfully beautiful environment. We lit the fire and explored the surrounding area until the snow water melted and boiled for breakfast. There were incredible views."

"We have telescopes in order to observe the stars, we intend to rest in a tent under a tree during the day, enjoy the sea at around 17.00-18.00, chat and watch the stars until morning."

DISCUSSION AND CONCLUSIONS

Virtual communities are platforms that provide a natural, high level of reality and sincere ethnographic data source in many areas. The prevalence of these communities day by day shows that the quality of interaction and communication between people continues through virtual environments rather than traditional environments. Therefore, it is stated that before communicating with virtual communities, which attract the attention of many areas, one should have information about the culture, hierarchical order, social structure and values of the group. The systematic monitoring, interpretation and analysis of virtual communities are realized through netnographic research (Baysal & Kayacan, 2022; Mutlu & Bazarıcı, 2017). In this direction, in this study, it is aimed to examine the behaviours and attitudes of individuals who

are members of camping virtual communities in Turkey, their experiences and their sharing on the sites they are members of, using the netnography method.

Although camping is regarded as a recreational activity that requires no special knowledge and could be achieved by anyone, where, how, how long a camp should be set up, clothes to be preferred, required camping equipment, correct employment of camping equipment and safety measures are main concerns to be dealt with. In this perspective, the interaction of the individuals with previous experience by sharing their knowledge and experience in the virtual communities in which they are a member of will help in keeping individuals who want to camp safe from possible problems.

The knowledge, experience, behaviour and attitudes of members of virtual camping communities have been studied under categories by netnography method. It is observed that the first category emerged regarding the comments made by individuals on these sites is the search for knowledge. In this category, individuals who have never camped before or do not have enough knowledge about camping are exchanging knowledge. Furthermore, individuals who have some knowledge about camping, interact about subjects like where to camp and also which sites are suitable and safe on this matter. Therefore, although camping is a recreational activity related to nature, the posts of individuals in virtual communities are seen as to have significance in attaining knowledge about the subject. Akar (2010) states that people in virtual communities create an environment of loyalty by connecting with others. Besides, Lam et al., (2010) defines that individuals who are members of virtual communities share knowledge, experience and recommendations by interacting with each other. Technical information is another subject that campers share with each other in virtual communities other than general information. They share some technical information such as how many minutes and how to boil water in order to make it potable while camping. In this perspective, sharing this kind of information about camping in virtual communities occurs to be important in order not to experience problems in a camp site.

Recommendations is another category that has emerged as a result of researching camping virtual communities. It is seen that campers advice each other, through the virtual communities they are members of, on matters such as the correct use of sleeping bag, how to deal with various insects in a campsite, and what kind of materials to use in order not to get cold. Uz Kurt and Özmen (2006) as well define virtual communities as communities that are created by people who come together on a special subject and provide and share the information they needed. Similarly, Saygın and Ersoy-Arca (2020) state that members open posts asking for help on topics, products and manufacturers they do not know. The recommendations written here assist members in their choices. Other members are also helpful when asked about products that are not in the group. When a problem is encountered in the group, members try to find a common solution in solidarity, and these solutions are effective in the formation of group rules.

Another category emerged as a result of the research is examined under the heading of dangers. In this category, issues like how campers should take precautions against wild animals such as wolf, boar, jackal, bear etc. and what to do when faced with them are significant. Additionally, it is also mentioned of possible dangers that could occur from natural phenomena such as lightning, and thunderbolt. As there may be a certain level of danger in every recreational activity, it is obvious that there may be situations that could endanger individuals exclusively

in recreational outdoor activities. In this perspective, it is important to gather information about various dangerous situations especially before going to camp sites and to take necessary precautions. In this context, it is possible to notify that the posts shared in virtual communities inform and warn individuals against possible dangers. Saygin and Ersoy-Arca (2020) state that informational questions are asked in virtual communities and explanatory articles for informational purposes are frequently shared. Communication is therefore strong in the virtual group. It is stated that individuals direct each other with their questions and requests. Similarly, members of the camping virtual community guide each other about possible dangers.

The last category emerged as a result of the research is named as camp diaries. This category includes the experiences of the individuals in a campsite and the pleasure they get from camping activity. Studying the relevant literature, Hagel and Armstrong (1997) as well consider virtual communities as a platform that experiences are shared. It is observed that individuals who have an interest in camping activity feel the need of sharing experiences gained in the camp site as well as subjects like information and recommendations. Similarly, Kitapcı et al., (2012) states that consumers feel the need to convey information electronically by sharing their positive or negative experiences about products with other consumers through different social networking and forum sites. Sharing information and experience about a recreational activity such as camping that is practiced in nature, through virtual platforms with others can be regarded as a complement to the pleasure that they get from the activity itself. Moreover, such sharing about one's experiences can be encouraging and guiding the others who want to camp but don't have the courage yet.

Theoretical and Practical Implications

This study focuses on the sharing of individuals in camping virtual communities. In this study, it is seen that virtual communities play an important role in the exchange of information between individuals. It can be said that they can obtain information about recreational activities, such as camping, which cannot be known without experience, through virtual platforms, quickly and easily. Therefore, individuals who have no previous camping experience and who will go camping for the first time can obtain detailed information and get advice through these platforms. In addition, they can take precautionary measures for possible dangers they may encounter during their camping experience. Besides, it is seen that camping equipment is also very important. In this direction, the results of the research can offer an idea to the suppliers of camping equipment. In addition, this study may contribute to the development of the method by paving the way for more researchers to use netnography, which is a newly used method in Turkey, in line with the opportunities it offers to researchers.

Limitations and Future Research

This study is limited only within the time period it is conducted so, the future research may include a broader data collection time period. Moreover, this study focuses only on the virtual camping communities in Turkey. The inclusion of different countries in similar studies to be carried out in the future may reveal the intercultural difference and enable more diverse results to emerge. This study is based only on campers. In the forthcoming studies, different experiences and cultures may emerge by working with individuals interested in different recreational sports.

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Authors' Contribution: Research design, Data collection, Statistical analysis, Preparation of the article, GY.

Ethical Approval

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Effect of Honeybee Products on Exercise Performance and Blood Chemistry Characteristics in Gymnasts

Nazmi SARITAŐ¹, Meltem SOYLU^{2*}, Hakan AKDOĐAN¹, Sibel SİLİCİ³

¹Erciyes University, Faculty of Sport Sciences, Kayseri.

²Alanya Alaaddin Keykubat University, Faculty of Health Sciences, Antalya.

³Erciyes University, Faculty of Agriculture, Kayseri.

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Abstract

Honeybee products have recently begun to attract attention with their effects on athlete performance. In the present study, it was aimed to investigate the effects of honeybee products' mixtures on the performance and some blood biochemical parameters of young trained gymnasts. Twenty-four young gymnasts aged between 6 and 12 years were observed for 4 weeks as they continued their usual daily training schedules. The gymnasts were divided into three groups. Group 1 was administered a mixture of honey and bee pollen at a dose of 50 g/day, whereas Group 2 was provided with a mixture of honey, bee pollen, royal jelly and propolis. Group 3 served as the control group and was administered a placebo of wheat starch at a dose of 50g/day. In the beginning and at the end of the study, performance parameters and biochemical parameters of young gymnasts were determined. After treatment, grip force and muscular strength measurements increased in Group 2 ($p<0.05$). The muscular endurance tests in the two honeybee product mixtures treatment groups showed improvement after supplementation ($p<0.05$). The improvement noted in the power test in Group 1 was significantly higher than the other groups ($p<0.05$). There was no significant difference between treatment and placebo groups in all investigated biochemical parameters except total protein, which was lower in placebo group. Although bee products supplements were administered only for a short period of time, the gymnasts showed higher performance in some investigated parameters. It is recommended to conduct further long-term studies using bee products.

Keywords: Honeybee products, Young gymnasts, Performance, Biochemical parameters, Sports nutrition

Genç Cimnastikçilerde Arı Ürünlerinin Egzersiz Performansına ve Kan Kimyası Özelliklerine Etkisi

Öz

Arı ürünleri, sporcu performansı üzerindeki etkileri ile son zamanlarda dikkat çekmeye başlamıştır. Bu arařtırmada, arı ürünleri karışımlarının genç cimnastikçilerde sporcu performansı ve bazı biyokimyasal parametreler üzerindeki etkileri incelenmiştir. Çalışma, yaşları 6 ve 12 arasında deđişen 24 genç cimnastikçi üzerinde olađan günlük antrenman programlarına devam ettikleri 4 hafta boyunca yürütülmüştür. Cimnastikçiler üç gruba ayrılarak 1. Gruba 50 gr/gün bal ve arı poleni karışımı, 2. Gruba bal, arı poleni, arı sütü ve propolis karışımı verilmiştir. 3. Grup kontrol grubu olarak alınmış ve 50g/gün dozunda buđday niřastası placebo olarak verilmiştir. Çalışmanın başında ve sonunda genç cimnastikçilerin performans ve biyokimyasal parametreleri deđerlendirilmiştir. Uygulama sonrasında sporcuların kavrama kuvveti ve kas kuvveti ölçümleri 2. Grupta artış göstermiştir ($p<0.05$). İki arı ürünü karışımı alan 1. Grupta ise kas dayanıklılık testleri iyileşme göstermiştir ($p<0.05$). 3. Grupta daha düşük olan serum toplam protein deđeri dışında, incelenen diđer tüm biyokimyasal parametrelerde gruplar arasında önemli bir fark görülmemiştir. Cimnastikçiler arı ürünleri desteđini kısa bir süre için kullanmalarına rağmen daha yüksek performans göstermişlerdir. Arı ürünlerinin daha uzun süreli kullanıldığı çalışmaların yapılması önerilmektedir.

Anahtar kelimeler: Arı ürünleri, Genç cimnastikçiler, Performans, Biyokimyasal parametreler, Sporcu beslenmesi

* **Corresponding Author:** Assoc. Prof. Meltem Soylu, **Email:** meltem.soylu@alanya.edu.tr

INTRODUCTION

Gymnastics, a sport branch that is exciting, admirable to watch with its artistic taste, has been very popular in recent years. Starting this sport early in life contributes to cognitive, effective and psychomotor development as well as healthy body development, and improves performance. Gymnastics requires strength, flexibility, agility, and coordination that enable all muscles to work using the body's natural movements (Jemni et al., 2006; Sands et al., 2002). With these features, gymnastics requires intense energy expenditure. Also, the increasing energy and nutritional needs of children and adolescent athletes during the period of rapid growth and development must be fully met.

This energy intake includes a high carbohydrate diet as well as protein and nutrient-rich foods to provide the raw materials for building and maintaining muscle tissue. Therefore, children and young athletes must develop good nutritional habits and maintain a diet containing sufficient amounts of energy and nutritious food. The ideal diet for all gymnasts should be high in carbohydrates, moderate in protein and low in fats, and should contain adequate amounts of vitamins, minerals and micronutrients (Artık, 2019; NCAA, 2018).

Honeybee products have recently begun to attract attention with their health effects and rich content because of their effects on athlete performance. Honey is a natural sweet substance produced by *Apis mellifera* bees from the nectar of plants or secretions of living parts of plants or excretions of plant-sucking insects onto the living parts of plants, which the bees collect, transform by combining with specific substances of their own, deposit, dehydrate, store and leave in honeycombs to ripen and mature (EU, 2002). Chemically, honey contains sugar (80%), water (15–20%) and minor compounds (1-2.6%) such as organic acids, minerals, proteins, phenolic compounds and amino acids (Bogdanov, 2016).

Royal jelly is a honeybee secretion used for feeding larvae as well as adult queens. It is secreted from glands in the hypopharynx of worker bees. The composition of royal jelly, in terms of proteins, carbohydrates and lipids, is reported in the literature (Sabatini et al., 2009). Chemically fresh royal jelly contains water (60-70%), proteins (9-18%), carbohydrates (5-15%), lipids (3-8%), mineral salts (1.5%) and vitamins together with a large number of bioactive substances (Ramadan and Al-Ghamdi, 2012). Additionally, royal jelly has a positive effect on the athlete's body and can be used for medical purposes ranging from pediatrics to geriatrics. It has been demonstrated that royal jelly has several physiological effects such as the improvement of heart function, strengthening and increasing the body's resistance, regulation of adrenal gland function under stress, depression, relief, fatigue, nervousness, insomnia, stimulation of endocrine glands and regulation of functioning of all organs and tissues, etc. (Joksimović et al., 2009). Additionally, Park et al., (2009) demonstrated that the administration of royal jelly protein in exercise-trained rats increases the muscle oxidative capacity and improves endurance in exercise performance.

Propolis, another honeybee product, is a resinous substance that bees collect from the exudates of plants, which they use to seal holes in the beehive. It is mainly composed of resin (50%), wax (30%), essential oils (10%), pollen (5%) and other organic compounds (5%). Propolis contains more than 300 components including phenolic aldehydes, polyphenols, sesquiterpene

quinines, coumarins, steroids, amino acids and inorganic compounds (Khalil, 2006). It has been shown that propolis has pharmacological properties such as antibacterial, antiviral, antifungal, antioxidant, anti-inflammatory, immunostimulating as well as cytostatic activity (Marcucci, 1995).

Bee pollen is mainly the male gametophyte of flowers collected by *Apis mellifera* to feed its larvae in the early stages of development. Bee pollen is composed of proteins, lipids, sugars, fiber, mineral salts, amino acids, phenolic compounds and vitamins. Pollen composition is very variable depending on the floral origin. The average commercially traded dried bee pollen composition is said to be not less than 40% carbohydrates, 15% proteins, 3% minerals and vitamins and 1.5% fat (Campos et al., 2008). Pollen is also rich in flavonoid and phenolic compounds. Their antioxidant effects are related mainly to their free radical scavenging activities. Bee pollen is accepted as an optimal food for athletes. In some countries, bee pollen preparations or extracts have been used by competitive athletes as a dietary supplement (Kostic et al., 2020).

It is thought that this rich and unique content of bee products will be effective in meeting the special energy and nutrient requirements of athletes. The effects of bee products, especially honey, on different sports branches have been investigated in various studies (Safitri et al., 2020). However, the effect of honeybee products mixture on young gymnasts, which are important for their energy and nutrient requirements, has not been studied sufficiently. Therefore, the main aim of this study was to determine the effects of honeybee products' mixtures on the performance and blood chemistry characteristics of young trained gymnasts.

METHODS

Research Model

This study examined the effects of honeybee products' mixtures on the performance and blood chemistry characteristics of young trained gymnasts. For this reason, the study adopted a relational screening model, one of the quantitative research designs. In this study, the research design consists of the pre-test and post-test experimental designs, and they are matched paired control group design. Experimental design is the research area in which the data to be observed are produced to discover the cause-effect relationships between the variables under the researcher's control.

Population and Sample

A total of 24 healthy gymnasts, an equal number of females and males, aged between 6 and 12 years old were included in the study. Volunteer athletes were selected from Gym Club in Kayseri, Turkey. Gymnasts were divided into three groups consisting of 8 athletes, according to given different honeybee product for 4 weeks and each group. They have performed the same usual daily training program. The workouts were mostly composed of strength exercises and continued for two hours. The effects of athletes given different mixtures on performance

and biochemical parameters were compared. The botanical origin of honey and pollen used in the study was Chestnut (*Castanea sativa*) and the geographic origin was Yalova, Turkey. Royal jelly and propolis were obtained from Nutral Therapy Company (Erciyes University Science and Technology Park, Kayseri). The athletes in Group 1 and Group 2 received two different mixtures of bee products (50g) and the placebo group received wheat starch (50g). The ingredients of the mixtures were as the follows: Group1, bee product mixture contained 95% honey, 5% bee pollen. Group 2, bee product mixture contained 84.25% honey, 10% bee pollen, 5% royal jelly and 0.75 % propolis. The dose was selected according to references (Yosef and Shalaby, 2010). Mixtures and starch were consumed 25-30 min before breakfast once a day for 4 weeks. The supplements did not contain food items other than the bee products. During the study, the athletes were instructed not to consume other bee products and maintain a standard diet.

Ethical Approval

Athletes and also their parents were informed about research and practice, and the "Enlightened Written Consent Form" was received from the athletes and their families. The study was approved by the Ethics Committee of Erciyes University in Kayseri (2012-403). This study was carried out following the latest version of the Helsinki Declaration. The data associated with the paper are not publicly available but are available from the corresponding author on reasonable request.

Data Collection

Blood samples were collected from the athletes in the beginning and at end of the study. After an overnight (12 h) fasting, blood glucose, total cholesterol, total protein, creatinine, BUN, Ca, P, Na, K, Cl, AST, ALT and ALP levels were measured. Biochemical analyses were performed at the Central Laboratory of the Hospital of Gevher Nesibe Medical School at Erciyes University. An Architect C800 Auto analyzer (Abbott, Istanbul, Turkey) was used (ISE speed 400 tests/hour) for spectrophotometric analysis. Anthropometric measurements (body weight, height, BMI, and body fat mass) of the athletes were performed before and after the study by bioelectrical impedance, Tanita 418 MA. Attention was paid to privacy during taking anthropometric measurements of children, and measurements were made in a private room with two researchers. Among performance parameters, pull-ups, sit-ups, flexibility, agility, speed and power characteristics were measured in the beginning of the study and after 4 weeks to assess whether there was a change in values within all of the research groups as well as possible differences between experimental and placebo groups. All the tests were repeated three times and three measurements were averaged.

Data Analysis

Statistical analyses were performed using the SPSS software version 15. Descriptive analyses were presented using means and standard error of the means. Changes in pre-training and post-training variables within the same group were tested by dependent samples Paired Student's t-test. One-way Anava analysis of variance was used to determine the statistically significant differences between the groups. When an overall significance was observed, pairwise post-hoc test were performed using LSD test. A p-value of less than 0.05 was considered to show a statistically significant result.

RESULTS

Table 1. Anthropometric variables of gymnasts

Variables	Group1 (n=8)	Group 2 (n=8)	Placebo (n=8)	p
	M±SEM	M±SEM	M±SEM	
Age (years)	7.75±0.70	7.75±0.59	7.13±0.44	0.690
Height (cm)	130.00±2.83	128.38±4.12	125.63±2.83	0.647
Body Weight (kg)	26.89±2.46	26.80±2.57	24.90±1.58	0.781
BMI (kg/m ²)	15.69±0.77	15.94±0.51	15.66±0.43	0.936
BMR	1102.50±41.18	1089.88±56.13	1089.25±38.79	0.974
Body Fat (%)	16.48±1.24	18.09±1.22	17.18±1.27	0.659
Fat Mass (kg)	4.51±0.68	4.88±0.61	4.29±0.41	0.771
FreeFat Mass (kg)	22.38±1.89	21.91±2.07	20.63±1.36	0.778
Total Body Water (kg)	16.39±1.39	16.04±1.52	15.10±0.99	0.777

$p < 0.05$; SEM: Standard Error of the Mean; Group1: 50 g (honey+ bee pollen+royal jelly +propolis); Group2: 50 g (honey + bee pollen+royal jelly); Placebo: 50 g wheat starch

Anthropometric measurements of the gymnasts are presented in Table 1. There was no statistically significant difference in anthropometric measurements between the groups ($p > 0.05$).

Table 2. Performance parameters of gymnasts between pre and post test.

Variables		Group 1 (n=8)	Group 2 (n=8)	Placebo (n=8)	p
		M±SEM	M±SEM	M±SEM	
Right Hand Grip Strength (kg)	Pre-test	13.00±1.49	12.38±1.66	10.63±1.48	0.602
	Post-test	13.38±1.46	13.71±2.07	11.38±1.51	0.448
	p	0.257	0.236	0.165	
Left Hand Grip Strength (kg)	Pre-test	12.50±1.81	11.75±1.56	11.00±1.49	0.819
	Post-test	12.75±1.63	12.71±2.00	11.50±1.68	0.775
	p	0.577	0.408	0.336	
Pull-up Test (Repeat)	Pre-test	6.25±2.14	7.38±1.85	5.75±2.18	0.69
	Post-test	6.38±2.12	8.50±2.17	6.63±2.56	0.703
	p	0.655	0.04	0.059	
Sit-ups Test (Repeat)	Pre-test	41.75±2.81	39.63±2.32	40.50±2.63	0.862
	Post-test	45.38±3.73	45.00±2.97	43.25±3.49	0.906
	p	0.017	0.018	0.223	
Flexibility Test (cm)	Pre-test	17.50±1.13	18.25±1.64	14.75±1.36	0.159
	Post-test	18.13±1.14	19.25±1.63	16.13±1.55	0.289
	p	0.096	0.197	0.038	
Agility Test (20 second)	Pre-test	4.48±0.23	4.61±0.39	4.09±0.33	0.366
	Post-test	4.43±0.23	4.58±0.38	4.06±0.33	0.366
	p	1	1	1	
Speed Test (50 Yard)	Pre-test	8.80±0.49	9.03±0.45	9.26±0.47	0.768
	Post-test	8.71±0.47	8.93±0.43	9.21±0.47	0.768
	p	1	1	1	
Power Test (long jump) (cm)	Pre-test	158.88±8.77	151.25±8.81	147.13±6.90	0.586
	Post-test	161.25±8.60	152.63±8.69	148.63±6.97	0.584
	p	0.016	0.016	0.026	

$p < 0.05$; SEM: Standard Error of the Mean; Group1: 50 g (honey+ bee pollen+royal jelly +propolis) Group2: 50 g (honey + bee pollen+royal jelly); Placebo: 50 g wheat starch

Concerning grip force and muscular strength measurements of the athletes, there was no significant difference between groups whereas, the increases in both parameters in honey+bee pollen+royal jelly+propolis treated group after treatment (Group 2) were statistically significant ($p<0.05$). The muscular endurance tests in the two treatment groups showed improvement after supplementation as compared to the values before the administration of the supplements ($p<0.05$). No significant difference was determined between groups for the flexibility test but it showed slight but not significant improvements in all three groups. No differences were determined in agility and speed tests. Power test showed improvement in the three groups, and the differences from the baseline values were found to be statistically significant ($p<0.05$, $p<0.01$, and $p<0.001$). The improvement noted in the power test in Group 1 was significantly higher than the other groups ($p<0.05$) (Table 2).

Table 3. Hemogram of gymnasts between pre and post test

Variables		Group 1 (n=8)	Group 2 (n=8)	Placebo (n=8)	p
		M±SEM	M±SEM	M±SEM	
Erythrocyte Subgroups					
RBC (10^6 /mL)	Pre-test	4.81±0.10	4.76±0.14	4.88±0.08	0.481
	Post-test	4.69±0.10	4.73±0.1	4.77±0.05	0.662
	p	0.183	0.833	0.208	
Hgb (g/dL)	Pre-test	13.52±0.44	12.86±0.32	13.42±0.22	0.180
	Post-test	13.12±0.42	13.07±0.24	13.31±0.23	0.709
	p	0.024	0.325	0.526	
Hct (%)	Pre-test	39.613±1.22	39.63±1	40.26±0.63	0.386
	Post-test	38.05±0.92	38.01±0.6	39.23±0.64	0.356
	p	0.042	0.092	0.123	
MCV (fL)	Pre-test	82.3±1.81	82.67±1.24	82.48±1.03	0.746
	Post-test	81.14±1.71	80.51±1.09	82.15±0.9	0.544
	p	0.05	0.012	0.575	
MCH (pg)	Pre-test	28.1±0.68	27.01±0.32	27.51±0.42	0.083
	Post-test	27.99±0.79	27.7±0.52	27.93±0.43	0.661
	p	0.575	0.107	0.262	
RDW (%)	Pre-test	13.57±0.39	14.01±0.34	13.47±0.36	0.369
	Post-test	13.6±0.36	13.68±0.28	13.42±0.25	0.695
	p	0.553	0.051	0.733	
Leukocyte Subgroups					
WBC(10^3 / μ L)	Pre-test	6.04±0.49	8.67±0.7	7.35±0.51	0.022
	Post-test	6.83±0.67	8.35±0.95	7.08±0.49	0.269
	p	0.012	0.779	0.575	
NE (%)	Pre-test	48.72±2.31	55.82±4.06	50.5±1.94	0.424
	Post-test	46.86±2.8	54.48±3.99	51.16±2.51	0.482
	p	0.401	0.575	0.401	
LY (%)	Pre-test	40.96±2.12	33.52±3.73	38.32±1.7	0.225
	Post-test	40.61±2.51	33.6±3.42	38.17±2.6	0.286
	p	0.069	1	0.779	
MO (%)	Pre-test	5.05±0.18	5.43±0.49	5.26±0.41	0.945
	Post-test	4.98±0.32	5.12±0.6	5.17±0.41	0.888
	p	0.182	0.889	0.833	
EO (%)	Pre-test	1.5±0.28	2.31±0.57	2.57±0.56	0.382
	Post-test	3.17±0.4	2.87±0.9	1.8±.24	0.05
	p	0.017	0.528	0.233	
BA (%)	Pre-test	0.58±0.13	0.5±0.11	0.67±0.15	0.604
	Post-test	0.58±0.08	0.3±0.06	0.52±0.06	0.027
	p	0.61	0.14	0.344	
Platelet Subgroups					
PLT (10^3 / μ L)	Pre-test	342.37±24.97	393.25±20.21	388.12±29.38	0.255
	Post-test	331.37±26.21	349.87±25.03	391.12±42.62	0.482
	p	0.674	0.05	0.944	
MPV (fL)	Pre-test	8.7±0.32	8.06±0.36	8±0.28	0.120
	Post-test	7.03±0.17	6.92±0.17	7.45±0.41	0.734
	p	0.017	0.017	0.208	

$p<0.05$; SEM: Standard Error of the Mean; Group1: 50 g (honey+ bee pollen+royal jelly +propolis) Group2: 50 g (honey + bee pollen+royal jelly); Placebo: 50 g wheat starch

In Group 1, significant decreases were observed in Hbg, Hct and WBC levels. The MCV levels were decreased in both treatment groups whereas RDW level decreased in only in Group 2 when compared to pre-treatment level (Table 3).

Table 4. Biochemical parameters of gymnasts between pre and post test

Variables		Group1 (n=8) M±SEM	Group2 (n=8) M±SEM	Placebo (n=8) M±SEM	p
Glucose (mg/dL)	Pre-test	95.13±2.72	88.50±3.85	91.13±2.64	0.338
	Post-test	90.13±2.59	87.63±2.38	84.88±2.05	0.305
	p	0.068	0.67	0.018	
Triglyceride (mg/dL)	Pre-test	57.13±6.30	61.38±5.12	59.13±6.91	0.588
	Post-test	65.25±8.10	76.25±13.75	64.88±9.81	0.697
	p	0.161	0.779	0.310	
Total cholesterol (mg/dL)	Pre-test	156.75±8.88	165.13±5.93	158.50±8.52	0.620
	Post-test	160.50±10.09	176.38±6.02	170.63±12.38	0.484
	p	0.575	0.107	0.068	
BUN (mg/dL)	Pre-test	11.25±0.77	11.00±0.85	11.75±1.29	0.952
	Post-test	11.13±0.77	10.50±0.65	9.13±0.67	0.143
	p	0.892	0.157	0.035	
Creatinine (mg/dL)	Pre-test	0.55±0.03	0.56±0.03	0.55±0.03	0.921
	Post-test	0.55±0.02	0.56±0.02	0.55±0.03	0.954
	p	1	0.528	0.245	
Calcium (mg/dL)	Pre-test	9.89±0.08	9.88±0.16	10.08±0.13	0.502
	Post-test	9.59±0.11	9.71±0.17	9.73±0.08	0.495
	p	0.041	0.307	0.024	
Phosphorus (mg/dL)	Pre-test	4.63±0.20	4.78±0.16	4.76±0.17	0.822
	Post-test	4.83±0.20	4.83±0.20	4.93±0.10	0.959
	p	0.207	0.799	0.235	
Sodium (mmol/L)	Pre-test	138.00±0.33	138.50±0.85	137.38±0.73	0.368
	Post-test	139.13±0.52	138.38±0.32	139.13±0.40	0.374
	p	0.071	0.798	0.119	
Potassium (mmol/L)	Pre-test	4.11±0.05	4.39±0.16	4.06±0.07	0.412
	Post-test	4.36±0.10	4.41±0.22	4.35±0.11	0.827
	p	0.026	0.892	0.024	
Chlorine (mmol/L)	Pre-test	106.88±0.77	106.50±0.60	106.63±0.75	0.917
	Post-test	105.88±0.44	105.50±0.57	106.63±0.56	0.424
	p	0.230	0.071	0.932	
CPK (u/L)	Pre-test	144.50±24.63	121.50±8.85	126.88±20.38	0.927
	Post-test	225.63±86.03	173.75±42.52	128.75±17.59	0.811
	p	0.575	0.612	0.889	
AST (u/L)	Pre-test	25.88±1.91	26.50±1.28	26.75±1.08	0.968
	Post-test	28.38±1.21	29.50±1.30	26.75±1.19	0.379
	p	0.121	0.104	1	
ALT (u/L)	Pre-test	19.13±1.55	15.88±0.77	18.88±1.65	0.214
	Post-test	16.63±1.56	16.88±1.67	20.38±2.46	0.651
	p	0.112	0.399	0.892	
ALP (u/l)	Pre-test	231.63±24.38	199.38±11.64	234.75±16.04	0.294
	Post-test	243.63±21.66	203.13±16.23	227.38±10.90	0.283
	p	0.260	0.735	0.574	
Total protein (g/dL)	Pre-test	7.06±0.13	7.33±0.19	7.09±0.05	0.442
	Post-test	7.10±0.10	7.08±0.14	6.68±0.06	0.003
	p	0.686	0.206	0.011	

p<0.05; SEM: Standard Error of the Mean; Group1: 50 g (honey+ bee pollen+royal jelly +propolis); Group2: 50 g (honey + bee pollen+royal jelly); Placebo: 50 g wheat starch

In terms of biochemical parameters, there was no significant difference between treatment and placebo groups in all investigated biochemical parameters except total protein, which was lower in placebo group. Compared to pre-test levels, slight but not significant decreases were determined in glucose levels in both treatment groups. But in placebo group, glucose and BUN levels decreased significantly (p>0.05). In Group 1 and placebo, decreases in Calcium and the

increases in Potassium levels were statistically significant. The lower total protein level in the placebo group were found to be statistically significant ($p>0.05$) (Table 4).

DISCUSSION

Two different bee product mixtures were used in this study. The first mixture contained honey and pollen, while the second mixture contained honey along with pollen, royal jelly and propolis. The reason for using these two different mixtures was to see the effect of compound groups with important biological activities such as protein, vitamin-mineral, fatty acids, phenolic compounds as well as energy needs in gymnasts. Because honey, with its high carbohydrate content, contributes to the energy need, while pollen and royal jelly with its protein, vitamin-mineral, fatty acids, etc. content and propolis with its high phenolic compound content, it has been tested whether it will contribute to the performance of gymnasts. As a matter of fact, it was possible to see that the effect differed when we increased the amount of pollen and added royal jelly and propolis to the mixture. Actually, it was possible to see this effect in the strength test in Group 1 and in the grip force and muscular strength measurements in Group 2. Apart from this, the biochemical values of the athletes given bee products were not adversely affected.

There are several supplements and sport foods that were claimed to increase endurance, enhance recovery, reduce body fat, increase muscle mass, minimize the risk of illness or achieve other goals that enhance sports performance. Particular attention must be paid to the consumption of sufficient amount of carbohydrates while performing endurance exercises for short or long periods. The depletion of muscle glycogen places the athletes in a difficult position, and fatigue and muscle cramps result in a pause in physical activity. Murray and Rosenbloom (2018) have reported that replenishment of glycogen stores in muscle and liver as rapidly as possible for the body to be prepared for subsequent training and competition is essential. It is a well-known fact that a carbohydrate-rich diet consumed immediately before a competition makes little contribution to meet energy demands on competition day. Therefore, several previous studies have been conducted to investigate the effects of various food items with or without supplements on performance and blood chemistry in human with slight or excessive physical activity (National Institutes of Health, 2017; Peeling et al., 2018).

Honey, the main component of the supplement used in the present study, has been a very important food throughout history due to its nutritional value, taste and unique aroma. It has also been used in the treatment of certain ailments and as an ingredient in certain preparations (Eraslan et al., 2010; Koç et al., 2009). Yusof et al., (2018) has reported that honey is an excellent source of energy for athletes due to its high carbohydrate content and functional properties²³. As claimed by other authors, honey is well tolerated and an effective carbohydrate source for athletic performance (Tikhonov et al., 2006; Turner et al., 2006; Traidl et al., 2003). Unlike carbohydrates and fats, proteins are not basic and efficient energy sources. Thus, athletes must consume sufficient amount of proteins in their diet. The bee pollen used as a supplement in the present study is known to be rich in B-group vitamins in addition to its protein and amino acid-rich content. Abramov et al., (1993) reported that the immune response, measured by the reactivity of T lymphocytes in sportsmen, returned to normal after intake of

pollen for two months. In one of the experiments with sportsmen in Russia, reviewed by Asafova et al., (2001), it was concluded that pollen can be used for recovery after periods of physical exertion. The influence of pollen intake was tested on the performance of military training in Russia and pollen could be used successfully for recovery after periods of physical strain and also improves physico-vegetative condition. Nechaeva (2009) tested the intake of 10 g pollen twice a day for 15 days on the performance of Russian female sport students. They found a significant improvement in the body's reaction to hypoxia and an improvement in visomotor reactions. However, in some studies no positive effect was obtained from the use of pollen in swimmers and long distance runners (Maughan and Evans, 1982, Wodhouse et al., 1987).

Protein-rich royal jelly, another component of the supplements in this study. Among relevant studies that have been conducted in football players, Jaskimovic et al., (2009) reported that royal jelly caused an increase in height and muscle mass and a decrease of fat levels in post-training measurement compared with pre-training levels. Furthermore, many researchers have obtained similar results in football players and royal jelly stimulates the growth and development of the body (Bonomi, 1983). Park et al., (2009) have reported that royal jelly protein administration in exercise-trained rats resulted in increased muscle oxidative capacity and promoted an improvement in endurance exercise performance. Yıldız and Umudum (2000) have reported that administration of royal jelly for a period of one month, decreased serum cholesterol and triglyceride levels in humans aged 35-50 years. There have been a limited number of studies carried out on the individual effects of propolis on performance and biochemical parameters in athletes. Among the few indirect relevant studies many researchers have reported positive effects of propolis on biochemical parameters in rats (Eraslan et al., 2008, Kanbur et al., 2009).

The most common problem associated with nutrition in children and young athletes is satisfying energy demand. The energy requirement depends on age and growth stage and the type, duration, and intensity of exercise. Children aged between 7-10 years who engage in very intensive physical activity and competitions require 3000-3500 kcal/day, and adolescents require 4000-5000 kcal per day. It is a basic principle of nutrition in athletes that they should consume a carbohydrate-rich diet at every meal to supply the fuel needed for muscles. In recent years the market has been offering thousands of remedies that help young athletes. Their content and quality vary from common water to hormonal remedies and may generally cause substantial damage to the body. The purpose of the present study was to evaluate the ergogenic potential of two different formulations of honeybee products compared to a wheat starch-based placebo. In the present study, the administration of these nutrient-rich and complementary products to the athletes aged between 6 to and 12 years for one month improved the muscular endurance tests in the two treatment groups and strength and power tests in the Group 2 after supplementation as compared to the values before the administration of the supplements ($p < 0.05$). These results confirm the findings of previous studies those investigated the ergogenic potential of honey (Wong, 2020).

