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# The Effect of the Life Satisfaction of Individuals Over 65 Years on Their Happiness

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**Abstract**

In our study, it was aimed to examine the effect of life satisfaction of individuals over 65 years of age on the happiness according to some demographic variables. 410 women and 399 men over 65 years of age participated in the study. The measurement tool to be used in the study was delivered to the participants via ' Google Form' and it was paid attention that they participated voluntarily. It was administered to 834 people in total and 809 scales were deemed suitable for analysis. The life satisfaction scale, which was developed by Diener et al. (15) and adapted into Turkish by Dagli and Baysal (10), and the happiness scale which was adapted by Demirci, İ.and Ekşi, H. (12), were used as data collection tools in the study. Descriptive statistics, reliability analysis, independent sample t test for binary variables, ANOVA test and Benferonni analysis for more than two variables were applied in the analysis of the data. As a result, according to the statistical results of the participants, it is seen that their happiness levels ($\bar{x}$=19.90) and life satisfaction levels are high ($\bar{x}$=15.72). It was determined that there was a high level of positive correlation between the life satisfaction of the participants and their happiness levels (r=0.723). As a result of the ANOVA analysis performed between life satisfaction and happiness levels and the variables of doing sports and sedentary life, it is seen that there are statistically significant differences (p<0.05).

**Keywords:** Over 65 Geriatrics, Sports, Life satisfaction, Happiness

**Özet**

**65 Yaş Üstü Bireylerin Yaşam Doyumlarının Mutluluk Üzerine Etkisi**

Araştırmamızda 65 yaş üstü bireylerin yaşam doyumlarının mutluluk üzerine etkisinin bazı demografik değişkenlere göre incelenmesi amaçlanmıştır. Çalışmaya 65 yaş üzeri 410 kadın, 399 erkek katılmıştır. Çalışmada kullanılacak ölçme aracı katılımcılara 'Google Form' aracılığı ile ulaştırılmış, gönüllü olarak katılmalarına özen gösterilmiştir. Toplamda 834 kişiye uygulanmış ve analiz için 809 ölçek değerlendirilmeye uygun görülmüştür. Araştırmada veri toplama aracı olarak Diener, Emmons, Larsen ve Griffin (15) tarafından geliştirilmiş olan, Dağlı ve Baysal (10) tarafından Türkçeye uyarlanmış olan yaşam doyumu ölçeği ile Demirci, İ. ve Ekşi, H. (12) tarafından uyarlaması yapılan mutluluk ölçeği çalışmamızda kullanılmıştır. Verilerin analizinde ise tanımlayıcı istatistik, güvenirlik analizi ve ikili değişkenlerde Bağımsız örneklem t testi, ikiden fazla değişkenlerde Anova testi ve

Benferonni analizi uygulanmıştır. Sonuç olarak; katılımcıların istatistik sonuçlarına göre mutluluk düzeylerinin ($\bar{x}$=19.90) ve yaşam doyum düzeylerinin yüksek olduğu görülmektedir ($\bar{x}$=15.72). Katılımcıların yaşam doyumları ile mutluluk düzeyleri arasında yüksek seviyede pozitif yönde ilişki olduğu tespit edilmiştir (r=0.723). Yaşam doyumları ve mutluluk düzeyleri ile spor yapma ve sedanter yaşama değişkeni arasında yapılan Anova analizi sonucunda ise istatistiksel olarak anlamlı farklılıklar olduğu görülmektedir (p<0.05).

**Anahtar Kelimeler:** Geriatri, Spor, Yaşam Doyumu, Mutluluk

## INTRODUCTION

Aging is the occurrence of irreversible functional changes in the organism as one gets older. With these changes, physical features and cognitive features regress, and the ability of the person to establish a balance between systems decreases (28,31). There are many definitions of aging in the literature. According to one definition, aging is defined as "being old and revealing of the effects of aging" (3). Aging is a process and how the elderly person maintains this process also depends on their living habits.

Today, 10 percent of the total human population in the world consists of people aged 65 and over, and it is estimated that this rate will be over 16 percent in 2050. By 2050, it is predicted that there will be around 16 million elderly people aged 65 and over in Turkey (25). This foresight, which will not be underestimated, reminds us of the value of healthy living and aging.

The expectations of aging individuals in order to live a quality life are to be able to perform daily life activities such as walking, climbing stairs, getting up from where they are without help. However, with aging, changes in the cardiovascular system, musculoskeletal system and neuromuscular systems make these functions difficult. This may lead to a decrease in the activities of daily living of the elderly or a completely sedentary lifestyle. As a result, individuals face the loss of their independence (9,26). However, individuals over 65 want to continue their remaining lives happily, because the ultimate goal of every person is life satisfaction and the desire to reach happiness.

The issue of what good living conditions is and how to achieve them is a situation that has been considered and studied for many years. Within the framework of this process, the first thing we encounter is the interpretations that good life is related to virtue, how the individual determines his/her life standards, the capacity to fulfill his/her roles and responsibilities correctly, or the component of emotions such as happiness that s/he expresses in his/her life (18).

The concept of life satisfaction is "the situation or result obtained by comparing the things one wants and has". In addition, life satisfaction refers not only to the satisfaction associated with a particular situation, but also to the state of being well in various aspects such as satisfaction, morale, happiness, motivation, etc. in our life in general (1). The concept of life satisfaction in elderly individuals is associated with the combination of various factors such as personality traits, physical opportunities and methods of coping with problems (28,21). Another definition of life satisfaction can be as "a measure of the well-being of individuals' quality of life" (4,28). Therefore, life satisfaction is one of the fundamental emotions, which individuals will require especially after the age of 65. It is because it is a satisfaction process that is necessary for coping with diseases, not losing their life energy, and of course for many mood controls.

Of course, happiness is one of the most significant aspects influencing and enhancing a person's life satisfaction. Since ancient times, philosophers stated that happiness is a great motivator for leisure activities (19). It is seen that it has not lost its importance today and it continues to be emphasized. Although the concept of happiness continues to be discussed on many different platforms, it is seen that a clear consensus has not been reached and many variables affect this situation. Although the studies conducted in this field have been the subject of researches in the last 30 years, happiness is still a concept that has uncertainties and the factors affecting happiness vary (27).

Diener et al. (17) defined the happiness in their study as the pleasure obtained from life, our satisfaction from life, our positive feelings, a meaningful life style and a feeling of contentment. Happiness is widely believed to be one of the most crucial elements of leading a good life. However, the concept of happiness is

expressed as an accumulation of emotions, which by its nature does not have a single definition, its difference makes sense in line with the different needs of individuals, but is indispensable for everyone at the end of the day (17).

In view of this knowledge, it is aimed to examine the effect of life satisfaction of individuals over 65 years of age on happiness according to some variables, considering that our study can help to determine the factors affecting life satisfaction and happiness of individuals over the age of 65 in our country and to plan priorities in line with socio-demographic variables.

## METHOD

The sample of the study consists of 809 people, 410 female and 399 male, over the age of 65. It is a descriptive study conducted in the survey model. According to Karasar (23), a descriptive study "handles a past or still ongoing situation, event, phenomenon, individual and objects as they are in their own conditions."

### Data Collection

The participants were included voluntarily, and the study's scale was distributed to them via "Google Form". 834 individuals in total were contacted, and 809 scale forms were accepted for analysis.

### Data Collection Tool

Demographic Information; personal information questions such as gender, age, marital status, educational status, number of children, sports experience were asked to the individuals participating in the study. The Life Satisfaction Scale (LSS), a unique scale with a total of 5 items and a single-factor structure, was created by Diener et al.(15) and adapted to Turkish by Dagli and Baysal (10). The original formula factor one of the scale is the self-assessment performance, consisting of five items and 7-point Likert-type ratings. Each item is evaluated according to a 7-point response system (1: Strongly Agree - 7: Completely Agree). To test the consistency between the scores obtained from both scales, the Pearson Product Multiplication Correlation Coefficient was calculated and found to be 0.92. "Happiness Scale" adapted by Demirci, Ekşi. (12) consists of one dimension and 6 items. There are no reverse items in the scale. 5-point Likert-type ratings. Each item is evaluated according to a 5-point response system (1: Strongly Agree - 5: Completely Agree). The Cronbach alpha internal consistency coefficient of the scale was calculated as .83.

### Statistical Analysis

The statistical package program SPSS 25.0 was used to analyze the information from the "Demographic Information Form" and the "Life Satisfaction and Happiness Scales". By examining the Skewness and Kurtosis values while analyzing the data, it was determined whether the parametric tests fulfilled the necessary requirements (6). When we look at the skewness and kurtosis values from the study, it appears that they are between (2-) and (+2), and it was decided to apply parametric tests in this direction (20). In this direction, descriptive statistics, t-test, and ANOVA tests were used as statistical methods within the evaluation of the data.

### Ethical approval and institutional permission

The ethics permission to do this research was obtained with decision number 33 at the Aydın Adnan Menderes University Ethics Committee meeting on 18.01.2023.

## FINDINGS

**Table 1.** Demographic Variables

| Variables | | f | % |
|---|---|---|---|
| **Gender** | Female | 410 | 50,7 |
| | Male | 399 | 49,3 |
| **Age** | 65-67 years | 274 | 33,9 |
| | 68-70 years | 221 | 27,3 |
| | 71-73 years | 118 | 14,6 |
| | 74 years and older | 196 | 24,2 |
| **Marital Status** | Married | 518 | 64,0 |
| | Single-Divorced-Widowed | 291 | 36,0 |
| **Education status** | Primary | 431 | 53,3 |
| | Secondary | 203 | 25,1 |
| | High School | 115 | 14,2 |
| | Bachelor's and above | 60 | 7,4 |
| **Number of children** | One child | 105 | 13,0 |
| | Two children | 243 | 30,0 |
| | 3 and more | 461 | 57,0 |
| **Sports Experience** | 10 years or less | 108 | 13,3 |
| | over 10 years | 59 | 7,3 |
| | I have never played sports | 495 | 61,2 |
| | I do sports intermittently | 147 | 18,2 |
| **Total** | | 809 | 100,0 |

In Table 1, the highest variables in the descriptive statistics for the participants consist of female participants (50.7%) in the gender variable, 65-67 years of age (33.9%) in the age variable, married participants (64.0%) in the marital status variable, primary school graduates (53.3%) in the education status variable, participants with 3 or more children in the number of children (57.0%), and the participants who did not do any sports in the sports experience variable (61.2%).

**Table 2.** Reliability Analysis Results

| Scale | Cronbach Alpha Coefficient |
|---|---|
| Happiness | .898 |
| Life Satisfaction | .875 |

Results of the scales' reliability analysis are displayed in Table 2. The scales are found to be extremely reliable.

**Table 3.** Descriptive Values for Scales

| Variables | $\bar{x}$ | Ss | Kurtosis | Skewness |
|---|---|---|---|---|
| Happiness | 19.9085 | 5.27056 | -.147 | -.335 |
| Life Satisfaction | 15.7244 | 4.63888 | -.088 | -.503 |

In accordance with the scales' descriptive statistics , table 3 shows that the participants' happiness levels ($\bar{x}$=19.90) and life satisfaction levels ($\bar{x}$=15.72) are high.

**Table 4.** Pearson Correlation Analysis Results for Variables

| | 1- | 2- |
|---|---|---|
| Happiness | 1 | |

| | | |
|---|---|---|
| Life Satisfaction | .723** | 1 |
| | .000 | |

**p<0.001

Table 4 revealed a positive and high level correlation between participants' levels of happiness and life satisfaction (r=0.723).

**Table 5:** Simple Regression Analysis to Examine the Effect of Participants' Life Satisfaction on Happiness Levels

| Dependent variable | Independent variable | β | Standard Error | Beta | t | p | R2 | Durbin Watson |
|---|---|---|---|---|---|---|---|---|
| Happiness | Constant | 6.994 | .453 | - | 15.438 | .000 | .522 | 1.903 |
| | Life Satisfaction | .821 | .028 | .723 | 29.719 | .000 | | |

When the independent variable's beta coefficient value, t value, and significance level of independent variable are examined, it is evident from the regression analysis results in Table 5 that life satisfaction has a statistically significant and favorable impact on happiness (t=29.719 p<0.05). It appears that 52.2% of the variation on happiness was explained (Adjusted R^2=0.522). A 1-unit increase in the variable of life satisfaction causes a 0.821 increase (β=0.821) on happiness.

**Table 6:** Independent Sample T-Test Results of Life Satisfaction and Happiness Levels of Participants according to Gender Variable

| Dimension | Gender | n | $\overline{X}$ | SS | t | p |
|---|---|---|---|---|---|---|
| Life Satisfaction | Female | 410 | 15.3439 | 4.80742 | -2.371 | .018 |
| | Male | 399 | 16.1153 | 4.43113 | | |
| Happiness | Female | 410 | 19.8073 | 5.12384 | -.553 | .580 |
| | Male | 399 | 20.0125 | 5.42165 | | |

According to the results of the t test, Table 6 demonstrates that there is a statistically significant difference between participants' life satisfaction and the gender variable in favor of male participant (p<0.05). There was no statistically significant difference, according to the t-test results, between the participants' levels of happiness and the gender variable (p>0.05).

**Table 7:** ANOVA Analysis Results of Participants' Life Satisfaction and Happiness Levels according to Age Variable

| Dimensions | Class | N | $\overline{X}$ | SS | F | p | Bonferroni |
|---|---|---|---|---|---|---|---|
| Life Satisfaction | [1]65-67 years | 274 | 15.94 | 4.49 | .682 | .563 | - |
| | [2]68-70 years | 221 | 15.77 | 4.67 | | | |
| | [3]71-73 years | 118 | 15.77 | 4.38 | | | |
| | [4]74 years and older | 196 | 15.33 | 4.94 | | | |
| Happiness | [1]65-67 years | 274 | 20.46 | 4.65 | 5.096 | .002 | 1.2>4 |
| | [2]68-70 years | 221 | 20.40 | 5.34 | | | |
| | [3]71-73 years | 118 | 19.63 | 5.22 | | | |
| | [4]74 years and older | 196 | 18.73 | 5.82 | | | |

p<0.05*

According to the ANOVA analysis, it can be seen in Table 7 that there is no statistically significant difference between the participants' levels of happiness and the age variable (p>0.05), while the participants' life satisfaction and the age variable were found to differ statistically and significantly (p<0.05). As a result of

the Bonferroni analysis to reveal the source of the difference, it was revealed that the happiness levels of the participants aged 65-67 and 68-70 were higher than the participants aged 74 and older.

**Table 8:** Independent Sample T-Test Results of Life Satisfaction and Happiness Levels of the Participants according to Marital Status Variable

| Dimension | Gender | n | $\bar{X}$ | SS | T | p |
|---|---|---|---|---|---|---|
| Life Satisfaction | Married | 518 | 16.35 | 4.50 | 5.228 | **.000** |
| | S-D-W | 291 | 14.60 | 4.67 | | |
| Happiness | Married | 518 | 20.52 | 5.17 | 4.521 | **.000** |
| | S-D-W | 291 | 18.80 | 5.26 | | |

p<0.05* (S-D-W= Single-Divorced-Widowed)

According to Table 8, the t-test between the participants' levels of life satisfaction and happiness and the marital status variable revealed a statistically significant difference in favor of married participants (p<0.05).

**Table 9:** ANOVA Analysis Results of Life Satisfaction and Happiness Levels of the Participants according to Education Status Variable

| Dimensions | Education | N | $\bar{X}$ | SS | F | p | Bonferroni |
|---|---|---|---|---|---|---|---|
| Life Satisfaction | [1]Primary | 431 | 14.87 | 4.74 | 14.828 | .000 | 2.3.4>1<br>4>2 |
| | [2]Secondary | 203 | 15.95 | 4.09 | | | |
| | [3]High School | 115 | 17.31 | 4.36 | | | |
| | [4]Bachelor's and above | 60 | 17.96 | 4.61 | | | |
| Happiness | [1]Primary | 431 | 18.91 | 5.18 | 18.693 | .000 | 3.4>1.2 |
| | [2]Secondary | 203 | 19.91 | 5.07 | | | |
| | [3]High School | 115 | 22.38 | 4.85 | | | |
| | [4]Bachelor's and above | 60 | 22.26 | 5.09 | | | |

p<0.05*

As a result of the ANOVA analysis, Table 9 revealed a statistically significant difference between the life satisfaction and happiness levels of the participants and the education status variable (p<0.05). It was revealed as a result of the Bonferroni analysis carried out to reveal the source of the difference that the life satisfaction of the secondary, high school, undergraduate and higher graduates was higher than the primary school graduates, and the life satisfaction of the undergraduate and higher graduates was higher than the secondary school graduates. It was figured out that the happiness levels of high school graduates, undergraduate and higher graduates were higher than both primary and secondary school graduates.

**Table 10:** ANOVA Analysis Results of Participants' Life Satisfaction and Happiness Levels According to Number of Children Variable

| Dimensions | Child | N | $\bar{X}$ | SS | F | p | Bonferroni |
|---|---|---|---|---|---|---|---|
| Life Satisfaction | [1]One child | 105 | 16.87 | 4.90 | 6.621 | .001 | 1>3 |
| | [2]Two children | 243 | 16.12 | 4.54 | | | |
| | [3]3 and more | 461 | 15.25 | 4.57 | | | |
| Happiness | [1]One child | 105 | 21.51 | 5.12 | 10.285 | .000 | 1.2>3 |
| | [2]Two children | 243 | 20.48 | 5.07 | | | |
| | [3]3 and more | 461 | 19.23 | 5.30 | | | |

p<0.05*

Table 10 revealed a statistically significant difference between the life satisfaction and happiness levels of the participants and the number of children as a result of the ANOVA analysis (p<0.05). It is seen as a result

of the Bonferroni analysis to reveal the source of the difference that the life satisfaction of the participants with one child is higher than the participants with 3 or more children. It is seen that the happiness levels of the participants with one child and two children are higher than the participants with 3 or more children.