Suh et al., (2007) have reported that athletes taking honey-based preparations are able to maintain blood glucose levels. Ahmad et al., (2015), have indicated that rehydration with honey

drink improves running performance and glucose metabolism compared to plain water in the heat. Maleki et al. (2016), indicated that honey is able to modulate exercise-induced peroxidative, antioxidative, and immunological changes in male road cyclists following chronic low-to-intensive exercise training and reported to be used as an anti-inflammatory and antioxidant supplement for competing athletes who participate in long-term moderate-to-intensive exercise training protocols. Kreider et al., (2002), have indicated that ingesting dextrose and honey gels during endurance cycling can improve performance, presumably by enhancing carbohydrate availability and work output. It was stated that honey significantly increases heart frequency and the blood glucose levels during a performance, and does not promote physical or physiological signs of hypoglycemia in fasting athletes (Leutholz and Kreider, 2002). In another study, Tikhonov et al., (2006) reported that honey did not promote physical or psychological signs of hypoglycemia in fasting athletes, or during resistance training. Also, in the same study, the effects of low and high glycemic index (GI) carbohydrate gels and honey were tested on a 64 km cycling performance. They have stated both high (glucose) and low GI (honey) gels increased cycling performance and the effect of honey was slightly better than the one of glucose. As claimed by other researchers (Traidl-Hoffmann et al., 2003; Turner et al., 2006), honey is well tolerated and can be an effective carbohydrate source for athletic performance. Suh et al., (2007) reported that honey-based preparations were able to maintain blood glucose levels during the trials. Again, Erejuwa (2012) stated that due to the relatively high fructose content in honey and the relatively slow rate of intestinal absorption of fructose, a slower blood glucose response following ingestion might have been expected. Yosef and Shalaby (2010) have reported that honey and water reduced the skin temperature and enhanced the glucose in the blood due to its fat absorption and its moderating effect on blood glucose in wrestlers. However, in the present study, there were no significant differences between treatments and placebo groups regarding the biochemical parameters but when pre and post treatment levels were considered, slight but not significant declines were occurred in glucose levels in both treatment groups. But the decreases in glucose and BUN levels in placebo group were significant ($p < 0.05$). (Table 3). Also, compare to the treatment groups, a significant decrease was observed in the total protein levels of the placebo groups (between pre and post-treatments). Compare to the pre and post measurements, significant increases were determined in the potassium levels of Group1 and the placebo group (Figure 4). The increase in potassium level may be due to the high potassium content of honey and pollen. Moreover, calcium levels decreased in all of the groups without any significant difference. Similar to the results of the present study, Sarıtaş et al., (2011) reported that supplementation of royal jelly during a 30-day exercise program was not significantly effective for swimmers. Also, they have reported that different doses of royal jelly were not effective on certain biochemical parameters (glucose, total cholesterol, HDL, LDL, CK levels and LDH, AST, and ALT activities) of the swimmers, whereas BUN levels were higher in a royal jelly group than others. According to these and findings of other studies, honey is well tolerated and can be an effective source of carbohydrates for athletic performance (Yosef and Shalaby 2010).

In the present study, the lack of a significant difference between the groups which were administered honeybee product mixtures and the placebo group, particularly in respect to biochemical parameters, may be related to the administration dose and duration. However, the treatments have positive effects on some performance parameters as pull-ups, sit-ups and

power. Honey, bee pollen, royal jelly and propolis are combined in different proportions, and they are marketed as different products due to their rich content. These mixtures have been widely propagated as nutritional supplements and for the prevention and treatment of different diseases such as infectious diseases, inflammatory disorders, immune and gastrointestinal ailments (Bogdanov, 2016). In the present study, the young gymnasts were treated with 50 g of mixtures of honeybee products per day. It is necessary to perform hematological and biochemical tests when giving any food supplement to the athletes. It is known that bee products have beneficial effects on health. However, in this study, a remarkable improvement was not expected since our athletes did not have any health problems. In addition, the absence of a negative effect is the findings supporting the research.

Conclusions

In conclusion, used mixtures of honeybee products had no significant adverse effect on the biochemical characteristics of young gymnasts. Although no negative effects are expected regarding the consumption of bee products, it is important to preserve the biochemical values of the athletes. It was determined that the application of 50 g honeybee product mixture to gymnasts for 4 weeks had a positive effect on some performance parameters. However, it is clear that these mixtures should be applied for a longer period of time and regularly in order for this effect to be observed more clearly. For this reason, it would be beneficial to practice with more athletes and for a longer period of time.

Conflict of Interests: The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

Authors' Contribution: Study design; NS, SB –Data collection; NS, HA –Statistical analysis; MS –Manuscript Preparation; MS, NS

Ethical Approval

Committee: Erciyes University, Scientific Research Ethic Committee

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Non-Invasive Evaluation of Heart Rate Variability During Platform Balance Test

Tuncay ALPARSLAN^{1*}, Ramiz ARABACI², Hüseyin TOPÇU²

¹Turkish Air Force, Aeromedical Research and Training Center, Eskişehir.

²Bursa Uludağ University, Faculty of Sport Sciences, Bursa.

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Abstract

Neuromuscular activity also increases as we try to maintain our balance. Neuromuscular activity also causes changes in heart-rate-variability parameters. In the measurement of heart-rate-variability, recordings are generally taken for 5-minutes or longer. However, in recent years, ultra-short-term heart-rate-variability measurements from 5-minutes to 10-seconds have been made, especially in physical capacity measurement. The aim of the present study is to compare the heart-rate-variability parameters between the groups formed according to the performance before, during and, after the dynamic balance test. The sixty-three healthy males were recruited (age=25.8±3.3 years; height=176.6±5.5; weight=77.6±8.0) participated voluntarily. Heart-rate-variability was recorded for 60-seconds prior to testing. Afterwards, the participants were taken to the platform without shoes. Heart-rate-variability was recorded for 60-seconds at this time and 60-seconds at the end of the test. At the end of the balance test, according to the test procedure of the balance device, those who could stay in the A, B, C, D regions the most, that is, in the region closest to the center point, were grouped as the 1st group (n=38) and the others as the 2nd group (n=25). As a result of the study, a statistically significant difference was found between the groups in terms of heart rate variability changes for normalized low-frequency and normalized high-frequency significant differences were found between which groups (p<0.05). As a result, it was concluded in our study that participants with better balance skills had higher heart-rate-variability values. Considering that heart rate variability is also an indicator of fatigue, we can say that the implementation of exercises aimed at improving balance skills will contribute to the autonomic nervous system of the athletes.

Keywords: Autonomic nervous system, Physical capacity, Sympathetic activity, Balance

Platform Üzerinde Uygulanan Denge Testi Esnasında Kalp Atım Hızı Değişkenliğinin Non-Invazif Değerlendirilmesi

Öz

Denge sağlamaya çalışılırken, sinir-kas aktivitesi artar. Artan sinir-kas aktivitesi kalp atım hızı değişkenliği parametrelerinde değişikliklere neden olur. Kalp atım hızı değişkenliği ölçümünde genel olarak 5 dakika ve üzerinde kayıtlar alınmaktadır. Fakat son yıllarda özellikle fiziksel kapasite ölçümünde 5 dakikadan 10 saniyeye kadar ultra kısa süreli kalp atım hızı değişkenliği ölçümleri de yapılmaktadır. Bu çalışmanın amacı dinamik denge testi öncesi, sırası ve sonrasında, denge test platformunda belirlenen merkezde kalma süresine göre oluşturulan gruplar arasında kalp atım hızı değişkenliği değerlerinin karşılaştırılmasıdır. Çalışmaya 63 sağlıklı erkek (yaş=25.8±3.3 yıl; boy uzunluğu=176.6±5.5; vücut ağırlığı=77.6±8.0) katılımcı olarak alınmıştır. Kalp atım hızı değişkenliği test öncesinde 60 saniye boyunca kaydedilmiştir. Daha sonra katılımcılar ayakkabısız olarak denge platformuna çıkartılmıştır. Kalp atım hızı değişkenliği bu sırada 60 saniye ve test bitiminde 60 saniye olarak kaydedilmiştir. Denge testi sonunda denge cihazının test prosedürüne göre A, B, C, D bölgelerinden en fazla A bölgesinde yani merkez noktasına en yakın bölgede kalabilenler 1. grup (n=38), diğerleri 2. grup (n=25) olarak gruplandırılmıştır. Çalışma sonucunda normalize edilmiş düşük frekans ve normalize edilmiş yüksek frekans için kalp atım hızı değişkenliği değişiklikleri açısından gruplar arası anlamlı farklılık bulunmuştur (p<0.05). Sonuçta çalışmamızda denge becerisi daha iyi olan katılımcıların kalp atım hızı değişkenliği değerlerinin daha yüksek olduğu sonucuna varılmıştır. Kalp atım hızı değişkenliğinin yorgunluğun da bir göstergesi olduğu düşünüldüğünde, denge becerilerini geliştirmeye yönelik egzersizlerin uygulanmasının sporcuların otonom sinir sistemine katkı sağlayacağını söyleyebiliriz.

Anahtar kelimeler: Otonom sinir sistemi, Fiziksel kapasite, Sempatik aktivite, Denge

* Corresponding Author: Tuncay ALPARSLAN, E-mail: tuncayalparslan@hotmail.com

INTRODUCTION

Postural control is defined as the act of maintaining, achieving or restoring a state of balance during any posture or activity (Pollock et al., 2000). Balance involves coordinated neuromuscular movements with signals from the visual, vestibular, and somatosensory structures to maintain the body's vertical position of the center of gravity on the base of support (Nashner, 2014). Balance skill is effective in providing many activities from postural posture to sportive performance. A horizontal position device is used to determine the dynamic balance skill. Weight is transferred to this device by climbing with two feet. At the end of the determined period, the performance is determined (Hrysomallis, 2011). Previous studies show that enhanced postural skills are accompanied by neuromuscular adaptations (Kneis et al., 2016; Taube et al., 2007; Zech et al., 2010). It is recommended to use balance exercises for postural and neuromuscular control improvements (Zech et al., 2010). Balance, neuromuscular control causes and increases changes in the autonomic nervous system (ANS) and therefore heart-rate-variability (HRV) to a certain extent (Kang & Hyong, 2014).

It is known that the cardiovascular system gives physiological responses such as tachycardia, increase in systolic blood pressure and cardiac output, and redistribution of blood flow to the heart and skeletal muscle against external physical or psychological stressors (Herd, 1991; Iellamo et al., 1997; Scalise et al., 2021) Unstable surfaces are an important source of external physical stress for the body. The HRV data of the athletes who had a good ability to cope with this stress were a better than the other group. Choi et. al (2010) in a study that compared the physiological values of talented golfers and less skilled golfers during the putting stroke, concluded that skilled golfers had better HRV values. They stated that this situation was associated with greater automaticity and reduced attention demands of the athlete with better ability to resist stress. The results of our study supported the findings of this study. Espinoza-(2021), in a study examining the relationship between the postural system and the autonomic system of Parkinson's patients, found evidence showing a relationship between the autonomic and postural systems. In the study, they reported that patients with more cardiac autonomic impairment had weaker postural control.

HRV, includes physiological changes between successive heartbeats controlled by the ANS (Baek et al., 2015), and performance context, exercise outcomes can be determined by HRV parameters evaluated ANS (Buchheit et al., 2010; Giles & Draper, 2018; Mosley & Laborde, 2015). Short-term and ultra-short term HRV measurement were evaluated after exercise, and consistent results were obtained (Kiviniemi et al., 2007; Makivić et al., 2013; Seiler et al., 2007). At the same time, there are studies on determining the timing to reach maximum performance in athletes (Chalencon et al., 2012; Manzi et al., 2009; Plews et al., 2012). In recent years, ultra-short-term heart-rate-variability measurements from 5-minutes to 10-seconds have been made, especially in physical capacity measurement (Esco et al., 2018; Nakamura et al., 2015). Balance ability and HRV are related to the functioning of the ANS (Billman, 2013; Robé et al., 2021). Balance ability refers to the ability to maintain a stable upright posture during standing or movement, and it requires the integration of sensory information from multiple systems, including the visual, vestibular, and somatosensory systems (Horak, 2006). HRV, on the other hand, refers to the variation in time between successive heartbeats and it is a measure of the activity of the ANS, which is composed of the sympathetic and parasympathetic nervous systems (PNS) (Shaffer & Ginsberg, 2017). Research has suggested that there is a correlation between balance ability and HRV.

Specifically, individuals with better balance ability tend to have higher levels of HRV, indicating a more balanced ANS with a greater capacity to adapt to changes in the environment (Robé et al., 2021). In contrast, individuals with impaired balance ability, such as those with Parkinson's disease or stroke, tend to have lower levels of HRV (Espinoza-Valdés et al., 2021). However, the exact nature of the relationship between balance ability and HRV is still being investigated, and more research is needed to fully understand the link between these two measures.

To the best of our knowledge, no research has been found using HRV data to determine the level of dynamic balance. In the balance test, we wonder about the importance of performance in maintaining vagal balance. The aim of the present study is to compare the HRV values between the groups formed according to the performance before, during, and after the dynamic balance test. We hypothesized that individuals with better balance performance would be more effective at suppressing sympathetic activity during and after testing, and better performing group would have significantly higher HRV values during the testing phases.

METHODS

Research Model

This research is a study conducted in a pre-test, test, post-test two-group comparative experimental design.

Research Groups

Sixty-seven healthy individuals who do recreational sports (walking, running, tennis, swimming, basketball, football) participated in the study. They were all male and had a medical report. Those who did not have a lower extremity injury in the last 6 months were included in the study. It was confirmed that the participants did not have a previous chronic disability that would affect their balance performance. A voluntary consent form was signed by the participants. Four participants were excluded from the study due to not completing all or part of the test. The final sample consisted of sixty-three participants (age=25.8±3.3 years; height=176.6±5.6 cm; weight=77.6±8.0 kg). Participants reported that they did not use medical drugs.

Data Collection Tools

Body Composition: Height was measured with Holtain Harpenden 601 stadiometer (Holtain Ltd., UK). Body weights was measured with an InBody brand 270 model (Biospace Co., S. Korea) body analyzer. The test was carried out according to the user manual and body mass index (BMI) was determined by formula $\text{weigh (kg) / height}^2 \text{ (cm)}$.

Balance Test: Sixty seconds of dynamic balance was measured by Sigma (Sigma Platform Balansowa, Poland). Participants stepped onto the balance platform with both feet. They tried to maintain their balance for 1 minute by looking at the screen in front of them. The device had a sensor that detects the change of position. There is also a system that determines the angle of oscillation. The results of the device were recorded in cm. The middle of the A region was considered the center.

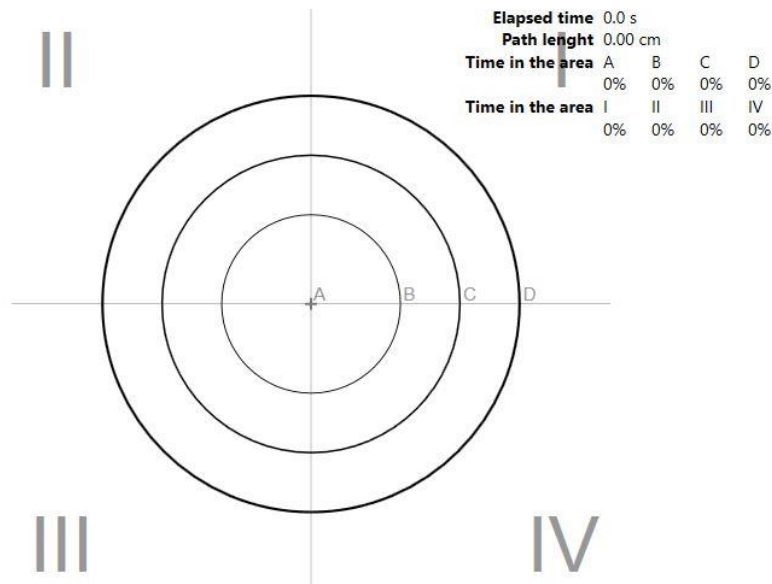


Figure 1. Balance Test platform program screenshot

Heart Rate Variability: Polar H7 band (Polar Electro, Kempele, Finland) was used for measurement of HRV. Polar V800 was used to collect HRV data. The correlation coefficient for calculating the RR interval of this device is high (intra-class correlation coefficient of >0.99) (Giles et al., 2016). HRV data was stored with Polar FlowSync Software (version 3.0.0.1337). The Kubios HRV standard for Mac (Biosignal Analysis and Medical Imaging Group, Department of Physics, University of Kuopio, Finland, version 3.1.0.1) was used for HRV analysis. Time-domain and frequency-domain values were processed. Recordings were transferred to PC with 1000 Hz sampling rates. Participants rested on their backs for 10 minutes before the test (Marek, 1996). Heart rate interval was recorded for sixty seconds separately before, during, and after the test. The spectral response was divided into 3 bands. Very low frequency (0.003–0.04 Hz), low frequency (0.04–0.15 Hz), and high frequency (0.15–0.4 Hz) (Makivić et al., 2013). Kubios 3.1 standard software was used for HRV analysis (Tarvainen et al., 2014). Evaluated time and frequency parameters for HRV:

- “Mean of R-R intervals (MeanRR)”,
- “Standard deviation (SDNN) of R-wave and R-wave intervals”,
- “Root mean square (RMSSD) of consecutive R-R intervals”,
- “Percentage of consecutive RR intervals that differ by more than 50 ms (PNN50)”,
- “Normalized absolute power of the low frequency band (LFnu)”,
- “Normalized absolute power of the high frequency band (HFnu)”,
- “Ratio of LF-HF power (LF/HF)”.

Ethical Approval

The experiments were approved by the Eskişehir Osmangazi University Research Ethics Committee (04.06.2020/07).

Collection of Data

Tests and applications were made on weekdays. It was held between the hours of 10:00 AM-12:00 AM. The temperature of the room where the measurement was made was 22-24°C and the humidity was 33-45%. The volunteers did not do vigorous exercise before the test day. It was requested not to use stimulants such as drugs on the test day. Researchers conducted the tests in groups consist of 6 participants. After the participants were informed and familiarized the test, HRV was recorded for 60 seconds (Esco et al., 2018; Nussinovitch et al., 2011). Afterwards, the participants were taken to the platform without shoes. HRV was recorded for 60-seconds during-test and 60-seconds after the test. Participants who could stay in the central region (A region) the most among the A, B, C, D regions were grouped as the 1st group (n=38), and the others as the 2nd group (n=25).

Analysis of Data

The mean and standard deviation of the research data were calculated. In relation to if the data distributed normally or not, for the kurtosis and skewness values, the Tabachnick and Fidell coefficients were used. For the comparison of age, height, weight, body fat, and BMI, t-test statistical method was used. Repeated two-factor analysis of variance (ANOVA) during the pre-test, test, and post-test was used to compare the 2 groups (3 times x 2 groups) HRV parameters. The Effect Size Eta squared (η^2) was calculated, which was considered small ($0.01 > \eta^2$), medium ($0.01 < \eta^2 < 0.06$), or large ($\eta^2 > 0.14$). Calculations were made with SPSS version 26 for mac OS, (SPSS Inc., Chicago, IL, USA). Significance level was accepted as $p < 0.05$.

FINDINGS

The physical characteristics of the participants in the balance test and their oscillations for 60 seconds are shown below (Table 1). There was no significant difference between the groups in terms of age, height, weight, BMI, and body fat.

Table 1. Physical characteristics of the subjects (n=63)

Physical Characteristics	G1 ($\bar{X} \pm SD$)	G2 ($\bar{X} \pm SD$)	t
Age (years)	25.4 ± 2.9	26.5 ± 3.8	1.34
Height (cm)	176.7 ± 5.4	176.3 ± 5.8	0.31
Weight (kg)	77.9 ± 6.9	77.1 ± 9.6	0.38
BMI (kg.m ⁻²)	24.9 ± 1.5	24.8 ± 2.2	0.32
Body fat (%)	19.8 ± 4.4	19.7 ± 4.7	0.08
Balance test performance average (cm)	9.4 ± 4.5	9.7 ± 2.8	0.26

BMI: Body mass index, G1: group above average of balance test, G2: group below average of balance test.

The changes in HRV parameters of the groups in balance tests before, during, and after the test are shown in Table 2. As seen in Table 2, there is a significant difference between the groups for LFnu ($F=3.9$, $\eta^2=0.06$) and HFnu ($F=3.9$, $\eta^2=0.06$) values ($p < 0.05$). Mean-RR ($F=0.9$, $\eta^2=0.01$), SDNN ($F=0.5$, $\eta^2=0.01$), RMSSD ($F=1.5$, $\eta^2=0.02$), PNN50 ($F=1.9$, $\eta^2=0.03$), and LF/HF ($F=3.0$, $\eta^2=0.05$) statistically significant difference was not found in the variables.

Table 2. The change of HRV parameters of the groups in balance tests before, during and after the test

	Group	Pre-test	Test	Post-test	F	ES
Mean RR (bpm)	G1	598.1 ± 86.1	577.1 ± 95.1	570.9 ± 71.9	0.9	0.01
	G2	572.7 ± 65.6	544.6 ± 68.9	556.2 ± 56.3		
SDNN (ms)	G1	34.6 ± 15.4	19.9 ± 10.9	34 ± 24.4	0.5	0.01
	G2	37.1 ± 16	18.1 ± 9	33.5 ± 20.9		
RMSSD (ms)	G1	21.8 ± 14.5	14.8 ± 11.4	25.2 ± 31.2	1.5	0.02
	G2	26.4 ± 19.3	17.2 ± 22	20.6 ± 11.7		
PNN50 (%)	G1	4.2 ± 5.6	2.6 ± 5.3	4.3 ± 6.8	1.9	0.03
	G2	6.6 ± 10.2	2.3 ± 7.3	4.8 ± 6.3		
LFnu (ms ²)	G1	80.8 ± 14.2	75 ± 17.5	76.7 ± 15.1	3.9*	0.06
	G2	71.7 ± 21.9	77.9 ± 14.6	78.6 ± 13.4		
HFnu (ms ²)	G1	19.1 ± 14.1	24.8 ± 17.4	23.2 ± 15	3.9*	0.06
	G2	28.1 ± 21.8	21.9 ± 14.4	21.3 ± 13.3		
LF/HF	G1	7.7 ± 6.7	5.3 ± 4	5.8 ± 5.4	3	0.05
	G2	5.2 ± 4.8	6.9 ± 7.9	5.5 ± 3.5		

MeanRR: Mean of R-R intervals, SDNN: Standard deviation of R-wave and R-wave intervals, RMSSD: Root mean square of consecutive R-R intervals, PNN50: Percentage of consecutive RR intervals that differ by more than 50 ms, LFnu: Normalized absolute power of the low frequency band, HFnu: Normalized absolute power of the high frequency band, LF/HF: Ratio of LF-HF power, * = p<0.05, G1: group above average, G2: group below average, ES=Effect size.

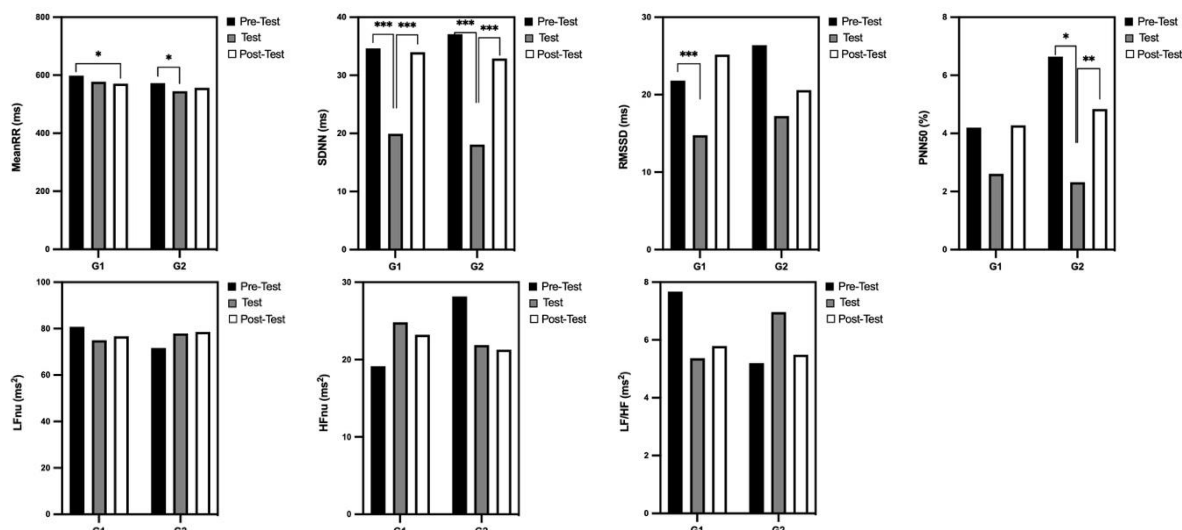


Figure 2. HRV changes in the balance test before, during and after the intra-group test

The changes in HRV parameters before, during, and after the intra-group test in the balance test are shown in Figure 2. In the balance test, pre-during-post test, for the G1 group intra-group comparisons; Mean-RR (G1: F=5.4**, $\eta^2=0.13$; G2: F=4.8*, $\eta^2=0.16$), SDNN (G1: F=14.8***, $\eta^2=0.29$; G2: F=22.1***, $\eta^2=0.48$), RMSSD (G1: F=5.1*, $\eta^2=0.12$). PNN50 (G2: F=6.2*, $\eta^2=0.20$) statistically significant difference was found in the variables.

DISCUSSION AND CONCLUSION

The aim of present study is to determine whether there is a significant difference between groups formed according to dynamic balance test performance in terms of HRV values pre-during-post test. Our findings shown a statistically significant difference between the groups in terms of HRV changes for LFnu and HFnu (p<0.05). There was no significant difference for MeanRR, SDNN, RMSSD, PNN50, and LF/HF. There were differences for G1 and G2 among some HRV changes in differences between intra-group test stages. For SDNN, it was significant at the p<0.05 level for pre-during-post test in both groups. According to the findings

of this study, we can accept the hypothesis that HRV values will significantly differ before and after the balance test and that there will be significant HRV changes among groups formed based on balance performance, in terms of both LF and HF.

As stated above, studies on balance and HRV are very limited. For this reason, the results of studies in which different groups were compared with HRV changes during exercise were used. There are some studies showing that those with better physical capacity have higher HRV values. In study conducted on elite athletes and sedentaries, Dixon et al., (1992) found that the LF/HF ratio returned to pre-exercise levels after exercise within 5-minutes recovery in athletes, while a 15-minute recovery time was required for sedentaries. At the beginning, it was seen that HF was higher in athletes. Middleton & De Vito, (2005) stated endurance training differs in cardiovascular autonomic control compared to sedentary. Higher MeanRR values ($p < 0.001$) were observed in the trained group, conversely, the athletes exhibited higher LFnu ($p < 0.001$) and lower HFnu ($p < 0.01$) as a result, the LF/HF ratio was higher in the trained group ($p < 0.01$). Biswas, (2020) did not record a significant difference in study which he compared the HRV values of cricketers and active and passive participants at rest.

It is widely thought that the HF peak reflects parasympathetic nerve activity and LF reflects sympathetic activity (Berntson et al., 1997; Billman, 2013; Malik, 1996). It was stated in some studies (Malliani et al., 1991; Pagani et al., 1986) that the LF/HF ratio could be used to measure the vagal balance between sympathetic and parasympathetic nerve activity. However, this is opposed in some studies (Berntson et al., 1997; Billman, 2011). Heart rate at rest can also affect HRV. The frequency domain analysis of HRV is similarly affected by the mean heart rate. Sacha & Pluta, (2008), found that LF was directly related, and HF was indirectly related to the subject's mean heart rate. As a result, they reported that LF/HF varied with heart rate, being lower in slower heartbeats and higher in faster heartbeats. Therefore, heart rate is independent of changes in cardiac autonomic nerve activity may affect the LF/HF as well. It has been reported in another study that respiratory rate increases the LF/HF ratio, but that it is unreliable in classifying fatigue (Saboul et al., 2014). It can be said that this may not be valid for tests where the respiratory rate does not increase much, such as the balance test.

Maheshkumar et al., (2017) have compared the short-term HRV between football players and sedentaries. MeanRR, SDNN, RMSSD, and PNN50 were significantly higher in the study group than the control group. HFnu showed significant higher value while LFnu and LF/HF of frequency domain parameters showed significant reduction among the football players. Janssen et al., (2004), in his study with cyclists and sedentary groups, had significantly higher SDNN, RMSSD, PNN50, and LF values in favor of cyclists while standing in a horizontal position, while HRV changes in standing measurements were not significant. Kayacan et al., (2023), examined the HRV values of professional handball players and sedentary players before and after the Wingate anaerobic strength test. There was no difference in parameters related to HRV frequency between the groups before and immediately after the test, but MeanRR ($p < 0.05$) before the test and PNN50 ($p < 0.05$) after the test increased in the athletes. Maior et al., (2015), investigated HRV values between elite volleyball players and individuals with recreational aerobic training with the progressive ramp treadmill test. RAT at rest showed lower values of MeanRR, RMSSD, LF and mean square of sequential difference of total power spectrum compared to volleyball players. There was no significant difference between the groups in terms of HF and LF/HF index. Another study confirms a faster return to hemodynamic equilibrium in physically active subjects, consistent with adaptations, compared to their

sedentary counterparts (Oyeyemi et al., 2015). Sharma et al., (2015) evaluated HRV in the time and frequency domains between elite Nepali football players and non-athletes. Examined temporal and spectral HRV parameters determined from a 5-minute continuous ECG during supine rest RMSSD was higher in football players than non-athletes. Similarly, SDNN, the determinant of global HRV, was higher in players ($p=0.003$). Also, LF/HF, reflecting LFnu and sympatovagal balance, was significantly lower in players. Hammami et al., (2017) evaluated the effects of soccer training on short-term heart rate variability, blood pressure, and physical condition in untrained healthy adolescents. While HF and RMSSD showed a significant increase in the experimental group, LF sympathetic activity decreased. Our research results are consistent with the above research results. Findings related to higher HRV values and faster recovery time in those with high physical capacity resulted in favor of those with higher readiness in the balance skill measurement in our study.

There are several limitations of the present study. Firstly, only healthy young men were included in this study. Therefore, our results may not be generalizable to other populations like athletes, the elderly, females, with low back pain, etc. Secondly, the sample size was small. Finally, in present study were not assessment non-linear parameters of HRV.

In future studies will be required to investigate participants from populations with different demographics. In our study during 60-second dynamic balance test participants' eyes was open and both feet on the platform. There is a need for studies that apply different balance tests (eye-closed, one leg, dynamic balance, etc.). Also, in our study, a 1-minute ultra-short HRV measurement method was used. However, different stabilization times may be required for each individual due to different performance levels and sports branches (Plews et al., 2012). Therefore, longer-term HRV measurements would be beneficial in future studies.

With these results, it can be said that the group with better balance performance was more successful in suppressing the increased sympathetic activity during the test stages, due to the significant change in LFnu and HFnu values. It can be explained by the change in SDNN that the balance test in both groups significantly changed the balance of the general ANS for pre-test and post-test.

Conflicts of Interest: The authors declare that they have no conflict of interest.

Authors' Contribution: Study Design-TA-RA, Data Collection-TA-HT, Statistical Analysis-TA-RA, Manuscript Preparation-TA-RA-HT. All authors read and approved the final manuscript.

Ethical Approval

Ethics Committee: Eskişehir Osmangazi University Research Ethics Committee

Date/Protocol number: 04.06.2020/07

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Self-Handicapping and Self-Esteem Levels of Judokas

Zafer DOĐRU^{1*} , Sedanur İÇAĐASI¹ 

¹Hitit University, Faculty of Sport Sciences, Çorum, Türkiye

Research Article

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Abstract

The present study was carried out to investigate self-handicapping and self-esteem levels of judokas. The categorical and demographic information of the subjects (N=149) who voluntarily participated were collected. Self-handicapping scale (SHS) adapted into Turkish by Akin (2012) and self-esteem scale (SES) adapted into Turkish by Tukas (2010) were used as online data collection tools. 149 judokas (62 male and 87 female) participated voluntarily. For statistical analysis, independent samples *t*-test, one-way ANOVA, Mann-Whitney *U*, Kruskal-Wallis *H* and Spearman's *rho* were conducted where appropriate. The level of significance was set as $p<.05$. As a result, statistically significant differences in the self-handicapping scores of judokas found in the gender, marital status, educational status, income, national athlete status and national athlete variables ($p<.05$). There are statistically significant differences in self-esteem scores in the gender, age, educational status, marital status, national athlete status, international success status, international ranking and training duration variables ($p<.05$). A moderate and negative correlation ($p<.05$) was found between self-handicapping and self-esteem. In conclusion, coaches, club managers and other interested parties should consider their athletes in this context, considering that self-handicapping and self-esteem scores are important indicators in sportive performance as it is very important for long-term performance and healthy sports life. It is recommended to record and periodically follow the self-handicapping and self-esteem levels of the athletes.

Keywords: Failure, Esteem, Judo, Competition, Athlete

Judokaların Kendini Sabotaj ve Benlik Saygısı Düzeyleri

Öz

Bu çalışma judokaların kendini sabotaj ve benlik saygısı düzeylerinin incelenmesi amacıyla gerçekleştirilmiştir. Katılıma gönüllü olur veren deneklerin kategorik ve demografik bilgileri toplanmış; kendini sabotaj ve benlik saygısı düzeylerinin belirlenmesi amacıyla Akin (2012) tarafından Türkçeye uyarlanan Kendini Sabotaj Ölçeği (KSÖ) ve Tukas (2010) tarafından Türkçeye uyarlanan Benlik Saygısı Ölçeği (BSÖ) kullanılmıştır. Verilerin toplanması için online veri toplama yöntemi kullanılmıştır. Çalışmaya 149 judoka (62 erkek ve 87 kadın) gönüllü olarak iřtirak etmiştir. İstatistiksel analizler için uygun olan yerlerde bağımsız örneklem *t* testi, tek yönlü ANOVA, Mann-Whitney *U*, Kruskal-Wallis ve Spearman korelasyonları yapılmış, anlamlılık düzeyi $p<0,05$ olarak kabul edilmiştir. Judokaların kendini sabotaj puanlarının cinsiyet, medeni durum, eğitim durumu gelir, milli sporcu olma durumu ve milli sporcu kategorilerine göre farklılařtığı ($p<0,05$), benlik saygısı puanlarının da cinsiyet, yaş, eğitim durumu, medeni durum, milli sporcu olma durumu, uluslararası başarı durumu, uluslararası derece ve antrenman süresine göre istatistiksel olarak anlamlı bir farklılık gösterdiği ($p<0,05$), kendini sabotaj ile benlik saygısı arasında negatif yönde orta düzeyde bir ilişki olduğu ($p<0,05$) bulunmuştur. Sonuç olarak; antrenörler, kulüp yöneticileri ve diđer ilgililerin kendini sabotaj ve benlik saygısının sportif performansın artırılmasında önemli bir faktör olduğunu düşünerek sporcularını bu bağlamda değerlendirmeleri gerekir. Bu durum ayrıca uzun süreli performansın devam ettirilmesi ve sağlıklı spor yaşantısının sağlanabilmesi açısından da oldukça önemlidir. Sporcuların benlik saygısı ve kendini sabotaj düzeylerinin hangi düzeyde olduğunun tespit ve takip edilmesi önerilmektedir.

Anahtar kelimeler: Başarısızlık, Saygı, Judo, Yarışma, Sporcu

* **Corresponding Author:** Assist. Prof. Zafer DOĐRU, **E-mail:** zaferdogru@gmail.com

INTRODUCTION

Today, the concept of success is emphasized by various criteria and categories in both business life and sports. When human behaviors are observed, the terms success and failure are noticed as two important concepts that can be encountered both in daily life and in areas that require expertise, such as sports and competitions. Barutu-Yıldırım and Demir (2017) stated that humans encounter some internal and/or external obstacles to achieve their goals and they also stated that external obstacles were more understandable and could be easily monitored. People face many events or situations that are evaluated as success and failure. It is possible to talk about success or failure as an anonymous phenomenon in many areas of life such as school success (academic success), sporting success (receiving medals or trophies at national or international level), success in business life (career advancement, product development, achieving high sales figures). The terms “success” and “failure” affect people’s emotional states, goals, and social relations and these terms were academically studied in a very wide range from academic self-efficacy (Barutu-Yıldırım & Demir, 2017) to football referees (Kamuk et al., 2018). An important concept related to success and failure is self-handicapping. It was considered that self-handicapping is related to self-esteem, therefore, self-handicapping and self-esteem are often studied together. An important concept related to success and failure is self-handicapping. It was considered that self-handicapping is related to self-esteem, therefore, self-handicapping and self-esteem are often studied together (Büyükgöze & Gün, 2015; Coudevylle et al., 2008; Gözmen-Elmas & Aşçı, 2017; Kamuk et al., 2018, 2020; Kamuk & Şensoy, 2019b, 2019a; Prapavessis & Grove, 1998; Tice & Baumeister, 1990).

It is possible to consider the realization of goals as success and vice versa as failure. The situation is not very different when it comes to the fulfillment of a task. One can speak of success when the task is fulfilled and failure when it is not. In such a situation, people may exhibit different attitudes and behaviors and may try to explain the failure. The concept of "self-handicapping" is used to explain this situation. Efforts, attitudes and behaviors in case of failure constitute the basis of the theoretical studies to explain self-handicapping behaviors. Üzar-Özçetin and Hiçdurmaz (2016) expounded self-handicapping as the anxiety experienced with the thought that an individual was unable to do a job or a task. The more interesting thing is emergence of the behaviour of self-handicapping while the person has the potential and the ability to perform the task. Self-handicapping was studied in very different areas such as education (Barutu-Yıldırım & Demir, 2017), health (Üzar-Özçetin & Hiçdurmaz, 2016), and sports sciences (Coudevylle et al., 2008; Gözmen-Elmas & Aşçı, 2017; Kamuk, 2022; Kamuk et al., 2018, 2020; Kamuk & Şensoy, 2019b, 2019a; Kuczka & Treasure, 2005), namely Judo (Finez & Sherman, 2012; Greenlees et al., 2006).

The internal and external obstacles, which may arise in various ways, may lead to an undesirable outcome of a performance or task that is intended to be performed. However, this possibility erroneously can lead to the conclusion that not every task is achievable, and every individual faced with a task may tend to create obstacles. Kearn et al., (2007) stated in their studies that individuals who were faced with performing a performance in relation to the existence of such a situation might have perceived a possible situation in the form of a negative result of the performance, that is, to fail, as a threat to their selves, and that in such a case, their individual performance will naturally fail. They have shown that the individuals may be consciously inclined to create the environment and conditions that will cause miscarriage to

appear as a result, and that they may even self-handicapping themselves by withdrawing their efforts in front of everyone.

The concept of self-handicapping (Higgins, 1990), which was first introduced to the literature by Jones and Berglas in 1978, has been defined in different forms. It can be defined as "the effort of individuals to protect their self by voluntarily producing excuses that will justify their possible future failures" (Kamuk & Şensoy, 2019a; Sniezek, 2001). The efforts of individuals to protect their own self may be handled in two ways. Cox and Guiliano (1999) categorized these types of self-handicapping as "behavioral self-handicapping" and "verbal self-handicapping" (Kamuk & Şensoy, 2019a). In case of failure, individuals try to protect their self-esteem by resorting to one of these two ways, perhaps as a strategy to demonstrate the behavior of starting again in order to achieve success in the future. In today's achievement-oriented society, the outcome of a performance situation can have powerful effects on the individual. These effects; a) can increase achievement, efficacy or predictions of efficacy, generate positive emotions such as happiness or pride, increase self-esteem and motivate continued task engagement, b) affect feelings of failure, inadequacy, and powerlessness, emotional responses such as sadness and shame, low self-esteem etc., and low self-esteem may cause a lack of enthusiasm for the task (Deppe & Harackiewicz, 1996).

Self-esteem is quite simply a positive or negative attitude towards a particular object, namely the self. Self-esteem has two different meanings; one of these meanings of high self-esteem is that the person thinks they are "very good"; in other words, he thinks he is "good enough". However, it is also possible for a person to see himself as superior to most people, but to feel inadequate in terms of some standards he has set for himself (Rosenberg, 1965: 30–31). There is also the value that a person gives by being influenced by different sources other than the value he gives to himself, in this regard, defining self-esteem poses some difficulties. Knightley and Whitelock (2007) stated that self-esteem is a complex psychological concept that is difficult to define, evaluate and research. They reported that people's concepts of value arise from two sources, making cognitive comparisons between what they want to achieve and what they have actually achieved, and social interactions and feedback from important people. In general, self-esteem refers to an individual's general perception and attitude about his/her own worth or value. It is a measure of how much the individual actually values, approves, appreciates, rewards or loves himself/hersel both internally and externally.

Successful athletes can feel good about themselves, feel proud, make cognitive comparisons with the values that the environment attributes to them in the formation and construction of self-esteem, and can easily reach conclusions with these effects. Once they have built their self-esteem, athletes may make an extra effort to maintain it, or they may tend to self-handicapping in order to maintain it. Self-esteem affects the decision-making processes, relationships, emotional health and general well-being of athletes and particular judokas. When the judokas (judo athletes) with a healthy, positive perception and attitude about themselves discover their potential, they may also provide the motivation they need to take on new challenges and responsibilities. It is also clear that low or high self-esteem will affect this motivation state.

As with self-handicapping, self-esteem can be seen as another important key to athletic success. In this respect, knowing the self-esteem scores of judokas and having information about their

current status can be useful for the trainers (relevant people) and sports psychologists. To the current knowledge, this is the first study considering the Turkish judokas' self-handicapping and self-esteem. Only one relevant paper (Greenlees et al., 2006) was found in the literature that studied the effects of self-handicapping in judokas. This study was believed to contribute in the literature by focusing on national-level athlete judokas.

In judo, as in all sports, athletes may have set a goal to be the best. These goals include winning olympic, world and European championships, as well as national ones. The national tournaments can be a steppingstone to have the chance to achieve international success. From this point of view, it can be seen that this sport indicates a difficult process, although it is not independent of many dimensions such as "training", "physiological", "motoric", "technical" and "tactical" features. Limited researches have been done in judokas. Literature research revealed that the studies on self-handicapping and self-esteem are carried out in the field of sports sciences are generally on referees, namely football referees (Kamuk et al., 2018), curling referees (Kamuk & Şensoy, 2019a), wave surfing referees (Kamuk & Şensoy, 2019b), badminton referees (Kamuk, 2019), disabled and non-disabled swimmers (Kamuk et al., 2020). Only one judo-related study was found in the literature review and that study investigated the effects of perceived mastery levels of judokas on self-handicapping (Greenlees et al., 2006).

The present study is considered to be a contributing study in the field of sports sciences in terms of revealing the self-handicapping behaviors and self-esteem levels of athletes competing in different sports branches. The study is supposed to help removing the potential obstacle in front of the athletes on the way to success.

METHODS

Research Model

In the present study, descriptive research was used. Descriptive research involves describing events or conditions, which the researcher does not actively manipulate. In this type of study, researchers often examine correlations in the data. A common tool of observational research is the survey. The researcher identifies the events or conditions to be described and seeks information from people or other sources by asking questions, often by using a questionnaire (Vincent & Weir, 2012).

Population and Sampling

The population of this study consisted of athletes who were supposed to participate in 2020 Turkish Judo Championship and 149 judokas (62 male and 87 female) were selected by convenience sampling method (Büyüköztürk et al., 2008). Convenience sampling can be used to develop hypotheses and objectives can be for use when no other sampling method is feasible, especially in rigorous research studies (Stratton, 2021). The study was first planned to be conducted by a total population sampling, however, because of the unexpected emerge of COVID-19 pandemic the Championship was cancelled, and the entire population was not covered by the researcher. Hence, the convenience sampling method was adapted, and the participants were invited to take part in the study online. The subjects who accepted the voluntarily participation is included in the study.

Data Collection

In the study, a personal information form consisted of 16 questions was used to obtain demographic information of the participants, self-handicapping scale (SHS) and self-esteem scale (SES) were also used. The SES, which was developed by Rosenberg (1965) and adapted into Turkish by Tukuş (2010), is a 4-point Likert type scale and consisted of 10 items. Item numbers 2, 5, 6, 8 and 9 are reverse coded. The SHS, which was developed by Jones and Rhodewalt (1982) and adapted into Turkish by Akın (2012), is a 6-point Likert type scale and consisted of 25 items. Item numbers 3, 5, 6, 10, 13, 20, 22 ve 23 are reverse coded. The items are scored 0 through 5. Items in the scale include a range of self-handicapping behaviors such as procrastination, emotional problems, poor health, insomnia, drug or medication use. The scores that can be obtained from SHS ranges between 0 and 125. High scores obtained from SHS indicate high levels of self-handicapping. Both scales are unidimensional. Cronbach's alpha reliability coefficients for the self-handicapping and self-esteem scales are 0.897 and 0.900, respectively.

Table 1. Median and mean values of SHS and SES in the studies conducted in Turkey in the sport sciences

Reference	SHS			SES	
	n	Median	$\bar{X} \pm S$	Median	$\bar{X} \pm S$
Football Referees: Kamuk et. al., (2018)	49	51	50.39±12.61		
Wave Surfing Referees: Kamuk & Şensoy, (2019b)	25	38	41.84±13.22		
Curling Referees: Kamuk & Şensoy, (2019a)	34	48	46.60±11.45		
Badminton Referees: Kamuk, (2019)	63	45	45.48±13.25	25	26.54±5.96
Swimmers: Kamuk et. al., (2020)	202	54	52.32±13.07	33	32.31±5.42
FSS* Students: Ünvanlı, (2021)	694	55	54.40±13.09	35	32.93±6.31
PES** Teachers: Tüzün & Kamuk (2021)	191	38	39.96±14.70	35	34.87±4.35
Judokas: Current Study	149	49	49.34±14.43	36	33.24±6.40

*Faculty of Sports Sciences, ** Physical Education and Sports

The mean and median scores obtained from the literature review are presented in Table 1. In the studies where self-handicapping scale was used, the median values ranged between 38 and 55, whereas in the studies where self-esteem scale was used, the median values ranged between 25 and 36.

Ethical Approval

The ethics committee permission required for the study was obtained from Hitit University Non-Interventional Research Ethics Committee (Approval Number: 2020/36) and the institutional written permission was obtained from the Turkish Judo Federation. The judokas who gave their written consent for participation were included in the study.

Data Analysis

The Shapiro-Wilk test used to test normal distribution revealed that the self-handicapping scale scores are normally distributed, while the the self-esteem scale scores are skewed. For multiple group comparisons SHS scores were analysed by using one-way analysis of variance (ANOVA), and pairwise comparisons were conducted by using independent samples t-test. SES scores were analysed by using Kruskal-Wallis H for multiple group comparisons and Mann-Whitney U test was used for pairwise comparisons (Bonferroni correction was also applied). Spearman's rho was used to test the correlations between SHS and SES scores. The significance level for all the statistical analysis was set at $p < .05$. SPSS 22.0 (IBM Corp., USA; Licensed to Hitit University) software was used for the statistical analysis.

FINDINGS

In this section, means, standard deviations and comparison statistics related to self-handicapping, and self-esteem of judokas are given.

Table 2. Descriptive analysis of the judokas participating in the study

		<i>n</i>	%	SHS Score ($\bar{X} \pm S$)	SES Score ($\bar{X} \pm S$)
Gender	Female	87	58.4	47.30±14.166	34.15±6.158
	Male	62	41.6	52.19±14.433	31.97±6.569
Place of Residence	Province	129	86.6	49.88±14.039	33.43±6.293
	District	20	13.4	45.80±16.729	32.00±7.108
Marital Status	Single	137	91.9	50.08±13.983	33.11±6.163
	Married	12	8.1	40.83±17.320	34.75±8.895
International Success Status	No	58	38.9	51.41±13.642	31.59±6.388
	Yes	91	61.1	48.01±14.838	34.30±6.217
National Success Status	No	14	9.4	54.57±14.914	32.14±5.641
	Yes	135	90.6	48.79±14.330	33.36±6.484
National Athlete Status	Yes	118	79.2	47.96±14.110	33.80±6.271
	No	31	20.8	54.58±14.678	31.13±6.556
Regular Training	Yes	115	77.2	48.10±14.452	33.43±6.498
	No	34	22.8	53.50±13.774	32.62±6.115
Age*	15-17 Years	22	14.8	49.18±13.190	29.05±6.425
	18-20 Years	35	23.5	51.00±13.215	33.20±6.300
	Over 20 Years	92	61.7	48.74±15.231	34.26±6.082
International Ranking	First Three Degrees	81	54.4	48.27±13.550	34.72±5.521
	4 and Lower Degrees	8	5.4	55.63±18.996	32.50±10.043
	No Degree	60	40.3	49.93±14.952	31.35±6.543
National Ranking	First Three Degrees	120	80.5	48.63±14.263	33.50±6.426
	4 and Lower Degrees	9	6.0	47.22±13.479	34.00±5.000
	No Degree	20	13.4	54.55±15.432	31.35±6.753
Income	Below Minimum Wage	29	19.5	47.66±13.213	32.90±7.063
	Minimum Wage	25	16.8	54.12±13.321	32.60±6.801
	Above Minimum Wage	14	9.4	38.71±16.255	36.50±3.653
	No Income	81	54.4	50.30±14.117	33.00±6.342
Training Duration	60-90 mins	12	8.1	50.33±11.308	35.08±5.452
	120-150 mins	90	60.4	47.62±15.205	34.10±6.183
	180 mins and over	13	8.7	49.38±11.983	27.23±6.534
	Missing	34	22.8		
Education Status	Middle School	9	6.0	44.11±9.597	31.78±6.741
	High School	76	51.0	53.41±13.540	32.75±6.291
	Associate Degree	9	6.0	52.33±11.467	27.44±8.353
	Undergraduate Degree	46	30.9	44.63±14.768	35.22±4.770
	Master's Degree	9	6.0	41.22±16.887	34.56±8.777
National athlete categories	Class A National athlete	15	10.1	41.07±15.215	34.73±6.756
	Class B National athlete	24	16.1	45.42±13.204	34.58±6.093
	Class C National athlete	47	31.5	52.00±13.630	33.21±6.093
	Unspecified	32	21.5	47.16±13.726	33.63±6.613
	Non-National	31	20.8		
Number of being a national athlete	Less than 5	53	35.6	49.55±14.360	33.02±6.240
	Between 6-10	15	10.1	50.53±14.947	35.13±6.390
	More than 10	18	12.1	42.56±12.885	35.28±5.686
	No Nationality Category	32	21.5	47.16±13.726	33.63±6.613
	Non-National	31	20.8		
Experience in sports (years)	5 and less	14	9.4	51.43±13.466	29.71±5.863
	6-8	34	22.8	51.82±14.175	31.94±7.088
	9-11	46	30.9	49.57±13.356	33.83±6.392
	12-14	30	20.1	51.57±13.480	33.60±6.360
	15 and over	25	16.8	41.68±16.658	35.48±4.883
Number of Training Days per Week	3	9	6.0	41.44±12.511	35.56±4.096
	4	10	6.7	46.80±11.153	36.00±5.676
	5	31	20.8	51.35±13.669	30.68±7.377
	6	51	34.2	46.76±15.155	34.59±5.808
	7	10	6.7	48.30±17.783	31.40±7.260
	Missing	38	25.5		

*Age variable was categorized by the competition categories determined by the Turkish Judo Federation (*Turkish Judo Federation, 2022*).

The data in Table 2 revealed that 58.4% of the judokas were female athletes. 86.6% of the judokas live in urban centers, 91.9% of them are single, 61.7% of their ages are in the category of seniors (20 and over age group), 51% of them have high school education level, 61.1% of them have international success, 89% of them have first three degrees (n=91 with international

success, n=81 with first three degrees). The majority of the judokas participating in the study (n=135, 90.6%) had national level success and 89% of the judokas (n=120) were also in the first three degrees. National athletes cover 79.2% of the subjects and 15 of them (10.1%) were Class A national athletes. It was found that 77.2% of them trained regularly, 60.4% of them trained between 120-150 mins per training unit, 34.2% of them trained 6 days per week, 30.9% of them had experience in sports between 9-11 year, and 54.4% of them did not earn any income from the sports performance (Table 2).

Table 3. Reliability coefficients of the scales

Data Collection Tools	n	Number of Items	Cronbach's Alpha
Self-Handicapping Scale (SHS)	149	25	.758
Self-Esteem Scale (SES)	149	10	.887

p<.05

It is known that the reference values of Cronbach's Alpha coefficient are generally interpreted as follows; > .9; excellent; >.8; good, >.7; acceptable, >.6; doubtful, >.5; poor, < .5; unacceptable (George & Mallery, 2021). The Cronbach's Alpha values of the scales revealed that SHS is acceptable (α =.758) and SES is nearly excellent (α =.887) (Table 3).

Table 4. Statistics related to the scores obtained from the scales

	Self-Handicapping Scale Scores	Self-Esteem Scale Scores
n	149	149
Mean	49.34	33.24
Median	49.00	36.00
Standard Deviation	14.434	6.402
Lowest score	18	11
Highest score	88	40
Shapiro-Wilk Statistics	.991	.884
p (Shapiro-Wilk)	.479*	.000

**p*<.05

When the data related to the scales from the study group are examined, it is seen that the mean for SHS is 49.34±14.434 and for SES is 33.24±6.402 (Table 4).

SHS scores according to the independent variables designed in pairs about judokas a) Gender, b) Marital status, c) Place of residence for the longest time, d) Regular training throughout the year, e) National Athlete Status, f) National Success Status, g) The findings in terms of International Success Status are presented in Table 5.

Table 5. SHS pairwise comparisons

Variables	Categories	n	\bar{X}	S	t	df	p																																																																				
Gender	Female	87	47.3	14.166	-2.060	147	.041*																																																																				
	Male	62	52.19	14.433				Martial Status	Single	137	50.08	13.983	2.154	147	.033*	Married	12	40.83	17.320	Place of Residence	Province	129	49.88	14.039	1.179	147	.240	District	20	45.80	16.729	Regular Training	Yes	115	48.10	14.452	-1.933	147	.055	No	34	53.50	13.774	National Athlete Status	Yes	118	47.96	14.110	-2.307	147	.022*	No	31	54.58	14.678	National Success Status	Yes	135	48.79	14.330	-1.431	147	.155	No	14	54.57	14.914	International Success Status	Yes	91	48.01	14.838	1.408	147	.161
Martial Status	Single	137	50.08	13.983	2.154	147	.033*																																																																				
	Married	12	40.83	17.320				Place of Residence	Province	129	49.88	14.039	1.179	147	.240	District	20	45.80	16.729	Regular Training	Yes	115	48.10	14.452	-1.933	147	.055	No	34	53.50	13.774	National Athlete Status	Yes	118	47.96	14.110	-2.307	147	.022*	No	31	54.58	14.678	National Success Status	Yes	135	48.79	14.330	-1.431	147	.155	No	14	54.57	14.914	International Success Status	Yes	91	48.01	14.838	1.408	147	.161	No	58	51.41	13.642								
Place of Residence	Province	129	49.88	14.039	1.179	147	.240																																																																				
	District	20	45.80	16.729				Regular Training	Yes	115	48.10	14.452	-1.933	147	.055	No	34	53.50	13.774	National Athlete Status	Yes	118	47.96	14.110	-2.307	147	.022*	No	31	54.58	14.678	National Success Status	Yes	135	48.79	14.330	-1.431	147	.155	No	14	54.57	14.914	International Success Status	Yes	91	48.01	14.838	1.408	147	.161	No	58	51.41	13.642																				
Regular Training	Yes	115	48.10	14.452	-1.933	147	.055																																																																				
	No	34	53.50	13.774				National Athlete Status	Yes	118	47.96	14.110	-2.307	147	.022*	No	31	54.58	14.678	National Success Status	Yes	135	48.79	14.330	-1.431	147	.155	No	14	54.57	14.914	International Success Status	Yes	91	48.01	14.838	1.408	147	.161	No	58	51.41	13.642																																
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	No	14	54.57	14.914				International Success Status	Yes	91	48.01	14.838	1.408	147	.161	No	58	51.41	13.642																																																								
International Success Status	Yes	91	48.01	14.838	1.408	147	.161																																																																				
	No	58	51.41	13.642																																																																							

**p*<.05

SHS scores of the participants differed by the gender [$t(147)=-2.060$, $p<.05$]; marital status [$t(147)=-2.154$, $p<.05$] and being a national athlete [$t(147)=-2,307$, $p<.05$]. The mean SHS scores of male judokas ($\bar{X}=52.19\pm14.433$) were higher than the mean scores of female judokas ($\bar{X}=47.3\pm14.166$). The mean SHS score of the single judokas ($\bar{X}=50.08\pm13.983$) is higher than the mean of married judokas ($\bar{X}=40.83\pm17.320$). The national athletes' SHS scores ($\bar{X}=47.96\pm14.11$) are lower than non-national athletes' scores ($\bar{X}=54.58\pm14.678$). No statistical differences were observed in place of residence for the longest time, regular training throughout the year, national success status, and international success status (Table 5).

SES scores according to the independent variables designed in pairs about judokas a) Gender, b) Marital status, c) Place of residence for the longest time, d) Regular training throughout the year, e) National Athlete Status, f) National Success Status, g) The findings in terms of International Success Status are presented in Table 6.

There are statistically significant differences in the gender ($U=2135.0$, $p<.05$), marital status ($U=542.0$, $p<.05$), national athlete status ($U=1359.5$, $p<.05$) and international success status ($U=1883.0$, $p<.05$). The mean SES scores of female judokas ($\bar{X}=34.15\pm6.158$) were higher than the mean scores of male judokas ($\bar{X}=31.97\pm6.569$). The mean scores of married judokas ($\bar{X}=34.75\pm8.895$) were higher than the mean scores of single judokas ($\bar{X}=33.11\pm6.163$). The national athletes ($\bar{X}=33.8\pm6,271$) had a higher SES average than non-national athletes ($\bar{X}=31.13\pm6,556$). It was also seen that the average of judokas with international success ($\bar{X}=34.30\pm6.217$) is higher than the average of judokas without international success ($\bar{X}=31.59\pm6.388$) (Table 6).

Table 6. SES pairwise comparisons

Variable	Category	n	\bar{X}	S	Mean Rank	Sum of Ranks	U	Z	p
Gender	Female	87	34.15	6.158	81.46	7087	2135.0	-2.173	.030*
	Male	62	31.97	6.569	65.94	4088			
Martial Status	Single	137	33.11	6.163	72.96	9995	542.0	-1.961	.049*
	Married	12	34.75	8.895	98.33	1180			
Place of Residence	Province	129	33.43	6.293	75.97	9800.5	1164.5	-.702	.483
	District	20	32.00	7.108	68.73	1374.5			
Regular Training	Yes	115	33.43	6.498	77.13	8869.5	1710.5	-1.11	.267
	No	34	32.62	6.115	67.81	2305.5			
National Athlete Status	Yes	118	33.80	6.271	78.98	9319.5	1359.5	-2.204	.027*
	No	31	31.13	6.556	59.85	1855.5			
National Success Status	Yes	135	33.36	6.484	76.11	10275	795.0	-.98	.327
	No	14	32.14	5.641	64.29	900			
International Success Status	Yes	58	31.59	6.388	61.97	3594	1883.0	-2.955	.003*
	No	91	34.30	6.217	83.31	7581			

* $p<.05$

There was no difference between the groups in the variables of place of residence for the longest period of time, regular training throughout the year and national success status. When the averages obtained from SES are analyzed, it is seen that the same differences in SHS were also observed in SES (Table 6).

SHS and SES scores for the independent variables with multiple groups (age, education, level of income, experience in sports, weekly training status, exercise time in each training unit, national ranking status, international ranking status, nationality category, and number of attending to competitions as a national athlete. The statistics related to these variables are

presented in Table 7 and Table 8. The results revealed that there is a difference between the scores in three independent variables and these differences are statistically significant (Table 7). The differences are between the subgroups of "education", "income" and "nationality category". Scheffe test, one of the post hoc tests, was conducted to determine the difference between the relevant subgroups.

Table 7. SHS multiple comparisons (ANOVA)

		Sum of Squares	df	Mean Square	F	p
Age	Between Groups	130.21	2	65.105	.31	.734
	Within Groups	30703.01	146	210.295		
	Total	30833.22	148			
Education Status	Between Groups	3197.704	4	799.426	4.165558	.003*
	Within Groups	27635.52	144	191.913		
	Total	30833.22	148			
						U < HS
Income	Between Groups	2308.284	3	769.428	3.911	.01*
	Within Groups	28524.94	145	196.724		
	Total	30833.22	148			
						AMW < MW & BMW
Experince in sports (years)	Between Groups	1888.741	4	472.185	2.349	.057
	Within Groups	28944.48	144	201.003		
	Total	30833.22	148			
Number of Training Days	Between Groups	822.237	4	205.559	.977	.423
	Within Groups	22306.2	106	210.436		
	Total	23128.43	110			
Training Duration	Between Groups	101.849	2	50.924	0.241	.787
	Within Groups	23706.9	112	211.669		
	Total	23808.75	114			
National Ranking	Between Groups	644.591	2	322.295	1.559	.214
	Within Groups	30188.63	146	206.771		
	Total	30833.22	148			
International Ranking	Between Groups	429.588	2	214.794	1.031	.359
	Within Groups	30403.63	146	208.244		
	Total	30833.22	148			
National Athlete Categories	Between Groups	1627.605	2	813.803	4.276	.017*
	Within Groups	15796.77	83	190.322		
	Total	17424.37	85			
						A < C
How many times was it national athlete?	Between Groups	751.062	2	375.531	1.869	.161
	Within Groups	16673.31	83	200.883		
	Total	17424.37	85			

* $p < .05$, **U**: Undergraduate, **HS**: High School; **AMW**: Above Minimum Wage, **MW**: Minimum Wage and **BMW**: Below Minimum Wage; **A**: A National athlete, **C**: C National athlete

The mean SHS scores of judokas with high school education ($\bar{X}=53.41\pm 13.54$) are higher than the mean scores of judokas with undergraduate education ($\bar{X}=44.63\pm 14.768$), and judokas with high school education tend to self-handicapping more than judokas with undergraduate education. It was seen that judokas earning income above minimum wage ($\bar{X}=38.71\pm 16.255$) are lower than both the averages of those earning minimum wage ($\bar{X}=54.12\pm 13.321$) and those earning income below minimum wage ($\bar{X}=47.66\pm 13.213$). The self-handicapping tendencies of judokas who earn above the minimum income due to their sport are lower than the other two income groups (those earning minimum wage and those earning below the minimum wage). When the mean SHS scores of national judokas are analyzed, it is seen that the mean scores of those who stated that they are Class C national judokas ($\bar{X}=52.13\pm 13.63$) are higher than the mean scores of those who stated that they are Class A national judokas ($\bar{X}=41.07\pm 15.215$), Class C national judokas are more prone to self-handicapping than Class A national judokas (Table 7).

Table 8. SES multiple comparisons (KWU)

	Categories	n	Mean Rank	df	X ²	p
Age	15-17 Years	22	47.93	2	11.466	.003* 20+ & 18-20 >15-17
	18-20 Years	35	72.83			
	Over 20	92	82.3			
Education Status	Middle School	9	67.89	4	12.567	.014* U > A
	High School	76	70.28			
	Associate degree	9	40.83			
	Undergraduate Degree	46	86.53			
	Master's Degree	9	97.22			
Income	Below Minimum Wage	29	74.12	3	4.513	.211
	Minimum Wage	25	70.02			
	Above Minimum Wage	14	97.89			
	No Income	81	72.90			
Age of Sport (time spent in sports)	5 Years and Under	14	50.14	4	9.937	.042 (p was calculated as .005 when Bonferroni correction was applied)
	6-8 Years	34	66.28			
	9-11 Years	46	78.95			
	12-14 Years	30	77.25			
	15 Years and Over	25	90.82			
Number of Training Days	3 days a week	9	63.83	4	8.368	.079
	4 days a week	10	70.20			
	5 days a Week	31	44.71			
	6 days a week	51	60.63			
	Every Day of the Week	10	46.15			
Training Duration	1-1,5 Hours	12	65.13	2	11.467	.003* 1-1.5 Hours > 3 Hours + 2-2.5 Hours > 3 Hours +
	2-2,5 Hours	90	61.26			
	3 Hours and above	13	28.85			
National Ranking	First Three Degrees	120	76.98	2	1.819	.403
	4 and Lower Degrees	9	75.39			
	No Degree	20	62.98			
International Ranking	First Three Degrees	81	84.60	2	10.249	.006* First Three > No Degree
	4 and Lower Degrees	8	80.38			
	No Degree	60	61.32			
National athlete categories	A National athlete	15	50.13	2	2.286	.319
	B National athlete	24	46.21			
	C National athlete	47	40.00			
How many times was it national athlete?	Less than 5	53	39.36	2	3.901	.142
	Between 6-10	15	51.37			
	More than 10	18	49.14			

* $p < .05$; U: Undergraduate, A: Associate degree

Kruskal-Wallis H test results shown that there were statistically significant differences in age ($X^2(2)=11.466$, $p < .01$), education ($X^2(4)=12.567$, $p < .05$), experience in sport ($X^2(4)=9.937$, $p < .05$), exercise time in each training unit; ($X^2(2)=11.467$, $p < .01$), and international ranking status; ($X^2(2)=10.249$, $p < .01$). No significant difference was found in the other five independent variables (income, weekly training status, national ranking status, nationality category, and number of being a national athlete) (Table 8). The results of the Mann-Whitney U (MWU) test for the variables in which there was a difference were evaluated according to the new significance levels with Bonferroni correction.

The MWU test results unveiled that there are differences between 15-17 and 18-20 age groups ($U=229.0$, $p < 0,0167$), between 15-17 and over 20 age groups ($U=572.5$, $p < .0167$). When the averages are examined, the mean self-esteem scores of 15-17 age group judokas ($\bar{X} = 29.05 \pm 6.425$) are lower than both 18-20 age group judokas ($\bar{X} = 33.20 \pm 6.300$) and 20+ age group judokas ($\bar{X} = 34.26 \pm 6.082$). There is a difference between the self-esteem scores of those with associate's degree and those with undergraduate degree in the independent variable of

education ($U=81.0$, $p<.01$). When the averages were examined, it was seen that the mean self-esteem scores of those who received education at the associate degree level ($\bar{X} =27.44\pm 8.353$) were lower than the mean self-esteem scores of those who received education at the undergraduate level ($\bar{X} =35.22\pm 4.770$). The self-esteem scores of the judokas who received education at the undergraduate level were higher. There was a difference between those who trained for 180 mins or more and those who trained for 60-90 mins ($U=27.5$, $p<.01$) and between those who trained for 180 mins or more and those who trained for 120-150 mins ($U=256.5$, $p<.01$). The mean self-esteem scores of judokas who trained for 180 mins or more ($\bar{X} =27.23\pm 6.534$) were lower than both the mean self-esteem scores of judokas who trained between 60-90 mins ($\bar{X} =35.08\pm 5.452$), and the mean self-esteem scores of judokas who trained between 120-150 mins ($\bar{X} =34.10\pm 6.183$). There is also a difference ($U=1661.0$, $p<.01$) between the judokas without any international ranking and the judokas with the first 3 degrees. The mean self-esteem scores of the judokas with the first three degrees in international competitions ($\bar{X} =34.72\pm 5.521$) are higher than the mean self-esteem scores of the judokas without any degree in international competitions ($\bar{X} =31.35\pm 6.543$).

Table 9. The correlation between the mean scores of SHS and SES

		Self-Handicapping Scores
Self-Esteem Scores	ρ (rho)	-.485*
	p	.000
	N	149

* $p<.01$

There is a statistically significant negative and moderate ($\rho=-.485$; $p=.001$) correlation between self-esteem scores and self-handicapping scores of the judokas participating in the study (Table 9).

DISCUSSION AND CONCLUSION

The literature review revealed that some studies have been conducted in the field of sports sciences on self-handicapping and self-esteem, but the number of these studies are very limited. Some of these inspected the self-handicapping and self-esteem levels of the football referees (Kamuk et al., 2018), curling referees (Kamuk & Şensoy, 2019a), wave surfing referees (Kamuk & Şensoy, 2019b), badminton referees (Kamuk, 2019), and disabled and non-disabled swimmers (Kamuk et al., 2020). In addition to these, there are also studies on sports science faculty students by Ünvanlı (2021) and physical education teachers by Tüzün and Kamuk (2021). This study is supposed to be one of the pioneering studies in which athletes and a sport branch were taken as a sample in Turkey. Gözmen-Elmas and Aşçı's (2017) study is also one of the studies in which university athletes from different branches were taken as a sample.

The results acquired from this study was thought to make important contributions to the discussion of the results related to other sports branches (and sport sciences). This study, which was conducted with a different sample group like other studies (Kamuk, 2019; Kamuk et al., 2018, 2020; Kamuk & Şensoy, 2019b, 2019a; Tüzün & Kamuk, 2021; Ünvanlı, 2021) conducted in the field of sport sciences, it could be another important contribution to the field of sport sciences.

In the present study, the SHS median value was 49 and the SES median value was 36. The SHS median value of judokas is between 38-55, while the SES median value is higher than the other studies (over 25-35). When we look at the differences that emerged as a result of the statistics at the current study, it is possible to say that important findings were reached. According to the results from the SHS analysis, it was seen that the self-handicapping tendencies of men were higher than the SHS averages of women and it was similar to the results of the study conducted by Tüzün and Kamuk (2021). It was found that there were different results related to gender in the literature. While some studies suggested no significant difference in gender (Büyükgöze & Gün, 2015; Coşgun, 2022; Kamuk, 2019; Kamuk et al., 2018, 2020; Kamuk & Şensoy, 2019a, 2019b; Tice, 1991; Ünvanlı, 2021; Yıldırım, 2020), some other studies reported that men had higher self-handicapping scores (Eblin, 2009; Hirt et al., 2003; Jones & Berglas, 1978; Kimble et al., 1998; McCrea et al., 2008; Rhodewalt & Hill, 1995). In addition to these, there are studies showing that women had higher levels of self-handicapping than men (Dietrich, 1995; Yavuzer, 2015).

According to the findings obtained from SES, there is a difference between genders in favor of female judokas. When compared with the results of some studies, no significant differences were found in badminton referees (Kamuk, 2019), in swimmers (Kamuk et al., 2020), in sports sciences faculty students (Ünvanlı, 2021) or in physical education and sports teachers (Tüzün & Kamuk, 2021).

It can be said that there is no strong evidence that the gender variable is determinant and in favor of someone in self-handicapping. In most studies on self-esteem, there is information that results in favor of men are reported and that men have higher self-esteem (Bleidorn et al., 2016; Casale, 2020). There is a significant gender difference in that males tend to report higher self-esteem than females. This gender difference emerges in adolescence and persists throughout early and middle adulthood before narrowing and perhaps even disappearing in old age (Bleidorn et al., 2016). An examination of previous research shows that the gender difference emerged after the 1970s, increased until 1995 and then decreased. The effect of culture can also be mentioned in explaining the differentiation of self-esteem according to gender (Zuckerman et al., 2016). In the present study, women's higher self-esteem may be due to differences in social and cultural structures between the genders.

Single judokas had higher self-handicapping scores than married judokas. In the previous studies no difference between married and single subjects were found (Büyükgöze & Gün, 2015; Kamuk, 2019; Kamuk et al., 2018; Kamuk & Şensoy, 2019b, 2019a; Tüzün & Kamuk, 2021). In the evaluation of the self-esteem levels of judokas, the average self-esteem scores of married judokas were higher than single judokas and only one supporting study was found in the literature having a similar result (Parlar & Gençal Yazıcı, 2017). In another study, the self-esteem scores of single badminton referees were found to be higher than married ones (Kamuk, 2019), and no difference was found to have between the self-esteem levels of married physical education and sports teachers and single physical education and sports teachers (Tüzün & Kamuk, 2021). Loneliness is an important factor explaining low self-esteem, "loneliness is feeling the need for other people and experiencing negative feelings by realizing that you are far away from people" (Copel cited in Seki & Dilmaç, 2020). Therefore, being single can be considered as a kind of loneliness, which supports self-handicapping tendency and low self-esteem. This may explain why married judokas had higher self-esteem averages. This may be

facilitated by the fact that they are in a life that is established both obligatorily and responsibly and willingly with family, spouse, children and other people. In addition, the positive linear relationship between high self-esteem and mastery-related goal orientation scores (Üzbe & Bacanlı, 2015) can be seen as an important factor in the high self-esteem of athletes who strive to become elite athletes in judo. Üzbe and Bacanlı (2015) referring to various studies, emphasized success in self-esteem as "the individual who is aware of competencies aims to gain expertise on the subject and improve his/her competence instead of aiming to be more successful than others or not to be seen as more unsuccessful while learning a subject". Since judokas also have a motivation to be successful and to put themselves in a highly competitive environment such as the Turkish National Judo Championship, this can be explained by high self-esteem and mastery.

It is seen that the self-handicapping levels of Judokas do not differ according to age categories. There is no significant relationship between age and self-handicapping tendencies (Want & Kleitman, 2006), age was not considered as a variable in studies conducted in the field of sports sciences (Kamuk, 2019; Kamuk et al., 2018, 2020; Kamuk & Şensoy, 2019a, 2019b; Tüzün & Kamuk, 2021). Ünvanlı (2021) did not directly compare age groups in his study, but made a comparison according to the grade levels of sport sciences faculty students and found that the self-handicapping levels of first grade students were higher than those of IV grade students, second grades were higher than both III and IV grades, and finally III grades were higher than IV grades. In another study, it was reported that self-esteem of physical education and sports department and coaching department students increased by age (Erşan et al., 2009). Individuals younger than 20 years old have higher self-handicapping scores than individuals older than 25 years (Yıldırım, 2020). It can be said that the changes caused by maturation and mastery with increasing age and grade level are reflected in self-handicapping scores. It can be said that older students have lower levels of self-handicapping than younger students and students in higher grades have lower levels of self-handicapping than students in lower grades.