**Table 11:** ANOVA Analysis Results of Participants' Life Satisfaction and Happiness Levels According to the Variable of Sports Experience Status

| Dimensions | Sports | N | $\bar{X}$ | SS | F | p | Bonferroni |
|---|---|---|---|---|---|---|---|
| Life Satisfaction | [1]10 years or less | 108 | 16.70 | 4.51 | 18.108 | .000 | 2>1<br>1>3<br>2>3.4<br>4>3 |
| | [2]over 10 years | 59 | 18.67 | 3.90 | | | |
| | [3]I have never done sports | 495 | 14.88 | 4.68 | | | |
| | [4]I do sports intermittently | 147 | 16.65 | 4.05 | | | |
| Happiness | [1]10 years or less | 108 | 21.24 | 5.49 | 23.614 | .000 | 1.2>3<br>4>3 |
| | [2]over 10 years | 59 | 23.38 | 4.66 | | | |
| | [3]I have never done sports | 495 | 18.78 | 5.21 | | | |
| | [4]I do sports intermittently | 147 | 21.30 | 4.31 | | | |

$p<0.05$*

According to the ANOVA analysis, there are statistically significant differences between the participants' life satisfaction and happiness levels and their sports experience, as shown in Table 11 ($p<0.05$). As a result of Bonferroni analysis to reveal the source of the difference, it was revealed that participants with more than 10 years of sports experience had higher life satisfaction than participants with 10 years or less sports experience, that participants with 10 years or less of sports experience had higher life satisfaction than participants who did not do sports, that participants with more than 10 years of sports experience had higher life satisfaction than participants who did not do sports and who did sports intermittently, and that the life satisfaction of the participants who did sports intermittently was higher than the participants who do not do any sports. In terms of happiness scores, it was figured out that the happiness levels of the participants with 10 years or less sports experience and more than 10 years of sports experience were higher than the participants who did not do sports, and the happiness levels of the participants who did sports intermittently were higher than the participants who did not do any sports.

## DISCUSSION AND CONCLUSION

As a result of our research, in which we examined the effect of life satisfaction of individuals over 65 years of age on happiness through sociodemographic variables, it was found that life satisfaction and happiness levels were highly positively correlated. There aren't many studies that focus on the relationship between happiness and life satisfaction in the literature, and the inadequacy of studies on participants aged 65 and over draws attention. However, studies conducted in different age groups show that life satisfaction and happiness levels are variables that predict and directly affect each other (14,11,13).

According to the results of our study's t test, there was no statistically significant difference between the participants' levels of happiness and the gender variable. Looking at the literature, Subramanian, Kim & Kawachi (30), who came to a different conclusion from our study, revealed that women are happier than men in their study on American individuals (30). Diener, Suh, Lucas & Smith (17), who reached a similar conclusion with our study, state that there is no difference in happiness levels between women and men in general. This can be interpreted as the fact that women experience the emotions, they experience in every period of life more intensely and sensitively than men.

The level of life satisfaction is seen to significantly differ between the group averages according to age, while the relationship between happiness levels and age is not statistically significant. The analysis performed to determine the cause of the difference led to the conclusion that although all age groups showed a similar scale of life satisfaction and happiness, individuals aged 74 years and older had higher levels of life satisfaction and happiness. In the field survey made in the age variable, it is seen that life satisfaction decreases as the age

progresses, and in parallel, there is a decrease in the level of happiness. This result, which is parallel to our results, draws attention to the importance of the support to be given to individuals in the aging process (28,24).

The study's findings show that married participants experience higher levels of life satisfaction and happiness than single participants. When the literature is examined, Diener et al., (17), who reached a similar conclusion with our study, concluded that married individuals are happier than unmarried individuals (17). Similarly, it is seen that the happiness levels of married individuals are higher than those of unmarried individuals, and their marital status has predictive effects on happiness (5,32). This can be interpreted as a reflection of individuals over the age of 65 against the feeling of loneliness. It is a known fact that human beings do not prefer to be alone at any age. Especially, it is important to have someone to share life with after illness, deprivation and a broken family life after the age of 65.

According to the research findings, it was concluded that life satisfaction and happiness differ significantly according to education level. Accordingly, university graduates have higher life satisfaction than primary school graduates. It is seen in the literature that Clark and Oswald (8) came to the conclusion that education level has a negative impact on life satisfaction, which did not support the findings of our study. This can be explained by the differentiation of living standards of individuals. The country where individuals live and the country economies have an impact on this variable, and this can directly reflect on the individual.

The characteristics of the participants, who are the focal point of our study, whether they do sports or not, have led us to reach remarkable results. The levels of life satisfaction and happiness of the participants and their participation in sports were found to differ significantly. It was found in our study that the life satisfaction and happiness levels of the participants who do sports for 10 years or more and those who do sports intermittently are higher than those who do not do any sports. In the Baştuğ & Duman (2)'s study, individuals living in Germany and Turkey were compared and their life satisfaction levels were examined depending on physical activity, and it was concluded that the life satisfaction levels of the participants who engage in physical activity differ significantly from those who do not. While drawing attention to the importance of physical activity in another study, it was stated that being psychologically sound and staying fit lead to positive results in the individual, thus reducing the levels of depression, stress and anxiety (28,29,22,7,19)

The most striking of the results we obtained in our study is that the variable that has an effect on the life satisfaction of individuals aged 65 and over is related to their state of doing sports. This conclusion is supported by numerous studies in the literature. Therefore, it is concluded that it is important for individuals aged 65 and over to do sports or be involved in a physical activity in order to support their life satisfaction and happiness levels. This shows us that physical activities should be increased especially for this age group, and individuals staying in nursing homes should be supported in this sense, making a positive contribution to both their life satisfaction and happiness levels.

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# Examination Of The Doping Knowledge Levels Of Natural Sled Athletes İn Terms Of Some Variables

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*Ethical Statement: It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited.*

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**Abstract**

This study; It was conducted to measure the doping knowledge levels of athletes in the natural luge branch who continue their active training in Turkey. For this purpose, the personal information form and the "Attitude Scale Towards Doping Use" developed by the researcher to measure the doping knowledge levels of natural luge athletes were applied to 55 athletes participating in the Natural Luge Turkey Championship in 2020. The collected data were initially entered into the SPSS 26 statistical program. Descriptive statistics, independent samples t-test, and one-way analysis of variance (ANOVA) were used for data analysis. Additionally, the Mann Whitney U test was used for the scores of the international medal variable. In one-way analysis of variance, the Scheffe Post Hoc multiple comparison test was used to determine which groups had significant differences. As a result of the statistics conducted, it was concluded that male athletes participating in the research had higher doping knowledge levels than female athletes, and the knowledge levels of athletes who were not subjected to doping tests were lower than those of athletes who were subjected to doping tests.

**Keywords:** Knowledge Levels, Athletes, Sled, Doping

**Özet**

**Natürel Kızak Sporcularının Doping Bilgi Düzeylerinin Bazı Değişkenler Bakımından İncelenmesi**

Bu çalışma; Türkiye'de faal olarak çalışmalarını sürdüren natürel kızak branşındaki sporcuların doping bilgi düzeylerini ölçmek amacıyla yapılmıştır. Bu amaç kapsamında natürel kızak sporcularının doping bilgi düzeylerini ölçmek için araştırmacı tarafından geliştirilen kişisel bilgi formu ve "Doping Kullanımına Yönelik

Tutum Ölçeği" 2020 yılında Natürel Kızak Türkiye Şampiyonasına iştirak eden 55 sporcuya uygulanmıştır. Toplanan veriler ilk olarak SPSS 26 istatistik programına girişi yapılmıştır. Verilerin analizinde; betimsel istatistik, bağımsız örneklemler için t-testi ve tek yönlü varyans analizi (ANOVA) kullanılmıştır. Ayrıca uluslararası madalya değişkeni puanları için Mann Whitney U testi kullanılmıştır. Tek yönlü varyans analizinde ise anlamlı farklılığın hangi gruplar arasında olduğunu belirlemek için de Scheffe Post Hoch çoklu karşılaştırma testi kullanılmıştır. Yapılan istatistikler neticesinde sonuç olarak araştırmaya katılan kadın sporculardan erkek sporcuların doping bilgi seviyeleri yüksek olduğu ve doping testine tabi tutulmayan sporcuların bilgi düzeylerinin, doping testine tabi tutulan sporculardan daha düşük olduğu sonucuna ulaşılmıştır.

**Anahtar Kelimeler:** Bilgi Düzeyi, Sporcu, Kızak, Doping.

## INTRODUCTION

Sport is a healthy and peaceful safety valve for the inherent aggression in humans, serving to control aggressive behaviors in individuals, creating a more suitable competitive environment, and fostering friendship. It is also a place where peace is prioritized over war (3). Therefore, sport should not be solely focused on winning. The prevailing understanding of sports, which is centered around the desire to win at any cost, brings along its own set of problems. Unfortunately, in today's world, the concept of sports built on the goal of winning is perceived as sacrificing everything and trying any means for success.

Yıldıran (15) emphasized that the expectation from athletes regarding their behavior has been centered around winning and success from the beginning of the relationship between humans and sports to the present day. The fact that all individuals within the realm of sports have their expectations from sports and athletes based on winning and success has led to various divergent paths in pursuit of these goals. Öngel (9) pointed out that throughout history, manipulation of success in the field of sports through unfair external interventions has always existed. It was also noted that these unethical doping practices not only have adverse effects on the physical and psychological well-being of athletes but also endanger their health and lives, ultimately eroding their moral values, and undermining the integrity of champion athletes, record-holding athletes, and the fairness of sporting competitions.

Athletes turn to doping in order to enhance their performance, achieve athletic success, and gain financial rewards. The term "doping" in English is derived from the root "dope," and in Flemish, it comes from the "dop" root. It is known that this word carried the meaning of physical stimulants for the English, while for the Flemish, it originated from a beverage made from grape skins that was used by Zulu natives in Africa to boost courage in battles (10). In another definition, doping is described as the intake of foreign substances into the body for the purpose of increasing physical strength (17). The official definition was first established in 1963 as "the use of substances or other methods by athletes or competitors during and before competitions to enhance their performance in a manner contrary to sports ethics, which may negatively affect the athlete's psychological and physical health" (10).

The doping substances used to enhance performance in sports vary depending on the diversity of sports disciplines. This diversity includes substances aimed at improving endurance, developing strength, reducing fatigue, and providing psychological comfort (1).

The adoption of sports as a profession by individuals, their dedication to living for sports, and the consequent emergence of aggressive behavior in individuals, the desire for superiority, self-esteem, and the pursuit of fame, exorbitant transfer fees, the desire to win medals and awards, and the prestige associated with sporting achievements in international competitions among nations have always provided a fertile ground for doping use (9). Despite the knowledge that doping use leads to unfair competition and is unhealthy and risky, it is still observed to be used by athletes in the present day (7). Therefore, it is emphasized that new preventive legal measures are necessary to combat doping use (8).

The use of doping has brought into question the legality of sports and has also influenced the attitudes of athletes towards it. This situation not only affects the legitimacy of sports but also has a negative impact on the physical and mental health as well as the social life of athletes. Numerous studies have been conducted on the effects of doping use on athletes. Öztürk, Suveren, and Çolakoğlu (11) examined the level of knowledge

about doping among athletes in their study. Yıldırım and Şahin (16) investigated the knowledge and usage levels of doping and ergogenic aids among elite wrestlers. Şenel, Güler, Kaya, Ersoy, and Kürkçü (13) also examined the knowledge and utilization levels of ergogenic aids among top-level Turkish athletes from various individual sports disciplines in their research.

To prevent doping use, it is essential to better understand athletes' knowledge about doping and their attitudes towards doping. In our research, we examined the doping knowledge levels of natural sled athletes based on their age groups, genders, international experience, participation in doping tests, international medal achievements, and sports ages.

## METHOD

This section of the study focuses on the research model, the research group, data collection tools, data collection, and data analysis.

The aim of this study is to measure the doping knowledge levels of elite sled athletes and examine them in terms of various variables.

The population of the research consists of active sled athletes in Turkey. The research sample is comprised of 55 volunteer sled athletes who participated in the Natural Sled Turkey Championship.

To measure the doping knowledge levels of natural sled athletes, a knowledge form developed by the researcher and the "Attitude Scale towards Doping Use" developed by Şapçı (12) were utilized. In this study, a survey model, which is one of the quantitative research methods, has been employed. The survey model is used to depict the existing situation as it is (6).

Statistical analyses in the research were conducted using SPSS 26 (Statistical Package for Social Science for Personal Computers). Descriptive statistics were calculated for data analysis initially. Subsequently, relationships between the variables in the research hypotheses were investigated. Independent samples t-test, one-way analysis of variance (ANOVA), and Mann-Whitney U test were used to examine the relationships between knowledge levels and independent variables. In the one-way analysis of variance, the Scheffe Post Hoc multiple comparison test was employed to determine which groups exhibited significant differences.

### Ethical approval and institutional permission

The research has obtained ethical approval with a letter numbered 165583 and dated 18.09.2023 from the Ethics Committee of Yozgat Bozok University, Faculty of Social Sciences and Humanities.

## FINDINGS

**Table 1.** One-way analysis of variance for the differences in sled athletes' doping knowledge scores according to the age variable.

| Source of Variance | **Kt** | **sd** | **KO** | **F** | **p** |
|---|---|---|---|---|---|
| Between Groups | 315,252 | 2 | 157,626 | 1,968 | ,150 |
| Within Groups | 4164,289 | 52 | 80,082 | | |
| Total | 4479,541 | 54 | | | |

When examining Table 1, it can be observed that the doping knowledge levels of sled athletes did not exhibit a significant difference based on different age groups [$F(2,52) = 1.968$; $p > 0.05$]. This finding indicates that sled athletes from different age groups have similar knowledge levels.

**Table 2.** Descriptive statistics for the age variable

| | Age | N | $\bar{X}$ | S |
|---|---|---|---|---|
| Age Groups | 10-15 | 13 | 23,8376 | 8,46 |
| | 16-20 | 29 | 23,9464 | 9,38 |
| | 21-25 | 13 | 29,5470 | 8,37 |
| | Total | 55 | 25,2444 | 9,11 |

When Table 2 is examined, it can be seen that there are 13 athletes in the age range of 10-15, 29 athletes in the age range of 16-20, and 13 athletes in the age range of 21-25.

**Table 3.** T-test results for the differences in sled athletes' scores on doping knowledge levels according to gender.

| | Gender | N | $\bar{X}$ | S | sd | T | p |
|---|---|---|---|---|---|---|---|
| **Knowledge Level** | Male | 31 | 27,87 | 7,52 | | | |
| | Woman | 24 | 21,85 | 9,99 | 53 | 2,56 | 0,14 |

When Table 3 is examined, it can be observed that sled athletes' doping knowledge levels did not exhibit a significant difference based on the gender variable [$t(53) = 2.56$; $p > 0.05$]. However, the slightly higher mean scores of male athletes in knowledge level compared to female athletes indicate that the gender factor has a minor influence on doping knowledge levels.

**Table 4.** T-test results for sled athletes' doping knowledge scores according to international experience

| | International Competition | N | $\bar{X}$ | S | sd | t | p |
|---|---|---|---|---|---|---|---|
| **Knowledge** | Yes | 19 | 26,34 | 9,61 | | | |
| **Level** | No | 36 | 24,67 | 8,91 | 53 | ,648 | ,520 |

According to Table 4, the doping knowledge levels of sled athletes did not exhibit a significant difference based on the international experience variable [$t(53) = 0.648$; $p > 0.05$]. However, the slightly higher mean scores of athletes who participated in international competitions in comparison to athletes without international experience indicate that having international experience has a minor influence on doping knowledge levels.

**Table 5.** T-test results for sled athletes' doping knowledge scores according to their participation in doping tests

| | Doping Test | N | $\bar{X}$ | S | sd | T | p |
|---|---|---|---|---|---|---|---|
| **Knowledge** | Yes | 7 | 36,81 | 3,56 | | | |
| **Level** | No | 48 | 23,56 | 8,418 | 53 | 4,085 | ,000 |

When examining Table 5, it can be observed that sled athletes' doping knowledge levels exhibited a significant difference based on the participation in doping tests variable [$t(53) = 4.085$; $p > 0.05$]. In this finding, it can be stated that the mean doping knowledge levels of sled athletes who underwent doping tests are higher compared to athletes who did not participate in the tests.

**Table 6.** T-test results for sled athletes' doping knowledge scores according to their achievement of national medals

| | National Medal | N | X̄ | S | sd | t | p |
|---|---|---|---|---|---|---|---|
| **Knowledge Level** | Yes | 23 | 26,40 | 10,26 | | | |
| | No | 32 | 24,41 | 8,25 | 53 | ,796 | ,430 |

According to Table 6, sled athletes' doping knowledge levels did not exhibit a significant difference based on the national medal achievement variable [t(53) = 0.796; p > 0.05]. However, the slightly higher mean scores of athletes who won medals in national competitions compared to those who did not win medals indicate that achieving medals has a minor influence on doping knowledge levels.