Previous research has shown that self-esteem is high in childhood, declines in adolescence, and gradually increases in adulthood and old age in Japan. On samples ranging from elementary school students to adults in their 60s, it has shown that patterns of age differences in self-esteem are consistent between men and women. Regarding the overall evaluation of the self, men and women show a similar pattern across the lifespan (Ogihara, 2020) and self-esteem increases with age, supporting the results of previous studies (Meier et al., 2011). Self-esteem increases during early and middle childhood (4-11 years) (there are studies suggesting that children experience a loss of self-esteem between 4 and 8 years of age), self-esteem does not change significantly during early adolescence (11 to 15 years), increases rapidly in young adulthood (up to 30 years) and gradually until middle adulthood (up to 60 years), peaks between 60 and 70 years of age, and then begins to decline fairly rapidly after 90 years of age (Orth et al., 2018). In the present study, in accordance with the literature, it is seen that those who are older have higher self-esteem averages. Judokas in the 15-17 ages category have the lowest self-esteem. Judokas in the over 20 ages category have higher self-esteem than judokas in the 18-20 ages category (the difference is not significant but quantitatively higher) and finally, judoka in the over 20 ages category have higher self-esteem than both categories. Maturation and mastery, as well as local, regional, national and international success, may have been helping consolidate the formation of self-esteem.

The self-handicapping levels of those with high school education are found to have higher than those with undergraduate (4-year Bachelor's, etc.) education. Many other study results (Kamuk, 2019; Kamuk et al., 2018; Kamuk & Őensoy, 2019b, 2019a; Sertel & Tanrıođen, 2019; Tüzün & Kamuk, 2021) are in line with the current results. In a study on firefighters; primary, secondary, associate, and undergraduate education levels do not make a difference in self-handicapping levels (Zafer, 2016). In addition, in rugby national team athletes, the mean self-handicapping scores of those with undergraduate education are higher than those with secondary education (CoŐgun, 2022). It should be known that self-handicapping tendency can occur at any educational level. Individuals can resort to self-handicapping regardless of their level of education. It can be said that the individuals with higher education levels are the group have a high tendency to self-handicapping in case they fail in the championship they participate in or if they cannot achieve a degree.

Regarding self-esteem, it is seen that those who have undergraduate education level among judokas have higher self-esteem than those who have associate degree level education. Some similar studies reported that the physical education and sports teachers with postgraduate level of education have higher self-esteem than those with undergraduate education (Tüzün & Kamuk, 2021). Saygılı et al., (2015) also reported that those who study at the preparatory, undergraduate, graduate, master's, doctoral level, and doctoral students have higher levels of self-esteem than both preparatory and undergraduate students. Along with these, (Kamuk, 2019) and CoŐgun (2022) reported no difference in their studies. The lower self-esteem averages of the judokas with associate degree education compared to the judokas with bachelor's degree education can be considered as a situation caused by not being able to study at the university at graduate level. Therefore, they may have defined themselves with low self-esteem. It may be explained by a sense of loser that comes from can not start undergraduate program, maybe they may be trying to increase their self-esteem with championships and getting success through judo sport.

The self-handicapping levels of judokas earning income below the minimum wage and at the minimum wage level are higher than those earning income above the minimum wage. The self-handicapping levels of sports sciences students with an income of less than 2000 TL are higher than those with an income of 4000 TL and above (Ünvanlı, 2021), those with low income have more self-handicapping tendencies than those with high income (Yıldırım, 2020). In contrast, no difference was found in football referees (Kamuk et al., 2018), in curling referees (Kamuk & Őensoy, 2019a), in wave surfing referees (Kamuk & Őensoy, 2019b), in badminton referees (Kamuk, 2019), in rugby national team athletes (CoŐgun, 2022), or in firefighters (Zafer, 2016). Low income causes a difference between the means of self-handicapping and low-income level may be an important variable for individuals in the low-income group to resort to self-handicapping. Lower income group judokas may have felt less fortunate in terms of nutrition, rest, recovery after training, and support depending on income. It can be considered as a group that has a tendency to self-handicapping in cases of possible failure or when they move away from their goals. Coaches and club managers may need to be prepared for low performance due to lower income and they should be ready to make solution plans.

Income did not make a difference in the self-esteem levels of judokas as reported in similar studies (CoŐgun, 2022; Kamuk, 2019; Kamuk et al., 2020; Zafer, 2016). Some other studies

suggested that higher income levels resulted in higher self-esteem levels (Erşan et al., 2009). The self-esteem of students with higher income levels is higher than that of students with lower income levels (Yıldız & Duy, 2015). Having a high income or above average income can provide judokas with more opportunities for quality training, coaches, equipment, as well as nutrition and support. Depending on these, judokas may perform better. However, in this study, self-esteem scores did not differ according to income group, and this is consistent with most of the studies. The result in favor of the high-income group in a study can be considered as a clue to be taken into consideration. In this study, income status was not household income. It was investigated whether judokas receive income from their clubs in return for their sports. Even the difference is not enough to get a significant level, it is seen that those who earn income above the minimum wage have higher self-esteem averages than the other three groups.

There are limited studies that consider place of residence as an independent variable in explaining self-handicapping and self-esteem. The self-esteem averages of badminton referees living in metropolitan areas are higher than badminton referees living in provinces and districts, while there is no difference in self-handicapping averages (Kamuk, 2019). There is no difference between the self-handicapping and self-esteem averages of swimmers living in metropolitan areas and swimmers living in cities (Kamuk et al., 2020). There is no difference between the self-handicapping and self-esteem levels between the groups (province, district, village) in the comparison made according to the places where the students of the sports sciences faculty lived for the longest time (Ünvanlı, 2021). There is no difference between self-handicapping and self-esteem averages of rugby national team athletes according to the variable of where they live (province, district, village) (Coşgun, 2022). Living in a metropolitan area can be interpreted as having access to more opportunities. Although there are some problems such as transportation problems, coping with them and not seeing them as problems may have increase the self-esteem of individuals.

In the current study, no difference in self-handicapping levels was found, while there is a difference in self-esteem levels in favor of national athletes. Kamuk et al., (2020) emphasized that there was no difference between the self-handicapping scores of national disabled swimmers and non-national disabled swimmers and non-national disabled swimmers had higher self-esteem scores than the disabled swimmers. The self-esteem levels of hearing impaired national volleyball players and national judo players are higher than those of hearing impaired non-sport individuals (Karakoç et al., 2012). In academic studies related to self-handicapping and self-esteem, being a national athlete has not been taken as an independent variable. It is thought to be a finding that can be a reference for future studies. Being a national athlete is indeed a stage that requires hard work and specialization, and it is a result in accordance with the literature that an athlete who rises to the national team level feels positive feelings about himself/herself and has high self-esteem.

Being a member of the national team may decrease the athletes tendency to self-handicapping because of living in a controlled and well-structured environment but even though the environmental factors are set at their best, the athletes may refer to self-handicapping somehow. This can be explained by maximizing the conditions necessary for performance such as national team camps, ideal working environments, psychologists, physiotherapists, and dieticians. Of course, it may not be possible to completely prevent this or protect athletes from self-handicapping at this level, and there may be uncontrollable situations such as referee

decisions, spectator pressure, power outages during the competition. Although these may seem like excuses to be used after failure, since they are known issues, they may lead to self-handicapping even before the competition too, even if they are national athletes.

The number of times the judokas were national athletes did not cause a difference either in self-handicapping or in self-esteem. Considering the difference between the self-handicapping levels of the Class C national judokas and the Class A national judokas, it is seen that the Class C national judokas have a higher self-handicapping level. In terms of self-esteem, the national athlete category does not make a difference. The following can be said about being one or more national athletes and being a national athlete. Becoming one or more national may possibly be one of the important goals that an athlete wants to achieve, and having reached this stage once may have caused there to be no difference between the self-handicapping and self-esteem scores of judokas, however, the Class C national athlete category is a lower mastery and performance indicator. Therefore, it is significant that the self-esteem of the Class A national athletes is higher, but this should not be interpreted as the Class A national athletes will not tend to self-handicapping.

National and international achievements had no significant effect on self-handicapping and self-esteem levels. It was seen that the self-esteem levels of judokas with international success were higher. There is no study that deals with national level success as a variable, but Coşgun (2022) compared rugby national team athletes who participated in international tournaments and those who did not and found that there was no difference. While there is no difference between the self-handicapping and self-esteem levels of judokas with national ranking, there is no difference between the self-handicapping levels of judokas with international ranking. In self-esteem levels, there is a difference between those who do not have a ranking in international competitions and those who obtained the first three ranking in favor of those who obtained the first three ranking. As a result of the comparison of Rugby National Team athletes grouped as "top three at the national level", "top three at the international level" and "other", it is seen that there is no difference in self-handicapping and self-esteem levels (Coşgun, 2022). It can be expected that athletes who have achieved international success such as being a national athlete and those who have achieved the first three ranking in international competitions will have higher self-esteem than the others. It may suggest that athletes who have the ability to represent and rank at the international level may tend to self-handicapping less due to the high self-esteem and self-affirmation. This situation may help spend training and competition preparation process more efficiently.

The experience in sport did not make a difference in either self-handicapping and or self-esteem levels of the judokas. Experience can be considered as an important predictor of positive self-esteem. Long practice time is required for the sport-specific technique to be established and perfected. There may be some exceptions, for athletes who learn very fast, it may be possible to reach high performance in a short time. Experience has taken its place in the literature as an important determinant in the formation of self-esteem. It is known that self-esteem reaches its highest point at the age of 60-70 and starts to decline at later ages. This information can be adapted to "time spent in sports". Late specialization sports branches such as athletics, swimming, football, basketball etc. and early specialized artistic and rhythmic gymnastics, ice skating, etc., the development period is between 14-30 years old (the lowest and highest values were taken from all sports). The age of women to start gymnastics is 6-8,

the age of specialization is 9-10, and the age of development is 14-18 (Aıkada & Hazır, 2016). Considering that (9-10) is the specialization period and (14-18) is the development period for a female gymnastics athlete who starts the sport at an appropriate age (6-8 years) and the best performance is revealed during the development period, it can be expected that the self-esteem of female gymnastics athletes will reach the highest level at the ages of 14-18 and self-handicapping tendencies will decrease in this period. The process may reverse for this branch after the age of 18. As a hypothesis, it needs to be tested and supported by scientific evidence.

There is no difference in the self-handicapping and self-esteem levels of the judokas who participated in the Turkish championship and who stated that they train regularly and those who stated that they do not training regularly. There is no difference between judokas in either self-handicapping or self-esteem levels by the number of training days per week. In the comparisons made in terms of the time allocated for daily training, there is no difference between the mean self-handicapping scores, but when we look at the self-esteem levels, the mean self-esteem scores of the judokas who spent 180 mins or more training time are lower than the group who spent 60-90 mins training time and the group who spent 120-150 mins training time.

Training is one of the most important parameters for success and performance in sport. It is unlikely for athletes to flee or avoid training, probably because athletes do not even think about it. Although weekly training frequency and whether or not to do it regularly did not make a difference in self-esteem or self-handicapping. It is an important result that self-esteem decreased as the time allocated for training units (hours) increased. The fact that those who train for 180 mins or more have lower self-esteem levels than the others or evaluate themselves in this way can be explained as follows. Training may be inefficient, boring, or overly tiring. Too much daily training time may suggest that judokas are subjected to exhausting training, which may have led to the emergence of low self-esteem scores. These can be interpreted as problems related to training planning. Low self-esteem can be increased by customizing the training times according to the athletes in accordance with scientific studies. In addition, the need to investigate the existence of different causes should also be taken into consideration.

In the current study, a moderate and negative correlation has been found between self-esteem and self-handicapping scores of the judokas. In some other studies inspecting the similar correlation Gzmen-Elmas & Aşı, (2017), Kamuk, (2019), and Tzn and Kamuk (2021) found weak and negative correlations, nvanlı, (2021) found a moderate and negative correlation, Kamuk et. al. (2020) found a moderate and positive relationship in swimmers with disabilities and a weak negative relationship in swimmers without disabilities. Self-esteem, success goals and fear of failure predict self-handicapping tendency in athletes (Gzmen Elmas & Aşı, 2017). The presence of this negative relationship between self-handicapping and self-esteem averages is an important result that should be taken into consideration by both athletes and coaches and sports managers. With quality training and achievable realistic goals, the tendency towards self-handicapping can be reduced and self-esteem can be increased. It can be accepted that self-handicapping is an important variable in sports. There are some suggestions in the studies about the treatment of self-handicapping. These suggestions can be taken into consideration in order to make effective decisions about athletes' tendency towards self-handicapping.

It can be said that self-handicapping is actually not a desirable behavior both in daily life and in sport. Empirical studies on various proposals to treat or eliminate this behavior are limited. There are few empirically based approaches to treating self-handicapping. However, Higgins and Berglas (1990) argue that a purely behavioral approach to treating self-handicapping is unlikely to be effective. For example, helping the self-handicapping to develop some skills (such as time management for a procrastinator) may not make a significant difference because the self-handicappers have a vested interest in holding on to self-handicapping.

In a study, it was found that when some children received feedback about failure while trying to complete a problem-solving task, they focused on their previous performance and bragged about themselves instead of focusing on success. They found that children did not try to protect themselves (self-handicapping) until they encountered negative feedback. Self-protection strategies that distract performers from the task may reduce rather than sustain intrinsic motivation (Deppe & Harackiewicz, 1996; Diener & Dweck, 1978). Another study deals with high and low self-handicappers and in that study, three situations can be mentioned when high self-handicappers and low self-handicappers explain positive things compared to negative events. First, everyone is self-serving in some way, as negative events are attributed to situational factors and positive events to themselves. Second, people with high levels of self-handicappers generally make more situational attributions than people with low levels of self-handicappers. Third, the tendency of those with a high level of self-handicappers to make situational attributions is most evident when the events to be explained are positive (Rhodewalt, 1990, p. 90). In a study conducted on judo athletes, it was reported that judo athletes with high self-handicapping tendency were more likely to attribute their failures to external factors than judo athletes with low self-handicapping tendency (Greenlees et al., 2006).

It can be said that important determinants such as under-training, inadequate work and motivation are important in self-handicapping, as well as cultural structure and socio-economic conditions are also important factors in the tendency towards self-handicapping. Coaches, club managers and other interested parties should consider self-handicapping and self-esteem as important indicators of sportive performance and evaluate their athletes in this context, which is very important for long-term performance and healthy sporting life.

Regarding the results of the study, the following recommendations can be made:

- The income status of judokas should be improved to help preventing self-handicapping attitudes. By improving the income status of judokas and athletes, their self-esteem can also be increased.
- Since all attempts to reduce self-handicapping behaviors will increase self-esteem, expert support can be obtained for judokas and athletes with high self-handicapping scores.
- For high self-esteem and low self-handicapping tendencies, special importance can be given to the educational life of judokas and therefore athletes and their education should be supported.
- Preventive measures can be taken by keeping in mind that judokas and athletes who have not yet become national or have not achieved a significant success may have high self-handicapping tendencies.

- Being successful also expresses a respect in itself. Therefore, advancing with "success goals" and "achievable goals" can increase the self-esteem of judokas.
- By decreasing the duration of training units or by reducing the time and intensity with innovations (training methods) to be added into it, the self-esteem levels of judokas and athletes may be increased.
- Age may be an important factor in the formation of self-esteem, considering that self-esteem will increase with age, attitudes and behaviors that will negatively affect the self-esteem of young judokas in the early stages may be avoided.
- Marital status; being married, having a regular family life, planned programmed life habits, roles and responsibilities may be an effective tool for sportive performance, but this is a controversial issue and should not be considered as a recommendation for marriage. Cultural and regional differences may also prevent the expected benefit. This issue can be further investigated.
- It is recommended to evaluate and regularly assess the judokas' self-handicapping and self-esteem levels.
- The results obtained from the scales can be discussed with a qualitative study, and an answer can be sought to the question of how judokas evaluate these results.

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Ethical Approval

Committee Name: Hitit University Non-Interventional Researches Ethics Committee

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Habits and Perceptions as Key Factors: How Online Gaming Predicts Aggression, Alienation and Emotional Intelligence*

Nihan Selin SOYLU-KONAK¹ , Mustafa ENGÜR^{2*} , Erdinç DEMİRAY² 

¹ Ege University, Faculty of Letters, İzmir.

² Ege University, Faculty of Sport Sciences, İzmir.

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Abstract

E-sport gradually reached large masses and is consuming a great deal of time and circulation of money. Literature shows us that there are relationships between online gaming and various psychological factors. Especially the relationship between online gaming and aggression was widely studied. Alienation and emotional intelligence were also treated as potential mediators on the relevant relationship. The literature has not properly come to an agreement on the direction of the relevant relationship, moderators and mediators, so far. Therefore, this study aimed to investigate the possible predictions based on online gaming habits and perceptions of online gaming for aggression, alienation and emotional intelligence. A sample of 316 online game players completed the online gaming habits and perceptions questionnaires, Buss-Perry Aggression Scale, Dean's Alienation Scale and Emotional Intelligence Scale. Results have shown that none of the aggression types were predicted by neither years nor daily hours of playing online games. Additionally, perceptions and habits predicted different dimensions of aggression, alienation and emotional intelligence diversely. Our results indicated that, the observed relationships are rooted from how players perceive the game and the degree of their socialization within the game, rather than mere exposure to online games. This study provides a new insight by putting forward the individual perspective in scope of effects of online games.

Keywords: Online gaming, E-sport, Aggression, Alienation, Emotional intelligence

Alışkanlıklar ve Algıların Anahtar Rolü: Çevrimiçi Oyun Oynamanın Saldırganlığı, Yabancılaşmayı ve Duygusal Zekayı Yordaması*

Öz

E-Spor çok sayıda insana ulaşmakta ve çok büyük miktarlarda zaman ve para tüketmektedir. Geçmiş literatür çevrimiçi oyun oynamanın başta agresyon olmak üzere çeşitli psikolojik faktörlerin ilişkilerini ortaya koymuştur. Özellikle çevrimiçi oyun o ve saldırganlık arasındaki ilişki yaygın olarak çalışılmıştır. Yabancılaşma ve duygusal zeka ise söz konusu ilişkinin potansiyel araçları olarak alınmıştır. Ancak bu ilişkilerin yönü, düzenleyici ve aracı değişkenleri konusunda henüz tam bir uzlaşıya varılmadığı görülmektedir. Bu çalışmanın amacı çevrimiçi oyun alışkanlıkları ve oyuna ilişkin algılar ile saldırganlık, yabancılaşma algıları ve duygusal zeka arasındaki olası ilişkileri araştırmaktır. Örneklemini 316 oyuncu oluşturmaktadır ve veri toplama süreci çevrimiçi olarak gerçekleştirilmiştir. Katılımcılar çevrimiçi oyun alışkanlıkları ve algılarına ilişkin formları, Buss-Perry Saldırganlık Ölçeği'ni, Dean'in Yabancılaşma Ölçeği'ni ve Duygusal Zeka Ölçeklerini tamamlamışlardır. Bulgular, saldırganlık boyutlarından hiçbirinin kaç yıldır çevrimiçi oyun oynadığı veya çevrimiçi oyunlara günlük kaç saat ayrıldığı tarafından yordanmadığını göstermiştir. Ayrıca, algılar ve alışkanlıkların saldırganlığın, yabancılaşmanın ve duygusal zekanın farklı boyutlarını çeşitli şekillerde yordama gücü olduğu görülmüştür. Sonuçlar, literatürde gözlenen ilişkilerin oyuncuların daha çok çevrimiçi oyunlara maruz kalmalarından ötürü değil, bu bireylerin oyunu nasıl algıladıkları ve oyun içerisinde ne düzeyde sosyalleştiklerinden kaynaklandığını göstermektedir.

Anahtar Kelimeler: Çevrimiçi oyunlar, E-spor, Saldırganlık, Yabancılaşma, Duygusal zeka

* **Corresponding Author:** Dr. Mustafa ENGÜR, **E-mail:** mustafa.engur@ege.edu.tr

INTRODUCTION

The term of sport is generally used to define the activity that offers amusement or relaxation; entertainment, fun but mostly a "game involving physical exercise". Especially the notion of inessentiality of physical reality on human activity is becoming clear after the technological development of last decades in which eSport concept has its roots (Sanchez & Remillard, 2018). Video games had an arcade identity in its first era but today video gaming became a complex digital ecosystem which has more than 335 million spectators worldwide. The game named DOTA 2 which has the number of monthly active users regularly exceeding 11 million and by May 2020, the game peaked at over 791 thousand concurrent players. Some of the international tournaments have \$34 million prize pools and hundreds of thousands of online viewers. It is estimated that video gaming is an enormous ecosystem with the market that can generate \$159.3 billion in revenue by 2020 (Business Insider, 2020).

The probable effects of the technology surrounding modern individuals are increasingly emphasized as negative, maybe because of the Putnam's (2000) "bowling alone" hypothesis which suggests social capital is eroding because of technology. Nevertheless, it must be mentioned that there are some approaches which specify online media and video games as exceptions (Steinkuehler & Williams, 2006). There are two research camps about the debate on promotion of aggression via video games and is continuing passionately. Some of the authors advocate the negative effects of video games while the others are appraising these effects are at minimum (Kühn et al., 2019). Video games might increase aggressive behaviors via the accessibility of antisocial thoughts (Anderson & Dill, 2000). Past research has shown that cortisol level and cardiovascular arousal might increase after playing a violent game (Gentile et al., 2017). Conversely, a great deal of research found no significant engagement between violent games and aggressive cognitions/behaviors (e.g. Charles et al., 2013; Engelhardt et al., 2015). Williams and Skoric's (2005) 1-month longitudinal study found no evidence for aggression and online game relationships.

As online gaming is discussed especially in youth or adolescents, alienation is considered one of the moderators along with negative effects such as aggression (Slater et al., 2004) and delinquency (Exelmans et al., 2015). Alienation can be described as a specific response to his or her relationship between individual and world. Individual suffering, meaningless, helplessness, loneliness, hostility and general unrelatedness are the characteristics of alienation (Hascher & Hadjar, 2018; Slater, 2003). Online gaming might serve as compensator of alienation in real life (Peng, 2020), because of online friendship acquisition (Calado et al., 2014), social skill development (Ducheneaut & Moore, 2005) and gaining social confidence (Herodotou et al., 2014). Furthermore, alienation might be designated by not only the online gaming habits but also how individuals perceive the games.

Herodotou et al., (2014) also points out that playing online games are known to be convenient arenas to express emotions. Emotional intelligence is defined as identifying, expressing, understanding and regulating individuals own emotions and others' emotions accurately by Salovey and Mayer (1990). Emotional intelligence was found to be lower in high-risk online game players and evaluated to be a strong predictor of excessively playing online game (gaming abuse/addiction) (Parker et al., 2008; Seo et al., 2012).

In the light of this literature, this study aimed to bring a new perspective from the flipside by examining whether gaming habits and perceptions of the game might predict the different dimensions of aggression, alienation and emotional intelligence.

METHOD

Research Model

This study is designed to have an exploratory approach. Quantitative data was collected and relational survey model was used in order to observe the relations between habits and perceptions of gaming and relevant psychological variables.

Sampling

The number of participants who completed the online survey was 324. Eight participants were excluded from the analyses due to untrusted patterns (e.g. same answers for whole questionnaires). The final sample used in this study consisted of 316 online gamers (ages 13-50, $M = 22.81$, $SD = 5.1$; 76.9% male) from Turkey. Data collection was online and participants were recruited in Spring 2019 through snowball sampling. All participants were voluntary. Our participants were playing online games for a miscellaneous length of time from one year to 15 years ($M = 6.31$, $SD = 3.55$). Forty-two of them were licensed as e-sport athletes. Our participants were playing League of Legends ($n = 237$), Counter Strike ($n = 211$), Knight Online ($n = 62$), Mortal Kombat ($n = 43$), Dota 2 ($n = 42$), World of Warcraft ($n = 36$) and Overwatch ($n = 34$).

Ethical Approval

Ege University Social Sciences Research Ethics Committee's approval for this study guarantees that the study was conducted in accordance with the Declaration of Helsinki.

Data Collection Tools

Online Game Habits: We used four questions to investigate these how much time they spend daily for playing (DHP), for how many years they were playing online games (YP), how many of their friends are playing the same game online on a 5-point Likert scale (1: None of them, 5: All of them) (GF) and how much they have conversations with the new people from the games about social issues other than the game on a 5-point Likert scale (1: Never, 5: Always) (SIGF). All questions were included in the analyses separately.

Perceptions of Online Games: We used three questions to investigate that how the gamers evaluate the game in the aspects of degree of visual verisimilitude (PVer), degree of containing violence (PVio) and cooperation (PC). All questions were included in the analyses separately.

Buss-Perry Aggression Questionnaire (BPAQ): This questionnaire was developed to measure aggression through four factors by Buss and Perry (1992). BPAQ is a tool consisting of 29 items on a scale of 1 (extremely uncharacteristic of me) to 5 (extremely characteristic of me). Example items are "I sometimes feel like a powder keg ready to explode." for anger, "I wonder why sometimes I feel so bitter about things." for hostility, "Given enough provocation, I may hit another person." for physical aggression and "My friends say that I'm somewhat

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argumentative.” for verbal aggression. Turkish adaptation of this scale was done by Demirtaş-Madran (2012) and the Cronbach Alpha coefficients were satisfying: $\alpha = .76$ for anger, $\alpha = .71$ for hostility, $\alpha = .78$ for physical aggression, $\alpha = .48$ for verbal aggression and $\alpha = .85$ for total scale.

Dean’s Alienation Scale (DAS): Dean (1961) has developed this scale to basically measure how distant an individual feels her/himself to society. Yalçın and Dönmez (2017) have adopted this scale to Turkish. It has three subscales and sample items are “*Sometimes I feel all alone in the world.*” for isolation, “*There is little I can do to prevent a major shooting war.*” for powerlessness and “*People’s ideas change so much I wonder if we’ll ever have anything to depend on.*” for normlessness. It has 20 items and was responded to on a 5-point Likert design ranging from (1) completely disagree to (7) completely agree. In Turkish adaptation study internal consistency values were satisfying: $\alpha = .60$ for isolation, $\alpha = .74$ for powerlessness, $\alpha = .61$ for normlessness and $\alpha = .79$ for total scale.

Trait Emotional Intelligence – Short Form (TEI-SF): TEI-SF was developed to measure individuals’ perceptions about their own emotional competence by Petrides and Furnham (2001). The adaptation of this measurement tool for Turkish population was done by Deniz et al., (2013). The Cronbach Alpha coefficient was .81 for total scale. TEI-SF has four subscales (well-being, self-discipline, emotionality and sociability) and the reliability of subscales showed between 66% and %72 which can be assessed as good. Sample items are “*On the whole, I’m pleased with my life.*” for well-being subscale, “*I usually find it difficult to regulate my emotions. (R)*” for self-discipline subscale, “*Many times, I can’t figure out what emotion I’m feeling. (R)*” for emotionality and “*I am usually able to influence the way other people feel.*” for sociability subscales. It was responded to on a 7-point Likert scale, ranging from 1 to 7.

Data Collection

The link of online survey was shared through online forums and chat groups about online games. The link of online survey was shared through online forums and chat groups about online games. Participants first read the informed consent and then filled the question forms including online game habits, perceptions of online games, aggression scale, alienation scale and emotional intelligence scale, respectively.

RESULTS

In the first instance, Pearson’s correlations revealed that daily hours of playing is positively correlated with years of playing and sharing with in-game friends, when negatively correlated with perceived violence. All correlations can be seen in Table 1.

Table 1. Correlations between online game habits and perceptions of the online games

	DHP	YP	PVio	PC	PVer	GF	SIGF
Daily hours of playing (DHP)	-						
Years of playing (YP)	.33***	-					
Perceived violence (PVio)	-.16**	.04	-				
Perceived cooperation (PC)	.05	.15**	.13*	-			
Perceived verisimilitude (PVer)	.05	.00	.17**	.26***	-		
Gamer friends (GF)	.07	.05	.05	.19**	.25***	-	
Sharing with in-game friends (SIGF)	.29***	.22***	.02	.18**	.18**	.20***	-

* $p < .05$, ** $p < .01$, *** $p < .001$

Multivariate regression was recruited in order to observe the associations between game habits, perceptions of games and types of aggression (Table 2.). Accordingly, having gamer friends was the only variable predicting dimensions of aggression. More friends playing the same game, the higher score on physical aggression ($b = 1.32$, $SE = .41$, $t = 3.25$, $p = .001$) and verbal aggression ($b = .60$, $SE = .21$, $t = 2.87$, $p = .004$). In consideration of possible relationships between game habits, perceptions of games and dimensions of alienation, multivariate regression was conducted. Results demonstrated that the game habits didn’t predict any dimensions of alienation, but perceptions of the games predicted isolation and powerlessness. Perception of violence in the game predicted isolation in a reverse way ($b = -.37$, $SE = .17$, $t = -2.16$, $p = .03$) and perception of cooperation predicted isolation ($b = .44$, $SE = .21$, $t = 2.11$, $p = .04$). Besides, perception of verisimilitude of the game predicted powerlessness in a reverse way ($b = -.73$, $SE = .29$, $t = -2.49$, $p = .01$).

The last multivariate regression analysis was conducted with the same predictors for the dimensions of emotional intelligence. Years of playing predicted sociability ($b = .17$, $SE = .08$, $t = 2.17$, $p = .03$). Besides, sharing social issues with gamer friends predicted emotionability ($b = .42$, $SE = .20$, $t = 2.08$, $p = .04$) and sociability ($b = .57$, $SE = .22$, $t = 2.61$, $p = .009$). also, perception of cooperation predicted emotionability ($b = .61$, $SE = .22$, $t = 2.79$, $p = .006$) and sociability ($b = .72$, $SE = .24$, $t = 3.01$, $p = .003$).

Table 2. Multivariate regression analyses summaries predicting aggression, alienation and emotional intelligence

	Aggression				Alienation				Emotional Intelligence													
	Anger		Hostility		Physical aggression		Verbal aggression		Isolation		Powerlessness		Normlessness		Well-being		Self-discipline		Emotionability		Sociability	
	B(SE)	t	B(SE)	t	B(SE)	t	B(SE)	t	B(SE)	t	B(SE)	t	B(SE)	t	B(SE)	t	B(SE)	t	B(SE)	t	B(SE)	t
DHP	-.10(.13)	.78	.07(.13)	.55	.02(.16)	.11	.04(.08)	.44	-.02(.08)	-.29	.02(.10)	.20	-.02(.08)	-.21	.13(.10)	1.38	-.01(.08)	-.14	-.12(.09)	-.14	-.05(.09)	-.54
YP	-.14(.11)	-1.21	.02(.11)	.19	.06(.14)	.47	.07(.07)	1.07	.01(.07)	.03	-.16(.08)	-1.89	-.12(.07)	-1.72	-.08(.08)	-.95	.01(.06)	.21	.03(.07)	.37	.17(.08)	2.17*
GF	.30(.33)	.89	.26(.33)	.78	1.32(.41)	3.25*	.60(.21)	2.87*	-.05(.20)	-.04	.18(.25)	.71	.33(.20)	1.64	.42(.24)	1.78	-.06(.19)	-.31	-.25(.22)	-1.18	.16(.23)	.68
SIGF	-.02(.31)	-.08	.19(.31)	.60	-.01(.38)	-.02	.03(.19)	.16	-.14(.19)	-.74	.20(.24)	.86	.13(.19)	.68	.18(.22)	.81	.23(.18)	1.29	.42(.20)	2.08*	.57(.22)	2.61*
PVer	.50(.39)	1.28	.61(.39)	1.58	.27(.47)	.58	-.10(.24)	-.43	-.34(.24)	-1.43	-.73(.29)	-2.49*	-.19(.24)	-.82	.04(.28)	.16	-.08(.22)	-.36	.01(.25)	.05	-.07(.27)	-.27
PVio	.20(.28)	.68	-.35(.28)	-1.23	.48(.34)	1.39	-.02(.17)	-.10	-.37(.17)	-2.16*	.06(.21)	.28	-.15(.17)	-.88	.25(.20)	1.22	-.02(.16)	-.14	-.34(.18)	-1.89	-.08(.20)	-.41
PC	-.34(.34)	-1.01	-.31(.34)	-.91	-.71(.42)	-1.71	-.01(.21)	-.02	.44(.21)	2.11*	.11(.26)	.41	.17(.21)	.82	.50(.24)	2.06	.25(.20)	1.28	.61(.22)	2.79*	.72(.24)	3.01*

* $p < .05$

DISCUSSION AND CONCLUSION

Online games gain wide currency all around the world. Although much research has investigated its complex relationships with human behavior, we still have a long way to go. This study aimed to examine the relationships between online games and aggression, alienation and emotional intelligence as mostly relatable psychological factors. Distinctively, we took into consideration that alongside the game habits, individual differences in perceptions about the games might make differences.

Past research has shown significant effects of playing online games on aggressive behaviors. Especially cumulative effects over time were observed (Hasan et al., 2013). Conversely, our results have demonstrated that the none of the aggression types were predicted by neither year of playing nor daily hours playing online games. This finding is consistent with Williams and Skoric's (2005), some other factors might be intervening in the aforementioned relationship, such as the interactions with other players. Accordingly, physical aggression and verbal aggression were predicted by number of gamer friends. This might signal that the circle of friends might be a promising mediator variable for the effects of online games on aggression (Adachi & Willoughby, 2011).

The main factors predicting dimensions of alienation were individual perceptions about the game. Perception of verisimilitude predicted powerlessness negatively. Verisimilitude of the game was associated with the aggression-related variables (Barlett et al., 2008; Krcmar et al., 2011). Considering that aggression might be defined as an attempt to take control, consistently powerlessness was decreased with the increase of perceived realism in the game. Furthermore, isolation was predicted by perceived cooperation and adversely predicted by perceived violence. Perceived cooperation in the game might have a contrast effect on the feeling of lack of social acceptance in the real-life. The more they feel cooperated in the game, the less they might feel social in the real-life, because of the comparison with game. Besides, perceived violence might have a compensator effect on social isolation. Aggression in real-life might cause loneliness and disconnection from others (Yavuzer et al., 2019). Therefore, it might be speculated that perceived aggression in game wouldn't cause the same pattern as real-life and they might feel connected with others via playing aggressively consistent with the nature of the games. In a similar vein, it was demonstrated that, independent from the types (prosocial or bot) video games might function as a therapeutic intervention for the feelings of self-esteem and belonging (Tamplin-Wilson et al., 2019).

According to our results, it is allegeable that emotional intelligence is positively related to online gaming. Conflicting with past research indicating the online gaming is ruining interpersonal relations (e.g. Hertlein & Hawkins, 2012; Lo et al., 2005; Nie, 2001) our data showed that years of playing predicted sociability. Besides, sharing social issues with gamer friends and perceived cooperation in the games predicted not only sociability but also emotionability. Online games constitute convenient environments for expressing emotions (Hereditou et al., 2011). Furthermore, online gamer identity might be a facilitator for making real-life friendships (Eklund & Roman, 2017).

To conclude, our findings advocate that online gaming constitutes a new social environment. Gaming habits and players' perceptions of the games seems to be important factors related to aggression, alienation and emotional intelligence. This study raises novel questions about the relationships between personal experiences with the game and their effects on players various psychological states. Future research might examine these relationships with an experimental design in order to observe the causal links. Considering the widespreading use of online games, understanding the effects would be inestimable for not only interventions and circumventions but also theorizing livingly.

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Author Contribution: Study design; NSSK, ME, ED –Data collection; NSSK, ME, ED – Statistical analysis; NSSK –Manuscript Preparation; NSSK, ME, ED.

Ethical Approval

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The Role of Generative Pre-trained Transformers (GPT) in Recreational Tourism: An Interview with ChatGPT

Okan OLAK^{1*} 

¹Harran University, School of Tourism and Hotel Management

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Abstract

This study explores the potential benefits of employing generative pre-trained transformers (GPTs) in recreational tourism, the difficulties that arise when implementing such technology, the impact it has on tourist behaviour, and the ways it can be utilised in recreational tourism management. The original aspect of the study is that it is the first to give detailed information about the use of GPT in recreational tourism. ChatGPT was used as an interviewer in the study. ChatGPT is a software application that utilizes the high-powered machine learning software called Generative Pre-trained Transformer (GPT-3), developed by the OpenAI organization. Six questions were posed on the ChatGPT query screen (<https://chat.openai.com/chat>). The interview queries were prepared with reference to the study by Fusté-Forné and Orea-Giner (2023). The question statements in this study on the use of GPT in gastronomy tourism were changed to recreational tourism. ChatGPT's replies were tabulated and presented descriptively. Inferences and suggestions were made in line with the answers given by ChatGPT. The study showed that using GPT technology in recreational-based tourism can offer better customer interaction, decision-making, and a personalized travel experience. ChatGPT underlined that new technologies continue to evolve, and recreational-based tourism will become more personalized, informative, and immersive, ultimately enhancing the overall travel experience, and contributing to the growth and sustainability of the tourism industry. ChatGPT also noted GPT models have the potential to shape and enhance the entire travel experience for tourists, from the initial planning stages to the actual trip itself. Although GPT makes significant contributions to recreational tourism management and recreational tourists, there are deficiencies in ethical, privacy, and authenticity concerns.