**Table 7.** Mann Whitney U test results for the differences in sled athletes' doping knowledge scores according to their achievement of international medals

| | International Medal | N | Ranking Average | Ranking Total | U | p |
|---|---|---|---|---|---|---|
| **Knowledge Level** | Yes | 3 | 40,00 | 120,00 | | |
| | No | 52 | 27,31 | 1420,00 | 42,000 | ,182 |
| | Total | 55 | | | | |

When looking at Table 7, athletes' doping knowledge levels did not exhibit a significant difference based on the variable of international medal achievement (U = 42.000; p > 0.05).

**Table 8.** One-way analysis of variance for the differences in sled athletes' doping knowledge scores according to their years of sports experience

| Knowledge Level | KT | sd | KO | F | p |
|---|---|---|---|---|---|
| Between Groups | 360,230 | 2 | 180,115 | | |
| Within Groups | 4119,311 | 52 | 79,218 | 2,274 | ,113 |
| Total | 4479,541 | 54 | | | |

When examining Table 8, it can be observed that the doping knowledge levels of sled athletes did not exhibit a significant difference based on the years of sports experience groups [F(2,52) = 2.274; p > 0.05]. However, the increase in the mean sports experience scores as the years of sports experience increase suggests that sports experience has a minor influence on doping knowledge levels.

**Table 9.** Descriptive statistics for the years of sports experience variable

| Sports Age | N | X | S |
|---|---|---|---|
| 1-4 | 28 | 23,1548 | 9,40 |
| 5-9 | 20 | 26,2111 | 8,12 |
| 10+ | 7 | 30,8413 | 8,97 |
| Total | 55 | 25,2444 | 9,11 |

When looking at Table 9, it can be observed that there are 28 athletes with a sports experience of 1-4 years, 20 athletes with a sports experience of 5-9 years, and 7 athletes with a sports experience of over 10 years.

## DISCUSSION AND CONCLUSION

The Turkish Anti-Doping Commission emphasizes that the spirit of sports is a reflection of the human soul, body, and intelligence, and that this spirit is based on values such as personality, education, health, adherence to rules and laws, respect for oneself and other athletes (14). However, these values have not always been upheld over time, and throughout history, humanity has turned to various chemical substances to enhance its strength and potential while engaging in sports activities. What initially began as the consumption of certain herbs in the form of herbal infusions eventually lost its innocence. Due to advancements in medicine and the transformation of sports competitions into an international platform, doping has become one of the most significant issues in the world of sports (2).

In a structure as highly valued as sports, the doping knowledge levels of athletes are of significant concern. In this study, we examined the doping knowledge levels of natural sled athletes based on their gender, international experience, international medal achievements, national medal achievements, and years of sports experience. A total of 55 athletes participated in our research, including 13 athletes aged 10-15, 29 athletes aged 16-20, and 13 athletes aged 21-25.

In the analysis conducted on natural sled athletes in the study, there was no significant difference in doping knowledge levels based on the gender variable. However, it was observed that male athletes had higher average scores in knowledge level compared to female athletes, indicating that the gender factor has a minor influence on doping knowledge levels. However, Karacabey, at al (5) found significant differences in doping knowledge levels among participants based on the gender variable in their studies. It can be argued that the different results in these studies may be attributed to the fact that the studied groups were involved in different sports disciplines.

In the research, doping knowledge levels did not show a significant difference based on the variable of international experience. However, it was found that athletes who participated in international competitions had higher knowledge levels compared to athletes without international experience. Therefore, our research shows a similarity, and it is understood that athletes competing at the international level have greater awareness of doping knowledge.

In our study, no significant difference was found in doping knowledge levels of athletes based on their international medal achievements. Similarly, when examining the national medal achievement variable, no significant difference was found. Therefore, it is believed that athletes' achievements do not lead to any changes in their doping knowledge levels.

In the research, when the scores of athletes with higher years of sports experience were examined, it was found that athletes with greater sports experience had higher knowledge levels. Yıldırım and Şahin (16) in their study found a statistically significant negative relationship in the comparison of years of sports experience regarding the statement "I try every means to succeed in sports" and the most commonly used stimulants in sports, such as caffeine and cocaine. Similarly, in a study by Gençtürk, at al. (4), it was observed that there was a significant difference in years of sports experience among wrestlers. These studies, along with our research, indicate that as years of sports experience increase, doping knowledge levels also tend to increase.

In the research, doping knowledge levels of natural sled athletes showed a significant difference based on the variable of participation in doping tests. This finding indicates that athletes who participated in doping tests had higher average doping knowledge levels compared to athletes who did not participate in the tests. In a study by Gençtürk, at al. (4), it was found that 72% of the participants had no previous experience with doping control, and 27.6% had no experience with doping control at all. According to this result, it is believed that properly conducted doping control practices can positively contribute to athletes' knowledge levels.

In conclusion, the results obtained in our study indicate that there is a parallel increase in athletes' knowledge levels with their age. While this may initially seem positive, it is understood that it is not necessarily beneficial for athletes. Instead of athletes gaining knowledge with age, it is suggested that educational programs related to doping and harmful substances should be provided as early as possible in an instructional format. Additionally, staying informed about the ongoing efforts in the world to combat doping

and taking inspiration from the work of expert organizations can provide opportunities for educating athletes about doping-related issues.

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# Investigation of the Relationship between Coping with Humor and Perceived Stress Levels of Faculty of Sport Sciences Students

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**Abstract**

The aim of this study is to examine the relationship between university students' levels of coping with humor and their perceived stress levels. As a data collection tool in the research, the Coping Humor Scale (CHS)) and The Perceived Stress Scale (PSS) was used. The participants of the research are N=135 university students studying at Dumlupınar University Faculty of Sport Sciences.Correlation analyses were performed in order to answer the research question "Is there a significant relationship between the levels of coping with humor and perceived stress levels of the students studying at the Faculty of Sport Sciences?" Pearson correlation coefficients were examined in order to determine whether there is a relationship between the students' total scores on the scale of coping with humor and the perceived stress scale. As a result of the research; there is a significant negative correlation between students' levels of coping with humor and their perceived stress levels. According to that as the level of coping with humor increases, perceived stress decreases. Then, linear regression analysis was applied to get an answer to the research question "Is perceived stress a significant predictor of the level of coping with humor among the students of the faculty of sports sciences?" Analysis results showed that the perceived stress level is a significant negative predictor of students' coping with humor. It's shown that 3.9% of the total variance in coping with humor is explained by the students' perceived stress levels. When the perceived stress level rises to 1, the level of coping with humor decreases by 0.12. As a result, it can be thought that as the skills of coping with humor increase, the stress levels perceived by the students in their daily lives decrease, thus helping the students to be less negatively affected by stressful situations.

**Keywords:** Humor, Perceived Stress, Student

**Özet**

**Spor Bilimleri Fakültesi Öğrencilerinin Mizahla Başa Çıkma ile Algıladıkları Stres Düzeyleri Arasındaki İlişkinin İncelenmesi**

Bu çalışmanın amacı üniversite öğrencilerinin mizahla başa çıkma düzeyleri ile algıladıkları stres düzeyleri arasındaki ilişkiyi incelemektir. Araştırmada veri toplama aracı olarak Mizah Yoluyla Başa Çıkma Ölçeği (MYBÇÖ) ve Algılanan Stres Ölçeği (ASÖ) kullanılmıştır. Araştırmanın katılımcılarını Dumlupınar Üniversitesi Spor Bilimleri Fakültesi'nde öğrenim gören N=135 üniversite öğrencisi oluşturmaktadır. "Spor Bilimleri Fakültesinde öğrenim gören öğrencilerin mizahla baş etme düzeyleri ile algılanan stres düzeyleri arasında anlamlı bir ilişki var mıdır?" araştırma sorusunu yanıtlamak amacıyla korelasyon analizleri yapılmıştır. Öğrencilerin mizahla başa çıkma ölçeği toplam puanları ile algılanan stres ölçeği toplam puanları arasında ilişki olup olmadığını belirlemek amacıyla Pearson korelasyon katsayılarına bakılmıştır. Araştırma sonucunda; öğrencilerin mizahla başa çıkma düzeyleri ile algıladıkları stres düzeyleri arasında negatif yönde anlamlı bir ilişki vardır. Buna göre mizahla baş etme düzeyi arttıkça algılanan stres azalmaktadır. Daha sonra "Algılanan stres, spor bilimleri fakültesi öğrencilerinin mizahla baş etme düzeylerinin anlamlı bir yordayıcısı mıdır?" araştırma sorusuna yanıt bulmak amacıyla doğrusal regresyon analizi uygulanmıştır. Analiz sonuçları, algılanan stres düzeyinin öğrencilerin mizahla başa çıkmalarının anlamlı bir negatif yordayıcısı olduğunu göstermiştir. Mizahla başa çıkma konusundaki toplam varyansın %3,9'unun öğrencilerin algılanan stres düzeyleri ile açıklandığı görülmektedir. Algılanan stres düzeyi 1'e yükseldiğinde mizahla başa çıkma düzeyi 0,12 azalmaktadır. Sonuç olarak mizahla baş etme becerileri arttıkça öğrencilerin günlük yaşamda algıladıkları stres düzeylerinin azaldığı, dolayısıyla öğrencilerin stresli durumlardan daha az olumsuz etkilenmelerine yardımcı olduğu düşünülebilir.

**Anahtar Kelimeler:** Mizah, Algılanan Stres,Öğrenci

## INTRODUCTION

The concept of humor carries out human employment for many years, and carrying the burden of historical people carries the burden of transmission until the early times. When they experience people's nerves and stress, they can alleviate this situation through humor (6). Sense of humor has a multidimensional character (7;15;16). Humor is accepted as an important tool in the explanations of relations in today's world order. Dialogues between individuals can be transmitted both in writing and verbally (4). On the other hand, coping with humor as a tool for coping with stressful life conditions is examined (9). People with a strong sense of humor are successful in coping with nervousness and stress. However, they are less exposed to psychological disorders such as anxiety and lead a healthier life. According to the recent studies shows that visualization of humor movies improves the levels of subjective happiness, and sense of humor. In addition to that decreases the perception of depressive symptoms (16).

There are 4 different humor styles: humor, self-destructive humor, self-enhancing humor and offensive humor. (8). Offensive humor style; It is a humor style that is preferred in line with the individual's own interests without respecting the people in front of him and is not suitable for social relations. Self-destructive humor; It is a style of humor that includes parts such as ignoring individuals, making fun of himself or making fun of himself to amuse people. participatory humor style; It is a humor style that is structured in the awareness of the characteristics towards them, since they respect the people in front of them. Self-enhancing humor style; It is a humor style that aims to prevent negative feelings in the environment where individuals are aware of their characteristics and personal characteristics (11). Stress is a phenomenon that we are exposed to in our daily life. Individuals feel the need to struggle with the stress created by their working situations (12). It is possible for disorders such as burnout to occur in stressful environments (3). Apart from this, focusing and attention deficit have negative effects on thoughts (14). Considering all these negative effects, physical vitality and activities can be effective in reducing stress (1). Perceived stress; It is a necessity related to the level of stress that individuals feel. It may increase or decrease due to stress in parallel with the intensity of the negative effects that individuals are exposed to (13). In this context, the study aims to investigate the relationship between coping with humor and the stress in our perception of faculty students of the faculties of work sports science.

## METHOD

In this study, the relational screening model was used, which aims to determine the relationships between students' levels of coping with humor and their perceived stress levels. The study group of the research consists of N = 135 university students studying at Dumlupınar University, Faculty of Sports Sciences. Is there is a significant relationship between students' levels of coping with humor and their perceived stress levels? Pearson correlation coefficients were examined to determine whether there was a relationship between the students' total scores of the coping with humor scale and the total scores of the perceived stress scale. Is the subsequent stress perceived by sports science faculty students a significant predictor of their level of coping with humor? Linear regression analysis was applied to answer the research question.

### Data Collection Tools

### Coping with Humor Scale

The Coping Humor Scale (The Coping Humor Scale), developed by Martin (10) and adapted into Turkish by Yerlikaya (18), is a 4-point Likert-type scale consisting of 7 items. The scale was developed to measure the use of humor as a coping strategy in stressful situations. The scores that can be obtained from the scale range from 7 to 28, while a high score indicates that humor is used more as a coping strategy. In the internal consistency studies of the scale, Cronbach Alpha coefficients ranged between .60 and .70 in its original form Martin (10), while the Cronbach Alpha coefficient of the Turkish version was .67 Yerlikaya (18). In this study, the Cronbach Alpha coefficient of the scale was calculated as .52.

### Perceived Stress Scale

The Perceived Stress Scale (PSS) is a measurement tool developed by Cohen (5) and widely used in studies conducted on different groups in the United States, Canada and Europe. PSS is a self-assessment scale developed to measure the level of stress experienced, depending on how unpredictable, uncontrollable and overloaded the respondent evaluates his life. The Turkish adaptation of the scale was carried out by Yerlikaya and Inanc (19). In this scale, which is frequently used in studies examining the relationships between sense of humor and stress, individuals are asked to rate how often they have experienced certain feelings or thoughts in the past month, from 0 (never) to 4 (very often). The stress level perceived by the respondent is determined by adding the scores obtained from the items, and a high score indicates a high level of perceived stress. The scale of perceived stress, developed as a five-point Likert-type rating scale, has 10 items. The scale consists of "never (0), almost never" (1), "sometimes" (2), "often" (3) "very often" (4). In this 10-item form, items 4-5-7 and 8 are scored in reverse. The lowest and highest scores a participant can obtain from this scale are 0 and 40, respectively. A high total score indicates a high Perceived Stress level. The internal consistency Cronbach's alpha coefficient of the scale was reported to be .84 Yerlikaya and Inanc (19). In this study, the Cronbach Alpha coefficient of the scale was calculated as .77.

### Ethical approval and institutional permission

The ethics permission to do this research was obtained with decision number 09 at the Dumlupınar University Ethics Committee meeting on 25.05.2023.

## FINDINGS

**Table 1.** The mean and standard deviations of the scores of the measurement tools

| | N | X | Ss | Min | Max |
|---|---|---|---|---|---|
| **Coping with Humor** | 135 | 18,78 | 3,582 | 10 | 27 |
| **Perceived Stress** | 135 | 24,47 | 5,63 | 16 | 37 |

According to the table, it is seen that the participants' average score for coping with humor was 18.78±3.58 points and the highest score that can be obtained from this scale is 27 points. It can be said that the participants' levels of coping with humor are above average. In addition, the average perceived stress score of the participants was 24.47±5.63 points and the highest score that can be obtained from this scale is 37 points. It can be said that the perceived stress levels of the participants were above average.

**Table 2.** Correlation Analysis Results

| | | **Perceived Stress** |
|---|---|---|
| **Coping with Humor** | Pearson Correlation | **-,196*** |
| | Sig. (2-tailed) | 0,022 |
| | N | 135 |

As a result of the correlation analysis, it was revealed that there was a significant negative relationship between coping with humor and perceived stress. $\alpha$=-.196;p<0.05. In other words, as the participants' level of coping with humor increases, their perceived stress levels decrease.

**Table 3**. Linear Regression Analysis Results

| **Model** | | **B** | **St. Error** | **Beta** | **t** | **Sig** |
|---|---|---|---|---|---|---|
| 1 | **Constant** | 21,836 | 1,358 | | 16,082 | ,000 |
| | **Perceived Stress Total** | -,125 | ,054 | -,196 | -2,311 | ,022 |
| R=0.196, R2=.039, F(1,133)=5,341, p<0.05. | | | | | | |

As a result of the regression analysis, it was revealed that there was a significant negative predictor of students' coping with humor R=0.196, R2=.039, F(1.133)=5.341, p<0.05. It is shown that 3.9% of the total variance in coping with humor is explained by the students' perceived stress levels $_{\beta}$=-0.125. When the perceived stress level rises to 1, the level of coping with humor decreases by 0.12 t(133)=-2.31, p<0.05

## DISCUSSION AND CONCLUSION

As a result of the research; It is seen that there is a negative significant relationship between students' levels of coping with Humor and their perceived stress levels. Accordingly, it can be said that as the level of coping with Humor increases, perceived stress decreases. Similar to the findings of our study, Abel (2) conducted a study in which undergraduate students' sense of humor had a reducing and regulating effect on the effects of stress, and concluded that students with high sense of humor were less stressed than students with low sense of humor. In a study conducted by Yerlikaya (18) on university students, he determined that there was a negative relationship between the students' coping with humor and their perceived stress, and he concluded that the stress and anxiety levels of the students who used humor as a strategy were lower. It can be thought that the reason why the findings obtained in these studies are similar to our study is due to the fact that the sample groups are students. Again, similar to the findings obtained in our study, when some studies conducted in different study groups were examined, it was stated in a study conducted by Tümkaya (17) on university lecturers that those with a high sense of humor experienced less negative emotional states related

to stress. Despite the differences in the sample groups in this study, the reason for showing similar results can be considered as the fact that the sense of humor can have a wide-ranging effect on reducing the feeling of stress. In addition, it is stated that humor is an alternative way that can be used to cope with stress situations, and it has been stated that individuals who use humor actively have less psychological disorders. The findings obtained in our study generally show similar results with the studies in the literature. The concept of humor and stress appears in every phase of our lives. When humor is used effectively in the awareness and importance of this situation, it can be used as an effective strategy in coping with stress. Accordingly, programs for students can be organized about how humor can be used as an effective strategy. Developing their skills for humor will increase their happiness levels.

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# Examination Of The Relationship Between Exercise Addiction And Physical Self-Concept Levels Of Students Studying At The Faculty Of Sport Sciences

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**Abstract**

The aim of this study is to examine the relationship between exercise addiction and physical self-esteem levels of students studying at the Faculty of Sport Sciences. Survey method was used as the research design in the study. The scope group of the study consisted of students studying in the faculties of sport sciences of 7 universities, randomly selected as one from each geographical region of Turkey. "Personal Information Form" was used to obtain the socio-demographic information of the participants, "Exercise Addiction Scale (EIS)" was used to determine the level of exercise addiction and "Physical Self Scale" was used to determine the level of physical self. Normality test was performed on the data obtained and it was determined that the data were normally distributed. Independent Sample T test was used for pairwise comparisons, One Vay ANOVA for multiple comparisons and Tukey HSD test was used to determine the source of difference. Pearson correlation test was used to determine the relationship between the two scales. In the statistical analysis and interpretations of the data, $p<0.05$ significance level was taken into consideration. As a result; gender, age, department of study, class of study, perceived economic level, sport branch and perception of exercise addiction affect the level of exercise addiction. In addition to this, gender, age, department of study, class of study, perceived economic level, sport branch and perception of exercise addiction affect the level of physical self. Finally, it was concluded that there was a positive correlation between exercise addiction and physical self-image level. According to these results; in order to facilitate students' access to psychological counselling services within educational institutions and to prevent false body perception that may occur due to the influence of the media, it may be recommended to conduct informative studies on healthy and realistic body standards in schools.

**Keywords:** Exercise Addiction, Physical Self, University Students

**Özet**

**Spor Bilimleri Fakültesinde Öğrenim Gören Öğrencilerin Egzersiz Bağımlılığı ve Fiziksel Benlik Düzeyleri Arasındaki İlişkinin İncelenmesi**

Bu araştırma ile Spor Bilimleri Fakültesinde öğrenim gören öğrencilerin egzersiz bağımlılığı ve fiziksel benlik düzeyleri arasındaki ilişkinin incelenmesi amaçlanmaktadır. Araştırma tarama (survey) metodu kullanılarak tasarlanmıştır. Araştırmanın kapsam grubunu Türkiye'nin her coğrafi bölgesinden birer tane olacak şekilde rastgele seçilmiş, 7 üniversitenin spor bilimleri fakültelerinde öğrenim gören öğrencileri oluşturmuştur. Katılımcıların sosyo demografik bilgilerinin elde edilebilmesi için "Kişisel Bilgi Formu", egzersiz bağımlılığı düzeylerinin belirlenebilmesi için "Egzersiz Bağımlılığı Ölçeği (EBÖ)" ve fiziksel benlik düzeylerinin belirlenebilmesi için "Fiziksel Benlik Ölçeği" kullanılmıştır. Elde edilmiş olan verilere normallik testi yapılmış olup, verilerin normal dağıldığı tespit edilmiştir. İkili karşılaştırmalarda Independent Sample T testi, çoklu karşılaştırmalarda One Vay Anowa ve farklılık kaynağının belirlenmesinde Tukey HSD testi kullanılmıştır. İki ölçek arasında nasıl bir ilişki olduğunun belirlenebilmesi için ise Pearson korelasyon testi kullanılmıştır. Verilerin istatistiksel analizinde ve yorumlarda, $p<0,05$ anlamlılık düzeyi dikkate alınmıştır. Sonuç olarak; cinsiyet, yaş, öğrenim görülen bölüm, öğrenim görülen sınıf, algılanan ekonomik düzey, spor dalı ve egzersiz bağımlılığı algısı egzersiz bağımlılığı düzeyini etkilemektedir. Buna ek olarak, cinsiyet, yaş, öğrenim görülen bölüm, öğrenim görülen sınıf, algılanan ekonomik düzey, spor dalı ve egzersiz bağımlılığı algısı fiziksel benlik düzeyini etkilemektedir. Son olarak, egzersiz bağımlılığı ile fiziksel benlik düzeyi arasında pozitif bir ilişki olduğu sonucuna varılmıştır. Bu sonuçlara göre; öğrencilerin eğitim kurumları bünyesinde psikolojik danışmanlık hizmetlerine erişimini kolaylaştırmak ve medyanın etkisiyle oluşabilecek yanlış beden algısının önüne geçmek için okullarda sağlıklı ve gerçekçi beden standartları konusunda bilgilendirici çalışmalar yapılması önerilebilir.

**Anahtar Kelimeler:** Egzersiz Bağımlılığı, Fiziksel Benlik, Üniversite Öğrencileri

## INTRODUCTION

It is known that regular physical activity is of great importance in maintaining the physical fitness of individuals. However, there is awareness that intense and excessive exercise may have negative psychological and physiological effects on individuals (9). Excessive exercise behaviour is seen as a behaviour that negatively affects the individual as in other types of addiction (16). In this direction, although exercise has many positive effects on individuals, it has been accepted that it has the potential to become a behaviour that can negatively affect individuals if it reaches obsessive dimensions (36).

Eysenck (15) used the concept of addiction to express the predisposition of individuals to harmful and abnormal actions. These behaviours may include the use of drugs or stimulants, alcohol, exercise, sex or work. Until recently, addiction manifested itself primarily as alcohol and drug use, but in recent years, behavioural addictions have also attracted considerable attention. When the relevant literature is examined, addiction is examined under two headings: behavioural addiction and substance addiction.

Substance addiction is defined as continuing to use a substance that a person uses for pleasure regardless of the physiological, psychological or social problems that arise during use. When a person becomes addicted to a substance, that substance becomes a psychological and physiological desire for him (2). Studies on the human brain have revealed that substance addiction is a continuous and recurrent disorder based on genetic and biological basis (43).

Behavioural addiction is a type that can create addiction without being addicted to the substance. Addictions of this type have pathological characteristics and are concerned with performing an addictive behaviour (35). Behaviour addiction, which can be seen in behaviours other than substance use such as games, internet, television, exercise, etc., can be evaluated by using the criteria used in the detection of substance addiction (21, 41). These criteria consist of six stages: mood change, tolerance, attention, withdrawal symptoms, relapse and conflict (42).

Exercise addiction is defined as the inability of individuals to quit exercise after starting to exercise or to encounter some emotional problems after quitting (19). Exercise addiction is described as the situation in which the individual cannot fulfil his/her responsibilities or spare enough time for his/her social environment by increasing the intensity, frequency and duration of the exercise continuously with the thought that the exercise continuity is out of control and the intensity, frequency and duration of the exercise can increase the efficiency that the individual can get from exercise (1, 46). While normal individuals may choose to rest by taking time for themselves after exercising or when they feel tired after their daily routines, exercise addicts may choose to continue exercising even if they are ill. They see it as a way to relieve stress or to recover, and if they do not do it, they experience frustration or a sense of incompleteness (9).

People consider physical appearance as an important criterion when evaluating themselves and other people. While this situation varies between societies, it is more apparent in some societies. There is a tendency to evaluate with terms such as beautiful-ugly, fat-thin. This standardisation situation can basically emerge through advertisements. Evaluations made on the basis of such criteria in society cause people to judge their physical appearance and consequently affect their happiness. This situation is called physical self-perception and involves individuals' perception and evaluation of themselves in line with certain criteria (10). In this context, when it is taken into consideration that individuals turn to exercise in order to bring themselves to a form they want to see physically or to maintain their own form, it is possible that they will benefit from the positive effects of exercise, but it is also possible to develop an addiction if they overdo it.

The aim of this study is to examine the relationship between exercise addiction and physical self-perception of students studying at the Faculty of Sport Sciences. When the related literature is examined, it is seen that there is a lack of studies in which physical self-perception and exercise addiction are examined together. In this context, it is thought that the study is original and will make an important contribution to the related literature.

## METHOD

### Research Model

This research was designed based on the relational survey model, one of the quantitative research methods.

### Research Group (Population-Sample)

The population group of the study consisted of students studying at the faculties of sport sciences of universities in Turkey, while the sample group consisted of a total of 621 students studying at the faculties of sport sciences of 7 universities (Gazi University, Dumlupınar University, Şırnak University, Atatürk University, Recep Tayyip Erdoğan University, Bandırma Onyedi Eylül University, Akdeniz University) randomly selected as one from each geographical region of Turkey. At least 10% of the population of the faculties were taken as participants.

### Data Collection Tools

Before starting the research, the ethics commission report dated 30.12.2022 and numbered 546967 was obtained from the Ethics Commission of Gazi University. In addition, necessary permissions were obtained via e-mail for the use of the scales determined as data collection tools. The "Personal Information Form" created by the researcher was used to obtain the socio-demographic information of the participants, the "Exercise Addiction Scale (EIS)" developed by Tekkurşun Demir et al. (38) to determine the level of exercise addiction, and the "Physical Self Scale" whose validity and reliability was conducted by Çağlar et al. (11) to determine the level of physical self.

### Exercise Addiction Scale (EAS)

In order to determine the exercise addiction levels of the participants, the Exercise Addiction Scale (EAS) developed by Tekkurşun Demir et al (38). The scale consists of 17 items in total and has three sub-dimensions: "Excessive Focus and Emotion Change", "Postponement of Individual-Social Needs" and "Tolerance Development and Passion". The scale was constructed using a 5-point Likert scale, and Cronbach's Alpha reliability coefficients were 0.83 for the hyperfocus and emotion change sub-dimension, 0.79 for the Deferral

of Individual-Social Needs sub-dimension, and 0.77 for the Tolerance Development and Passion sub-dimension. Cronbach's Alpha Total value was determined as 0,88. In addition, the test-retest reliability coefficient of the scale was calculated as 0.90 (p<.01).

**Physical Self Scale**

The "Physical Self Scale", which was developed by Ninot et al. (32) and adapted into Turkish by Çağlar et al. (11), was used to determine the physical self levels of the participants. The scale consists of 25 items in total and includes 6 sub-dimensions. In the study conducted by Çağlar et al. (11), it was found that the R2 and Lambda values for item 3 in the "physical fitness" sub-dimension were quite low (0.07 and 0.28, respectively) and the error variance was quite high (0.93). In line with this information, it should be taken into consideration that item 3 should not be taken into account in the calculation.

**Personal Information Form**

In the form created by the researcher, there are questions to obtain data such as gender, age, department and class, economic status, sports branch and exercise addiction perception.

**Data Analysis**

After the data obtained were classified in Excel, statistical evaluations were made using SPSS 25 package programme. Normality tests of the scores obtained from exercise addiction (EAD) and physical self-scale were performed and it was determined that Skewness and Kurtosis values were between ±1.5 . In this case, it is accepted that the data are normally distributed (37). Independent Sample t test was used for pairwise comparisons, One Vay Anova for multiple comparisons and Tukey HSD test was used to determine the source of difference. Pearson correlation test was applied to determine the relationship between the two scales. In the statistical analysis and interpretation of the data, p<0.05 significance level was taken into consideration.

## FINDINGS

**Table 1.** Exercise addiction levels of the participants depending on gender variable

| Gender | N | Hyperfocus and Emotion Change | | Postponement of Needs and Conflict | | Tolerance Development and Passion | | General Exercise Addiction | |
|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss |
| **Male** | 357 | 26.81 | 6.06 | 16.30 | 5.06 | 11.95 | 4.14 | 55.07 | 12.07 |
| **Woman** | 264 | 25.78 | 6.08 | 15.73 | 5.68 | 11.90 | 4.40 | 53.43 | 14.04 |
| **Total** | 621 | 26.37 | 6.08 | 16.06 | 5.34 | 11.93 | 4.25 | 54.37 | 12.96 |
| **T** | | 2.091 | | 1.279 | | .140 | | 1.564 | |
| **P** | | **.037*** | | .201 | | .889 | | .127 | |

p<0,05

When Table 1 was analysed, it was found that there was no statistically significant difference between the postponement of individual-social needs and conflict, tolerance development and passion sub-dimensions of the exercise addiction scale (EAS) and the total score of the scale depending on the gender variable; however, it was determined that the scores of men were higher than women in the sub-dimension of hyperfocus and emotion change and this difference was statistically significant (p<0.05).

**Table 2.** Exercise addiction levels of the participants depending on age variable

| Yaş | N | Hyperfocus and Emotion Change | | Postponement of Needs and Conflict | | Tolerance Development and Passion | | General Exercise Addiction | |
|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss |
| **18-21 Years[1]** | 270 | 26.71 | 6.44 | 15.82 | 5.74 | 11.81 | 4.43 | 54.34 | 14.26 |
| **22-25 Years [2]** | 213 | 26.46 | 5.59 | 16.83 | 4.79 | 12.16 | 4.08 | 55.46 | 11.58 |
| **26-29 Years [3]** | 111 | 25.59 | 5.10 | 14.81 | 4.68 | 11.59 | 3.92 | 52.00 | 10.23 |
| **30 and above[4]** | 27 | 25.55 | 9.16 | 17.55 | 6.71 | 12.77 | 5.01 | 55.88 | 18.07 |
| **f** | | 1.061 | | 4.459 | | .880 | | 1.875 | |
| **p** | | ,365 | | **,004*** | | ,451 | | ,133 | |
| **Tukey HSD** | | | | 2 > 3 | | | | | |

*p<0.05

When Table 2 was analysed, it was found that there was no statistically significant difference between the sub-dimensions of over-focusing and emotion change, development of tolerance and passion, and total values of PBI depending on the age variable, whereas there was a statistically significant difference in the sub-dimension of postponement of individual-social needs and conflict (p<0.05).

**Table 3.** Exercise addiction levels of the participants depending on their department of study

| Department | N | Hyperfocus and Emotion Change | | Postponement of Needs and Conflict | | Tolerance Development and Passion | | General Exercise Addiction | |
|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss |
| **Physical Education [1]** | 174 | 27.05 | 5.95 | 15.12 | 5.25 | 11.39 | 3.94 | 53.56 | 12.40 |
| **Coaching[2]** | 198 | 26.48 | 5.81 | 15.92 | 4.78 | 11.36 | 3.86 | 53.77 | 11.56 |
| **Sports Management [3]** | 144 | 23.97 | 6.70 | 15.95 | 5.30 | 11.72 | 4.46 | 51.66 | 13.85 |
| **Recreation [4]** | 105 | 28.34 | 4.83 | 18.02 | 6.06 | 14.20 | 4.47 | 60.57 | 13.32 |
| **f** | | 12.488 | | 6.791 | | 12.836 | | 10.962 | |
| **p** | | **.000*** | | **.000*** | | **.000*** | | **.000*** | |
| **Tukey HSD** | | 4>1>2>3 | | - | | - | | 4>2>1>3 | |

*p<0.05

When Table 3 is analysed, a statistically significant difference was found between the sub-dimensions of over-focusing and emotion change, postponement of individual-social needs and conflict, development of tolerance and passion, and the total score of EBÖ (p<0.05).

**Table 4.** Exercise addiction levels of the participants depending on the class variable

| Grade | N | Hyperfocus and Emotion Change | | Postponement of Needs and Conflict | | Tolerance Development and Passion | | General Exercise Addiction | |
|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss |
| **1.Grade [1]** | 138 | 25.30 | 6.68 | 16.15 | 5.07 | 10.93 | 3.35 | 52.39 | 11.75 |
| **2. Grade[2]** | 132 | 26.63 | 5.16 | 16.38 | 5.74 | 12.36 | 3.70 | 55.38 | 12.53 |
| **3. Grade[3]** | 177 | 25.55 | 6.53 | 16.28 | 5.67 | 12.13 | 4.70 | 53.98 | 14.58 |
| **4. Grade[4]** | 174 | 27.86 | 5.45 | 15.51 | 4.86 | 12.20 | 4.69 | 55.58 | 12.32 |
| **f** | | 6.175 | | .884 | | 3.393 | | 1.913 | |
| **p** | | **.000*** | | .449 | | **.018*** | | .126 | |
| **Tukey HSD** | | 4>3>1 | | | | 2>4>1 | | | |

*p<0.05

When Table 4 is analysed, a statistically significant difference was found in the sub-dimension of hyperfocus and emotion change and the sub-dimension of tolerance development and passion depending on the class variable of the participants (p<0.05).

**Table 5.** Exercise addiction levels of the participants depending on their perceived economic level variable

| Economic Level | N | Hyperfocus and Emotion Change | | Postponement of Needs and Conflict | | Tolerance Development and Passion | | General Exercise Addiction | |
|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss |
| **Very Good[1]** | 48 | 26.50 | 6.40 | 15.18 | 6.18 | 12.50 | 4.57 | 54.18 | 15.41 |
| **Good[2]** | 153 | 26.80 | 5.98 | 16.31 | 5.58 | 12.31 | 4.41 | 55.43 | 13.46 |
| **Medium[3]** | 330 | 26.10 | 6.19 | 15.84 | 4.89 | 11.45 | 3.95 | 53.40 | 11.81 |
| **Bad – Very Bad[4]** | 90 | 26.56 | 5.74 | 16.90 | 5.96 | 12.76 | 4.70 | 56.23 | 14.50 |
| **f** | | .498 | | 1.464 | | 3.268 | | 1.573 | |
| **p** | | .684 | | .223 | | **.021*** | | .195 | |
| **Tukey HSD** | | | | | | 4>3 | | | |

*p<0.05

When Table 5 is analysed, a statistically significant difference was found between the economic level of the participants and tolerance development and passion sub-dimension (p<0.05).