Keywords: Generative pre-trained transformers (GPT), ChatGPT, Recreational tourism

* Corresponding Author: Okan OLAK, Email: okancolak@harran.edu.tr

INTRODUCTION

The tourism sector is encountering significant transformations in its services because of the rapid developments in digital and intelligent technology applications (Başer, 2020). Especially with technology integration, tourism has undergone significant transformations from production to presentation and after-sales evaluations, and technology has started to play an essential role in the tourism experience (Dilek and Dinçer, 2020). The digital travel market is expected to grow from USD 400 billion in 2022 to USD 1,618 billion by 2032 (Future Marketing Insights, 2023). Tourists use technology before, during and after visits. Online leisure and business travel accounts for 47% of all travel in the US. Consumers use their smartphones to discover destinations and products. 37% of travellers use mobile devices to shop for flight tickets, and 43% purchase accommodations (Sorrells, 2018). According to Carter (2017), 55% of tourists like social media pages related to their planned trips, 48% check a location while on holiday, 70% update their Facebook status, and 72% share holiday photos on social networks. Finally, 85% of leisure travellers use their smartphones whilst abroad.

Technological developments affect the forms of leisure (Metin et al., 2013) and transform individuals' leisure behaviours and experiences (McCommon, 2023). With the development of technology, limited leisure time has become easier to perform more valuable activities (Eryilmaz and Bal, 2019). In addition, some recreational activities in physical areas have started to be carried out in virtual or digital environments with the technological changes experienced (Aylan and Aylan, 2020). For example, virtual tours to natural environments such as caves, waterfalls, canyons, mountains, and cultural places such as ancient cities, churches, mosques, and various digital entertainment activities such as cycling, hiking, and yoga are recreational activities performed virtually (Baran and Karaca, 2023).

McCommon (2023) states that digital transformation is no longer a luxury but a necessity for companies to keep up with the latest trends and customer demands. He also states that businesses need to adapt to technological developments, especially due to the competition in the recreation sector and the increasing expectations of consumers. For instance, tourism businesses have become part of the digital world as numerous tourists use the internet to gather information about their trips. In this way, tourism businesses have gained significant advantages in offering customers different experiences, saving time in the execution of work, increasing service quality, and reducing operating costs. Additionally, 360-degree panoramic trips are used in promotional activities to attract more tourists in destination marketing (Aylan and Aylan, 2020). Furthermore, special software applications for recreation businesses have also been developed. Sport-scheduling software (creation of leagues, preparation of program flows, match schedules, game schedules, etc.), facility-scheduling software (facility availability, event registration, reservation creation, staff planning, management reports, etc.), recreation registration software (coordinators, trainers, etc.), booking for managers), fitness & wellness software (fitness assessment profiles, health risk assessment, personal fitness programs, weight management, etc.) are some of these applications (Ross and Sharpless, 1999).

Decision-making processes related to using recreational resources and tourism and recreation planning and management involve complex situations requiring extensive evaluation and analysis. It is inevitable to use technology to prevent this complexity in decision-making processes in tourism and recreation. Some of those are tour planning problems (many factors

such as the tourist's time and money resources, facilities, transportation, and attraction centres in the tour planning process make the tour plan difficult), tour route design and optimization problems (route/cost related to the transportation network, tour and stop waiting times, stopover points are open) /closure situations), overbooking and revenue management (reservation cancellation measure, target market selection, market segmentation, etc.), planning of recreation facilities (appropriate land selection for the facility, initial construction cost for each facility, land budget constraints) (Shcherbina and Shembeleva, 2014). The decision to purchase a holiday, which has an essential place in the purchasing behaviour of tourists, is affected by many factors such as destination, transportation, food and dining activities, attractions, shopping, and leisure activities (Liu et al., 2020) This situation complicates the purchasing decision (Özyıldırım and Koçoğlu, 2019). Tourists also try to eliminate this confusion by using technology. There are many studies on the effect of social media on tourist purchase decisions (Akyol and Öztürk, 2023; Liu et al., 2020; Pop et al., 2022; Xiang and Gretzel, 2010; Yuan et al., 2022).

Technology is used to plan and experience a more effective holiday for consumers and to plan and offer more effective services for producers. In recent years, information and communication technologies have revolutionized the tourism industry. One of the latest innovations shaping new dynamics and fostering a remarkable behavioural change in the interaction between service providers and tourists is increasingly sophisticated chatbots (Calvaresi et al., 2021). Chatbots are one of the most prominent examples of emerging artificial intelligence (AI) technologies (Orden-Mejía and Huertas, 2022). As with other businesses, tourism businesses also benefit from modern technologies. Chatbots are a new technology adopted by hotels, travel agencies and airlines (Melián-González et al., 2021). Chat Generative Pre-Trained Transformer (ChatGPT) is the most famous artificial intelligence (AI) chatbot developed by OpenAI, an artificial intelligence research and deployment company in California (Zhang et al., 2023). ChatGPT has the potential to contribute to increasing the consumer experience in the field of tourism, improving service quality, increasing efficiency, providing information, making data analysis, making suggestions, and finding solutions to the problems experienced (Erul and Işın, 2023). ChatGPT also can play a role in new product development and benchmarking. For example, ChatGPT can create surprise meal recipes in restaurants based on customers' preferences or on-premises ingredients. In addition, it can analyze customer feedback (e.g., online reviews, surveys, social media posts) on different themes such as "room quality", "service", or "food" (Carvalho and Ivanov, 2023). Tourists can also use ChatGPT to create an itinerary or identify the best hotels (Sorrells, 2023). Thanks to ChatGPT, tourists can plan their trips in real-time and according to their personalized preferences, thus experiencing an improved travel experience (Grundner and Neuhofer, 2021).

In the tourism literature, there are studies about the contributions of ChatGPT's role in tourism (Carvalho and Ivanov, 2023; Erul and Işın, 2023; Mich and Garigliano, 2023), with these contributions, potential difficulties and threats (Dwivedi et al., 2023; Gursoy et al., 2023; Ukpabi et al., 2019), the evolution of chatbots in tourism (Calvaresi et al., 2021) and GPT's contributions within the scope of gastronomy tourism, the opportunities it offers, the challenges in implementation (Fusté-Forné and Orea-Giner, 2023). Also, there are studies about the role of ChatGPT in improving tourists' information-seeking and decision-making processes (Sudirjo et al., 2023), the tourists' intention to use chatbots for travel and tourism (Melián-González et al., 2021), and the relationship with informativeness, empathy, accessibility,

interaction and tourists' chatbot user satisfaction (Orden-Mejía and Huertas, 2022). In addition, there are also studies about ChatGPT's accuracy in its answers to the exams to be held in the field of tourism (Göktaş, 2023), how ChatGPT will disrupt tourism education and research (Ivanov and Soliman, 2023), the potential impact and limitations of ChatGPT in tourism education applications (Skavronskaya et al., 2023), the benefits and constraints of using ChatGPT by students and faculty members in hospitality and tourism schools (Ali and ChatGPT OpenAI, 2023), and the potentially disruptive effects of ChatGPT on higher education and academic publishing (Iskender, 2023).

There are two studies on the relationship between ChatGPT and recreation. Erul and Işın (2023) focused on the contributions that ChatGPT can provide in the general tourism field. In the same study, the ChatGPT's contributions that can be made in the recreation field are briefly presented as a sub-title. Keiper's (2023) study provides faculty members with information on how and where to use ChatGPT to support event planning in an event management classroom. This study explores the potential benefits of employing generative pre-trained transformers (GPTs) in recreational tourism, the difficulties that arise when implementing such technology, the impact it has on tourist behaviour, and the ways it can be utilised in recreational tourism management. Many advantages of Chat Generative Pre-Trained Transformer (ChatGPT) such as new product development, analysing customer feedback (Carvalho and Ivanov, 2023), creating itineraries, determining the best hotels (Sorrells, 2023), personalised travel experience (Grundner and Neuhofer, 2021) have been revealed in previous studies. This study contributes to the literature in theory and to public and private sector operators in practice by demonstrating the opportunities that the use of Generative Pre-Trained Transformers in recreational tourism will provide with its limitations, present and future. The original aspect of the study is that it is the first to give detailed information about the use of GPT in recreational tourism.

METHOD

Research Model

In this study, the researcher used the qualitative research method, an approach that gives priority to studying and comprehending social phenomena in a realistic and comprehensive framework. In accordance with the research aim, ChatGPT was utilised as an interviewer to gather insights on the impact of GPT on recreational tourism, challenges surrounding its implementation, its implications for recreational tourists, its role in managing recreational tourism, and its future in recreation-based tourism.

Data Collection Procedures and Ethical Considerations

ChatGPT was used as an interviewer in the study. ChatGPT is an application that uses powerful machine learning software called Generative Pre-trained Transformer (GPT-3), developed by the OpenAI organization. ChatGPT aims to interact via conversation, which includes a series of questions from users and responses from the application (Rospigliosi, 2023). The same methodology was applied in investigations on similar subjects in the field of tourism (Carvalho and Ivanov, 2023; Dwivedi et al., 2023; Erul and Işın, 2023; Fusté-Forné and Orea-Giner, 2023). In this research, where the articles were reviewed through document analysis, no ethics committee approval or legal/special permission was required.

Instruments

Six questions were posed on the ChatGPT query screen (<https://chat.openai.com/chat>). The interview queries were prepared with reference to the study by Fusté-Forné and Orea-Giner (2023). The question statements in this study on the use of GPT in gastronomy tourism were changed to recreational tourism. ChatGPT's replies were tabulated and presented descriptively. Inferences and suggestions were made in line with the answers given by ChatGPT. Interview questions are:

Q1. What are the opportunities of using Generative pre-trained transformers (GPT) in recreational tourism?

Q2: What are the challenges of using Generative pre-trained transformers (GPT) in recreational tourism?

Q3: Can Generative pre-trained transformers (GPT) influence recreational tourists?

Q4: How can Generative pre-trained transformers (GPT) contribute to recreational tourism management?

Q5: What is the future in recreational-based tourism focused on Generative pre-trained transformers (GPT) and new technologies?

Q6. How can research contribute to the potential of Generative pre-trained transformers (GPT) in recreational tourism?

Data Analysis

Responses from ChatGPT were presented descriptively by tabulating. And inferences and suggestions were made in line with the answers given by ChatGPT.

FINDINGS

Under this heading, there are responses to the inquiries posed to ChatGPT regarding the prospects that GPT can provide in the recreation sector, complications in implementation, the influence of the application on recreational tourists, its supportive role in the administration of recreational tourism, and the future of recreation-based tourism.

Table 1 shows the responses received from ChatGPT regarding the opportunities that GPT will provide in recreational tourism. According to the ChatGPT response, there are twelve different opportunities for the use of GPT in recreational tourism (content generation, chatbots and virtual assistants, language translation, personalized recommendations, virtual tours and experiences, content curation and social media, local insights and culture, sustainability and responsible tourism, historical and educational experiences, predictive analytics, real-time updates and alerts, storytelling, and marketing campaigns). Also, ChatGPT underlines that incorporating GPT technology into recreational tourism can enhance customer engagement, improve decision-making, and create a more immersive and personalized travel experience, ultimately benefiting tourists and the tourism industry.

Table 1. The opportunities of using generative pre-trained transformers (GPT) in recreational tourism

GPT's opportunities	ChatGPT's answers about opportunities
Content generation	- GPT models can generate high-quality and contextually relevant content for travel websites, blogs, and social media platforms. This can include personalized travel itineraries, destination descriptions, activity recommendations, and local insights, providing valuable information to potential tourists.
Chatbots and virtual assistants	- GPT-powered chatbots and virtual assistants can interact with travellers in real-time, answering their questions, assisting with booking inquiries, and providing guidance on travel plans. This offers a seamless and personalized customer service experience, enhancing customer satisfaction.
Language translation	- GPT models can be used to develop more accurate and contextually sensitive language translation tools for tourists. This would help break down language barriers and enable more meaningful interactions between travellers and locals.
Personalized recommendations	- By analysing user preferences and past behaviours, GPT models can provide personalized travel recommendations for accommodations, activities, restaurants, and attractions. This tailored approach enhances the overall travel experience and increases the likelihood of positive reviews and repeat visits.
Virtual tours and experiences	- GPT-powered virtual reality (VR) or augmented reality (AR) applications can offer immersive virtual tours of destinations, landmarks, and attractions. This allows potential tourists to explore and experience a destination before actually travelling, potentially influencing their decision to visit.
Content curation and social media	- GPT can assist in curating user-generated content from social media platforms, aggregating photos, reviews, and stories to create compelling narratives about a destination. This content can be used for marketing and promotion purposes.
Local insights and culture	- GPT models can provide travellers with in-depth insights into local culture, customs, and traditions, helping them to have a more authentic and meaningful experience during their trips.
Sustainability and responsible tourism	- GPT-powered tools can educate tourists about sustainable practices, eco-friendly activities, and responsible tourism. This promotes environmentally conscious behaviour and helps reduce the negative impact of tourism on local ecosystems.
Historical and educational experiences	- GPT can be used to create interactive historical narratives or educational content related to tourist attractions, museums, and cultural sites, enriching visitors' understanding of the places they visit.
Predictive analytics	- GPT models can analyse travel trends and data to predict upcoming tourist preferences and behaviours. This insight can assist tourism businesses in adapting their offerings and marketing strategies accordingly.
Real-time updates and alerts	- GPT-powered applications can provide tourists real-time updates about weather conditions, traffic congestion, and event cancellations, helping them make informed decisions and adjust their plans.
Storytelling and marketing campaigns	- GPT models can aid in creating captivating and engaging storytelling for tourism marketing campaigns, captivating potential tourists with compelling narratives about destinations and experiences.

Source(s): Table created by author/s.

Table 2 illustrates the responses from ChatGPT regarding the challenges that may be experienced in using GPT in recreational tourism. According to ChatGPT response, there are twelve different difficulties (quality and accuracy of generated content, bias and cultural sensitivity, language nuances and localization, data privacy and security, lack of contextual understanding, inconsistent and unreliable information, over-reliance on technology, user interaction and experience, model size and resource intensiveness, maintenance and updates, legal and ethical considerations, user trust and transparency) the use of GPT in recreational tourism. ChatGPT also highlights addressing these challenges requires a combination of technological advancements, ethical considerations, user-centred design, and continuous monitoring. And it states while GPT models offer exciting possibilities in the tourism industry, a thoughtful and comprehensive approach is essential to mitigate potential drawbacks and ensure a positive impact on the travel experience.

Table 2. The challenges of using generative pre-trained transformers (GPT) in recreational tourism

The challenges of using GPT	ChatGPT's answers about challenges
Quality and accuracy of generated content	- GPT models generate text based on patterns learned from large datasets. However, the generated content may sometimes be inaccurate, misleading, or lack the necessary depth of information required for accurate travel recommendations or descriptions.
Bias and cultural sensitivity	- GPT models can inadvertently generate biased or culturally insensitive content, which can be particularly problematic when providing information about diverse destinations and cultures. - Ensuring that the generated content is culturally appropriate and free from bias is a significant challenge.
Language nuances and localization	- Travel involves diverse languages and dialects. GPT models may struggle with translating complex language nuances accurately, leading to potential misunderstandings or misinterpretations.
Data privacy and security	- Tourism involves sensitive personal and financial information. Implementing GPT-powered solutions requires careful consideration of data privacy and security to protect user information from potential breaches.
Lack of contextual understanding	- GPT models lack true comprehension and understanding of context, which can lead to generating content that seems coherent but lacks accurate context or relevance, impacting the quality of generated recommendations or information.
Inconsistent and unreliable information	- GPT models can sometimes generate inconsistent or unreliable information, potentially leading travellers to make incorrect decisions or receive inaccurate guidance.
Over-reliance on technology	- An over-reliance on GPT-powered solutions could reduce human interactions and the personal touch that is often a key aspect of the travel experience. - Travelers may miss out on authentic cultural interactions and personalized recommendations.
User interaction and experience	- Designing user interfaces and interactions that effectively leverage GPT models for travel-related tasks can be challenging. - Ensuring a seamless and intuitive user experience requires careful design and testing.
Model size and resource intensiveness	- Large GPT models require significant computational resources for deployment, which can be a barrier for smaller businesses or organizations with limited technical infrastructure.
Maintenance and updates	- GPT models need to be continuously updated and fine-tuned to remain relevant and accurate. This requires ongoing effort and expertise to ensure the information provided to travellers is up to date and reliable.
Legal and ethical considerations	- The use of GPT models in tourism must adhere to legal and ethical guidelines. Plagiarism concerns, copyright issues, and potential misinformation need to be carefully managed.
User trust and transparency	- Travelers may be sceptical or cautious about relying on AI-generated content. Ensuring transparency about the use of GPT and building user trust are important challenges.

Source(s): Table created by author/s.

Table 3 exhibits the responses from ChatGPT regarding the possible effects of GPT on recreational tourists. ChatGPT's response shows GPT has twelve different effects (information and inspiration, personalized recommendations, virtual exploration, language assistance, travel planning efficiency, engaging content, accessibility to information, user reviews and feedback, education and enrichment, influence on social media, sustainability and responsible tourism, memorable experiences) on recreational tourists. ChatGPT also emphasizes GPT models have the potential to shape and enhance the entire travel experience for tourists, from the initial planning stages to the actual trip itself. And it specifies that while GPT can influence tourists, the accuracy, quality, and ethical considerations surrounding AI-generated content should be carefully managed to ensure a positive and authentic travel experience for all travellers.

Table 3. GPT’s influences on recreational tourists

GPT’s influences on recreational tourists	ChatGPT’s answers about influences
Information and Inspiration	- GPT-powered content can provide tourists with detailed and engaging information about destinations, attractions, activities, and local culture. This information can inspire and influence travellers’ decisions on where to go and what to do.
Personalized recommendations	- GPT models can generate personalized travel recommendations based on individual preferences and interests. These recommendations can guide tourists towards experiences that align with their tastes, making their trips more enjoyable and fulfilling.
Virtual exploration	- GPT-powered virtual tours and experiences can allow potential tourists to virtually explore destinations before making travel decisions. This immersive preview can influence their perceptions and encourage them to visit in person.
Language assistance	- GPT-powered language translation tools can break down language barriers, making it easier for tourists to communicate with locals and navigate unfamiliar environments. This can enhance cultural interactions and overall travel satisfaction.
Travel planning efficiency	- GPT models can help streamline the travel planning process by assisting with itinerary creation, suggesting activities, and providing real-time information about weather and local events. This efficiency can positively influence tourists' overall experience.
Engaging content	- GPT-generated content can captivate tourists through engaging storytelling, enticing them to explore and discover new destinations and experiences.
Accessibility to information	- GPT-powered chatbots and virtual assistants can provide quick and accessible information to tourists, helping them make informed decisions and address their queries in real time.
User reviews and feedback	- GPT models can analyse and generate insights from user-generated reviews and feedback, helping tourists make well-informed decisions based on the experiences of others.
Education and enrichment	- GPT-generated historical and cultural insights can enhance tourists' understanding of the places they visit, making their trips more educational and enriching.
Influence on social media	- GPT-generated content can contribute to tourists' social media presence, shaping the way they share their experiences and influencing their followers to consider similar travel experiences.
Sustainability and responsible tourism	- GPT-powered tools can promote responsible tourism practices, influencing tourists to make eco-friendly choices and reduce their impact on local environments.
Memorable experiences	- GPT-generated personalized itineraries and recommendations can help tourists create memorable and unique travel experiences tailored to their interests and preferences.

Source(s): Table created by author/s.

Table 4 demonstrates the possible contributions of GPT in recreational tourism management. According to ChatGPT's responses, GPT has contributed to sixteen different (content generation and marketing, personalized customer interaction, real-time information and updates, itinerary planning and recommendations, language translation and communication, data analysis and insights, sustainability and responsible tourism, crisis management and safety, local culture and experience enhancement, accessibility enhancement, social media engagement, data-driven decision making, innovation and new experiences, efficient customer feedback processing, historical and cultural preservation, local business support) recreational tourism management subjects. And ChatGPT remarks while GPT models offer promising contributions to recreational tourism management, it's crucial to ensure that the technology is used ethically, responsibly, and in a way that enhances the overall travel experience while respecting the authenticity and cultural integrity of destinations.

Table 4. GPT’s contributions to recreational tourism management

GPT’s contributions to recreational tourism management	ChatGPT’s answers about contributions
Content generation and marketing	- GPT models can generate compelling and engaging content for tourism marketing campaigns, websites, and promotional materials. This content can attract and inform potential tourists, showcasing destinations and experiences in a captivating way.
Personalized customer interaction	- GPT-powered chatbots and virtual assistants can handle customer inquiries, provide real-time assistance, and offer personalized recommendations for tourists. This improves customer satisfaction and reduces the workload on human staff.
Real-time information and updates	- GPT-powered tools can deliver real-time information to tourists, such as weather updates, event schedules, and local news. This ensures tourists stay informed and can adapt their plans accordingly.
Itinerary planning and recommendations	- GPT models can assist in creating tailored travel itineraries based on tourists’ preferences, optimizing their time and ensuring they have a well-rounded experience.
Language translation and communication	- GPT-powered language translation can facilitate communication between tourists and locals, fostering positive interactions and cultural exchange.
Data analysis and insights	- GPT models can analyse large volumes of data, including user reviews and feedback, to provide insights into tourist preferences, trends, and areas for improvement in tourism offerings.
Sustainability and responsible tourism	- GPT can promote sustainable tourism practices by generating content that educates tourists about eco-friendly activities, conservation efforts, and responsible behaviour.
Crisis management and safety	- GPT-powered tools can provide timely alerts, safety tips, and emergency information to tourists during natural disasters, accidents, or other emergencies.
Local culture and experience enhancement	- GPT-generated content can offer tourists insights into local culture, traditions, and history, enhancing their understanding and appreciation of the destinations they visit.
Accessibility enhancement	- GPT-powered applications can improve accessibility for tourists with disabilities by providing relevant information and recommendations that cater to their needs.
Social media engagement	- GPT can assist in generating social media content that encourages engagement and user-generated content sharing, amplifying the reach of tourism campaigns.
Data-driven decision making	- By analysing data from various sources, GPT-powered systems can help tourism managers make informed decisions regarding resource allocation, marketing strategies, and infrastructure development.
Innovation and new experiences	- GPT models can contribute to the creation of innovative and immersive experiences, such as AR/VR tours or interactive exhibits, that attract and engage tourists.
Efficient customer feedback processing	- GPT can assist in processing and analysing customer feedback and reviews, helping tourism businesses address concerns and improve their offerings.
Historical and cultural preservation	- GPT-generated content can aid in documenting and preserving historical and cultural information, contributing to the conservation of heritage sites.
Local business support	- GPT-generated recommendations can promote local businesses, encouraging tourists to explore lesser-known attractions and support the local economy.

Source(s): Table created by author/s.

Table 5 shows findings about the future of recreational-based tourism focused on GPT and new technologies. According to ChatGPT's responses, there are sixteen different projections (hyper-personalization, enhanced user interfaces, AR and VR experiences, seamless language translation, AI-generated creativity, predictive analytics, sustainable tourism promotion, instant virtual tours, cultural immersion, tourism data insights, content collaboration, crisis management and safety, digital souvenirs, innovative accommodations, ethical and cultural considerations, eco-friendly travel planning) regarding the future of recreational tourism.

ChatGPT also highlights as GPT and new technologies continue to evolve, recreational-based tourism will become more personalized, informative, and immersive, ultimately enhancing the overall travel experience and contributing to the growth and sustainability of the tourism industry. However, it also emphasizes that addressing ethical, privacy, and authenticity concerns will be essential to ensure that technology serves as a positive enabler for both tourists and the destinations they visit.

Table 5. The future of recreational-based tourism focused on GPT and new technologies

The future of recreational-based tourism focused on GPT and new technologies	ChatGPT's answers about projections
Hyper-personalization	- GPT-powered systems will become even more adept at generating highly personalized travel recommendations, itineraries, and experiences based on individual preferences, behaviour, and interests.
Enhanced user interfaces	- User interfaces that leverage GPT technology will become more intuitive and conversational, allowing tourists to interact seamlessly with AI-powered virtual assistants and chatbots for real-time travel guidance.
AR and VR experiences	- GPT-powered AR and VR applications will provide tourists with immersive and interactive experiences, allowing them to virtually explore destinations and attractions before making travel decisions.
Seamless language translation	- Language translation tools powered by GPT will become more accurate and contextually sensitive, facilitating communication between tourists and locals.
AI-generated creativity	- GPT-generated content will contribute to more creative and captivating travel marketing campaigns, inspiring tourists through compelling storytelling and engaging visuals.
Predictive analytics	- GPT-powered predictive models will analyse travel data to anticipate upcoming travel trends, enabling tourism businesses to proactively adjust their offerings and marketing strategies.
Sustainable tourism promotion	- GPT will aid in promoting sustainable and responsible tourism practices, educating tourists about eco-friendly activities and conservation efforts.
Instant virtual tours	- Tourists will be able to take instant virtual tours of attractions or historical sites through their mobile devices, offering on-the-spot insights and enriching their in-person experiences.
Cultural immersion	- GPT-generated content will provide tourists with deeper insights into local culture, traditions, and history, facilitating more authentic and immersive travel experiences.
Tourism data insights	- AI-powered analysis of tourism data will help governments and organizations make informed decisions about tourism management, infrastructure development, and resource allocation.
Content collaboration	- GPT-powered tools will facilitate collaboration between tourists and content creators, enabling them to co-create personalized travel guides and recommendations.
Crisis management and safety	- GPT-powered systems will provide tourists with real-time safety alerts and emergency assistance during natural disasters or unexpected events.
Digital souvenirs	- GPT-generated digital souvenirs and immersive mementos will offer tourists unique ways to capture and remember their travel experiences.
Innovative accommodations	- GPT-powered virtual room tours and interactive hotel experiences will help tourists choose accommodations that best suit their preferences.
Ethical and cultural considerations	- GPT will be used to ensure that generated content respects ethical, cultural, and sensitive issues, offering a more responsible and inclusive approach to travel promotion.
Eco-friendly travel planning	- GPT will aid tourists in planning environmentally friendly trips, suggesting low-impact transportation options, sustainable accommodations, and eco-conscious activities.

Source(s): Table created by author/s.

DISCUSSION AND CONCLUSION

Decision-making processes in recreational tourism planning and management are complex, requiring thorough evaluation and analysis of both tourists and service providers (Liu et al., 2020; Özyıldırım and Koçoğlu, 2019; Shcherbina and Shembeleva, 2014). Thus, using technology to simplify decision-making processes in tourism and recreation management and for tourists is essential. Chatbots, which are considered one of the most prominent forms of artificial intelligence (AI) technology (Orden-Mejía and Huertas, 2022), have been recently adopted by hotels, travel agencies, and airlines (Melián-González et al., 2021). ChatGPT offers several benefits to the tourism industry, including enhancing the tourist experience, enhancing service quality, providing personalized service, analyzing feedback, and solving problems in real-time (Carvalho and Ivanov, 2023; Erul and Isin, 2023; Grundner and Neuhofer, 2021; Sorrells, 2023).

This study explores the potential benefits of employing generative pre-trained transformers (GPTs) in recreational tourism, the difficulties that arise when implementing such technology, the impact it has on tourist behaviour, and the ways it can be utilised in recreational tourism management. Although there are studies about the role of ChatGPT in the tourism sector (Calvaresi et al., 2021; Carvalho and Ivanov, 2023; Dwivedi et al., 2023; Erul and Işın, 2023; Fusté-Forné and Orea-Giner, 2023; Gursoy et al., 2023; Mich and Garigliano, 2023; Ukpabi et al., 2019), tourists (Melián-González et al., 2021; Orden-Mejía and Huertas, 2022; Sudirjo et al., 2023), and tourism education (Ali and ChatGPT OpenAI, 2023; Göktaş, 2023; Iskender, 2023; Ivanov and Soliman, 2023; Skavronskaya et al., 2023), two studies have been reached on the recreation relationship with ChatGPT (Erul and Işın, 2023; Keiper, 2023). This study contributes to the literature in theory and to public and private sector operators in practice by demonstrating the opportunities that the use of Generative Pre-Trained Transformers in recreational tourism will provide with its limitations, present and future.

Applying GPT in recreational tourism provides several opportunities to augment the authentic experience. Personalized itineraries, real-time interaction guidance, and better-translated communication with locals mean that tourists can enjoy a more meaningful interaction with the places they visit. Moreover, virtual tours, the generation of more compelling social media content, and improved insight into local culture can help visitors appreciate their destination better, behave more responsibly, and gain more knowledge about the relevant sites and locations. Tourist trends can be analyzed more effectively to optimize service content, and real-time updates and warnings (relating to weather, traffic, and events) can be promptly communicated. Finally, GPT can contribute to creating engaging marketing campaigns.

Specific difficulties must be addressed when using GPT for recreational tourism. Issues that need to be addressed are potential user distrust towards provided content, the accuracy and in-depth quality of travel tips and explanations, creating unintentionally insensitive content towards destination-specific and cultural aspects, identifying and correcting language errors, ensuring data confidentiality and safety, maintaining a comprehensive viewpoint, avoiding incorrect content, and preventing misinformation that could lead tourists to make erroneous decisions. Furthermore, potential shortcomings comprise an excessive dependence on automated systems, decreased levels of human involvement, challenges in delivering a seamless and user-friendly interface, customization options that may not cater to all user

preferences, the ongoing commitment and expertise required to ensure information remains current, as well as questions regarding the ethical and legal standing of the presented content.

GPT impacts recreational tourists in multiple ways, including offering extensive information and inspiration on destinations, providing tailored travel advice and experiences, promoting physical travel through virtual tours, simplifying communication with locals by overcoming language barriers and simplifying navigation in unfamiliar territories, planning journeys more effectively by taking into account factors such as weather, events and routes holistically, encouraging tourists to explore new locations, providing real-time information and analyzing feedback to make more informed travel decisions, enhancing travel experiences through informative content, fostering social media sharing and promoting responsible tourism. Additionally, GPT enables personalized travel experiences, resulting in unforgettable trips.

GPT has the potential to have a substantial impact on the management of recreational tourism by improving the effectiveness of marketing tools and campaigns. It can also create engaging content and enhance client satisfaction through real-time interaction with chatbots and assistants. Additionally, GPT provides real-time warnings and information on weather, event schedules, and local news. It offers personalised and optimised (cost/time) services, translations, and encourages increased interaction between tourists and locals. GPT helps to keep service and offer contents up-to-date through analysis of tourist feedback and promotes responsible tourism practices by sharing content on sustainability. Furthermore, it can immediately provide warnings in crisis or emergency situations such as natural disasters or accidents. GPT also offer advantages for recreation management such as obtaining a more meaningful experience from the destination/local culture with informative content, providing accessible services for everyone, guiding managers in areas such as producer/consumer social media sharing integration, improving marketing strategies and infrastructure, creating AR/VR tours/exhibitions, helping to document and preserve historical/cultural information, and supporting the local economy by encouraging tourists to go to lesser-known places.

GPT and new technologies are anticipated to make sizeable strides in recreational tourism. These include hyper-personalised services, intuitive and conversational real-time guidance through advanced interfaces, sustainable tourism promotion and education, innovative lodging (virtual room tours, interactive hotel experiences, personalised trips), digital souvenirs, prompt virtual tours with mobile applications, engaging AR/VR experiences, coordinated language translation, and responsible tourism, observing ethical and cultural sensitivities. Additionally, GPT and new technologies will enable proactive prediction of travel trends, offer content and services for customers, develop effective marketing strategies, provide in-depth information on culture and history, aid public institutions in developing infrastructure through efficient analysis of tourism data, issue real-time crisis warnings, plan eco-friendly travel, and create travel marketing campaigns with artificial intelligence.

The study is limited to the queries addressed to ChatGPT concerning recreational tourism. According to the responses obtained from ChatGPT, it is evident that forthcoming research is necessary, particularly for addressing issues related to ethics, privacy, and authenticity. Furthermore, ChatGPT was requested to suggest research topics that contribute to the potential of GPT in recreational tourism. Further research is required to investigate the impact of GPT-generated content on tourists' decision-making processes, as well as the accuracy and quality

of the content. It is also essential to examine the content's conformity with ethical and cultural values, user experiences, and the effectiveness of personalized travel suggestions. There is a necessity for further research on the economic benefits of promoting the local economy, the impact of language translations, the effectiveness of security warnings and emergency aids during times of crisis, and the influence of content on holiday decision-making. The integration with other innovative technology applications (e.g., AR and VR) and trustworthiness should also be considered for future research.

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The Effect of Team Support and Attitude Towards the Sponsor on Purchase Intention in Sports Club Sponsorship

Bora GÜNDÜZYELİ^{1*} 

¹İstanbul Topkapı University, İstanbul.

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Abstract

Considering that the sponsorship relations between brands and sports clubs are based on a win-win model, it is inevitable for the parties to consider some variables based on their target groups in their sponsorship agreements. The most important motivation of brands in sponsorship agreements is to increase brand awareness, strengthen brand image, and increase sales of products and services. This study investigates how fans' team support affects their purchase intention for sponsor brand products directly and indirectly through attitude towards the brand. Accordingly, in this study, the effect of sports team sponsorship on consumer behavior is explored in terms of the impact of fans' team support and attitudes towards the sponsor brand on purchase intention. Data collected from surveys conducted with 448 Fenerbahçe Football A Team supporters were analyzed using SPSS-AMOS and SPSS PROCESS Macro. The validity and reliability of the research model were evaluated with confirmatory factor analysis. The results indicate that the support of the fans' team support has a statistically significant and positive effect on the purchasing intention of the sponsor brand. In addition, according to the result of the analysis made with SPSS PROCESS Macro Model-4, the positive attitude towards the sponsor brand mediated the effect of team support on the purchase intention of the fans. Therefore, it could be said that the supporters who identify themselves with their team and support their team in all circumstances, regardless of whether they win or lose, are more likely to purchase the products and services of the brand with which the sports club has a sponsorship agreement. It is also observed that a positive fan attitude toward the sponsor strengthens the statistical relationship between team support and purchase intention.

Keywords: Sports sponsorship, Purchase intention, Team support

Spor Kulüpleri Sponsorluęunda Takım Desteęi ve Sponsora Karşı Tutumun Satın Alma Niyetine Etkisi

Öz

Markalar ve spor kulüpleri arasındaki sponsorluk ilişkilerinin kazan-kazan modeline dayandığı düşünöldüğünde tarafların sponsorluk anlaşmalarında kendi hedef kitleleri bazında bir takım deęişkenleri göz önünde bulundurmaları kaçınılmazdır. Sponsorluk anlaşmalarında markaların en önemli motivasyonu marka farkındalığın artması, marka imajının güçlenmesi ve ürün ve hizmetlerinin satışların artmasıdır. Bu çalışmanın amacı taraftarların takım desteęinin sponsor marka ürünlerine yönelik satın alma niyetini doğrudan ve markaya yönelik tutum aracılığı ile dolaylı olarak nasıl etkilediğini arařtırmaktır. Buna göre çalışmada spor takımı sponsorluęunun tüketici davranışı üzerindeki etkisi taraftarların takım desteęi ve sponsor markaya yönelik tutumlarının satın alma niyeti üzerindeki etkisi açısından incelenmektedir. 448 Fenerbahçe Futbol Takımı taraftarından anket yoluyla toplanan veriler SPSS-AMOS ve SPSS PROCESS Macro kullanılarak analiz edilmiştir. Arařtırma modelinin geçerlilik ve güvenilirliği doğrudan faktör analizi ile deęerlendirilmiştir. Elde edilen sonuçlar taraftarların takım desteklerinin sponsor markaya yönelik satın alma niyetini istatistiksel olarak anlamlı şekilde ve pozitif olarak etkilediğini göstermektedir. İlaveten, SPSS PROCESS Makro Model-4 ile yapılan analiz sonucunda taraftarların takım desteęinin satın alma niyeti üzerindeki etkisine sponsor markaya yönelik olumlu tutumun aracılık ettięi sonucuna ulařılmıştır. Buna göre takımla özdeşleşmiş, takımın kazanması ya da kaybetmesinden bağımsız olarak her koşulda destekleyen tarafların spor kulübünün sponsorluk anlaşması yaptıęı markanın ürün ve hizmetlerini satın alma ihtimallerin daha fazla olduęu söylenebilir. İlgili markaya yönelik mevcut bir olumlu tutumun varlığı ise, takım desteęi ile satın alma niyeti arasındaki istatistiksel ilişkisini güçlendirdięi görölmektedir.