**Table 6.** Exercise addiction levels of the participants depending on the sport branch variable

| Type of Sports | N | Hyperfocus and Emotion Change | | Postponement of Needs and Conflict | | Tolerance Development and Passion | | General Exercise Addiction | |
|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss |
| **None[1]** | 249 | 25.96 | 6.10 | 15.91 | 5.64 | 11.91 | 4.25 | 53.79 | 13.48 |
| **Individual Sports[2]** | 153 | 27.50 | 6.44 | 16.70 | 5.25 | 12.19 | 4.21 | 56.41 | 12.64 |
| **Team Sports[3]** | 219 | 26.05 | 5.72 | 15.78 | 5.02 | 11.78 | 4.29 | 53.61 | 12.47 |
| **f** | | 3.558 | | 1.511 | | ,433 | | 2.525 | |
| **p** | | **.029*** | | .222 | | ,649 | | .081 | |
| **Tukey HSD** | | 2>1 | | | | | | | |

*p<0.05

When Table 6 is analysed, it is seen that there is no statistically significant difference between the postponement of individual-social needs and conflict, tolerance development and passion sub-dimensions and EBÖ total scores depending on the sport branch variable; however, a statistically significant difference was found in the sub-dimension of over-focusing and emotion change (p<0.05).

**Table 7.** Exercise addiction levels of the participants depending on the variable of their perception of exercise addiction towards themselves

| Exer. Addiction Perception | N | Hyperfocus and Emotion Change | | Postponement of Needs and Conflict | | Tolerance Development and Passion | | General Exercise Addiction | |
|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss |
| **Yes[1]** | 216 | 29.54 | 4.85 | 18.18 | 5.24 | 13.80 | 4.52 | 61.52 | 12.14 |
| **Undecided[2]** | 150 | 25.76 | 6.14 | 16.08 | 4.45 | 12.04 | 3.54 | 53.88 | 11.71 |
| **No[3]** | 255 | 24.05 | 5.85 | 14.25 | 5.26 | 10.29 | 3.72 | 48.61 | 11.30 |
| **f** | | 57.236 | | 34.964 | | 45.584 | | 71.400 | |
| **p** | | **.000*** | | **.000*** | | **.000*** | | **.000*** | |
| **Tukey HSD** | | 3>2>1 | | 1>2>3 | | 1>2>3 | | 1>2>3 | |

*p<0.05

When Table 7 was analysed, a statistically significant difference was found between the participants' perceptions of exercise addiction towards themselves and the sub-dimensions and total score of the scale (p<0.05).

**Table 8.** Participants' levels of physical self according to gender variable

| Gender | N | General Self | | Physical Self | | Physical Fitness | | Sport Competence | | Physical Attractiveness | | Physical Strength | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss |
| **Man** | 357 | 4.43 | .84 | 4.91 | .81 | 4.26 | 1.00 | 4.37 | .92 | 4.52 | 1.08 | 4.46 | .95 |
| **Woman** | 264 | 4.46 | .86 | 4.98 | 1.03 | 4.06 | 1.16 | 4.32 | 1.14 | 4.67 | 1.16 | 4.45 | 1.13 |
| **t** | | -.511 | | -.892 | | 2.204 | | .613 | | -1.531 | | .136 | |
| **p** | | .609 | | .373 | | **.028*** | | .540 | | .126 | | .892 | |

*p<0.05

When Table 8 is analysed, it is seen that there is no significant difference between gender variable and general self, physical self, sportive competence, physical attractiveness and physical strength sub-dimensions, whereas there is a statistically significant difference between physical fitness sub-dimension (p<0.05).

**Table 9.** Participants' levels of physical self according to age variable

| Age | N | General Self | | Physical Self | | Physical Fitness | | Sport Competence | | Physical Attractiveness | | Physical Strength | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss |
| **18-21 Years[1]** | 270 | 4.48 | .80 | 4.96 | .83 | 4.23 | 1.19 | 4.40 | 1.11 | 4.56 | 1.15 | 4.44 | 1.14 |
| **22-25 Years[2]** | 213 | 4.41 | .90 | 4.84 | 1.03 | 4.13 | 1.00 | 4.27 | .94 | 4.55 | 1.12 | 4.49 | .97 |
| **26-29 Years [3]** | 111 | 4.38 | .91 | 5.02 | .86 | 3.91 | .78 | 4.23 | .89 | 4.68 | 1.07 | 4.45 | .79 |
| **30 and above[4]** | 27 | 4.55 | .69 | 5.28 | .78 | 5.19 | .88 | 4.83 | 1.03 | 4.70 | 1.04 | 4.33 | 1.24 |
| **f** | | .584 | | 2.406 | | 11.084 | | 3.123 | | .461 | | .261 | |
| **p** | | .625 | | .066 | | **.000*** | | **.025*** | | .710 | | .853 | |
| **Tukey HSD** | | | | | | - | | 4>2,3 | | | | | |

*p<0.05

When Table 9 is analysed, no significant difference was found between the age variable and general self, physical self, physical attractiveness and physical strength sub-dimensions, whereas a statistically significant difference was found between physical fitness and sportive competence sub-dimensions (p<0.05).

**Table 10.** Participants' levels of physical self according to the variable of the department they are studying

| Department | N | General Self | | Physical Self | | Physical Fitness | | Sport Competence | | Physical Attractiveness | | Physical Strength | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss |
| **Physical Education [1]** | 174 | 4.45 | .92 | 4.85 | .90 | 4.11 | 1.14 | 4.23 | 1.01 | 4.55 | 1.24 | 4.37 | .96 |
| **Coaching[2]** | 198 | 4.35 | .78 | 4.86 | .88 | 4.22 | 1.05 | 4.35 | .79 | 4.49 | 1.09 | 4.31 | 1.08 |
| **Sports Management[3]** | 144 | 4.56 | .86 | 4.87 | 1.02 | 4.15 | 1.14 | 4.26 | 1.15 | 4.57 | 1.02 | 4.47 | 1.01 |
| **Recreation [4]** | 105 | 4.42 | .85 | 5.32 | .73 | 4.25 | .90 | 4.65 | 1.17 | 4.84 | 1.05 | 4.83 | 1.01 |
| **f** | | 1.684 | | 7.462 | | .548 | | 4.179 | | 2.402 | | 6.535 | |
| **p** | | .169 | | **.000*** | | .649 | | **.006*** | | .067 | | **.000*** | |
| **Tukey HSD** | | | | 4>3,2,1 | | | | 4>3,1 | | | | 4>3,1,2 | |

*p<0.05

When Table 10 is analysed, it is seen that there is no statistically significant difference between the variable of the department of study and general self, physical fitness and physical attractiveness sub-dimensions, whereas statistically significant difference is found in physical self, sportive competence and physical strength sub-dimensions (p<0.05).

**Table 11.** Participants' levels of physical self according to class variable

| Grade | N | General Self | | Physical Self | | Physical Fitness | | Sport Competence | | Physical Attractiveness | | Physical Strength | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss |
| **1. Grade[1]** | 138 | 4.36 | .93 | 4.83 | .95 | 4.17 | 1.08 | 4.27 | .97 | 4.38 | 1.01 | 4.49 | 1.01 |
| **2. Grade[2]** | 132 | 4.31 | .81 | 4.88 | .82 | 4.09 | 1.11 | 4.15 | 1.08 | 4.59 | 1.13 | 4.23 | 1.07 |
| **3. Grade[3]** | 177 | 4.35 | .86 | 4.87 | 1.05 | 4.21 | 1.12 | 4.47 | .92 | 4.47 | 1.21 | 4.45 | 1.06 |
| **4. Grade[4]** | 174 | 4.69 | .76 | 5.16 | .76 | 4.21 | 1.00 | 4.42 | 1.07 | 4.86 | 1.05 | 4.60 | .96 |
| **f** | | 7.029 | | 4.637 | | .428 | | 3.007 | | 5.696 | | 3.284 | |
| **p** | | **.000*** | | **.003*** | | .733 | | **.030*** | | **.001*** | | **.021*** | |
| **Tukey HSD** | | 4>1 | | 4>2 | | | | - | | 4>3 | | 4>2 | |

*p<0.05

When Table 11 is analysed, a statistically significant difference was found between the participants' class variable and the sub-dimensions of general self, physical self, sportive competence, physical attractiveness and physical strength (p<0.05).

**Table 12.** Participants' levels of physical self according to their perceived economic level variable

| Economic Level | N | General Self | | Physical Self | | Physical Fitness | | Sport Competence | | Physical Attractiveness | | Physical Strength | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss |
| **Very Good[1]** | 48 | 4.53 | .69 | 4.88 | .80 | 3.73 | .99 | 4.10 | 1.06 | 4.77 | 1.04 | 4.20 | 1.05 |
| **Good[2]** | 153 | 4.56 | .70 | 5.11 | .83 | 4.20 | 1.03 | 4.41 | 1.01 | 4.77 | 1.12 | 4.59 | 1.06 |
| **Medium[3]** | 330 | 4.42 | .91 | 4.92 | .91 | 4.20 | 1.09 | 4.32 | .96 | 4.43 | 1.12 | 4.44 | .99 |
| **Bad – Very Bad[4]** | 90 | 4.28 | .90 | 4.76 | 1.06 | 4.29 | 1.11 | 4.45 | 1.19 | 4.75 | 1.08 | 4.41 | 1.09 |
| **f** | | 2.475 | | 3.081 | | 3.166 | | 1.410 | | 4.797 | | 1.919 | |
| **p** | | .061 | | **.027*** | | **.024*** | | .239 | | **.003*** | | .125 | |
| **Tukey HSD** | | | | 2>4 | | 4>3,2>1 | | | | 2>3 | | | |

*p<0.05

When Table 12 is analysed, a statistically significant difference was found between the perceived economic level variable and physical self and physical fitness and physical attractiveness sub-dimensions (p<0.05).

**Table 13.** Participants' physical self-identity levels depending on the sport branch variable

| Type of Sports | N | General Self | | Physical Self | | Physical Fitness | | Sport Competence | | Physical Attractiveness | | Physical Strength | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss |
| **None[1]** | 249 | 4.34 | .78 | 4.83 | .87 | 3.90 | 1.13 | 4.05 | 1.10 | 4.73 | 1.13 | 4.31 | 1.09 |
| **Individual Sports[2]** | 153 | 4.45 | .87 | 5.10 | .91 | 4.46 | .96 | 4.56 | .96 | 4.60 | 1.10 | 4.64 | 1.03 |
| **Team Sports[3]** | 219 | 4.55 | .91 | 4.95 | .95 | 4.29 | 1.01 | 4.53 | .86 | 4.41 | 1.10 | 4.49 | .93 |
| **f** | | 3.427 | | 4.174 | | 14.844 | | 18.508 | | 4.776 | | 5.010 | |
| **p** | | **.033*** | | **.016*** | | **.000*** | | **.000*** | | **.009*** | | **.007*** | |
| **Tukey HSD** | | 3>1 | | 2>1 | | 2>3 | | 2>3 | | - | | 2>1 | |

*p<0.05

When Table 13 is analysed, a statistically significant difference was found between the participants' sport branch variable and all sub-dimensions of the physical self scale (p<0.05).

**Table 14.** Participants' physical self-esteem levels depending on the variable of exercise addiction perceptions towards themselves

| Exer. Addiction Perception | N | General Self | | Physical Self | | Physical Fitness | | Sport Competence | | Physical Attractiveness | | Physical Strength | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss | x | Ss |
| **Yes[1]** | 216 | 4.63 | .80 | 5.41 | .64 | 4.62 | .94 | 4.80 | .86 | 4.87 | 1.02 | 4.95 | .83 |
| **Undecided[2]** | 150 | 4.18 | .94 | 4.60 | 1.04 | 3.97 | .99 | 4.20 | 1.09 | 4.32 | 1.19 | 4.16 | .98 |
| **No[3]** | 255 | 4.44 | .80 | 4.75 | .86 | 3.92 | 1.12 | 4.05 | .96 | 4.50 | 1.11 | 4.21 | 1.06 |
| **f** | | 12.884 | | 52.330 | | 31.316 | | 38.083 | | 12.433 | | 43.491 | |
| **p** | | **.000*** | | **.000*** | | **.000*** | | **.000*** | | **.000*** | | **.000*** | |
| **Tukey HSD** | | 1>3 | | 1>3 | | 1>3 | | 1>3 | | 1>3 | | 1>3 | |

*p<0.05

When Table 14 is examined, a statistically significant difference was found between the participants' perceptions of exercise addiction towards themselves and all sub-dimensions of the physical self scale (p<0.05).

**Table 15.** The relationship between participants' exercise addiction levels and their physical self-image levels

| | | Exercise Addiction | Physical Self |
|---|---|---|---|
| **Physical Self** | **r** | .427** | 1 |
| | **p** | **.000*** | |
| | **n** | 621 | |

*p<0.05

When Table 15 was analysed, a positive correlation was found between exercise addiction and physical self-image level (p<0.01).

## DISCUSSION AND CONCLUSION

The aim of this study was to investigate the relationship between exercise addiction and physical self-esteem levels of students studying at the faculty of sport sciences. The concepts of exercise and sport are important in the field of sport sciences and should not be used interchangeably. Exercise is a pre-planned and structured subcategory of physical activity that is performed to improve or maintain one or more components of physical fitness (14). Sport, on the other hand, includes concepts such as competition, competition, record breaking, scoring, championship, relegation, etc. and appears as a profession. In this context, an athlete and an individual who exercises are differentiated. In the relevant literature, when the studies on exercise addiction are examined, it is seen that the research group consists of individuals who are athletes (3, 5, 7, 8, 13, 22, 24, 27); there are also studies in which the research group consists of individuals who are not athletes but exercise (12, 17, 20, 26, 39, 44). Considering this remarkable situation, it is recommended that the concept of exercise and sport should be taken into consideration when determining the research group in the studies to be conducted on exercise addiction.

When the exercise addiction levels of the participants depending on the gender variable were analysed, it was found that there was no statistically significant difference between the postponement of individual-social needs and conflict, tolerance development and passion sub-dimensions and the total score of the exercise addiction scale, while men had higher values of hyperfocus and emotional change than women and this difference was statistically significant (p<0.05). The higher values of men may be related to gender roles and masculinity ideals. Men may have been raised with a social expectation that emphasises physical strength, endurance and muscle mass. This expectation may lead to a more intense interest and commitment to exercise and physical activities. In addition, the fact that women had lower values than men in the excessive focus and emotion change sub-dimensions of the exercise addiction scale may be a reflection of differences that may arise from social and cultural influences. Women may tend to be more concerned with body perception and body image, which may affect their motivation to exercise in different ways. In addition, the idea that social

pressures and judgements may be more pronounced among women should also be considered. Such factors may be influential in explaining gender differences in levels of exercise addiction.

When the relevant literature is examined, there are studies showing that exercise addiction is more common among men (29, 30). In the study conducted by Paksoy (34), no significant difference was found between the gender factor of the participants and the postponement of individual-social needs and conflict sub-dimension. Güzel (18) did not find a significant difference between the gender factor and postponement of individual-social needs and conflict, tolerance development and passion, and total values of exercise addiction scale. In addition, there are many studies (25, 33, 42, 45) in which no significant difference was found between gender factor and postponement of individual-social needs and conflict, tolerance development and passion, and exercise addiction scale total values, and these results are in parallel with the findings of our study. In addition, in the study conducted by Kuzucu (28), it was determined that the levels of hyperfocus and emotion change were higher in favour of men depending on gender, and this result is in parallel with the findings of our study.

When the exercise addiction levels of the participants depending on the age variable were analysed, it was found that there was no statistically significant difference between the sub-dimensions of over-focusing and emotion change, tolerance development and passion sub-dimensions and total values of EAS depending on the age factor, while the values of postponement of individual-social needs and conflict of the participants between the ages of 22-25 were higher than the participants between the ages of 26-29 ($p<0.05$). These findings show that the young adulthood period witnesses significant changes in the personality development and social interactions of individuals. Individuals in this age range may have more freedom to determine their individual needs and goals. Therefore, exercise addiction can be used as a tool to fulfil their individual needs, cope with stress or build their identity. On the other hand, it was found that participants aged 26-29 years had lower values for postponing individual-social needs and experiencing conflict. This finding may indicate that with advancing age, individuals gain more experience and are able to balance their individual-social needs more effectively. Participants in this age group may adopt exercise as part of a healthier lifestyle, but may be less likely to be overly dependent on exercise.

When the literature is examined, Güzel (18) found that the values of the participants between the ages of 22-25 were higher than the values of the participants aged 26 and over in the postponement of individual-social needs and conflict dimension in his study, in which the sample group consisted of students of the faculty of sport sciences. The findings of this study are in parallel with the findings of our study. Yıldızdal (45) examined the effect of exercise addiction on psychological endurance in swimmers and found no difference between the age factor and exercise addiction levels of the participants. Çingöz and Mavibaş (12), on the other hand, did not find a significant difference in exercise addiction levels depending on the age factor in their study in which the sample group consisted of university students studying in different fields. As can be seen, there are studies in the relevant literature that are in parallel with the findings of our study, as well as studies that do not show parallelism. The fact that the sample group used in our study and the sample group of other studies in the literature are different may cause the factors affecting exercise addiction to change and may affect the findings.

When the exercise addiction levels of the participants depending on the department in which they study are examined, there is a statistically significant difference between the averages of over-focusing and emotional change, postponement of individual-social needs and conflict, tolerance development and passion sub-dimensions and total dimension of exercise addiction ($p<0.05$). In addition, considering the results of Tukey HSD test, it was determined that the highest value in the dimension of over-focusing and emotion change was found in the students studying in the recreation department, then in the students studying in the departments of physical education and sports, coaching, and sports management, respectively, and in the total dimension of exercise addiction, the highest value was found in the students studying in the recreation department, then in the students studying in the departments of coaching, physical education and sports, and sports management, respectively. This situation shows that students studying in the recreation department are more prone to an excessive focus on exercise and emotional changes. The recreation department generally focuses on programmes and activities for people to use their free time in an effective and healthy way. Therefore, students studying in this department may have a more intense relationship with exercise and a

higher level of commitment to exercise. Extreme focus may mean that they are motivated to continuously improve their performance and achieve their goals while exercising. Emotional change may refer to the intensity of emotional reactions that occur during exercise. Students' higher scores in these dimensions may indicate that they are more deeply affected while exercising and experience this experience more intensely. On the other hand, the fact that the highest value in the total dimension of exercise addiction was found in students studying in the recreation department may mean that students in the recreation department can allocate more time and energy to exercise and make exercise a central part of their lives.

When the related literature is examined, Güzel (18) found that the total dimension values of exercise addiction of the students of the coaching department were higher than the values of the students of the sports management department in his study in which the participants consisted of students receiving sports education. These results are in parallel with our findings. In his study, Uzun (42) did not find a significant relationship between exercise addiction and the department of study. This result contradicts our findings. As can be seen, there are contradictory findings in the relevant literature. It can be said that the reason for these contradictions is sample differences. The sample size in the studies may be different from the sample size in other studies. Sample size may affect the power of statistical analyses. For example, smaller sample sizes may be more difficult to detect statistical significance and may affect the detection of differences.

When the exercise addiction levels of the participants depending on the class variable were examined, it was found that the group with the highest mean in the sub-dimension of hyperfocus and emotional change was 4th grade students, followed by 3rd grade and 1st grade students respectively; while the group with the highest mean in the sub-dimension of tolerance development and passion was 2nd grade students, followed by 4th grade and 1st grade students respectively ($p<0.05$). Firstly, the fact that 4th grade students experienced a higher level of hyperfocus and emotional change in exercise addiction may indicate that as the academic burden and future pressures of students increase, they may tend to turn to exercise and develop an addiction related to it. In addition, the fact that 2nd year students had higher values in tolerance development and passion sub-dimension may indicate that as students adapt to university life and their passion for exercise increases, they develop a higher tolerance and tend to exercise more.

When the related literature is examined, it is seen that the studies in which the sample group consists of students of the faculty of sport sciences are incomplete. Some of the studies are as follows: Güzel (18) found that the values of 2nd year students were higher than the values of 4th year students in the sub-dimension of tolerance development and passion. In this context, the findings are in parallel with the findings of our study. Paksoy (34), on the other hand, found that the values of 3rd grade students were higher than the values of 1st grade students in the sub-dimension of hyperfocussing and emotion change, which is in parallel with the findings of our study.

When the exercise addiction levels of the participants depending on the economic level variable perceived by the participants were examined, it was found that there was no statistically significant difference between the economic levels of the participants and the levels of over-focusing and emotion change, postponement of individual-social needs and conflict sub-dimensions and the total dimension of exercise addiction; in the sub-dimension of tolerance development and passion, the values of the participants with poor-very poor economic level were higher than the levels of the participants with medium level ($p<0.05$). These findings emphasise the effect of economic level on exercise addiction. Especially in the dimensions of tolerance development and passion, it was observed that the exercise addiction levels of the participants who faced economic difficulties were higher. These results suggest that economic factors may contribute to exercise addiction and may be effective in the development of this addiction. It is thought that individuals struggling with economic difficulties may turn to exercise for reasons such as reducing stress, improving mood or feeling better by exercising. This may explain the higher levels observed in the dimension of tolerance development. Likewise, it is thought that individuals who struggle with economic difficulties may have more intense passion for exercise. The fact that participants with poor to very poor economic status showed higher levels in the passion dimension suggests that this addiction may require a deeper and more intense commitment.

When the literature is examined, Demirel and Cicioğlu (13) did not find statistically significant differences between the economic levels of the participants and the levels of hyperfocus and emotion change, postponement of individual-social needs and conflict, and total dimension of exercise addiction. Tekkurşun

Demir and Türkeli (39) did not find statistically significant differences between the economic levels of the participants and the levels of hyperfocus and emotional change, postponement of individual-social needs and conflict, and total dimension of exercise addiction. In his study, Paksoy (34) did not find a significant difference between the economic levels of the participants and the dimension of hyperfocus and emotion change. These findings are similar to the findings of our study. On the other hand, İskender (23) found a statistically significant difference between the economic level of the participants and the total score of the exercise addiction scale. This finding contradicts the findings of our study. It is thought that the reason for this difference is that the participants of the study and the scale used are different.

When the exercise addiction levels of the participants depending on the sport branch variable were examined, it was found that there was no statistically significant difference between the postponement of individual-social needs and conflict, tolerance development and passion sub-dimensions and exercise addiction scale total scores and the sport branch; in the sub-dimension of hyperfocus and emotional change, it was found that the averages of the participants who were interested in individual sports were higher than the averages of the individuals without a branch ($p<0.05$). Based on these findings, we can conclude that participants who are engaged in individual sports are more hyperfocused and experience emotional changes during the exercise process. Individual sports usually include activities in which the individual is alone with himself/herself, sets his/her own goals and evaluates his/her own performance. In this case, it is possible that participants who are interested in individual sports have more intrinsic motivation and focus themselves more while exercising. At the same time, they may experience more pressure and stress to meet performance goals, which can lead to emotional changes.

When the related literature is examined, Güzel (18) did not find a significant difference between all dimensions of the exercise addiction scale and the sport branch in his study. Likewise, Demirel and Cicioğlu (13) did not find any significant difference in their study. Although these findings are partially parallel to the findings of our study, they differ in the dimension of over-focusing and emotion change. The reason for this difference may be due to different sample characteristics and size, geographical and cultural differences.

When the exercise addiction levels of the participants depending on their perceptions of exercise addiction towards themselves were analysed, it was found that the group with the highest value in the sub-dimensions and total dimension of the EBQ was the group that thought that they were exercise addicted, followed by the group that was undecided and the group that thought that they were not exercise addicted, respectively ($p<0.05$). Several factors and theories can be considered to explain these findings. Firstly, exercise addiction is a concept that reflects individuals' passionate commitment to exercise. Perceived exercise addiction refers to individuals' awareness of their own level of addiction. The group who thought that they were exercise addicted had the highest values in the perceived exercise addiction dimensions. This group thinks that they have a great passion and addiction to exercise. Perceptions of exercise addiction may increase individuals' commitment to exercise and lead them to exercise more. On the other hand, the undecided group cannot clearly determine whether they are exercise addicts or not. This indicates that this group of individuals do not fully understand their level of exercise addiction or are undecided about it. The fact that they scored at moderate levels in the perceived exercise addiction dimensions indicates that they may have a certain level of addiction. However, they may have had difficulty in determining whether they were fully addicted to exercise. The group who thought that they were not addicted to exercise scored lower on the perceived exercise addiction dimensions. This group thought that they did not feel addicted to exercise. This may indicate that individuals' awareness of exercise addiction is low or that they have not really reached the level of addiction.

When the related literature is examined, Paksoy (34) found that the group who thought that they were addicted to exercise had the highest values in the dimensions of postponement of individual-social needs and conflict, tolerance development and passion. In his study, Karabıyık (25) found that the group who thought that they were addicted to exercise had the highest value in all dimensions of the exercise addiction scale, followed by the group who were undecided and the group who thought that they were not addicted to exercise, respectively. These findings are in parallel with the findings of our study.

When the physical self-esteem levels of the participants depending on the gender variable were analysed, it was found that men had a higher mean score than women in the physical fitness sub-dimension ($p<0.05$). This may be due to the fact that men generally participate in more sports and physical activities and therefore

tend to have a higher level of physical fitness. On the other hand, widely accepted gender norms and role expectations in society may cause men to be associated with physical strength and fitness and women to focus more on abilities in other areas. In addition, the influence of the media may contribute to the emergence of gender differences in physical self-perception. In particular, advertisements, magazine covers, films and social media may present idealised physical images and may cause these images to be associated with men more frequently. This may lead men to focus more on their physical self and encourage themselves to achieve a higher level of physical fitness.

When the related literature is examined, Aygün (6) found that the physical fitness values of men were higher than women in his study. Uskan (40) also found that the physical fitness values of men were higher than women in his study. In addition, there are different studies that obtained similar results (4, 31). These findings are in parallel with the findings of our study.

When the physical self levels of the participants depending on the age variable were examined, it was determined that the values of the participants aged 30 years and over in the sportive competence sub-dimension were higher than the values of the participants aged 22-25 years and 26-29 years ($p<0.05$). Participants aged 30 and over are likely to have more experience in sports and to have received more advanced education in the faculty of sport sciences. This experience and expertise may contribute to improving their sporting competences and performing at a higher level. In addition, individuals aged 30 years and older may generally have more physical and mental maturity than their younger counterparts. Being physically stronger and more resilient can increase their sporting competences. At the same time, mental skills such as motivation, discipline and concentration may also improve with age. This may also affect their sporting competences.

When the related literature is examined, it is seen that the studies on physical self-perception are quite few. When the few studies are examined, it is seen that there is no study examining the relationship between physical self-perception levels and age factor. In this context, it is thought that the findings of our study will contribute to the literature.

When the physical self-esteem levels of the participants depending on the department variable, it was found that the students studying in the recreation department had higher values in the sub-dimensions of physical self-esteem, sportive competence and physical strength than the students studying in other departments ($p<0.05$). This situation can be explained as follows; recreation department usually provides education in places where physical activities such as sports halls, outdoor facilities and exercise areas are carried out. Participating in physical, fun activities and gaining practical experience in these environments can positively affect students' physical self-concept. In addition, students studying in the recreation department may be individuals who are generally interested in physical activities and sports activities and adopt an active lifestyle. These students may have more motivation to develop their physical selves and increase their sportive competences by participating in physical activities. In addition, students' major preferences may be based on their physical abilities, interests and goals. Among the participants, those who choose recreation may have higher levels of physical self as they may be more involved in physical activities and sport.

When the related literature is analysed, the number of studies in which physical self-esteem levels are examined in terms of various variables is almost negligible. Among these studies, it is seen that there is no study examining the physical self level with the departments of study. In this context, it is thought that our study will contribute to the relevant literature and will be a source for future studies.

When the physical self-esteem levels of the participants depending on the class variable were examined, it was found that the values of the students studying in the 4th grade were higher than the students studying in the lower grades in the sub-dimensions of general self, physical self, physical attractiveness and physical strength ($p<0.05$). It can be thought that this result may have been influenced by the increase in self-confidence of the students over time with their sports sciences education and experience. 4th grade students may have received more education and may have developed their knowledge and skills in the field of sport more. This may positively affect their physical self-perception.

When the related literature is examined, it is seen that there is a considerable deficiency in the number of studies on this subject. In this context, it is thought that our study will contribute to the related literature and guide the studies to be conducted.

When the physical self levels of the participants depending on the economic level variable perceived by the participants were analysed, it was found that the values of the participants with good economic level in the sub-dimensions of physical self and physical attractiveness were higher than the values of the participants with lower economic level; in the sub-dimension of physical fitness, the values of the participants with poor-very poor economic level were higher than the values of the participants with better economic level ($p<0.05$). These results suggest that economic status may have an effect on people's physical self-perceptions. The fact that individuals with better economic status have a higher perception of physical self and physical attractiveness may probably be due to the fact that they have more economic security and access to resources. These individuals may have factors such as better nutrition, access to gyms or better clothing. This may positively affect their physical self-concept. On the other hand, participants with poor economic status may be individuals who have less access to material resources or have fewer opportunities for sport and a healthy lifestyle. In this case, their better values in the physical fitness dimension can be explained by their resistance to challenging conditions and greater effort. They may show more motivation and perseverance to improve themselves physically.

When the related literature is examined, it is seen that there is a considerable deficiency in the number of studies on this subject. In this context, it is thought that our study will contribute to the related literature and guide the studies to be conducted.

When the physical self levels of the participants depending on the sport branch variable were analysed, it was found that the values of the participants who were interested in individual sports had higher values than the values of the participants who were not interested in individual sports in the sub-dimensions of physical self and physical strength; in the sub-dimension of physical fitness and sportive competence, the values of the individuals who were interested in individual sports had higher values than the values of the individuals who were interested in team sports; in the general self sub-dimension, the values of the individuals who were interested in team sports had higher values than the values of the individuals who were not interested in team sports ($p<0.05$). Firstly, it can be thought that participants who are interested in individual sports may have more motivation to improve their physical self. Since individual sports are usually related to the individual's own performance, athletes take more personal responsibility and may make more effort to improve their own physical skills. Furthermore, individual sports may often require the development of more specific physical skills. For example, an athlete may need to perfect a specific technique or movement. This can help individuals involved in individual sports to reach higher levels of physical strength, fitness and sporting competence. In team sports, team play skills and co-operation may be at the forefront. Such sports are usually based on communication, coordination and strategy within the team. Therefore, the fact that individuals who are interested in team sports have higher general self-esteem levels may be due to the fact that they are more skilful in teamwork and group dynamics. Finally, the fact that individuals without a sport branch have lower levels of physical self may be due to a low interest or low level of participation in sport. Individuals who are not interested in sports usually spend less time in sports and do physical activities less regularly, which may lead to a decrease in physical self-concept.

When the related literature is examined, the number of studies in which the physical self-esteem level is examined in terms of various variables is almost negligible. Among these studies, it is seen that there is no study examining the relationship between sport branch and physical self level. In this context, it is thought that our study will contribute to the relevant literature and will be a source for future studies.

When the physical self levels of the participants depending on their perceptions of exercise addiction towards themselves were examined, it was found that the values of the participants who thought that they were exercise addicted in the sub-dimensions of general self, physical self, physical fitness, sportive competence, physical attractiveness and physical strength were higher than the values of the participants who thought that they were not exercise addicted ($p<0.05$). Physical self is an individual's perception of his/her own physical characteristics. This perception includes the way of liking, accepting and evaluating oneself physically. In relation to the perception of exercise addiction, since the participants believe that they can improve themselves by exercising, their physical self-esteem levels increase. Individuals who think that they are addicted to exercise may think that they increase their physical fitness by exercising regularly, improve their sportive competences by doing sports, and consequently increase their physical attractiveness and

strength. It is thought that these thoughts increase the participants' self-confidence and increase their general self-confidence.

When the relevant literature is examined, the number of studies in which the physical self level is examined in terms of various variables is almost negligible. Among these studies, it is seen that there is no study examining the relationship between exercise addiction perception and physical self level. In this context, it is thought that our study will contribute to the relevant literature and will be a source for future studies.

When the relationship between the participants' exercise addiction levels and physical self levels was analysed, a positive relationship was found between exercise addiction and physical self level ($p<0.01$). The findings show that as the level of exercise addiction increases, the participants' physical self-esteem levels also increase. In other words, individuals with high levels of exercise addiction generally feel better physically and have a more positive physical self-perception. Students of sport sciences faculties may experience the relationship between exercise addiction and physical self levels more distinctly, as they generally have an active lifestyle and have more knowledge and awareness of exercising. Exercise can increase positive feelings about body image and body perception. Individuals who exercise continuously may experience a higher level of self-confidence and physical abilities with increased physical performance. As a result, individuals who exercise feel better about themselves due to physical activity, which may lead to an increase in their physical self-concept.

As a result, gender, age, major of study, class of study, perceived economic level, sport branch and perception of exercise addiction affect the level of exercise addiction. In addition, gender, age, major of study, class of study, perceived economic level, sport branch and perception of exercise addiction affect the level of physical self. Finally, it was concluded that there was a positive correlation between exercise addiction and the level of physical self.

Based on the results of the study, the following suggestions can be made:

- Students should be emphasised that exercise is a part of a healthy lifestyle and should be told at every opportunity that excessive exercise can lead to negative consequences.

- Students can be advised to regularly perform physical self-assessment. This can increase students' awareness of their bodies and help them develop a positive physical self-perception.

- Students can be given trainings about the concept of healthy body image. Informative studies emphasising healthy and realistic body standards can be conducted in order to prevent the wrong body perception that may occur due to the influence of the media.

- Since this study was conducted only on the students of the Faculty of Sport Sciences, this may be a limitation in terms of generalising the results. Similar studies to be conducted on individuals of different age groups and students studying in different disciplines may provide a more comprehensive understanding of the relationship between exercise addiction and physical self-image levels.