Anahtar kelimeler: Spor sponsorluęu, Satın alma niyeti, takım desteęi

* **Corresponding Author:** Bora GÜNDÜZYELİ, **Email:** boragunduzelyeli@topkapi.edu.tr

INTRODUCTION

Sports sponsorship is an important marketing activity that many organizations from various sectors have been using as an indirect marketing tool for many years. The total value of the global sports sponsorship market in 2022 is approximately 66 billion dollars and is expected to continue its growth trend in the coming years as the number of sports events around the world increases, sponsorships have a wider reach compared to traditional marketing activities such as advertising and sales promotions, and they are associated with the enthusiasm and passion of the individual for sports. The global sports market is anticipated to reach \$108 billion by 2030 (Gough, 2023).

With the rapid growth of sponsorship activities, evaluating the effectiveness of sports sponsorships has become crucial, which also made it increasingly important to understand the effect of sponsorship agreements on consumer behavior, to investigate consumer perception of and reaction to the sponsor brand, and to reveal the contribution of sponsorship activities to the brands (Koronios et al., 2022). Regarding sponsor brands, the most critical indicator of sponsorship events is the effect of consumers' purchase intention on future sales (Nguyen & Vu, 2022). However, according to some researchers, the studies conducted so far on the effects of sponsorship activities on consumers and brands have not been satisfactory enough (Hsiao et al., 2021; Nguyen & Vu, 2022). The primary method to boost sports and sports organizations is to encourage sponsors capable of providing substantial financial support to participate in sports events (Jaberi & Barkhordar, 2022). For this, it is essential to understand the contributions of sponsorship activities both to sponsors and sports clubs. Companies will remain reluctant to sponsor unless they realize the importance of sponsorship in terms of the sport's contribution to brand equity and revenue growth. So, exploring the relations of sports fans with sports and sponsors is considered a critical approach in developing cooperation between sports and sponsor companies (Jaberi & Barkhordar, 2022).

The literature on consumer behavior in sports is developing with an interdisciplinary perspective, with the contribution of different disciplines such as sports sciences, social psychology, marketing, and communication (Ko et al., 2023). This study aimed to investigate the effects of related variables on the intention to purchase sponsor brand products by examining consumer behaviors in sports, supporters' support for the team, and current attitudes towards the sponsor company.

Revealing the direct and indirect effects of supporters' attitudes towards the brand on the effect of sponsorship agreements on consumers' purchase intention expands the existing knowledge on consumer behavior in sports. This new information will contribute significantly to the literature, as it is seen as one of the determinants of the success of the a sponsorship agreement in terms of both the potential sponsors and the sports clubs. Companies can evaluate the general public attitude towards their brands by studying the fan group in the sports events they plan to sponsor or in the sponsorship of various sports clubs. As for the sports clubs, it should be noted that the fans' positive or negative brand attitude towards the sponsor brand can also affect their attitude towards the club.

The findings obtained in this study contribute to the sports sponsorship literature by revealing that the presence of a fan base that identifies itself with the team and supports their team

whether they win or lose increases the positive fan attitude of the sponsors and the fans' strong support for their team positively affects their intention to buy sponsor products.

Conceptual Framework and Hypotheses

Sports sponsorship is an indirect form of marketing in which the company promotes its products and services by associating the brand with a sports event, unlike the direct advertisements of branded products and services to the target audience (Dixon et al., 2019). As a matter of fact, today's sponsorship activities expand beyond one-way advertising and promotion, adopting two-way interaction and real-time campaign forms (Dreisbach et al., 2021).

Sports events aimed to entertain large audiences are sponsors' most preferred sporting activity. (Baş, 2008; Koronios et al., 2022). Sponsorship in sports comprises three main types: individual athlete sponsorship, sports team sponsorship, and sports events sponsorship (Baş, 2008). Sports events need corporate sponsorship to continue and grow their activities. Sponsorships are an essential source of revenue for organizations in the sports industry. So, without the financial support by sponsors, we could say that many sports events, from the minor local leagues to the Olympics, would not be possible (Cornwell et al., 2023). For this reason, it is vital to examine and evaluate the results of sports sponsorship from different perspectives (Thomas et al., 2022). Sports sponsorships are attractive for brands in many aspects, including providing various advantages to brands in reaching their target audiences effectively, creating a positive perception of the brand or changing the negative perception to a positive one, supporting the brand image with the success and positive features of sports events, and establishing emotional bonds with the target audience through the excitement and dynamism of sports (Amis et al., 1999; Copeland et al., 1996; Mason, 2005).

Cornwell (2005) summarizes the basic mechanism of sponsorship from a corporate perspective in three steps: (1) with sponsorship, consumers are more exposed to the brand, thus increasing brand awareness and appreciation; (2)) the good match between the sponsor and the events allows consumers to easily remember the sponsor brand's name and place the brand on their cognitive map; (3) the articulation formed through the association of the sponsor and the sponsee enables the brand to have a permanent place in consumer's memory.

Besides, the more individuals identify themselves with sports, the more likely they are to develop a positive attitude toward brands associated with the sports club (Dixon et al., 2019). Fans' identification with the team they support expresses their intense feelings of the parties towards their favorite team and the culture of solidarity. This identification and team support is an antecedent to the fans' emotional, behavioral, and cognitive reactions (Wann & Branscombe, 1993). In their study, Korinos et al. (2022) concluded that team commitment affects the attitude toward and the awareness of the sponsor. In the context of sponsorship, the sponsor company, which is interested in the team and its performance and provides substantial funds to the club, will be seen as an ally by the fans who strongly identify themselves with the team (Silva, 2022).

Team Support and Attitudes Towards the Sponsor Brands

Many studies reveal the positive contribution of sports sponsorship to brands. Previous research indicates that consumer attitude towards the sponsor's brand affects their approach to sponsorship agreements (Schönberner & Woratschek, 2023). Brand attitude refers to the learned predispositions based on consumers' favorable or unfavorable personal evaluation of the relevant brand, which is relatively stable but can change over time with new information (McFadden, 1998; Spears & Singh, 2004). Many studies support that attitudes are antecedents of behavioral intentions, such as purchase intention (Ajzen, 1991; Schönberner & Woratschek, 2023; Tsai et al., 2015). Wakefield et al. (2020) state that consumer attitude towards and perception of the sponsor company are vital to the success of sponsorship. A global study focusing only on football fans concluded that global brands sponsoring sports activities make the brand more attractive in the eyes of consumers (Gough, 2023).

Sports sponsorship potentially increases fans' familiarity with the brand and keeps brand associations in their memory. It is claimed that increasing brand familiarity through exposure can improve attitudes towards the sponsor brand. Fans are repeatedly exposed to the brand name and logo during the relevant sporting event. In addition, a brand's interest in sports and providing financial support to sports can help develop a positive attitude towards sports (Levin et al., 2001).

Sponsor fit, defined as a logical connection between the sponsor brand and the team, emerges as an essential factor in sponsorship success. (Parganas et al., 2017). In addition, a strong team support that is ready to support their team under any circumstances is essential in developing a positive attitude towards the sponsor brand. The teams can create a positive brand attitude towards the sponsor companies that support their teams with their commitment and support to the team and reward the sponsors with their attitude towards the brand and purchasing intentions (Angell et al., 2016). In light of this information, the following hypothesis has been formalized:

H₁: Team support of the fans positively affects their attitude towards the sponsor brand.

Attitudes Towards the Sponsor Brands and Purchase Intention

Two factors are reasonably accepted in the literature as antecedents of consumers' purchase intentions: a positive attitude towards the brand and brand exposure or familiarity from previous experiences (Smith et al., 2008). One of the main goals of sports sponsorship is to increase brand awareness and strengthen the brand image. Accordingly, it is accepted that familiarity, awareness, and attitudes toward the sponsor brand affect consumption behaviors and intentions (Levin et al., 2001).

Raising brand awareness, sponsor-team match, helping fans develop a positive attitude towards the brand, and strengthening word-of-mouth marketing are among the crucial criteria in evaluating the effectiveness of sponsorship activities for the sponsor. Also, increasing the behavioral intentions to purchase branded products is seen as the main driving force behind the sponsorship activities of the companies. Therefore, the effects of sponsorship on consumers' purchase intention are considered a typical representative criterion in sponsorship activities (Koronios et al., 2021). Accordingly, it is thought that positive consumer attitudes toward the

sponsor positively affect purchasing intentions and behaviors (Parganas et al., 2017). In addition, purchase intention is an important indicator that legitimizes the relationship between sports institutions and sponsor brands (Nguyen & Vu, 2022). Certainly, purchase intention and actual purchasing behavior are not the same, but there is a reasonable consensus in the literature regarding the positive effect of intentions on driving behavior (Ajzen, 1991; Nguyen & Vu, 2022). Moreover, considering the experiential and hedonistic nature of sports consumption, it is thought that emotional attachment to sports teams affects the purchasing intentions of the parties through the positive attitude towards the sponsor brand (Lee et al., 2018).

In the light of this information in the literature, the following hypotheses have been developed:

H₂: There is a positive relationship between the fans' attitudes towards the sponsor brand and their intention to purchase the sponsor brand.

H₃: The fans' attitudes towards the sponsor brand mediate the relationship between team support and purchase intention.

METHODS

Research Model

The research model in Figure 1 examines the direct effect of football fans' support for their team on their purchase intention and the indirect effect of their attitude towards the sponsor brand (the mediating role of brand attitude) on their purchase intention.

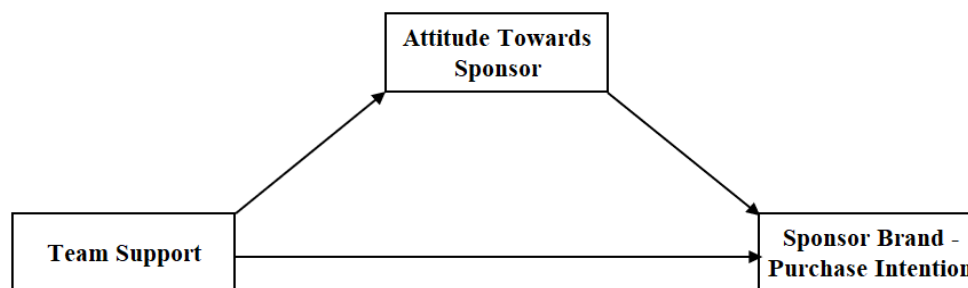


Figure 1. Research Model

Research Group

Considering this study's financial and time constraints, surveys were conducted with Fenerbahçe football team fans to test the hypotheses constructed in the research model. Accordingly, Fenerbahçe football team fans aged 18 and above served as the research group for this study. The data were collected by convenience sampling method. Given the size of the population, the convenience sampling method was considered the most appropriate technique. Under these conditions, 448 Fenerbahçe fans participated in the study.

Ethics Approval

Before the research, approval was obtained from the Academic Research and Publication Ethics Committee of Istanbul Topkapı University with the decision number E-49846378-050.01.04-2300009941.

Data Collection Tools

The data were collected through an online survey based on a convenience sampling method, which the users completed after reading the participant information sheet. Afterward, participants were asked screening questions to ensure their suitability as the target audience. In the second part of the survey, team support, attitude towards the sponsor, and purchase intention were measured with a 7-point Likert scale (1= Strongly disagree, 7= Strongly agree). Ülker brand, the name sponsor of the Fenerbahçe Football A Team facility, was chosen to measure the attitude towards the sponsor brand and the intention to purchase the sponsor's products.

Data Collection

To ensure whether participants were suitable as the target audience, the study's purpose and scope were explained to them before starting the survey, and the name of the football team they support was asked as the first screening question. As the second screening question, users were asked whether they consume Ülker brand products. Based on their answer, the survey continued with the participants who support the Fenerbahçe football team and had previously purchased Ülker products. In all survey questions regarding the sponsor brand, the questions were asked directly through the Ülker brand. Surveys have been designed to be sent when all questions are answered. Therefore, there is no missing data. To increase the possibility of reaching the fans with strong team support, Fenerbahçe fan group pages were asked to share the survey link with their followers on social media. In this context, data were collected from 448 fans. Table 1 below shows the demographic data of the participants.

Table 1. Descriptive statistics of the sample

Category	Frequency	Percentage (%)	Category	Frequency	Percentage (%)		
Gender	Male	284	63.4	Education Level	Primary education	53	11.8
	Female	164	36.6		High school	90	20.1
Age	18-24	86	19.2		University	248	55.4
	25-34	114	25.4		Post-graduate or above	57	12.7
	35-44	139	31.0	<11,440	49	10.9	
	45-54	55	12.3	11,401 – 25,000	228	50.9	
	55-64	30	6.7	Income (per month – TRY)	25,001 – 45,000	107	23.9
≥ 65	24	5.7	45,001 – 70,000		31	6.9	
Marital Status	Single	240	53.6	≥ 70,001	33	7.4	
	Married	208	46.4				

Data Analysis and Interpretation

SPSS-AMOS and SPSS PROCESS Macro programs were used to analyze the data. The validity and reliability analysis of the research model were evaluated by a confirmatory factor analysis (CFA) using the AMOS. Before CFA, the skewness and kurtosis values of the data were examined. Table 2 shows that the skewness and kurtosis values of the data are in the range of +1/-1 and are in accordance with the normal distribution (Hair et al., 2014). In variance and covariance-based analyses, the critical value of multiple kurtosis was examined since it is more important that the data not be kurtosis. Table 2 shows that the multiple normality index is 10.78. Although this value is expected to be below 10 in the literature, it is reported that it does not

constitute a problem that would violate the normal distribution unless it exceeds 20 (Gürbüz, 2019a, p. 30). SPSS PROCESS Macro Model-4 was used to test the hypotheses developed as part of the research model.

Table 2. Skewness and Kurtosis values for variables

Code	Skewness	Kurtosis
STN1	-.694	-.074
STN2	-.491	-.302
STN3	-.575	-.114
MTUT1	-.477	-.110
MTUT2	-.681	.523
MTUT3	-.476	-.250
MTUT4	-.627	.378
TDES1	-.444	.450
TDES2	-.275	.003
TDES3	-.290	-.109
TDES4	-.427	.098
Multivariate		10.783

The scales used in the research model consist of scales with validity and reliability previously tested in the relevant literature. A study by Smith et al. (2008) was used for the scale of team support, and Özer (2011) was used for the scale of attitude and purchase intention. The English scales were translated into Turkish by the author(s) and checked by two experts in the field, one in English Language and Literature and the other in Marketing.

FINDINGS

A confirmatory factor analysis was performed with the SPSS-AMOS tool to confirm the scales for the variables previously used in the current literature with the data collected in this study. DFA analysis results are presented in Figure 2.

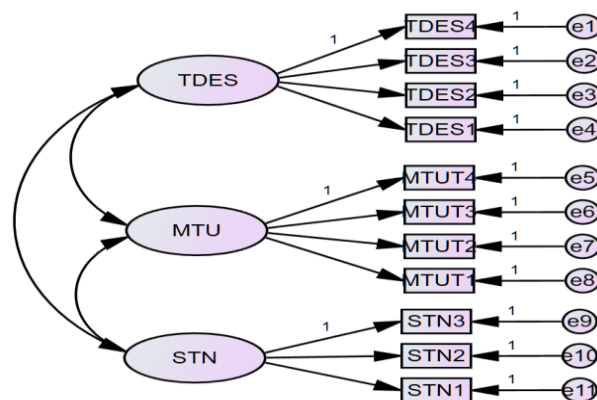


Figure 2. Research Model DFA analysis results

The factor loadings and Cronbach's Alpha coefficients of the variables are provided in Table 3. Accordingly, all items are loaded on the relevant factor in a statistically significant manner.

The same table shows that all Cronbach Alpha coefficients of the factors are above .80 (Acceptable limit: .70). The Cronbach's Alpha coefficient above .80 expresses the appropriateness of the internal consistency and relevancy among the questions in the scale (Gürbüz & Şahin, 2017).

Table 3. Factor loading of variables and Cronbach's Alpha coefficient.

Variables	Factor loading	Cronbach's Alpha	AVE	CR
Team Support		0,88	0,66	0,88
I passionately support the Fenerbahçe football team.	0,885			
I love the Fenerbahçe team and the club	0,907			
Win or lose, I always support Fenerbahçe in a positive manner.	0,806			
I always talk positively about Fenerbahçe.				
Attitude Towards Sponsor		0,86	0,61	0,86
I have positive thoughts about the Ülker brand, the sponsor of Fenerbahçe	0,701			
I like the Ülker brand.	0,759			
I am satisfied with the Ülker products.	0,818			
My thoughts on Ülker are positive.	0,857			
Sponsor Brand – Purchase Intention		0,82	0,60	0,82
Ülker's sponsorship of Fenerbahçe might increase my likelihood of buying Ülker products.	0,769			
Ülker's sponsorship of Fenerbahçe might increase the probability of me purchasing Ülker products in my next purchase.	0,823			
I will more likely buy Ülker's products due to Ülker's sponsorship.	0,705			

The goodness-of-fit values obtained by DFA and recommended threshold values for related values are reported in Table 4 (Recommended values were compiled from the study of Kaur and Sohal (2022)). Accordingly, when the model goodness-of-fit values are examined, it is seen that the GFI, AGFI, RMSEA, and SRMR values are within the accepted threshold values, and the CMIN/df value is quite close to the threshold of ≤ 3 . The results show that the theoretical structure of the model is confirmed by the data collected in the study.

Table 4. Model fit indices

Fit Indices	CMIN/df	GFI	AGFI	RMSEA	SRMR
Observed values	3.26	.95	.92	.07	.51
Recommended values	≤ 3	$\geq .90$	$\geq .90$	$\leq .08$	< 1
Reference	(Kline, 2005)	(Hu & Bentler, 1999)	(Hooper et al., 2008)	(MacCallum et al., 1996)	(Byrne, 1998)

A regression analysis based on the bootstrap method was conducted to analyze the direct effect of fans' team support on the purchase intention towards the sponsor brand and the indirect effect on the purchase intention through the fan attitudes towards the sponsor brand. 5000 resampling options were preferred in the analyses. This technique generates random new samples from the observations in the original dataset (Efron, 1987). Analyzes were made using SPSS PROCESS

Macro, developed by Hayes (2018), using model number 4. Calculating the indirect effect in the mediation model analysis and evaluating the relationship between the variables and the mediating role of the related variable over this indirect effect are accepted as a contemporary approach in mediation analysis (Gürbüz, 2019b).

Regression analysis results are provided in Table 5 and Figure 3 as a statistical diagram. Accordingly, team support has a statistically significant positive effect on the fans' attitudes toward the sponsoring brand ($a = .209$ %95 CI [.135 - .283], $t = 5.571$, $p < .001$), which supports the hypothesis H₁.

Team support explains about 7% ($R^2 = .07$) of the change in perceived attitude towards the sponsor brand. The fans' attitudes towards the sponsor brand affect the purchase intention in a statistically significant and positive way ($b = .763$ %95 CI [.651 - .875], $t = 13.378$, $p < .001$), confirming the hypothesis H₂. Accordingly, it is estimated that two fans with the same team support perception, whose attitudes towards the sponsor brand differ by one unit, will show a difference of .763 units in their purchase intention. Based on the results in the same table, it is seen that the fans' support affects the purchase intention in a statistically significant and positive way ($c' = .110$ %95 CI [.186 - .202], $t = 2.364$, $p < .05$). In consequence, team support and perceived attitude towards the sponsor explain approximately 33% ($R^2 = .325$) of the change in purchase intention.

Table 5. Regression analysis results for mediation Test (N=448)

	Consequent							
	M (Attitude Towards Sponsor)			Y (Purchase Intention)				
Antecedent		Coeff.	SE	p	Coeff.	SE	p	
X (Team Support)	<i>a</i>	.209	.038	< .001	<i>c'</i>	.110	.048	< .05
M (Attitude Towards Sponsor)	-	-	-	-	<i>b</i>	.763	.057	< .001
Constant	<i>i_M</i>	4.652	.185	< .001	<i>i_y</i>	.211	.347	.543
		$R^2 = .065$				$R^2 = .325$		
		$F(1; 446) = 31.036, p < .001$				$F(2; 445) = 107.329, p < .001$		

Note: Unstandardised regression coefficients are reported, SE = Standard Error.

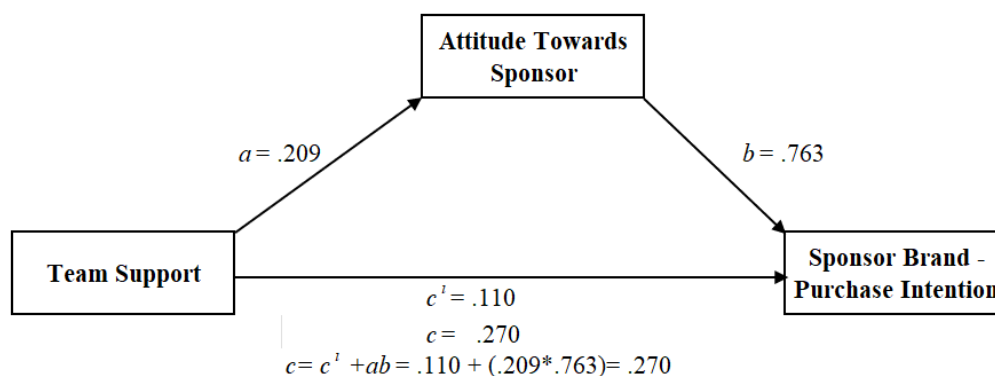


Figure 3. Statistical diagram for direct and indirect effect

The mediating role of the attitude towards the sponsor brand in the effect of team support on purchase intention is indicated in Figure 3 and Table 6. The total effect of team support on purchase intention is the sum of the direct and indirect effects ($c = c' + ab = .110 + .159 = .270$). As seen in the results in Table 6, the confidence interval for the indirect effect ($ab = .159$) is above zero (.097 to .227), which supports the hypothesis H₃. The supporters' attitude towards the sponsor brand mediates the relationship between team support and purchase intention.

Tablo 6. The mediating role of the attitude toward the sponsor

	<i>ab</i>	SE	%95 CI	
			LL	UL
Attitude Towards Sponsor	.159	.033	.097	.227

DISCUSSION AND CONCLUSION

This study has three primary purposes: (1) to investigate the effect of fans' support for their team on their attitudes towards the sponsor of the club, (2) to examine the effect of the fans' current attitudes towards the sponsor on their purchase intention, (3) to test the mediating role of the current fan attitude towards the sponsor in the relationship between team support and purchase intention.

First, the SPSS-AMOS modeling tool was used to run a confirmatory factor analysis of 448 data from surveys completed by Fenarbahçe football team fans. The analysis revealed that, as Gürbüz (2019a) suggested, all factor loads were statistically and significantly above .50. Then, the model goodness-of-fit values were examined. The recommended values table compiled by Kaur and Sohal (2022), which is the most widely accepted one in the literature, was used to evaluate the model goodness-of-fit values. It was accordingly observed that all values of the model were found to be compatible with the recommended threshold values.

SPSS PROCESS Macro tool was used to test the hypotheses. In line with the existing literature (Gwinner & Swanson, 2003; Smith et al., 2008), the findings brought the conclusion that fans' support for their team positively affects their attitudes towards the sponsor company and their intention to purchase the sponsor branded products. The findings are also important in terms of revealing the tangible benefit that sponsorship will bring to the company when sponsoring a sports club with a massive fan base strongly identifying themselves with their team and never stopping supporting their team regardless of the circumstances. Considering that the existence of sports activities and events largely depend on sponsors in terms of being the main suppliers of finance to clubs, revealing the potential advantages of being a sponsor would further encourage the organizations' willingness for sponsorship. Numerous studies show that a positive attitude toward a brand positively affects purchase intention and behavior (Ghorban, 2012; Jung & Seock, 2016). The findings of this study as well confirm that the attitudes of the fans towards the sponsoring brand affect their purchase intentions in a statistically significant and positive manner. Furthermore, this study has tested the mediating role of fans' attitudes towards the sponsoring brand in the effect of team support on purchase intentions.

The findings obtained by calculating the indirect effect of the independent variable on the dependent variable, which is accepted as a contemporary approach in mediation analysis

(Gürbüz, 2019b), show that the attitudes of the fans towards the sponsor brand mediate the effect of team support on the purchase intention. Accordingly, as explained in the findings section, it was concluded that among the fans who showed an equal amount of team support for their team, fans who have a more positive attitude towards the sponsor statistically tend to have stronger intentions to purchase its products.

Some of the limitations of this study may be useful for future research. The first limitation concerns Fenerbahçe football team fans, chosen as the population and the sample to help analyze the variables related to the research model developed as part of this study. In future studies, the research population and sample can be expanded to include other sports clubs and different sports branches, and comparative analyses can be made between various sports clubs and sports categories. Another limitation of the research is related to the brand chosen to measure the attitude toward the sponsor. In this case, it was Ülker, the facility name sponsor of the Fenerbahçe football team. In the future, by measuring the attitude toward the sponsor brand, a classification can be made based on convenience, shopping, and specialty goods in brand selection and comparative analyses of the relevant brands. Both this study and the sponsorship literature have focused mainly on the potential benefits of sponsorship for companies and brands. Future research can evaluate the risks and potential negative consequences of sponsorship (e.g., sponsor boycott by fans).

Conflicts of Interest: The author declares that he has no conflict of interest.

Authors' Contribution: Research design, Data collection, Statistical analysis, Preparation of the article, BG.

Ethical Approval

Ethics Committee: Istanbul Topkapı University Academic Research and Publication Commission

Date/protocol number: 27.01.2023 / E-49846378-050.01.04-230000994.

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Physical Activity in Turkish Esports Players: Age Differences Approach

Egemen MANCI^{1*} , Erkan GÜNAY² 

¹Izmir Demokrasi University, Faculty of Health Sciences, Department of Exercise and Sport Sciences, Izmir

²Manisa Celal Bayar University, Faculty of Sport Sciences, Department of Coaching Education, Manisa

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ABSTRACT

Esports, which is a sport with high cognitive load, is thought to have certain dark side points from a sustainable health perspective due to the prolonged seated position. In this study, the focus has been on addressing the dark points through the physical activity levels and daily gaming durations of Turkish esports players. The research included 373 esports players between the ages of 14-24 residing in different cities of Turkey. The participants were divided into 3 categories: Adolescents (14-16), Late Adolescents (17-19), and Adults (20-24). The participants' demographic information, International Physical Activity Questionnaire (IPAQ) data, and daily gaming durations were collected through a web-based survey program. IPAQ and gaming times were separately analyzed using one-way independent measures ANOVA to compare three different age groups (Adolescent, Late Adolescent, and Adult). Results showed that there was a significant effect of age on gaming years, $F(2, 370) = 19.84, p < .001, \omega^2 = .09$ (medium effect), high-level physical activity $F(2, 370) = 3.33, p < .05, \omega^2 = .01$ (small effect) and sitting time scores $F(2, 370) = 6.15, p < .01, \omega^2 = .02$. The study results indicate that as years of e-gaming experience increase, it reveals the risk of 'professionalization'-based sedentary behavior.

Keywords: Esports, Physical activity, Video games, E-athlete, Gaming

* Corresponding Author: Egemen MANCI, Email: egemenmanci@gmail.com

INTRODUCTION

Esports is a branch of sports that requires strong cognitive skills (Adamus, 2012), can be performed individually or in teams like other known sport branches, has certain rules and standards, and has become a phenomenon considering the number of both spectators and participants (Adamus, 2012; Mancı, 2022; Wagner, 2006). The announcement by the IOC that the Esports branch will be included in the upcoming Olympic games, along with the creation of leagues consisting of teams established with huge budgets, accelerated the 'professionalization' process of the athletes. Esports, which is newly developing in Turkey, has a federation and the number of licensed athletes is increasing day by day. Esports has a large participant base especially in the adolescent, young adult, and adult population (SHGM, 2023). The efforts of researchers on the general level of esports players in terms of 'sustainable health' are creating awareness and becoming an initiative that supports the increase in the quality of life.

The possible negative effects of 'sedentary life' and 'physical inactivity' that may arise due to the daily habit changes created by intense computer game participation on these individuals seem to be the dark corner of the subject. In general, there is a long sitting in the nature of computer games. Although new type of games like virtual reality aim to activate players physically, popular game types are still played in the traditional way. Esports players perform tasks that require mental effort, such as strategizing, decision-making, etc., rather than physical activities such as running and jumping. For this reason, it is reported that the stress, excitement, and motivation seen in esports participation cause changes on some physiological parameters such as respiratory rate and heart rate (Rudolf et al., 2016). There is no consensus yet on how esports affect physical activity levels. The study conducted by Hygen et al., (2022) on 1130 adolescent individuals, reported that the rate of moderate and high-level physical activity decreased while playing time increased (Hygen et al., 2022). Similarly, DiFrancisco-Donoghue et al., (2022) compared young adults who are non-gamers with esports players by matching their age (DiFrancisco-Donoghue et al., 2022). In the study, it was reported that esports players were physically less active than the non-gaming group. On the other hand, the study conducted by Giakoni-Ramírez et al., (2022) showed that 92.7% of 260 professional esports players had a moderate or high intensity physical activity (Giakoni-Ramírez et al., 2022). Considering that esports activity is performed by sitting down, studies showed that esports players are three times more physically active than office workers, and they have better hand-eye coordination compared to athletes (Grushko et al., 2021; McGeechan et al., 2009).

The studies in literature suggest that esports participation is concentrated on the young population and may have possible side effects. Moreover, the issue of whether esports by its very nature creates a state of physical inactivity is still controversial. In the literature, it is remarkable that experimental groups are with low numbers of participants and the studies are conducted without dividing the age by groups. Additionally, there is no research on the physical activity levels of Esports players from the Turkey perspective. In our study, we aimed to examine the physical activity levels and computer game playing times of adolescent, late adolescent, and adult esports players. In the light of the findings, it is aimed to define the potential benefits and risks of Esports in terms of physical health of the esports players.

METHODS

Research Model

This research is an experimental model from quantitative research methods.

Participants

The study group of this research consists of 373 participants between the ages of 14-24 who are interested in esports and reside in different provinces of Turkey such as Izmir, Ankara, Istanbul, Adana, Diyarbakır and Trabzon. The research data were collected from esports players who received esports education through a web-based survey. According to McKay et al. (2022), the esports athletes recruited in this study can be classified as Tier 2 and Tier 1 representing “Trained/Development” players that compete on the local level (McKay et al., 2022) or can be classified as 'hardcore' gamers according to Scharkow et al. (2015) and Toth et al. (2021) (Scharkow et al., 2015; Toth et al., 2021). All subjects were informed about the procedures, and each gave their written informed consent to participate. In addition, for participants under 18 years of age, parental approval was obtained in addition to the consent forms.

Ethical Approval

The Ethics Committee of the Dokuz Eylül University approved all procedures and the experimental design (2021/29-04,6078-GOA). The study protocol follows the latest version of the Declaration of Helsinki.

Data Collections

The research data were collected through a web-based survey from esports players who received esports education, trained /played regularly, and volunteered to participate in the study (<https://forms.gle/WVtVi7suPDZagw7f7>).

Demographic Form: With the questions in the survey prepared for the participants, both their demographic information (age, gender, city, with whom they live, etc.) and their game playing time (daily game playing time and how many years they have been playing games) were collected.

International Physical Activity Questionnaire- Short Form: IPAQ-SF: It consists of 4 separate sections and 7 questions, and the questions in the survey ask about the participant's high-intensity, moderate-intensity, and low-intensity activities in the last week. The answers obtained allow the participants' physical activity levels to be determined indirectly in MET (min/week). Physical activity levels were classified as low physically active (600 MET min/week), moderate physically active (600-3000 MET min/week), and very active (> 3000 MET min/week). Many studies in the literature have shown that the form is valid and reliable for determining physical activity level (Craig et al., 2003; Saglam et al., 2010). IPAQ Turkish versions validity and reliability study in the Turkish version was conducted by Saglam (Saglam et al., 2010).

Following the data collection, the participants were divided into three groups as Adolescents (14-16 years old), Late Adolescents (17-19 years old) and Adults (20-24 years old) and analyzed according to the physical activity levels and playing time of the groups.

Analysis of Data

Analyses were conducted across 373 participants. IPAQ and gaming times were separately analyzed using one-way independent measures ANOVA to compare three different age groups (Adolescent, Late Adolescent, Adult). Effect sizes were calculated using r values ($\sqrt{SS_M/SS_T}$), ω values ($\sqrt{SS_M - (df_M) MS_R / SS_T + MS_R}$) and $r_{contrast}$ values ($\sqrt{t^2/t^2 + df}$) were reported as estimations of effect size of main and interaction effects. In addition, three sets of planned comparisons were carried out to look at the changes in gaming year, high level physical activity and sitting time between each age group. Findings of planned comparisons were provided instead of post-hoc comparisons where predicted results were also determined to be significant.

FINDINGS

Participants' Demographic Information and Physical Activity Results

The study included 373 participants interested in esports with an average age of 18.26 ± 2.57 (years). The physical activity levels and playing time of the participants according to age groups are given in Table 1.

Table 1. The physical activity levels and playing time of the participants

	Adolescent (14-16) n=120 \bar{X}	Late Adolescent (17-19) n=127 \bar{X}	Adult (20-24) n=126 \bar{X}	Total Group n=373 \bar{X}
Age (year)	15.34±0.7	18.07±0.8	21.23±1.21	18.26±2.5
Gaming Time (hour/day)	5.58±2.681	5.64±2.847	6.06±2.768	5.76±2.76
Gaming Experience (year)	7.04±2.594	8.32±3.407	9.94±4.525	8.45±3.78
Physical Activity Level (MET/week)	3173.55±2819.00	3226.85±2845.58	2694.11±2701.83	3031.17±2792.43
High Physical Activity (min/week)	1544.33±1946.74	1279.06±1580.97	974.72±1648.50	1262.41±1739.26
Moderate Physical Activity (min/week)	611.33±1046.70	587.31±1518.42	603.68±1545.95	600.52±1390.81
Low Physical Activity (min/week)	1017.88±948.03	1360.47±1542.17	1115.71±1144.68	1168.23±1247.86
Sitting Time (min/week)	444.47±443.24	363.98±490.38	239.42±448.51	348.13±468.02

\bar{X} : mean, \pm : standard deviations, min: Minute

A one-way independent ANOVA was conducted in order to see the effect of age on score of gaming year, daily gaming hour, and exercise type (high, moderate, low, sitting and met). Results showed that there was a significant effect of age on gaming years, $F_{(2, 370)} = 19.84$, $p < .001$, $\omega^2 = .09$ (medium effect), high level physical activity $F_{(2, 370)} = 3.33$, $p < .05$, $\omega^2 = .01$ (small effect) and sitting time scores $F_{(2, 370)} = 6.15$, $p < .01$, $\omega^2 = .02$. This significance shows a linear trend in gaming year $F_{(1, 370)} = 19.84$, $p < .05$ and high physical activity $F_{(1, 370)} = 3.33$, $p < .05$, which indicates that as age increased with gaming year positively but decrease with high physical activity scores proportionately. Planned contrasts revealed that adolescents significantly have higher high exercise scores than adults $t(233.183) = -2.467$, $p < .05$, $r_{contrast} = .16$ (Figure 1).

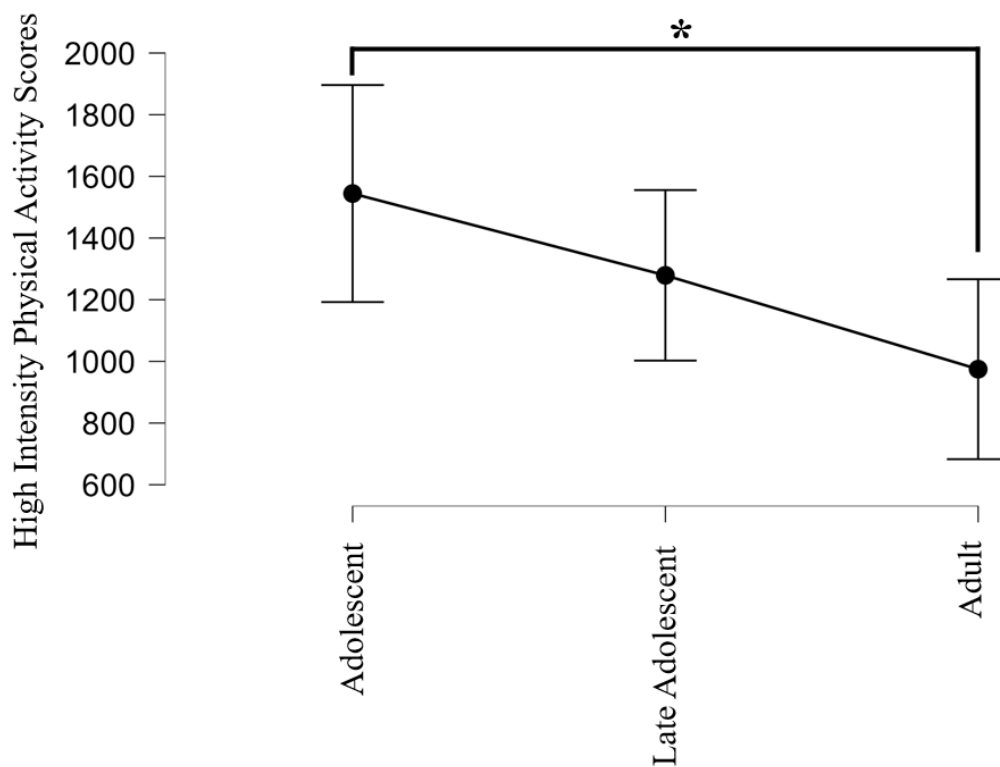


Figure 1. Mean (with 95% CI) high level physical activity scores of the participants by different age group
* $p < 0.05$

Results also showed that there was a significant quadratic trend between age and low exercise $F(1, 370) = 4.70, p < .05$. Planned contrast showed that adolescents significantly have low level exercise scores than late adolescents $t(213.074) = 2.12, p < .05, r = .14$ (Figure 2).

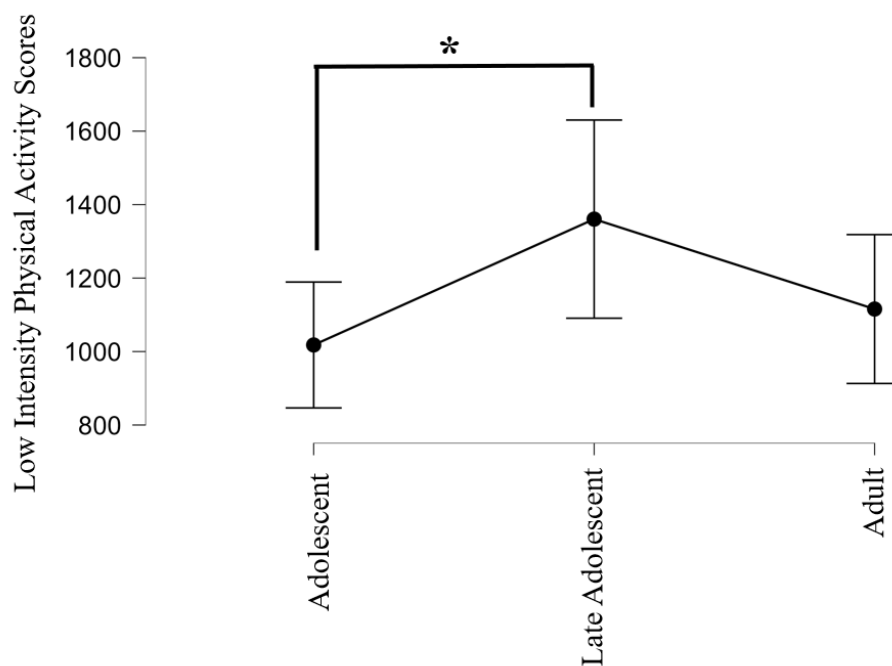


Figure 2. Mean (with 95% CI) low level scores of the participants by different age
* $p < 0.05$

The correlation analyses showed that age is significantly correlated with gaming year $r = .33$, $p < .001$, high level exercise $r = -.14$, $p < .01$, and sitting time scores $r = -.19$, $p < .001$ (Figure 3). This indicates that as person's age increase gaming year also increase; however, high level exercise and sitting time scores decrease with age. Another significant correlation is that gaming year increases with daily gaming hour increase $r = .24$, $p < .001$, This can be interpreted as screen time increases as a person's gaming year increase (Figure 3).

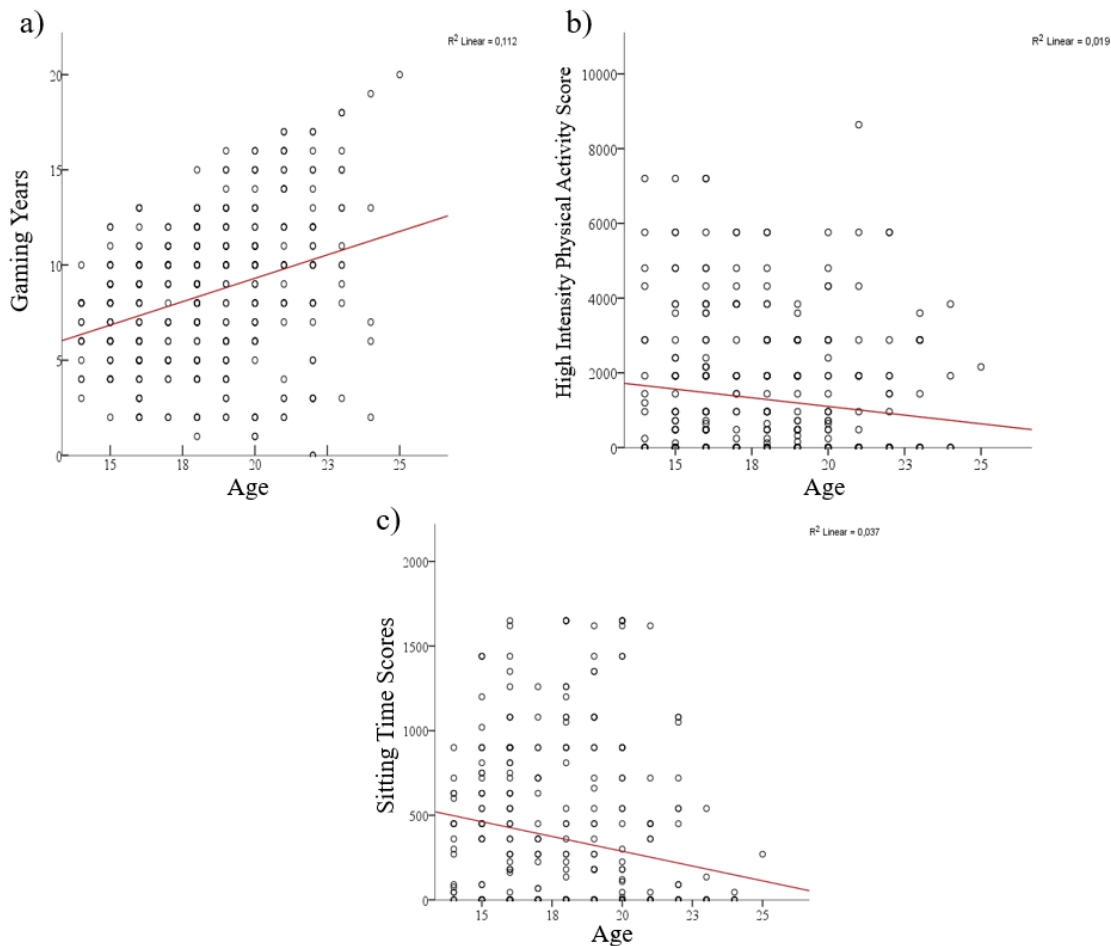


Figure 3. Correlation between age and gaming years (a), High level exercise (b), and Sitting Time (c)

DISCUSSION

The study aimed to investigate the playing time and physical activity levels of Turkish esports players. Present study has a higher number of participants than similar studies (Giakoni-Ramírez et al., 2022; Kopp, 2017; Seo, 2013). The main findings of the study were I) the level of high intensity physical activity decreased significantly with advancing age II) total physical activity levels decreased to inadequate level with advancing age III) esports activity duration was not affected by the age variable.

The interesting finding of the study was that the high intensity activity level of the adolescent group was significantly higher than the adult group (Adult = 974 MET (min/week) vs

adolescent= 1544 MET (min/week). The energy expended for high intensity physical activity decreases linearly with age. Considering the data of a few studies conducted on esports players in the literature; Hygen et al., (2022) reported that the rate of moderate and vigorous exercise decreased as the duration of the game increased in their study on 1130 adolescents (Hygen et al., 2022). Similarly, DiFrancisco-Donoghue et al., (2022) compared young adults who were esports players and non-gamers by age-matching (DiFrancisco-Donoghue et al., 2022). In the study, it was reported that esports players were less physically active than the non-playing group. On the other hand, Pedraza-Ramirez et al., (2020) reported that 92.7% of the participants participated in moderate or vigorous exercise in their study conducted with 260 professional esports players (Valdez et al., 2012).

The aforementioned research findings are very similar to our study findings. We would like to draw attention to the need for an in-depth investigation into the underlying causes of this age-related decline. The benefits of regular exercise are varied and well known, including improved respiratory and cardiovascular functioning, improved muscular fitness (i.e., muscular strength, endurance, and power), reduced risk factors for cardiovascular disease, reduced morbidity, and mortality, as well as a plethora of other benefits (e.g., reduced depression and anxiety, enhanced quality of life, and improved cognitive function and sleep (Kanaley et al., 2022). High-intensity activities, on the other hand, may offer similar health and performance benefits as moderate-intensity activities despite requiring less time (Atakan et al., 2021). According to our results, it is thought that the age-related decrease in high intensity activity may be a 'risk factor that negatively affects health' due to the gradual loss of regular exercise behavior and that the awareness of esports players on the subject should be increased.

The results of our study indicate that adolescent and late adolescent esports athletes were 'adequately' active, whereas adult esports athletes were moderately active (3173.55 MET (min/week) and 2694.11 MET (min/week, respectively). There are studies in the literature reporting that esports athletes generally lead an active lifestyle and meet the recommendation standards of the World Health Organization (Harding & Noorbhai, 2021; Pereira et al., 2021; Rudolf et al., 2020). In a study conducted by Pereira et al., (2021) with 433 participants, it was reported that the median value of the physical activity level of esports athletes was 5.625 (MET-min x week-1) and 87.1% of the participants met WHO standards (Pereira et al., 2021). In a study conducted by Harding and Noorbhai (2021) with 102 participants, it was reported that the majority of participants achieved the reference value for moderate and vigorous exercise, even during the Covid-19 period (Harding & Noorbhai, 2021). In addition, Rudolf et al. (2020) reported that 2/3 of esports players lead an active life in accordance with WHO standards in their study on 1066 people (Rudolf et al., 2020). The physical activity level findings of Turkish esports players are similar to the literature information presented above.

Another finding was that the daily playing time of esports players increased as their playing age increased. Esports activity is a passionate sport that involves intense cognitive tasks (Kowal et al., 2018; Mancı, 2022) and increases the workload of physiological mechanisms of cardiovascular (Dykstra et al., 2021), hormonal, neuronal and partially metabolic systems during the game. Nonstable physiological responses occur during the game or competition depending on the reactions caused by visual or auditory stimuli. In its general characteristics, skills such as attention, perception (Green & Bavelier, 2003), intuition, planning, and reaction are at the forefront (Granic et al., 2014; Zimmer et al., 2016; Zimmer et al., 2022). Therefore,

this sport is not based on 'physical exertion' but on 'structured physical exertion' in pre-game preparations to be successful. In support of this information, research results showing that the game performances of physically active esports players are at a higher level than other players have started to find a place in the emerging literature (Giakoni-Ramírez et al., 2022; McNulty et al., 2023; Nicholson et al., 2020). As a result of the research, we think that the fact that the time spent during the game in esports players shows a relationship with age-related physical activity levels and sitting times indicates that esports is related to possible health risks and personal physical activity preferences.

It was found that the findings related to low intensity physical activity of adolescent age esports athletes and adult age athletes were significantly lower than those of late adolescent age athletes. This quadratic table is quite remarkable. Low-intensity physical activity includes core activities such as walking along with daily chores. Independent of moderate and high intensity physical activity, daily activities are more determinant, as there is less 'exercise' related physical activity. We emphasize that the variables affecting the emergence of this finding should be examined in more depth.

Limitations

The inability to collect data such as height and body weight has impeded the examination of the anthropometric implications of physical activity and esports. Potential errors in anthropometric information provided in personal inquiries, rather than being measured by the researcher, should also be considered, as they can affect the accuracy of the study in web-based data collection processes. Another limitation is the high standard deviation in the data. From a general perspective, this arises from variables influencing lifestyle, such as natural socio-economic and socio-cultural differences among participants in a newly emerging sport throughout Turkey. On the other hand, when measuring subjective feedback-based physical activity levels, individuals' tendency to exaggerate should not be forgotten. As a precaution, although our questionnaire explanations address this issue, the objectivity of measurements conducted through field tests is an undeniable fact.

CONCLUSION

The study results highlight the following key points for Turkish esports players:

- I. As age progresses, the increase in time spent at the beginning of gaming might be a process expected during the 'professionalization' phase; however, the 'risk of physical inactivity' arising from prolonged sitting time becomes evident.
- II. The linear decrease in high-intensity physical activity duration with age stands out as a 'Risk Factor,' potentially leading to the loss of esports players' 'Regular Exercise Participation' behavior.
- III. Regarding the low participation in low-intensity physical activity, the observed decline in adolescent and adult groups also encompasses daily activities like walking, necessitating further detailed investigation.

IV. For future research, we believe there is a need for large participant group-based field-test studies.

Raising awareness among esports players about physical activity and exercise, along with promoting cognitive-motor exercise applications (e.g., efforts enriched with complex audio-visual stimuli), could potentially enhance participation through the enjoyment of exercise, positively impacting esports performance.

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Conflicts of Interest: The authors declare no conflict of interest in the study.

Ethical Approval

Ethics Committee: Dokuz Eylül University Ethics Committee

Date: 2021/29-04

Decision/Protocol Number: 6078-GOA

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Women's Empowerment within the Framework of the Sustainable Development Goals: The Case of “Girls on the Field”*

Feyza Meryem KARA^{1†} , Aylin UŐURLU² , Gizem KARACA¹ 

¹Kırıkkale University Faculty of Sport Sciences, Kırıkkale.

²Aydın Adnan Menderes University Faculty of Sport Sciences, Aydın.

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Abstract

In Türkiye, efforts to eliminate gender inequality, barriers to access to sport and cultural norms in sport are increasing by the day. The aim of this research is to the empowerment of girls and women through football within the framework of the Sustainable Development Goals (Goal 5) using the “Girls on the Field” platform as a case. According to the findings, the 'Girls on the Field' platform as been seen as an exemplary platform that "prioritizes sustainability in terms of its founding purposes" and adopts empowerment activities in sport through football. As a result, the “Girls on the Field” platform is seen as an exemplary organization in establishing similar platforms in Turkey and the world to achieve the Sustainable Development Goals.

Keywords: Sustainable development goals, Girls on the Field, Gender equality, Football, Türkiye

Sürdürülebilir Kalkınma Amaçları Çerçevesinde Kadınların Güçlenmesi: “Kızlar Sahada” Örneđi

Öz

Türkiye'de de toplumsal cinsiyet eşitsizliğinin, spora erişimin önündeki engellerin ve sporda kültürel normların ortadan kaldırılmasına yönelik çalışmalar her geçen gün artıyor. Bu araştırmanın amacı, Sürdürülebilir Kalkınma Hedefleri (Hedef 5) çerçevesinde kız çocuklarının ve kadınların futbol yoluyla güçlendirilmesini "Kızlar Sahada" platformu örneđi üzerinden incelemektir. Elde edilen bulgulara göre "Kızlar Sahada" platformu, kuruluş amaçları itibariyle sürdürülebilirliği ön planda tutan ve futbol aracılığıyla sporda güçlendirme faaliyetlerini benimseyen örnek bir platform olarak görülmüştür. Sonuç olarak, “Kızlar Sahada” platformu, Sürdürülebilir Kalkınma Hedeflerine ulaşmak için Türkiye'de ve dünyada benzer platformların kurulmasında örnek bir kuruluş olarak görülmektedir.

Anahtar kelimeler: Sürdürülebilir kalkınma hedefleri, Kızlar Sahada, Toplumsal cinsiyet eşitliği, Futbol, Türkiye

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²Corresponding Author: Assoc. Prof. Feyza Meryem KARA, E-mail: feyzameryemkara@gmail.com

INTRODUCTION

"Sustainable development" is a development model that meets the needs of the present without compromising the ability of future generations to meet their own needs. The basic formula of sustainable development is to ensure that everyone equally benefits from opportunities by evaluating the interaction between the economic and social structure and the environment in a holistic manner (UNGA, 2015). The United Nations adopted the Sustainable Development Goals (SDGs) in 2015 and set out to achieve 17 priority targets by 2030. These goals define the steps needed for an economically, socially, and environmentally sustainable future (UNGA, 2015). Gender equality is one of these development goals.

The goal of gender equality has been on the agenda of many national and international policies in recent years, especially in the fields of sports. The empowerment of girls and women in and through sports is the subject of much research (McDonald, 2015; Meân, 2012; Theberge, 1987). In this context, a clear relation is evident between sports and the concept of women's empowerment, which is considered as a global issue both nationally and internationally, and sports. Various institutions and organizations are working to the development and enhancement of women's empowerment through sports.

Efforts to eliminate gender inequality in sports, barriers to access to sports, and cultural norms are increasing day by day (Kay, 2009; Kwauk, 2022). In this context, SDGs are important in sports as in many other areas. Accordingly, within the framework of SDGs the "Kızlar Sahada (Girls on the Field)" platform, one of the most important initiatives aiming to empower girls and women through football was analysed in Turkey. In the context of these objectives, the "Girls on the Field" platform aims to understand strategies to end gender inequality in sport. Thus, the study analyzes the "Girls on the Field" platform, which works in parallel with SDGs on gender equality (Goal 5), reducing inequalities (Goal 10), quality education (Goal 4), peace, justice, and strong institutions (Goal 16), and partnerships for the goals (Goal 17).

The Sustainable Development Plans entered the world agenda towards the end of the 20th century and became a global implementation plan with international agreements signed in the 1990s (UNGA, 2015). Furthermore, the "increasing contribution of sports to the realization of development and peace" (UNGA, 2015) is clearly identified in the 2030 Agenda for Sustainable Development. The Declaration represents a significant milestone for sport. It also represents an opportunity to build on previous commitments and progress made by the Commonwealth, the United Nations, and other international, national, and local stakeholders. This guidance supports this effort by providing direction to government policymakers and other stakeholders to ensure that sport makes the highest possible contribution to sustainable development (Kjaerulf et al., 2016; UNGA, 2015),

One of them, Goal 5, aims to achieve gender equality and empower all women and girls. This objective refers to striving to promote gender equality in sports, in addition to taking advantage of opportunities for gender empowerment through sports. It can be evaluated that the possible contributions of developing sport-based policies to the Global SDGs as direct and related contributions (Lindsey & Chapman, 2017).

Direct Contribution:

Target 5.1: End all forms of discrimination against women and girls everywhere.

Target 5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic, and social life.

5.c. Adopt and strengthen sound policies and legally enforceable legislation to advance gender equality and empower women and girls at all levels.

Linked Contribution:

Target 5.2: Eliminate all forms of violence against all women and girls in public and private spaces, including trafficking, sexual, and all forms of exploitation.

Target 5.3: Eliminate all harmful practices such as child marriage, early marriage, forced marriage, and female genital mutilation.

Globally, important steps are being taken to break down gender stereotypes or change gender norms. In this context, sport is considered a crucial tool in solving gender inequality. Governments continue to target women for health improvement, with a growing interest in women's participation in sports (Miller et al., 2017; Sport England, 2015). Furthermore, many projects have been undertaken worldwide to break down gender norms through sports (e.g., This Girl Can) (Sport England, 2015). Moreover, efforts have been made to empower girls and women especially in the field of football (Skogwang, 2023).

In Türkiye, gender inequality prevails in every branch and field of sports (KASFAD, 2021). Research has indicated that male and female athletes face difficulties in their chosen sports as a reflection of gender (Kavasoglu & Anderson, 2022, Kavasoglu & Yaşar, 2016). In particular, football is traditionally seen as a sexist and men's stronghold, and female football players are subjected to various gender-based discrimination (Kavasoglu, 2021; Nuhurat, 2022; Öztürk & Koca, 2015; Öztürk & Koca, 2020). Despite policies such as reducing and eliminating gender inequalities in football (European Football Association, 2017), gender discrimination and unequal power relations continue to significantly shape football in Türkiye. When we compare the number of women playing licensed football within the Turkish Football Federation (TFF) with the country's population, the number of female football players is almost non-existent (Women's Football Across the National Associations, 2019). In Türkiye, football is the sport with the highest rate of male athletes (99.06%) and the lowest rate of female athletes (Koca, 2020, p.38). Therefore, football is one of the sports in our country where it is most necessary to take concrete and sustainable steps toward girls' and women's empowerment.

"Girls on the Field" is a dedicated women's football platform founded in 2013. "Girls on the Field" has a unique place in the Turkish football conjuncture, both structurally and ideologically. It is not affiliated with the TFF. It is not a project, a women's football club, or an association but a social initiative. In addition to football clubs and associations, it is in contact with many private institutions, public institutions, social enterprises, and non-governmental organizations. Moreover, it designs various programs for the empowerment of women and children in society against discrimination. It works with people of all ages and

genders who are interested in football and development. "Girls on the Field" is a platform where people of all ages can find a place for themselves (Kızlar Sahada, 2022).

"Girls on the Field" tries to break gender stereotypes through football, one of the sports that girls and women are least likely to participate in and challenges the "You Cannot Do It" discourse that girls and women are exposed to from an early age. It invites women and girls to take to the field, to believe that they can do what men can do, and to a world where they are not isolated it advocates that sports and every profession are for everyone (Kızlar Sahada, 2022).

Since 2013, "Girls on the Field" has been organizing the Istanbul Cup, the first and still the only dedicated women's football tournament for women in Türkiye. Since 2015, it has organized the Youth Cup for high school girls every year (Kızlar Sahada, 2022). As of 2022, Visa Girls on the Field Football Schools (Adana, Ankara, Erzincan, Istanbul, Kayseri, Kocaeli, Soma, Ordu, and Şanlıurfa) and Kotex Girls on the Field Football Player Development Programs (Denizli, Kayseri, Malatya, Ordu, and Samsun) continue their activities in Türkiye. This program has conducted a project development program with creativity and trainings from sports to arts as well as entrepreneurship to technology to produce solutions to the problems of young women university students. With the selected project ideas, it was planned to create "Girls on the Field" spokespeople at universities and carry out activities within the framework of sports and gender equality (Kızlar Sahada, 2022).

The platform also provides corporate trainings. They provide trainings for corporations, educational institutions, and sports clubs, where diversity management, team building, inclusion, dialogue development, and inclusion processes are experienced on the football field. As the sole representative in Turkey, the football method, which is used in more than 150 institutions in more than 85 countries worldwide, it provides practical for women, men, children, youth, and participants of all ages and profiles (Kızlar Sahada, 2022).

Volunteering activities are also supported under this platform. In line with the needs of the "Girls on the Field" team, people can voluntarily join the team for operational jobs in the field, as trainers in trainings, and for desk jobs such as translation, social media, and visual design. In this context, in addition to the "Girls on the Field Volunteer Trainer Certificate," the aim is for them to gain privileges in many areas such as coaching and networking opportunities. Additionally, football and social development camps and football and psycho-social development training programs are organized for children with various backgrounds from all over Türkiye. In these programs, activities are exclusively designed for girls or mixed groups of girls and boys to empower special groups (refugees, socio-economically and culturally disadvantaged groups, etc.) and raise awareness regarding gender equality (Kızlar Sahada, 2022). This research aims to examine the empowerment of girls and women through football within the framework of the SDGs (Goal 5) through the example of the "Girls on the Field" platform.

METHODS

Research Model

The study preferred a qualitative research method to understand how people create their social lives, better perceive the world they live in, and reveal their experiences (Creswell et al., 2007). The research design was determined as a case study. A case study is a method in which a single situation or event is examined in-depth longitudinally, data are collected systematically, and what happens in the real environment is examined. (Ruane, 2005).

Study Group

The study group was selected through the criterion sampling method, one of the purposeful sampling methods. This method enables in-depth research information-rich situations by selecting people or institutions with certain qualities appropriate to the research topic (Ruane, 2005). Since the current situation was analyzed through the example of the "Girls on the Field" organization, the study group included a co-founder, a trainer, an instructor of trainers, and a project consultant. Participation in projects, trainings, and activities based on SDGs carried out by the "Girls on the Field" organization were determined as the criteria for the participants.

The age range of the participants was between 23 and 52 years. The co-founder among the participants has been involved in key roles in all processes for the development of "Girls on the Field," in which she has been involved since 2014. The participants who contributed to the study as project advisors and trainers are academicians at the Faculty of Sports Sciences and board members of the *Association of Sports and Physical Activity for Women (Kadınlar için Spor ve Fiziksel Aktivite Derneği, KASFAD)*, who have contributed important research on gender in sport to the literature. The trainer instructor participant is a graduate of the Faculty of Sports Sciences, takes part in various volunteering programs, and is interested in gymnastics.

Ethical Approval

Before starting the research, the researchers obtained an Ethics Committee Approval Certificate as a result of session number 08 dated 9.09.2022 from the Ethics Committee of the Kırıkkale University Social and Human Sciences Ethics Committee. In addition, researchers presented the necessary information about the research and the principles of volunteering to the participants in advance, and they had participants sign a consent form.

Data Collection

As a data collection tool in the study, the researchers prepared an information form containing various demographic information such as participants' age, occupation, and the time of their introduction to "Girls on the Field." In addition, the study used a semi-structured interview technique within the scope of qualitative research. With the proliferation of qualitative methods in research involving sports and cultural contexts, researchers are increasingly using interviews to collect data (Sparkes & Smith, 2009). Data collection occurred through a semi-structured interview form prepared by experts. The interview questions were prepared in line with SDG 5, which is "Ensuring Gender Equality," by academics working in the field of gender. In this context, in-depth individual interviews were conducted with participants who had made various contributions to the "Girls on the Field" initiative about what has been done and what will be done in line with SDGs.

Interviews were conducted with the participants via the Zoom application for a minimum of 30 and a maximum of 50 minutes. Interviews were audio and video recorded with the permission of the participants.

Data Analysis

Data analysis occurred through the content analysis method. The aim of content analysis is to reach the concepts and relationships that can explain the data obtained by examining the files and documents reflecting the views of the participants (Guba & Lincoln, 1994; Maxwell, 2008; Pope et al., 2000). In this direction, the researchers recorded the audio and video recordings of the interviews with the participants in writing. Accordingly, the research team used the original information obtained from the participants to determine the vision and mission of the “Girls on the Field” platform from the SDG framework and create the necessary themes. Three qualitative researchers who are experts in the fields of gender and sport assisted in determining the codes and categories in the study. Through the analysis of the research data, two categories and codes defining these categories were determined. The codes and categories were then organized, and the findings were interpreted.

Role of the Researcher

In qualitative research, the role of the researcher is crucial as they spend time in the field, directly interview participants, and gain experience in using the perspective gained in the field to analyze the data obtained. Being close to the sources of information, talking to the relevant people, making observations, analyzing relevant documents, and getting to know and understanding the subject matter closely have a significant place in qualitative research (Ruane, 2005). In this sense, the fact that the researchers’ fields of study are parallel to the subject is considered a positive effect. Moreover, the researchers were actively involved in the semi-structured interviews and the analysis process from start to finish.

FINDINGS

This study, which analyzed “Girls on the Field” within the scope of SDGs (especially Goal 5), reached two themes (luxury and inappropriate field, equal and powerful). The themes and sub-themes generated as a result of content analysis are presented.

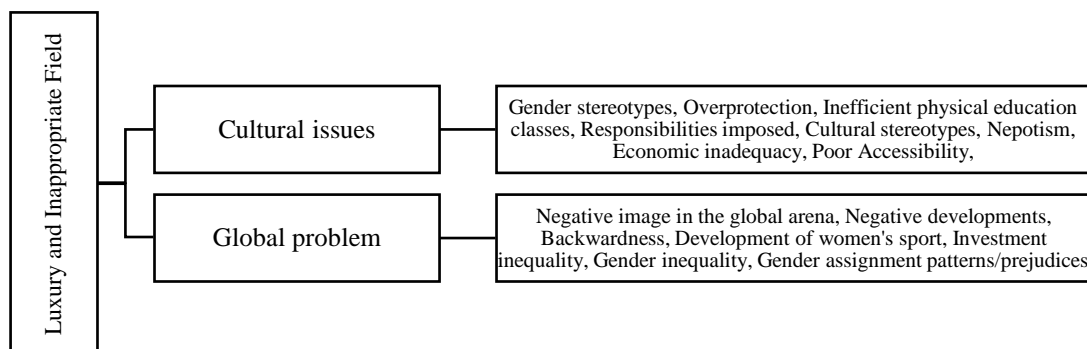


Figure 1. Luxury and inappropriate field

Researchers observed that the co-founder and other participants of "Girls on the Field" are in this organization because they believe that there is a cultural and global bias against girls and women in the national and international arena. "Sport is a luxury and unnecessary/inappropriate field for girls and women." It can be said that this awareness forms the fundamental strength of the "Girls on the Field" project. In the sub-theme of cultural issues, it was found that women in Türkiye are aware of issues such as gender prejudices, overprotectiveness against girls and women, economic injustices, and favoritism of men in sports.

Trainer instructor Esra stated, *...One of the biggest reasons for this is the tradition, culture, cultural norms, even religious and patriarchal codes in our country. For example, when a girl wants to do sports, of course, this may vary between central and provincial or eastern and western regions, but her father may not allow it, a family member may not allow it.*

Founding member Betül stated, *...I do not think we, as Girls on the Field, need to express how bad the current situation is. Even if you present 3 research results, you will not need to write what I say...*

It is seen that the roles assigned to women in society and family culture patterns negatively impact girls' participation or continuity in sports. For instance, Fasting and Pfister (1999) observed that the low age of marriage in Türkiye and, therefore, the responsibilities that young women take on related to the home form at an early age, the burden of motherhood at a very young age, and the authority of male family members are barriers to participation in sports. Similarly, in a study conducted on female athletes, Kavasoglu and Yaşar (2016) determined that problems such as stereotyped value judgments of society, family pressure, the view that the responsibilities of marriage belong to women, and economic inequality cause serious problems in their sports lives. They also determined that the reflection of social presuppositions in sports, which attribute the basis of physical activities to power and power to the natural privilege of men due to the perception that the field of sports belongs to men, also itself in football. This is also supported by the trainer instructor's opinion in this study.

In line with the findings of the research, it is understood that people find it is not appropriate for women and girls to participate in the world of sports due to the stereotypes produced by the cultural structure and male hegemony. At this point, sports for women and girls are perceived as an unnecessary luxury. The results of the research and the literature are parallel in this regard. Im et al., (2012) emphasized that sport is seen as a luxury in the lives of girls and women and that girls are always of secondary importance in sporting activities due to their physical characteristics and traditional reasons. Furthermore, men are more likely to participate in sports activities than women. Schedler and Wagstaff (2018) stated that the responsibilities attributed to women in society lead to inequalities and discrimination among men. In fact, Koca and Bulgu (2005) argued that as a global problem, the people who control women's sports are men. Moreover, they mentioned the fact that some sports branches are closed to women subordinates and excludes women. Again, even when sports activities in school environments are considered, researchers have argued that in physical education classes, female students are considered suitable for gymnastics and volleyball because of their gender, whereas male students are considered suitable for football and basketball branches. Otherwise, these students are not considered normal (Koca et al., 2005). The perception that sport is a male domain is one of the main pillars of the ambivalent position of women athletes in this field. The projection

of social assumptions that attribute the basis of physical activities to power and power to the natural privilege of men in sports manifests itself in football (Kavasoğlu & Yaşar, 2016; Öztürk & Koca, 2019; Öztürk & Koca, 2020).

Founding member Betül stated, *...sports is not considered a profession for girls. Then we start school, and in physical education classes, the group that receives the ball is the boys. Girls, you guys hang out, jump rope or play volleyball... This causes girls' and women's participation in sports to decrease and disappear from daily life...*

The study findings indicate that families, who should be in a position to guide and encourage children, singled out their children in sports based on their gender. A report published by Women's Sports Foundation (WSF, 2020) revealed that families (32.2%) consider boys to be more talented in sports than girls and that this is a situation that prevents girls from playing sports. The same report determined that middle-income families provided more opportunities for boys (34.7%) to watch football matches than girls (26.4%). This situation, which one can define as the invisibility of experience, is also emphasized in the quote of the instructor in the study and is in parallel with the study.

Ferda, the Girls on the Field Project Advisor, and Pinar, the Instructor, stated that not only cultural norms were influential in the emergence of this formation.

Project advisor Ferda stated, *...We already know that girls and women are disadvantaged in terms of accessibility in sports compared to boys and men in our country and all over the world*

Trainer Pinar stated, *.... Girls on the Field is a platform based on football. Men are more interested in football. Boys are much more likely to be taken to matches than women. In that respect, I think women are one step behind...*

The starting point of sustainability is awareness. People are involved in this project to be effective in shaping a better future and create change along the way. This awareness makes the project sustainable in creating a social impact for gender equality and women's empowerment.

The Women's Sports Foundation (WSF), founded in 1974 by Billie Jean King to raise awareness and empower girls for a better future through sport, is an organization dedicated to ensuring that all girls and women have equal access to sport and the enormous lifelong benefits it provides (Zarrett et al., 2020). The organization is instrumental not only in enabling girls to play sports but also in supporting them through champion organizations. So, it enables them to find the confidence, strength, and sense of belonging that they need to grow at the community level over the years and throughout their lives (Staurowsk et al., 2022).

In the globalized world of sports, in many countries, there are campaigns for gender equality in sports participation, and people even prepare declarations on this issue. For instance, in the 1970s and 80s in the US, the WFS was established as a national organization to promote girls' and women's participation in sports, and the Canadian Association for the Advancement of Women in Sport and Physical Activity helped to increase women's participation in sport. In the 1990s, many international organizations were established for the same purpose. Again, at the First World Conference on Women and Sport held in Brighton, England in 1994, decisions

were taken to increase international organizations to increase the participation of women and girls in sports (Jeanes et al., 2021; Meier, 2005).

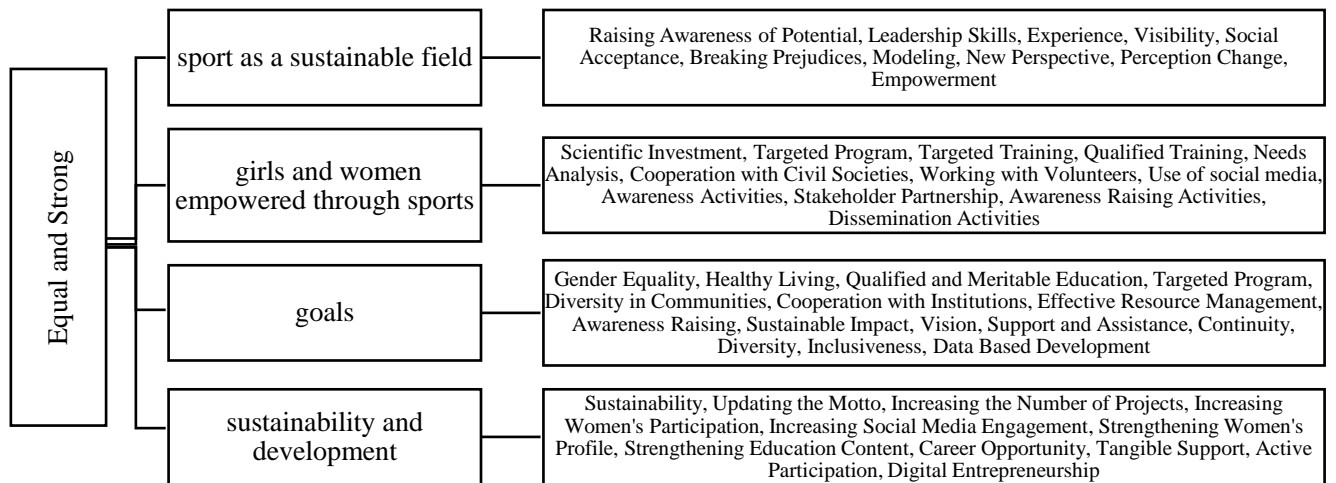


Figure 2. Equal and strong

According to the research findings, the “Girls on the Field” project has reached four sub-themes in the formation of equitable and empowered women within the scope of sustainability. Within the sub-theme of sport as a sustainable field, codes such as increasing the potential awareness of girls and women, providing experience, high visibility, breaking prejudices, and changing perceptions through sport were identified. In this context, achieving sustainable gender equality, especially through sport, is seen as a crucial field in building a stronger and more equal world. The 2005 World Summit on Social Development emphasized the importance of social development (UNGA, 2005). A study conducted by UEFA, the governing body of football in Europe, reveals that young girls who play football report higher levels of self-confidence than those engaged in other sports (UEFA 2017).