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# The Effect of Warming on Visual Response Time in Dominant and Non-Dominant Lower and Upper Extremities

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**Abstract**

The aim of this study was to investigate the effect of warm-up on the visual response time of the dominant and non-dominant hand and foot in basketball players. A total of 13 male basketball athletes with an age of 14.38 ± .506 years, height 180.15 ± 8.07 cm, body weight 66.54 ± 13.73 kg and sports experience 4.69 ± 13.73 years were voluntarily included in the study. Visual response time of the dominant and non-dominant hands and feet were measured before and after the warm-up protocol. The warm-up protocol consisted of a 20-minute warm-up including basketball-specific movements and 5-minute stretching movements. Visual response time of the athletes were measured with the Blazepod system. There was no significant difference in the group main effect and time x group interaction of the athletes' hand visual response times after warm-up ($F=2.403$; $p>0.05$; $F=0.170$; $p>0.05$). There was a statistically significant difference in the time effect ($F=22.943$; $p<0.05$). In the comparison of visual response times of both dominant hand ($p=0.001$) and non-dominant hand ($p=0.005$), a significant decrease was found in visual response times after warm-up compared to before warm-up. There was no significant difference between the visual response time of the dominant and non-dominant foot after warm-up ($U=60.50$; $p=0.506$). No significant difference was detected in the comparison of the visual response times of the dominant foot before warm-up with those after warm-up ($Z=-1.804$; $p=0.071$). Similarly, no significant difference was found after warming up in the non-dominant hand ($t=2.150$; $p=0.055$). It can be said that the warm-up protocol applied to basketball players increased the visual response times of the dominant and non-dominant hand and this increase was more significant in the dominant hand. However, the warm-up protocol did not affect visual response time in both dominant and non-dominant feet.

**Keywords:** Basketball, dominant leg, hand dominance, response time.

**Özet**

**Baskın ve Baskın Olmayan Alt ve Üst Ekstremitelerde Isınmanın Görsel Tepki Süresine Etkisi**

Bu çalışmanın amacı basketbolculara uygulanan ısınma aktivitesinin baskın ve baskın olmayan el ile ayağın görsel tepki süresine etkisini incelemektir. Araştırmaya yaşları 14,38 ± ,506 yıl, boy uzunlukları 180,15 ± 8,07 cm, vücut ağırlığı 66,54 ± 13,73 ve spor deneyimleri 4,69 ± 13,73 yıl olan toplam 13 erkek basketbol sporcusu gönüllü olarak dahil edildi. Araştırma grubu ısınma protokolü öncesi ve sonrası baskın ve baskın olmayan el ile ayağın görsel tepki süreleri ölçüldü. Isınma protokolü basketbola özgü hareketleri içeren 20 dakikalık bir ısınma aktivitesi ve 5 dakikalık germe hareketleri şeklinde uygulandı. Sporcuların görsel tepki süreleri, Blazepod sistemi ile gerçekleştirildi. Çalışmaya katılan sporcuların ısınma sonrası el görsel tepki süreleri grup ana etki ve zaman x grup etkileşimi skorlarında anlamlı farklılık tespit edilmedi (F=2,403; p>0,05; F= 0,170; p>0,05). Zaman etkisinde ise istatistiksel olarak anlamlı farklılık belirlendi (F=22,943; p<0,05). Isınma öncesine kıyasla hem baskın el (p=0,001) hem de baskın olmayan el (p=0,005) görsel tepki sürelerinin karşılaştırılmasında ısınma sonrası görsel tepki sürelerinde anlamlı derecede azalma saptandı. Baskın ve baskın olmayan ayağın ısınma sonrası görsel tepki sürelerinin karşılaştırılmasında anlamlı farklılık tespit edilmedi (U=60,50; p=0,506). Isınma öncesi baskın ayak görsel tepki sürelerinin ısınma sonrası ile karşılaştırılmasında anlamlı farklılık belirlenmedi (Z=-1,804; p=0,071). Benzer şekilde baskın olmayan ayakta ısınma sonrasında anlamlı farklılık olmadığı saptandı (t=2,150; p=0,055). Basketbolculara uygulanan ısınma protokolünün baskın ve baskın olmayan el görsel tepki sürelerinde artış görüldüğü ve bu artışının baskın el de daha anlamlı olduğu söylenebilir. Fakat ısınma protokolünün hem baskın hem de baskın olmayan ayakta görsel tepki süresini etkilemediği belirlenmiştir.

**Anahtar Kelimeler:** Basketbol, baskın ekstremite, el baskınlığı, tepki süresi.

## INTRODUCTION

Basketball is one of the sports branches where motoric characteristics must be at the highest level. Mainly anaerobic energy systems are used and therefore factors such as strength, quickness and timing must be realized in harmony. The athlete's ability to perform technical movements correctly and easily is related to factors such as strength, jumping, balance, speed and rhythm (13). Among these factors, response time, which is a component of speed, is an important parameter for performance (7). Response time and reaction time are often used interchangeably (25) but there is a semantic difference between these two terms (19, 14). Reaction time is defined as the rate at which the organism responds to external stimuli. Response time refers to the time between the occurrence of the stimulus and the completion of the movement (20).

Being able to react quickly to these stimuli is also shown among the important performance parameters in terms of athletes reaching high performance (6). Response time is affected by some factors, both good and bad. Among these factors, factors such as gender, age, fatigue and readiness for stimulation are mentioned (2, 26, 34). One of these variables, readiness for stimulation, is related to warm-up exercises to become ready both physically and mentally before practicing a sport branch (3). Warm-up is the optimization of psychological and physiological conditions passively or actively with general and special movements before competition and training (33). In other words, warming up is making the body ready for a physical performance before it is performed (17). The aim of warming up is to increase body and intramuscular temperature and to meet physiological responses in the most effective way by increasing the blood flow rate in the vessels (15). The fact that warming up increases intramuscular temperature and makes it ready for performance has provided some researchers with the opportunity to investigate the effect of cerebral lateralization on performance (9, 21, 28). The fact that the dominant and non-dominant part of our body is more prone to one side is called lateralization. In other words, the difference between right and left or the occurrence of a structure or function more on one side is called lateralization (23). The best indicator of brain-related functional asymmetry is hand preference. Since one hand is dominant over the non-preferred hand in undertaking a task, it is referred to as the dominant hand (18). This situation has led to some studies and studies on the effects of dominant and non-dominant limbs on performance have been carried out (9, 11, 28). Chouamo et al. (2021) In a study, it was investigated whether there was a difference in dominant and non-dominant hand response times. Found that the dominant

hand response time s of male and female participants were faster than the non-dominant hand. Paillard et al. (2018) In a study, the effect of warm-up on postural control in the dominant and non-dominant foot was investigated and it was reported that there was no difference in both feet before and after warm-up. However, Brighenti et al. (2022) Hemphasized that warm-up is effective on the dominant leg and that this effect is more than athletes in asymmetrical sports branches. Based on the findings of these studies, we wanted to find out whether warm-up has different effects on the visual response time of dominant and non-dominant hand and/or foot. Therefore, the aim of this study was to examine the effect of warm-up on the visual response time of dominant and non-dominant hand and foot in basketball players.

## METHOD

### Participants

A total of 13 male basketball athletes with an age of 14.38 ± 0.506 years, a height of 180.15 ± 8.07 cm, a body weight of 66.54 ± 13.73 kg, and a sports experience of 4.69 ± 13.73 years were voluntarily included in the study. Before the study, the purpose of the study and the tests to be performed were explained to all participants verbally in detail. In addition, the Voluntary Consent Form, which included information about the study, was read to the athletes and their parents and their written consent was obtained.

### Procedure

Hand-eye response time and foot-eye response time measurements were performed on 2 separate days with 3-day intervals. Hand-eye response time was measured on the first measurement day and foot-eye response time was measured on the second measurement day. The same measurement procedure was applied on both measurement days (Figure 1). Response time measurements were performed as pre-test and post-test. After the pre-test measurements, the participants performed the warm-up protocol and then took the post-test measurements. The dominant hand was determined by asking "which hand do you actively use when writing?" and the dominant foot was determined by asking "which foot do you primarily use to kick a ball?". Before the tests, the participants were randomly divided into 2 groups. The first group was pre-tested first with the dominant limb and then with the non-dominant limb, while the second group was pre-tested with the non-dominant limb and then with the dominant limb. In the post-test response time measurements, the first group was taken first with the non-dominant limb and then with the dominant limb, while the second group was taken first with the dominant limb and then with the non-dominant limb. This was done to minimize the learning/practice effect in response time tests.

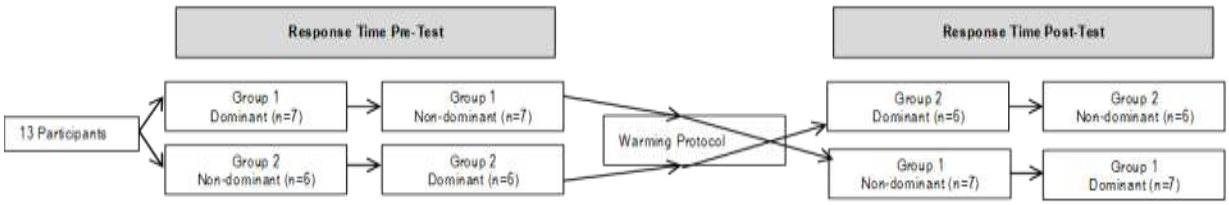


**Figure 1.** Experimental process for dominant and non-dominant limbs.

### Dynamic Warm-Up Protocol

Participants performed a 10-min warm-up protocol adapted from Romaratezabala et al. (2018) and Chen et al. (2022). The protocol started with 5 minutes of jogging with a heart rate of approximately 140 beats/min. It was followed by 5 minutes of static stretching exercises. These exercises included immobilization at the end of the range of motion for the hip, shoulder, calf and thigh muscles. This was followed by 5 minutes of dynamic joint mobility exercises. These exercises were performed for all joints and up to the limits of range of motion. Exercises included: Arm movements up and down, back and forth, diagonal, open and close, lateral and circular movements of the hip, heel striking the hip with a two-foot jump, right and left backward swing of the torso with shoulders, side running with knee pulling and cross-stepping, vertical and lateral jumps, running with gradually increasing acceleration. Then, basketball-specific full-court lay-ups were applied for 10 minutes, followed by hand-over-hand, leg-to-leg, back-to-back, two- and three-point free throws, and stretching exercises. The warm-up lasted a total of 25 minutes and was performed with the coach of the team.

**Hand-Eye and Foot-Eye Response Time**

Response time measurements were performed with the BlazePodtm system, which consists of wireless light disks controlled by a smartphone and works on the basis of extinguishing the light by touching the lighted disk. Tests were taken 3 times each for dominant and non-dominant sides and the best time was recorded as the participant's response time (milliseconds, ms).

**Hand-Eye Response Time**

Hand-eye response time test was measured separately for dominant and non-dominant hand. For the test, the "Formula Reactions" protocol in the BlazePodtm system was applied. Five discs were fixed to a flat wall with vacuum apparatus as shown in Figure 2 (4), with 4 discs spaced 1.5 m apart from each other in a square shape with the 5th disc in the center of this square. Participants stood with both feet on the floor, facing the disks and at a distance where they could easily touch the disks according to their arm length. The participants were instructed to turn off the light of the disk by touching the illuminated disk with the hand they used for the test as soon as possible for 30 s consecutively and in random order. The test was started when the first disk was illuminated after the "Ready" command and was automatically terminated at the end of the test period.

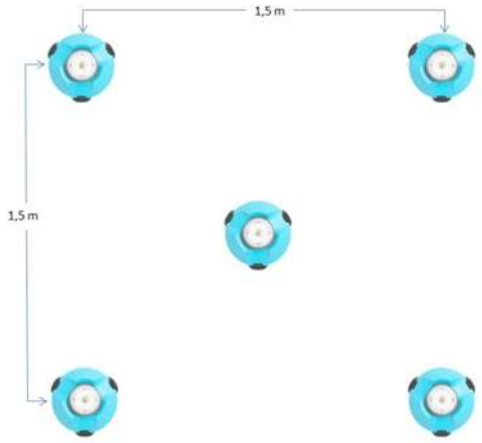


**Figure 2.** Layout of BlazePod illuminated disks (4).

**Foot-Eye Response Time**

To determine foot-eye response time s, the "Fast Feet" protocol, which is available in the BlazePodTM system and can be controlled with a smartphone, was applied. On a flat surface, 4 disks were placed side by side at 30 cm intervals and fixed to the ground with a vacuum apparatus (Figure 3). Participants stood with both feet on the floor, facing the disks and just in front of the center disks. The distance to the disks was adjusted according to the length of each participant's foot that could most easily touch the disks. Before each test, participants were instructed which foot would turn off the light of the illuminated disk. During the test, the other foot was instructed to touch the ground continuously. The test was automatically started after the "get ready" and the participant was asked to extinguish the lighted disk in random order for 30 s by touching the lighted disk with the test foot as soon as possible. At the end of the time, the test was automatically terminated.

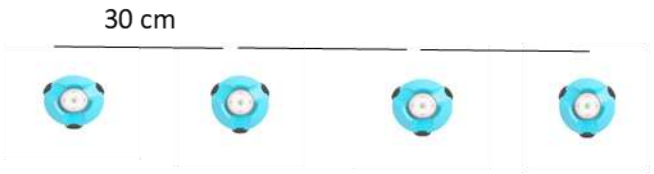


**Figure 3.** Layout of BlazePod light disks.

**Ethical approval and institutional permission**

Selcuk University Faculty of Sports Sciences Non-Interventional Clinical Research Ethics Committee approval was obtained for this study (Date: 04.10.2022; Decision no: /133).

**Data Analysis**

Research data were summarized as mean and standard deviation. Normality analysis was tested with Shapiro Wilk test. Two-factor ANOVA, paired t-test for dependent groups in the pre-test and post-test comparisons, and t-test for independent samples in the comparison of two independent groups were applied in the analysis of normally distributed data. Mann Whitney U and Wilcoxon tests were used to analyze non-normally distributed data. The significance level was accepted as 0.05. SPSS 26 statistical package program was used in all analyses.

## FINDINGS

**Table 1**. Descriptive characteristics of the study group (n=13).

| Group | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|
| Age (year) | 14.38 | 0.506 | 14 | 15 |
| Height (cm) | 180.15 | 8.07 | 175.0 | 184.00 |
| Body weight (kg) | 66.54 | 13.73 | 48.00 | 104.00 |
| Sports experience (year) | 4.69 | 2.29 | 2.00 | 8.00 |

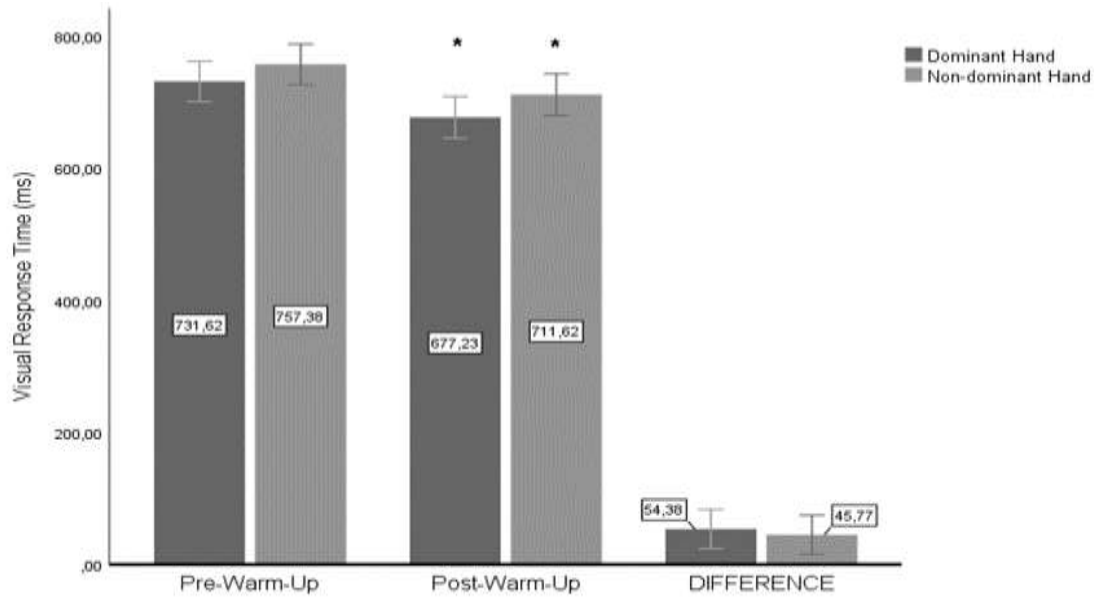


**Figure 4.** Dominant and non-dominant hand visual response times before and after warm-up. Error bars are presented as ± 2 standard errors. *p<0.05

No significant difference was found in the group main effect and time x group interaction scores of the athletes' hand visual response time after warm-up (F=2.403; p>0.05; F=0,170; p>0.05). There was a statistically significant difference in the time effect (F=22.943; p<0.05). Visual response time of dominant hand (p=0.001) and non-dominant hand (p=0.005) improved after warm-up. No statistically significant difference was found in the comparison of the differences (t=0.412; p= 0.684) (Figure 1).