Childhood is an ideal time to build a solid foundation in critical awareness of discriminatory practices and develop to the transferable skills necessary for building a more just, critical, and egalitarian society. Here, the concept of “effective equality” or similar social categories constitute the educational process through sport, which takes the form of practices in which learning is the goal. Thus, this potential awareness can influence perception change (Hortigüela-Alcalá et al., 2021).

Founding member Betül stated, *...we also saw that one of the participating companies had a CEO that played football in the team. And this team had stores, and one of the sales consultants working in the stores was the captain of the team, and within the team, the CEO followed the guidance of the sales consultant. Now I do not know where else such an experience, such leadership skills, such management skills would be available...*

Trainer Instructor Esra stated, *...Women's football in Europe is still not in a position to be compared with men's football, but despite this, the momentum it has gained in recent years, the work done, the developments in this field ... the World Championship in 2019, the European Championship, etc. shows that IT EXISTS NOW. The demand is high, there is a big audience,*

the quality of the game is good, experts and journalists state that, compared to men's football, it is technically more watchable, more exciting...

However, within the framework of the women empowered through sports sub-theme, ensuring sustainability is subject to certain conditions. Ensuring scientific investment, conducting programs toward the target, providing targeted training, providing qualified training, conducting needs analysis, ensuring cooperation with non-governmental organizations, working with volunteers, increasing the use of social media, increasing awareness-raising activities, ensuring stakeholder partnership, and increasing awareness raising activities and dissemination activities represent acts related to the empowerment of girls and women through sports.

In the global sports world, many organizations are collaborating to positively change girls' knowledge, attitudes, and behaviors through sport, such as the UN's Girl Up, Plan International Girls Get Equal, and the Nike Foundation's Girl Effect. Researchers have claimed that these programs are seen as an opportunity to change the perception of the world (Grosser & van der Gaag, 2013; Mitra, 2021). The campaign objectives identified in the media content are addressing the traditions of early marriage, increasing access to education, and providing trainings to eliminate gender-based violence. At this point, examining the “Girls on the Field” platform according to the concept of international sports goals, one can say that it is an effective structure for the empowerment of girls through football and the removal of barriers to prevent discrimination.

In a study of 18 young women's personal experiences in participating in sports and physical activities in Pakistan, Laar et al., (2022) determined that development plans can be designed based on the experiences of young women and girls in identifying resistance factors that prevent sports participation in domestic and foreign policy areas. It was also emphasized that policies should consider the attitudes of families and others in communities toward women who play sports and participate in physical activities, especially in public places. Based on these experiences, one can argue that strategies and structures should be formulated to ensure equal rights for young women to play sports in public spaces where men are present. At this point, within the scope of sustainability for development, the achievability of the objectives is seen as an important criterion. The “Girls on the Field” project consultant also noted that individual empowerment is also important in this sense.

Project consultant Ferda stated, *..when we look at accessibility to sports in general, not in terms of the branch, it is against women and girls...I think that individual empowerment is very important, but unless we choose collective empowerment, the sustainability is not enough in terms of women's football and at the same time the reality of strengthening the field in women's football...*

In addition, the “Girls on the Field” project has shown that sustainability goes through goals. We can see this in the other sub-theme, “goals.” Participants defined the sustainability of this project as gender equality awareness, healthy living awareness, understanding of quality and qualified education, preparation of targeted programs, consideration of diversity in communities, cooperation with different institutions, awareness regarding effective resource management, awareness regarding raising activities, vision for sustainable impact, support and

cooperation, continuity, diversity, inclusiveness, and data-driven development. The most fundamental of these goals is gender equality, one of the SDGs.

Founding member Betül stated, *our team, works directly with goal number 5 since the purpose of "Girls on the Field" is to ensure gender equality. In doing so, we also serve other goals with the tools we use and the way we work.*

Trainer Pınar stated,... *Now these trainings we received were primarily aimed at raising awareness. So, thanks to the trainings, I learned many things I did not know. There are also many events. We often receive invitations. In terms of sustainability, events are actually being organized in such a way that they "will continue"...*

One can observe that the Western countries of the sports world have initiated studies to raise awareness to increase the participation of girls and women in physical activity (Brady & Khan, 2002). Foremost among these are studies on the health benefits of sports. Sport has also, under certain conditions, provided opportunities for girls and women to increase their self-confidence and develop their identities (Brady, 2005). In the UK, the Premier Skills program, organized by the British Council since 2007, has partnered with the Premier League and works with coaches and trainers from many countries worldwide to help girls and vulnerable young people build better lives through the power of football. They also serve as positive role models for young people and future educators (Morgan, 2010).

The Premier Skills project has trained more than 32,000 coaches, referees, and trainers in 29 countries. The research on 14 young female football players in Zambia, Jeanes, and Magee (2013) found that non-governmental organizations are a useful tool to support the broader development goals of gender equality and women's empowerment in football-related sustainability efforts. It was emphasized that apart from the sports institutions of the countries of Norway and the UK, global companies such as Nike had the opportunity to provide financing and that the goals were achieved together with NGO employees. In addition, in his study with a focus group interview with 17 sports leaders and coaches and 24 young athletes, Larsson (2021) emphasized that the Swedish Sports Confederation (SSC) gives girls and boys equal opportunities and conditions to play and lead sports, giving them a voice and ample opportunities to influence the activities they are part of.

In Kenya, the Addressing Violence Against Women and Girls Through Football program used football to address some of the behaviors and attitudes that lead to violence against women and girls. In this framework, studies were conducted through trainers to provide knowledge, attitudes, life skills, behaviors, teamwork, fair play, and self-confidence trainings relating to football and education on gender equality and behaviors to participants aged 10-20 (Newbatt & Punton, 2018). In Egypt, the Premier Skills "1,000 Girls 1,000 Dreams" project, in partnership with the Egyptian Ministry of Youth and Sports, used football as a tool to provide opportunities for girls and coaches to develop their skills and better integrate into society (Premier Skills Egypt, 2018)

Another issue mentioned by the interviewees was sustainability and development. Furthermore, it is important to strengthen the motto of "Girls on the Field" day by day, increase the number of projects, and the number of women participants. One can observe that the platform is more and more involved in social media and that the training content it provides is

updated. Moreover, they value digital entrepreneurship opportunities. They also work to create career development opportunities for girls and women.

Founding member Betül stated, *...We will keep working until equality is achieved in every opportunity to improve and develop every situation until every woman is free in this country, this is our point of view...*

Founding member Betül stated, *...People say that men's football is no longer enjoyable, that matches are played with very well-known set-ups. But when we look at revenues, sponsorships, and broadcasting, there is still a long way to go in Europe too. If we ask ourselves, "Where is Türkiye in this?" I do not want to say at point zero, but women's football in Türkiye is still in its infancy...*

With the popularization of the use of today's media tools, the success of female athletes who can be successful in international sports is encouraged and made visible on social media. For example, female athletes such as Yasemin Adar - wrestling, İrem Yaman - taekwondo, İlke Özyüksel - pentathlon, and Eda Erdem - volleyball, who have received or are likely to receive a quota at the Tokyo Olympics on behalf of Türkiye, inspire women by sharing their sports achievements and sporting careers on their social media accounts. For sportswomen who are underrepresented in the mainstream media, social media has become a means of creating their own brands, finding sponsor support, communicating with their supporters, and becoming visible (Koca, 2020). The social media initiative, which offers new distribution platforms for sports that receive little media attention, offers people new hope by reducing sexism (Coche, 2014). With the use of the Internet and social media bringing a new kind of interactivity, new platforms allow direct access to women's sports and participation in sports (Hutchins, 2011). However, the popularity and influence of sports in Western society are growing, and the most visible of sports remains professional men's sports, which dominate the media. This indicates a tendency to reinforce gender inequality (Knoppers & Anthonissen, 2005).

CONCLUSION

Physical activity and sports are important for lifelong health, but in many societies, women's role is limited to the home and the household, which can hinder their access to sports. Therefore, girls and women are not able to appreciate the health and other positive effects of participating in sports (Eime et al., 2010). As football is a male-dominated sport that excludes girls and women, civil society organizations (e.g., KASFAD in Türkiye) and projects (FIFA, 2023) have focused on this area. These organizations and projects emphasize that football belongs to everyone. In Türkiye, it is possible to talk about a platform similar to these organizations, which is unique within the country, "Girls on the Field." The platform is the only one in Türkiye that aims to eliminate gender inequality, access barriers, and cultural norms in sports through football. They work to eliminate gender norms in sports that almost every woman and girl in Türkiye has internalized (Kızlar Sahada, 2022).

Pfister (2015) stated that research-based knowledge, implementation projects, and an exchange of experiences are crucial to facilitate the advancement of women and girls in various football-related roles and positions. Thus, the "Girls on the Field" platform was chosen as an example because of its efforts to empower girls and women through football and because it is a pioneer

in Türkiye in the field of research, project design, and implementation. In addition, the fact that the platform prioritizes sustainability with its founding objectives and adopts sports empowerment activities through football was reflected in our research as another selection criterion. In conclusion, the “Girls on the Field” platform is seen as a model organization for the establishment of similar platforms to achieve SDGs in Türkiye and worldwide.

This study was a case study, one of the qualitative research designs. Future studies can utilize different qualitative research designs and the data to be obtained through using different data collection techniques to enrich the previous findings. Similarly, it is advisable to conduct mixed-method research by supporting the related topic with quantitative research. The fact that this research only examines the “Girls on the Field” platform reveals the limitations of the research. Research examining similar platforms or organizations would provide a better understanding of the context. In addition, comparative cross-cultural studies, including different country contexts, can contribute to a better understanding of inequalities and sustainable efforts in girls’ and women’s sports.

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Ethical Approval

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The Investigation of Aggression Levels of The Combat Sport Athletes*

Ümid KARLI¹, Nuh Osman YILDIZ¹, Ünal KARLI¹, Hanifi ÜZÜM^{1†}

¹Bolu Abant İzzet Baysal University, Faculty of Sport Sciences, Bolu.

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Abstract

The purpose of this study was to evaluate the aggressiveness level of male and female combat sport athletes and the sedentary individuals. This study was designed on cross-sectional research method, which is one of the general survey models. Buss Perry Aggression Questionnaire was used as data collection tool. Convenient sampling method was conducted, and the sample group of the study was composed of 104 combat sport athletes and 97 sedentary participants. Independent samples t-test and Pearson Correlation Coefficient test was conducted for statistical analysis. According to the independent samples t-test the physical aggression level of combat sport athletes was significantly higher than the sedentary individuals ($p<0.05$). Additionally, physical aggression level of female athletes was significantly higher than their sedentary counterparts ($p<0.05$). In the comparison of the gender difference, the results revealed that sedentary males' physical aggression level was significantly higher than sedentary females ($p<0.05$). No significant relationship was found between subjects' aggression level and their age and sports age. The female combat athletes' higher physical aggression level, when compared to their sedentary counterparts, was the most interesting finding of this study. On the other hand, no significant difference was found between male athletes and their sedentary counterparts, and between male and female combat sport athletes according to their aggression levels. To sum up briefly, it is possible to say that females, who participate in combat sports and consequently who believe that they have gained enough physical power, may show higher physical aggression tendency.

Keywords: Combat athletes, Physical aggression, Hostility, Verbal aggression, Anger

Mücadele Sporü Sporcularının Saldırđanlık Düzeylerinin İncelenmesi

Öz

Bu çalışmanın amacı, erkek ve kadın mücadele sporü sporcuları ile sedanter bireylerin saldırganlık düzeylerini deęerlendirmektir. Bu çalışma genel tarama modellerinden biri olan kesit alma yöntemine göre tasarlanmıştır. Veri toplama aracı olarak Buss Perry Saldırđanlık Ölçeęi kullanılmıştır. Arařtırmada kolayda örnekleme yöntemi kullanılmış olup, örnekleme grubunu 104 dövüş sporü sporcusu ve 97 sedanter katılımcı oluşturmuştur. İstatistiksel analiz için bağımsız örneklemlerde t testi ve Pearson Korelasyon Katsayısı testi yapılmıştır. Bağımsız örneklemlerde t testine göre mücadele sporü yapan sporcuların fiziksel saldırganlık düzeyi sedanter bireylerden anlamlı ($p<0.05$) olarak daha yüksek bulunmuştur. Ayrıca kadın sporcuların fiziksel saldırganlık seviyesi sedanter olan kendi hemcinslerinden anlamlı ($p<0.05$) olarak daha yüksek tespit edilmiştir. Cinsiyetler arası farka bakıldığında sedanter olan erkeklerin fiziksel saldırganlık düzeyinin sedanter olan kadınlardan anlamlı ($p<0.05$) bir biçimde daha yüksek olduęu saptanmıştır. Mücadele sporları ile ilgilenen bireylerin yaşları veya spor yılları ile saldırganlık arasında bir ilişki belirlenmemiştir. Bu çalışmanın en önemli sonucu kadın mücadele sporcularının fiziksel saldırganlık düzeylerinin sedanter olan hemcinslerinden daha yüksek olmasıdır. Dięer taraftan saldırganlık seviyesi bakımından sporcü olan ve olmayan erkekler arasında ve kadın ve erkek mücadele sporcuları arasında fark bulunmamıştır. Sonuçlar kısaca özetlenirse mücadele sporlarına katılan ve dolayısıyla fiziksel olarak yeterli güç kazandıęını düşünen kadınların fiziksel saldırganlık eğilimlerinin artabileceęi söylenebilir.

Anahtar kelimeler: Mücadele sporcuları, Fiziksel saldırganlık, Düşmanlık, Sözel saldırganlık, Öfke

* This study was presented as an oral presentation at the World Congress of Sports Sciences Researches held in Turkey/Manisa between 23-26 November 2017.

† **Corresponding Author:** Assoc. Prof. Dr. Hanifi ÜZÜM, **E-mail:** uzum_h@ibu.edu.tr

INTRODUCTION

Aggression which was defined as one's physical or mental behaviours towards any other individual with the intent of endamaging (Krishnaveni and Shahin, 2014), appears as a conception that individuals might be faced with almost at any moment in daily life as the enforcer or the exposed. Aggression is involved in daily life, at home, at workplace, in traffic and even at shopping malls, amusement centres, sports areas where people go with recreative purposes to feel happy and comfortable. It is observed that the aggressive behaviours at sports areas where trail large masses are especially increasing. As a matter of fact, this unfavourable situation has been perceived as a social problem in countries such as Canada, England, Australia; and commissions have been established to investigate and prevent the aggression and violence in sports. Furthermore, countries such as USA, England, Canada, Australia, Germany, and Türkiye resort to judge and punish those acts aggressively in sports by way of courts (Tenenbaum et al., 1997). When the current literature is examined, it is seen that the concepts of aggression and sports are the subject of a lot of research. Some researchers have investigated the reasons of aggression in sports, and they have stated the factors which influence the aggression as mass media, fans, managers, trainers, family structure (Burton, 2005; Wann, 2005; Yücel et al., 2005), fanaticism, individual and collective immaturity (Lansford, 2018; Taştan, 2019; Taştan, 2022).

The notion of aggression in sports was subjected to studies like aggression levels of individuals who do and who do not participate in sports (Dervent et al., 2010), the elements that trigger athletes' aggressive behaviours (Donahue et al., 2009), the impacts of aggression tendency regarding the athletes' performances (Krishnaveni and Shahin, 2014), aggression levels of athletes who are handicapped and who are not (Açak and Kaya, 2015), aggression levels of athletes who participate in team or individual sports (Tutkun et al., 2010).

Sports by nature is based on inter-individual struggle within specific rules as both in team and individual sports. Athletes display high performances to gain victory. When sports branches such as Judo, Karate, Taekwondo, Kickboxing and Muay Thai are examined, where the level of physical contact is very high, aggressive behaviours that constitute a crime when done outside sports areas are legal and allowed within the scope of these combat sports. The basis of all these sport branches lies a set of actions which contain high aggressiveness and physical violence to get points from the opponent but not towards causing direct injuries. Therefore, the possibility of injury and harsh response for combat sport athletes are accepted to be inevitable (Krishnaveni and Shahin, 2014). Concordantly, it is important how much the sets of aggression containing behaviours that fall into the rules in combat sports affect the daily life and actions of the athletes who participate in those regarded sports branches. In the studies about combat sports and aggression that take part in literature (Ahmadi et al., 2011; Graczyk et al., 2010; Keeler, 2007), researchers mostly investigated the impacts of different types of sports on aggression level. A few numbers of studies which compare the combat sport athletes and sedentary individuals (Boostani and Boostani, 2012; Kuśnierz and Bartik, 2014) were encountered. In one of those studies, Kuśnierz and Bartik (2014) measured the aggression levels of jiu-jitsu, box and karate athletes and individuals who do not participate in sports; and presented their average aggression scores. In another study conducted by Boostani and Boostani (2012) aggression levels of kickbox, karate and swimming athletes and sedentary individuals were checked against; and kickboxers were found to be more assailant. However,

there was not any study encountered where the aggression levels of genders within combat sport athletes were evaluated and compared. In this study the aggression levels of male and female combat sport athletes (CSA) and sedentary individuals (SI) were examined by being contrasted in the context of physical aggression, hostility, verbal aggression, and anger sub dimensions.

METHODS

Research Model

The study design was based on the cross-sectional approach and the relational screening model of the general survey models.

Sample

The study group of this research was determined according to the accessible sampling technique, which is one of the non-random sampling methods. The sample group of the study was consisted of 104 combat sport athletes (Muay Thai, Boxing, Kickboxing, Taekwondo, Wushu, Karate, Wrestling) and 97 sedentary totally 201 participants. The mean of participants' age was 21.86 ± 2.57 years.

Ethical Approval

All stages of this study were approved by the Ethics Committee of Human Research in Social Sciences. Ethical approval was received for this study from Bolu Abant İzzet Baysal University Human Research Ethics Committee on 10.05.2017 with protocol number 2017/165.

Instruments

As data collecting tool, Personal Information Form which was created by the researcher and "Buss Perry Aggression Questionnaire" (BPAQ) which was developed by Buss and Perry (1992) and adapted to Turkish by Madran Demirtaş (2012) were employed. The questionnaire was consisted of 4 sub-factors and 29 items graded by 5-point Likert scale (Very often: 5, Often: 4, Sometimes: 3, Almost never: 2 and Never: 1). The sub-factors were aligned as Physical Aggression (Item 2, 5, 8, 11, 13, 16, 22, 25 and 29), Hostility (Item 3, 7, 10, 15, 17, 20, 24 and 26), Anger (Item 1, 9, 12, 18, 19, 23 and 28) and Verbal Aggression (Item 4, 6, 14, 21 and 27). Items 9 and 16 were processed by reverse coding as they had negative values. The Cronbach Alpha internal consistency coefficient of the total scale was found as "0.84" within the scope of this study.

Data Collection Procedures

The study data were gathered by using face to face interview technique with questionnaire method. Before the data collection process was started, each participant was informed about the study and signed consent was obtained.

Statistical Analysis

At first the mean and the standard deviation of demographic characteristics and other measured data were calculated for statistical analysis. As a result of Shapiro Wilks test, it was noted that the collected data about the groups show normal distribution, and it was decided to apply the parametric hypothesis tests. Accordingly, Independent Sample t-test to compare the groups and

Pearson Correlation Coefficient test to determine the correlation between ungrouped data were performed. Significance level was accepted as $p \leq 0.05$ and statistical package for the social sciences (SPSS version 20.0) was used for the analysis of the data.

FINDINGS

Table 1. Results of the independent t test executed for the comparison of physical aggression scores

Group	n	Mean	Std. D.	df	t	p
CA	104	25.33	5.21	199	3.999	0.001*
SD	97	22.38	5.23			
CA Female	40	24.35	6.07	95	3.066	0.003*
SD Female	57	21.05	4.52			
CA Male	64	25.94	4.53	102	1.656	0.101
SD Male	40	24.28	5.63			
SD Male	40	24.28	5.63	95	3.121	0.002*
SD Female	57	21.05	4.52			
CA Male	64	25.94	4.53	102	1.522	0.131
CA Female	40	24.35	6.07			

* $p < 0.05$, CS: Combat Athlete, SD: Sedentary

As shown in Table 1, significant difference was noted between the physical aggression scores of Combat Sport Athletes and Sedentary Individuals ($t=3.99$; $p=0.001$). After reviewing the means, it is seen that the mean score of combat sport athletes (25.33 ± 5.21) was higher than the sedentary individuals (22.38 ± 5.23). A significant difference was found between the physical aggression levels of female combat sport athletes and female sedentary individuals ($t=3.066$; $p=0.003$). After analysing the difference to see from which group the difference is originated, it was observed that the mean score of female combat sport athletes (24.35 ± 6.07) was higher than the female sedentary individuals (21.05 ± 4.52). It was determined that there is a significant difference between sedentary males and females on Physical Aggression sub-factor ($t=3.121$; $p=0.002$). Investigations on the difference show that the sedentary males' mean score (24.28 ± 5.63) was higher than the females (21.05 ± 4.52). This situation is clearly seen in the graph in Figure 1. On the other hand, no significant difference was found between the male combat sport athletes and female combat sport athletes ($t=1.522$; $p=0.131$) and between the male combat sport athletes and male sedentary individuals ($t=1.656$; $p=0.101$) with respect to physical aggression levels.

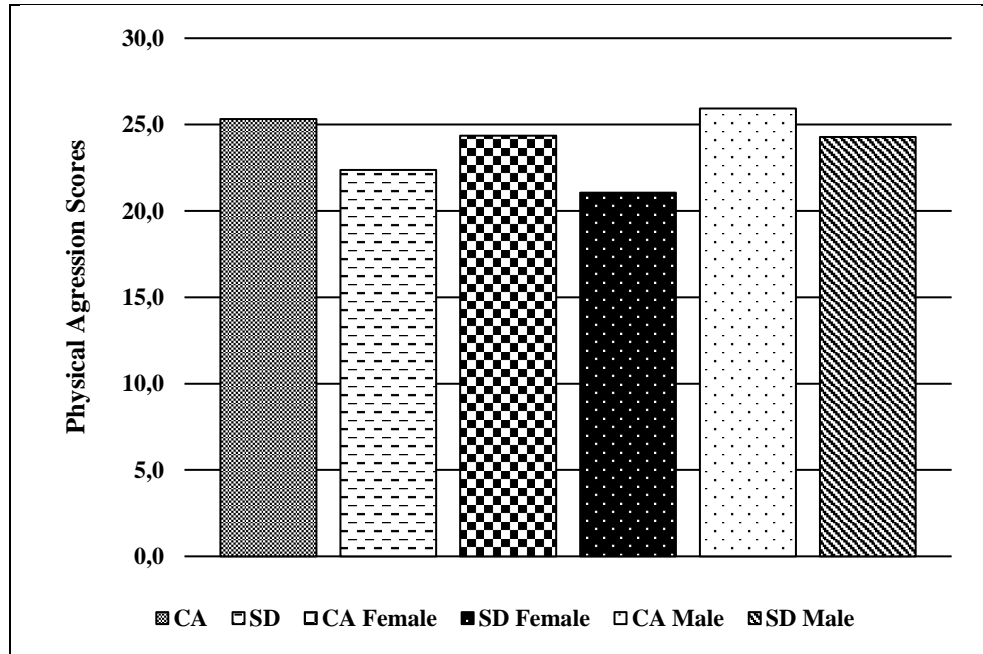
Table 2. Results of the independent t test executed for the comparison of verbal aggression scores

Group	n	Mean	Std. D.	df	t	p
CA	104	15.35	2.63	199	0.889	0.375
SD	97	14.98	3.20			
CA Female	40	15.00	2.79	95	0.000	1.000
SD Female	57	15.00	2.90			
CA Male	64	15.56	2.53	102	1.014	0.313
SD Male	40	14.95	3.63			
SD Male	40	14.95	3.63	95	-0.075	0.940
SD Female	57	15.00	2.90			
CA Male	64	15.56	2.53	102	1.061	0.291
CA Female	40	15.00	2.79			

CS: Combat Athlete, SD: Sedentary

As seen in Table 2, there was no significant difference between the verbal aggression scores of Combat Sports Athletes and Sedentary Individuals ($t=0.89$; $p=0.375$). There was no significant

difference between the verbal aggression levels of female combat athletes and sedentary female individuals ($t=0.000$; $p=1.000$). No significant difference was found between sedentary men and women in the verbal aggression sub-factor ($t=1.014$; $p=0.313$). On the other hand, no significant difference was found between male combat sports athletes and female combat sports athletes ($t=1.061$; $p=0.940$) and between male sedentaries and female sedentaries ($t=-0.075$; $p=0.940$) in terms of verbal aggression.



CA: Combat Athletes / SD: Sedentary

Figure 1. Physical aggression scores of participants

Table 3. Results of the independent t test executed for the comparison of hostility scores

Group	n	Mean	Std. D.	df	t	p
CA	104	23.34	4.97	199	-0.982	0.327
SD	97	24.08	5.80			
CA Female	40	23.33	4.91	95	-1.035	0.303
SD Female	57	24.60	6.59			
CA Male	64	23.34	5.04	102	-0.006	0.995
SD Male	40	23.35	4.41			
SD Male	40	23.35	4.41	95	-1.043	0.300
SD Female	57	24.60	6.59			
CA Male	64	23.34	5.04	102	0.019	0.985
CA Female	40	23.33	4.91			

As seen in Table 3, there was no significant difference between the Hostility scores of Combat Sports Athletes and Sedentary Individuals ($t=0.982$; $p=0.327$). There was no significant difference between the Hostility levels of female combat athletes and sedentary female individuals ($t=-1.035$; $p=0.303$). No significant difference was found between sedentary men and women in the Hostility sub-factor ($t=-0.006$; $p=0.995$). On the other hand, no significant difference was found between male combat sports athletes and female combat sports athletes ($t=0.019$; $p=0.985$) and between male sedentaries and female sedentaries ($t=-1.043$; $p=0.300$) in terms of Hostility.

Table 4. Results of the independent t test executed for the comparison of anger scores

Group	n	Mean	Std. D.	df	t	p
CA	104	21.06	4.07	199	-0.168	0.867
SD	97	21.15	4.09			
CA Female	40	20.68	4.35	95	-0.772	0.442
SD Female	57	21.39	4.54			
CA Male	64	21.30	3.91	102	0.631	0.530
SD Male	40	20.83	3.37			
SD Male	40	20.83	3.37	95	-0.663	0.509
SD Female	57	21.39	4.54			
CA Male	64	21.30	3.91	102	0.756	0.451
CA Female	40	20.68	4.35			

CS: Combat Athlete, SD: Sedentary

As seen in Table 4, there was no significant difference between the anger scores of Combat Sports Athletes and Sedentary Individuals ($t=-0.168$; $p=0.867$). There was no significant difference between the anger levels of female combat athletes and sedentary female individuals ($t=-0.772$; $p=0.442$). No significant difference was found between sedentary men and women in the anger sub-factor ($t=-0.631$; $p=0.530$). On the other hand, no significant difference was found between male combat sports athletes and female combat sports athletes ($t=0.756$; $p=0.451$) and between male sedentaries and female sedentaries ($t=-0.663$; $p=0.509$) in terms of anger.

Table 5. Results of the independent t test executed for the comparison of total aggression scores

Group	n	mean	Std	df	t	p
CA	104	85.07	13.04	199	1.306	0.193
SD	97	82.60	13.77			
CA Female	40	83.35	14.73	95	0.446	0.657
SD Female	57	82.04	13.99			
CA Male	64	86.14	11.87	102	1.083	0.281
SD Male	40	83.40	13.59			
SD Male	40	83.40	13.59	95	0.479	0.633
SD Female	57	82.04	13.99			
CA Male	64	86.14	11.87	102	1.062	0.291
CA Female	40	83.35	14.73			

CS: Combat Athlete, SD: Sedentary

As seen in Table 5, there was no significant difference between the total aggression scores of Combat Sports Athletes and Sedentary Individuals ($t=-1.306$; $p=0.193$). There was no significant difference between the total aggression levels of female combat athletes and sedentary female individuals ($t=-0.446$; $p=0.657$). No significant difference was found between sedentary men and women in the total aggression ($t=1.083$; $p=0.281$). On the other hand, no significant difference was found between male combat sports athletes and female combat sports athletes ($t=1.062$; $p=0.291$) and between male sedentaries and female sedentaries ($t=0.479$; $p=0.633$) in terms of total aggression.

In point of total aggression scores which contain all the sub-factors of the scale, no significant difference ($p>0.05$) was detected between Combat Sport Athletes and Sedentary Individuals and between genders (Table 5). No significant correlation was confirmed between combat sport athletes age or sports years and aggression sub-factors according to the Pearson correlation coefficient analysis.

DISCUSSION AND CONCLUSIONS

In compliance with the findings obtained from this study where the behaviours of combat sport athletes and sedentary individuals investigated, it was concluded that the physical aggression levels of combat sport athletes are significantly higher ($p < 0.05$) than sedentary individuals. This acquired result coincides with the similar studies in the literature (Gedik, 2023; Gorsy & Muskan, 2023; İmamoğlu et al., 2020; Koç, 2022; Öztürk, 2019). When the results of the studies conducted by Derwent et al. (2010), Erşan et al., (2009) are examined, it was also ascertained that the physical aggression levels of individuals who participate in sports are higher in comparison to the ones who do not participate in any kind of sports. In one of their studies, Kuśnierz and Bartik (2014) examined the aggression levels of jiu-jitsu, boxing, karate athletes and sedentary individuals, and found out that their physical aggression levels line up from high to low in the order of jiu-jitsu athletes, sedentary individuals, boxing, and karate athletes. Boostani and Boostani (2012); in a study which was exercised on athletes of kickboxing, karate, swimming, and sedentary participants, they determined that physical aggression levels of kickboxing athletes are significantly higher than athletes of karate, swimming, and sedentary participants. Along with these studies, Krishnaveni and Shahin (2014) and Lotfian et al., (2011) stated as well that contact athletes who participate in combat sports which require close contact have a higher tendency of aggression and combat sport athletes implement some of the physically aggressive behaviours which they normally perform in sports activities- outside of the sports environments too, therefore their aggression levels are high. This diversity might be originated from the combat sport athletes' ability to easily apply the techniques that are aimed at defence and offence included in their respective sports branches and require physical strength. Because, for the reason of having high self-confidence, the athletes who possess this ability might not refrain from acting aggressively to overcome several physical challenges that they might encounter in social life.

In the sense of gender, when female combat sport athletes and sedentary females were compared in their own rights, it was designated that physical aggression level of female combat sport athletes are significantly higher ($p < 0.05$) than their sedentary congenics' (Table 1). When the similar studies on the subject investigated (Akdağcık, et al., 2022; Gorsy & Muskan, 2023), it can be seen that Lenzi et al., (1997) reported that women who participate in sports are more aggressive than women who do not; and Özdemir and Akabay (2017) determined that female football players scored higher than female volleyball players on destructive aggression sub-dimension and emphasized that the reason to this outcome is the volleyball players' lack of direct contact with opponent, in other words, place switching of intended direct aggression with indirect aggression at some point. In another research, Çelik et al., (2017) emphasize that female students had higher scores on destructive aggression sub-factor of sportive high school players' aggressive behaviours. Santos et al., (2022) compared the aggression levels of female participants before and after e-sports. As a result of the study, it was determined that aggressive attitudes increased. Öcal (2007) found a significant difference between general aggression level of female volleyball players and female wrestlers in favour of wrestlers. When these results evaluated together, it can be said that every kind of sports are more or less being exercised by using physical strength, and physical aggression tendency of females who especially participate in combat sports and thereby think that they are making more of a physical effort higher than

females of sports branches which do not embody physical contact and also higher than sedentary females.

Comparison of the sedentary participants with respect to gender point out that physical aggression scores of sedentary males are significantly ($p < 0.05$) higher than sedentary females (Table 1). In the studies conducted by Björkqvist (2017), Alp et al., (2014) and Bettencourt and Miller (1996), it was established that the aggression level of males were significantly higher than females. Acet et al., (2016) compared Taekwondo referees from the point of gender in their research and they come to a conclusion that destructive sub-dimension ratio of males' aggression inventory is higher than females. Scharf (2000) mentions that physical aggression is being used by males rather more. When all these results considered, it can be declared that sedentary males expose more aggressive behaviours than sedentary females due to being physically big and strong.

In summary, it was noted that there are significant differences between combat sport athletes and sedentary individuals, female combat sport athletes and sedentary females and, sedentary males and females in terms of physical aggression factor. In spite of that, regarding the physical aggression, no significant difference was found between male combat sport athletes and sedentary males, male combat sport athletes and female combat sport athletes. It is possible to interpret this situation as combat sports may increase the physical aggression levels of female participants. In other words, it is known that men are physically stronger than women and males are more self-confident and bolder compared to females in case of situations which require physical strength, on the contrary females behave more timidly in situations that involves the need for physical strength. However, the fact that higher physical aggression level of female combat sport athletes (24.35 ± 6.07) compared to their sedentary congenics' (21.05 ± 4.52), that there was not any difference between male combat sport athletes (25.94 ± 4.53) and female combat sport athletes (24.35 ± 6.07), and between male combat sport athletes (25.94 ± 4.53) and sedentary males (24.28 ± 5.63) make us think that the differences in Table 1 derive from female combat sport athletes. For that matter, when the existing means considered, it is possible as well to say that reasons of the significant difference between combat sport athletes and sedentary individuals are that the physical aggression scores of female combat sport athletes were higher and sedentary females' scores were lower. This circumstance can be commented as males balance their substantial physical aggression levels through combat sports regardless of being sedentary or combat sport athlete, in other words combat sports do not affect physical aggressiveness of males; as for female combat sport athletes, in contrast with males and sedentary females they become more physically aggressive by gaining self confidence in terms of physical strength with the influence of combat sports. In the research conducted by Lenzi et al., (1997) and Rahimizadeh et al. (2011), it was found that women who participates in sports are more aggressive in comparison to women who do not participate in sports and there is not any significant difference between men who participate in sports and who do not with respect to direct aggression. It was sighted that the findings in this study overlap with the regarded literature.

In the present study, no correlation was found between the aggression level and the age and the sports years of individuals who practices combat sports. Investigations of the literature show that there was not any significant relationship between the age and sports year of athletes and

their aggression scores (Derwent et al., 2010; Donahue et al., 2009; Keeler, 2007; Kuśnierz and Bartik, 2014; Güvendi & Keskin, 2020; Akdağcık, 2022; Gedik, 2023). Also, analysis was conducted between the gender variable and hostility, verbal aggression, and anger sub-factors of aggression by trying all the combinations as combat sport athletes and sedentary individuals, sedentary females and males, female and male combat sport athletes, female combat sport athletes and sedentary females and male combat sport athletes and sedentary males; and no significant difference was encountered.

The result of not finding any difference regarding the anger levels of individuals with respect to gender variable in a study conducted about individuals who participates in sports and who do not by Üzüm et al., (2016) to coincide with the result of this study. Additionally, in research of Karagün and Çağlayan (2014), no difference was established regarding gender variable from point of view of hostility and anger. The results of this study and the other studies in literature happen to be supporting each other. It is thought that the reason of not finding any difference on sub-factors of the scale –which were mentioned above- besides the physical aggression sub-factor is based on the fact that the participants feel physically more competent and do not experience any difficulties when it comes to execution on account of the mentioned combat sports to be sport branches that require physical contact.

In conclusion, relying on the study results, it can be said that the physical aggression levels of individuals who participate in combat sports are higher compared to individuals who do not participate in combat sports, sedentary males are more aggressive than sedentary females with respect to gender variable, female combat sport athletes lean towards the physical aggression more than their sedentary congenics and combat sports have an additive effect on physically aggressive behaviours of females.

Conflicts of Interest: The authors declare that they have no conflict of interest in relation to this manuscript.

Declaration of Researchers' Contribution Rate: Author/s' contribution to the research should be explained in this section. Research Design - ÜK(1) and NOY, Data Collection - NOY and HÜ, statistical analysis - ÜK(1), NOY and ÜK(2) Preparation of the article, ÜK, NOY, HÜ, ÜK.

Ethical Approval

Ethics Committee Name: Bolu Abant İzzet Baysal University Ethics Committee for Human Research in Social Sciences

Date: 10.05.2017

Protocol number: 2017/165

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