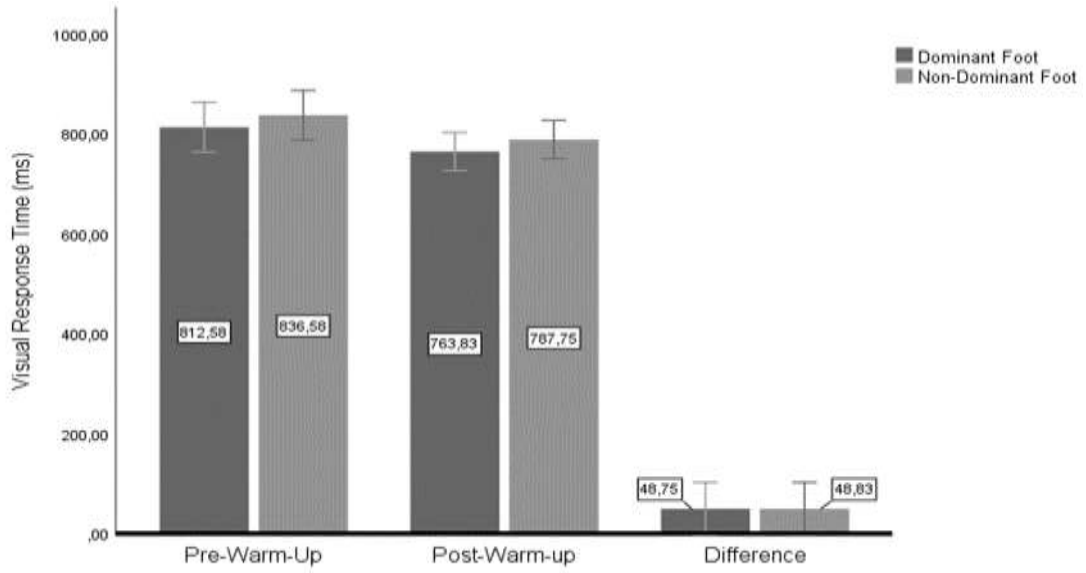


**Figure 5.** Dominant and non-dominant foot visual response time before and after warm-up. Error bars are presented as ± 2 standard errors.

## DISCUSSION AND CONCLUSION

This study has a unique value in terms of investigating the dominant and non-dominant hand and foot visual response time of warm-up. The study was conducted to determine whether there was a difference between dominant and non-dominant limbs in hand and foot visual response time before and after warm-up.

In studies on hemispheric asymmetry, it was aimed to determine the hand, foot and eye preference of individuals in order to provide a basis for research on cerebral lateralization. Cerebral lateralization is the anatomical and functional differentiation between the right and left hemispheres of the brain. Hemispheres have different tasks within themselves and the dominant hemisphere can perform its task better than the non-dominant hemisphere (8). Therefore, there is a significant difference in the hand dominance of most people, and this difference suggests that there may be a difference in sensory-motor tasks such as response time and performance tasks performed with the dominant and non-dominant hand (11).

Basketball is one of the sports where both dominant and non-dominant hands are used in training and competition. The success of basketball players during the game usually depends on their ability to perform different skills equally well with the dominant and non-dominant hand (32). In this study, it was found that after the warm-up protocol applied to basketball players, an increase was observed in the visual response time of the dominant and non-dominant hand and this increase was more significant in the dominant hand.

Doğan and Şen (2019), Chouamo et al. (2021) and Aslan et al. (2023), who reported results compatible with this study, investigated whether there was a difference in dominant and non-dominant hand response time. Doğan and Şen (2019) examined the hand response time of participants with different hand preferences. The researchers reported that the response time of the dominant hand of the participants was shorter than the non-dominant hand. Chouamo et al. (2021) examined 15 male and 14 female participants with computer-assisted reaction test. Twenty-seven participants were reported to have right dominant hand while 2 participants had left dominant hand. The findings of the study indicated that the dominant hand of both male and female participants had shorter response times than the non-dominant hand. Arslan et al. (2023) examined the hand-eye response times of boys and girls. The "Formula Reactions" protocol in the BlazePodtm system was used to determine the hand-eye response times of the participants. In the study conducted in two different task conditions (classical music and preferred music), they reported that the dominant hand had better visual response time than the non-dominant hand in the preferred music condition.

There are also findings in the literature that are not in parallel with the results of this study. These findings were reported by Gignac & Vernom (2004), Badau et al. (2018), and Gignac & Vernom (2004) reported

that there was no significant difference between dominant hand and non-dominant hand preferences in simple response time in a study conducted on a total of 81 participants (53 women and 28 men). Badu et al. (2018) Examined the response times of athletes from individual branches (gymnastics, boxing, judo, taekwondo, wrestling and karate) using computer games. In the study, they stated that the left hand performed significantly better than the right hand according to the results of the Benchmark test, regardless of which of the participants with dominant right and left hand.

Visual response time, which is among the performance parameters that affect success in sports, is very important. In high-level competitions where success is affected by very small performance parameters, it should be ensured that the athlete reaches the highest efficiency from the pre-competition warm-up (30). Therefore, in sports branches such as basketball, it is important for success that the foot reacts as quickly to a stimulus as the hand.

However, in the comparison of the dominant and non-dominant foot times of basketball players before and after warm-up, it was found that there was no significant difference in both feet after warm-up. This research supports the studies conducted by Karadağ & Kutlu (2006) and Açak et al. (2012). Karadağ and Kutlu (2006) examined the effect of visual and auditory stimuli on dominant and non-dominant foot response times in a study on soccer players. As a result of the study, it was reported that there was no significant difference in the response times of dominant and non-dominant feet of soccer players. Açak et al. (2012) found that there was no difference in the dominant and non-dominant foot response times of hearing impaired national athletes. In the literature, the number of studies on dominant and non-dominant foot visual response times of warm-up is limited. Therefore, the findings of Karadağ & Kutlu (2006) and Açak et al. (2012) were discussed. However, Brighenti et al. (2022) reported that the improvement in balance control after warm-up in participants from symmetrical and asymmetrical sports branches was greater in the dominant leg compared to the non-dominant leg. In the study conducted with 12 participants (8 boys and 4 girls) who were actively practicing sports, asymmetry athletes were reported as 5 in total, with gender and branch differences among the participants. This caused the sample of the study to be limited. In this study, in determining the dominant and non-dominant standing visual response times of warm-up, it was tried to ensure that the sample group was larger and homogeneous by including only male participants from the basketball branch, which is an asymmetric sport.

As a result; the warm-up caused an improvement in the dominant and non-dominant hand response times of basketball players. This improvement was more pronounced in the dominant hand. However, there was no difference in feet response times after warm-up compared to before warm-up. Since this study only included team sports, it is recommended that team and individual athletes should be compared in studies that will examine the effect of warm-up on dominant and non-dominant limbs. In addition, examining the effect of warm-up on visual response time in both limbs in physically active and inactive athletes may also reveal the chronic effect of training.

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# Problems Faced by Students with Intellectual Disabilities in Their Participation in Sports Education: Parent Views*

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**Abstract**

The research aims to examine the problems encountered by students with intellectual disabilities in their participation in sports education in terms of parents' views and to develop solutions to the problems based on Socio-Ecological Model (SEM). Case study design, one of the qualitative research approaches, was used in the study, and the study group was reached by maximum diversity sampling from purposeful sampling methods. Parents of children with intellectual disabilities in different cities of Turkey in the spring and autumn semesters of the 2021-2022 academic year were included in the study. During the research process, data were collected by individual interviews. Thematic analysis was used and analyzed by creating codes, categories, and themes. The findings obtained were categorized under four main themes created according to SEM. These are individual problems, social problems, problems arising from the physical environment, and problems arising from politics. Despite the difficulties encountered, as a result, in this study, it was concluded that parents of students with intellectual disabilities have a positive attitude towards physical activities and sports education, they are aware that their children with intellectual disabilities need to participate in physical activities and sports education.

**Keywords:** Students with Intellectual Disabilities, Sports Training, Parents' Views, Socio-Ecological Model, Special education.

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**Özet**

**Zihinsel Yetersizliği Olan Öğrencilerin Spor Eğitimine Katılımlarında Karşılaştıkları Problemler: Veli Görüşleri**

Araştırmanın amacı, zihinsel yetersizliği olan öğrencilerin spor eğitimine katılımlarında karşılaştıkları problemleri veli görüşleri açısından inceleyerek, problemlere yönelik çözüm önerilerinin Sosyo-ekolojik Model (SEM) temelinde geliştirilmesidir. Araştırmada nitel araştırma yaklaşımlarından biri olan durum çalışması deseni kullanılmış ve amaçlı örnekleme yöntemlerinden maksimum çeşitlilik örneklemesiyle çalışma grubuna ulaşılmıştır. Araştırmaya, 2021-2022 eğitim-öğretim yılının bahar ve güz döneminde Türkiye'nin farklı şehirlerinde zihinsel yetersizliği olan çocuğa sahip veliler dahil edilmiştir. Araştırma sürecinde veriler bireysel görüşme tekniği ile toplanmıştır. Veriler tematik analize tabi tutularak kod, kategori ve tema oluşturularak analiz edilmiştir. Elde edilen bulgular SEM'e göre oluşturulan dört ana tema altında toplanmıştır. Bunlar; bireysel sorunlar, toplumsal sorunlar, fiziksel çevreden kaynaklı sorunlar ve politikadan kaynaklı sorunlardır. Karşılaşılan sorunlara rağmen sonuç olarak bu araştırmada zihinsel yetersizliği olan öğrenci velilerinin fiziksel aktivitelere ve spor eğitimine olumlu baktıkları, zihinsel yetersizliği olan çocuklarının fiziksel aktivitelere ve spor eğitimine katılmalarının önemli olduğunun bilincinde oldukları ortaya çıkmıştır.

**Anahtar Kelimeler:** Zihinsel Yetersizliği Olan Öğrenciler, Spor Eğitimi, Veli Görüşleri, Sosyo-Ekolojik Model, Özel Eğitim.

## INTRODUCTION

Intellectual disability can negatively affect people's daily, social and practical skills (1). For example, unhealthy nutrition, sedentary life and physical movement limitation are among the most common lifestyle problems encountered in students with intellectual disabilities (2). Students with intellectual disabilities engage in less physical activity than their typically developing peers, and a sedentary lifestyle is quite common (3). Sports training is associated with improvements in the motor functions like balance (5), muscle strength development and hand-eye coordination (6) of students with intellectual disabilities (7,6,8) but ıt is known that, there are many obstacles to the regular participation of students with intellectual disabilities in sports education (4). In addition, sports training can positively contribute to the motivation levels, anxiety levels, neurotic and behavioral problem levels of students with intellectual disabilities, as well as their psychological adaptation (9,8).

The positive effects of sports education on the development of students with intellectual disabilities and other types of special needs have been proven. However, these students encounter some problems in physical education and sports classes at school. These students cannot participate in physical activity sufficiently due to reasons such as not being included in the class, not being able to socialize with their peers, being excluded, having a negative experience in physical education and sports classes, structuring the course content, limited resources, architectural structure of the school and environmental factors (10,11,12,13,14,15,16).

Parents also play an important role in the participation of students with intellectual disabilities in sports education (17). In some research results, it has been stated that the support given by parents of special students may be low level (4) and, parents' expectations from physical education and sports lessons are met at a moderate level (18). It has been reported that parents with intellectual disability generally welcome their children's participation in sports activities (18,19,20) and that parents' awareness of the effects of sports is at a moderate level (21). Although parents with intellectual disability welcome students' participation in sports, it is known that these students struggle with various problems in sports participation due to policies, environment and personal problems (4,22,23,24,25). Therefore, it is limited in an important issue such as the evaluation of parents' views on the restrictions faced by students with intellectual disabilities in their participation in physical activities and sports education.However, the number of studies on the reasons for the difficulties encountered by students with intellectual disabilities in their participation in sports is not sufficient. For this reason, this study aims to examine the problems encountered by students with intellectual

disabilities who receive education and training in primary and secondary education levels in their participation in sports education, in terms of their parents' views.

For this reason, it seems important to examine the problems encountered by students with intellectual disabilities who receive education and training at primary and secondary education levels in their participation in sports education in terms of parents' views. Because revealing the problems faced by parents of students with intellectual disabilities can be a guide for the solution of these problems. In this context, in this study, the problems faced by the parents of students with intellectual disabilities were examined within the framework of the Socio-Ecological Model.

Socio-Ecological Model (SEM), based on the individual, the factors affecting the individual are categorized with certain systems: The closest system, which includes factors such as family, school and kinship ties, is the Microsystem; Exosystem, which includes factors such as relations with neighbors, social services, and the legal system; Mesosystem, which is responsible for the transition and/or relationship between the Microsystem and Exosystem; Macrosystem, which includes factors such as culture, values, and the effects of mass media (26) and finally, there is the Chronosystem, which expresses time from past to future (27). The system closest to the individual, SEM, focuses on the individuals themselves and divides the factors affecting their participation in physical activity from near to far, respectively, as individual (their own cognitive and affective process), interpersonal (the process with family and friends) and physical (the neighborhood, region, policies, culture) explains. These three dimensions holistically affect individuals' participation in physical activity (28, 29). Sallis et al. (30) describe five levels of impact regarding SEM: 1. Internal factors; It includes characteristics of the individual such as knowledge, attitudes, beliefs and skills. 2. Interpersonal factors; These are social networks and social support systems established with friends and family. 3. Institutional factors include organizations in society. Examples include day care centers, schools, universities and business environments. 4. Community factors refer to the rules and norms that exist formally or informally among individuals, groups, and organizations. 5. Public policy includes local, state, and federal policies. All factors at five impact levels have the potential to affect individuals' active participation in physical activity at different levels (31).

Since multiple factors must be considered together in the participation of students with intellectual disabilities in physical activities and sports training, this study is based on the SEM. SEM provides the opportunity to consider multiple factors in individuals' participation in physical activity. SEM is an exploratory model in understanding the multidimensional and complex factors that are effective in the decision-making and continuation process of individuals' participation in physical activity, as well as in their experiences (32,33). For this reason, the study was designed based on SEM's levels; the problems faced by intellectually disabled students were examined from the perspective of their parents. At this point, the findings and discussion of the study are structured based on the levels in SEM.

## METHOD

This study is a case study, one of the qualitative research approaches. It is a method that makes it possible to examine a single situation or event in depth through systematically collected data in order to reveal what is happening in the real environment (34).

Study group; the parents of intellectual disabled students studying in primary and secondary schools in different provinces of Turkey in the 2021-2022 academic year were included in the study. In this study, the sample group was reached by maximum diversity sampling method, which is one of the purposeful sampling methods. Accordingly, parents of students with different characteristics were included in the sample group. According to our purposive sampling, the criteria for inclusion of parents in the study are as follows (35):

1. The parents' students has mild and/or moderate intellectual disability, 2. The student with intellectual disability continues his/her education in general public schools (mainstreaming education-special sub-class) and special education and rehabilitation centres,

In addition, 12 of the participants' children with intellectual disabilities receive mainstreaming education in special education and rehabilitation schools, 6 in special subclasses and 12 with typically developing peers.

Verbal information about the purpose and procedure of the research was given to physical education teachers and administrators working in different provinces of Turkey. 40 participants voluntarily contacted the study team. However, 10 participants were not included in the study because they did not meet the criteria for their child's special needs and the type of service they received. Data saturation was reached after 30 individual interviews during the research process.

The demographic information of the participants is as follows: Their ages ranged between 29 and 58. Two of the participants are male and 28 of them are female. Six of them graduated from primary school, eight from secondary school, eight from high school and eight from bachelor's degree. 26 of the participants were married and four were single. All participants undertake the care and education of their child with intellectual disability. 24 participants have children with typical development and one participant has other children with special needs. When the monthly income levels of the participants are analysed, it is seen that 11 participants are below minimum wage, three participants are at minimum wage level and 16 participants are above minimum wage. The duration of receiving special education for children with intellectual disabilities varies between one year and 12 years.

**Data collection**

In this research, the interview technique was used as a data collection tool. A semi-structured interview form was used in the interviews. In the interviews, a semi-structured interview form was developed by the research team based on literature reviews, the opinions of two experts (who have conducted research with individuals with special needs in the field of Physical Education and Sports) and pilot interviews with three participants. Some examples of interview questions are as follows: 1. What kind of education does your child benefit from in the special education institution or school he/she attends? 2. Who provides sports education to your child at the special education institution or at the school he/she attends? 3. How do you think the teacher's approach to students with special needs is? 4. What are your views on the necessity of the child's participation in sports education? 5. Does your child face difficulties in terms of participation in sports education? If yes, what kind of difficulties does he/she face?

During the data collection process, three researchers conducted in-depth individual interviews. 20 of the interviews were held over the internet (Zoom and WhatsApp); 10 were held face-to-face. The interviews started with general information about the research, legal rights, and obtaining verbal permission. The interview then continued by asking the participants to describe their experiences with their intellectual disabled children in the education and training environment. Later, when the participants came to the opinion that there were parts of the interview process that were not understood by the researchers or that they needed to be explained in more depth, participants were asked the following question: "Can you explain this opinion in more detail?" (36). Examples of basic questions in the semi-structured interview form are as follows: "What are your views on the necessity of the child's participation in sports training?" "Does your child have difficulty participating in sports training? If your answer is yes, what difficulties do you encounter?" Interviews lasted between 30 minutes and 40 minutes. The interviews were recorded with the knowledge of the participants.

**Data analysis**

The data obtained from the participants were subjected to inductive thematic analysis and analyzed by creating codes, categories and themes. Common themes and patterns among the participants were identified according to the six-stage thematic analysis method suggested by Braun and Clarke (37). The steps to create themes are as follows: Raw data was transcribed electronically, word for word, by two researchers. Three researchers read the transcribed data until they became familiar with the data. Afterwards, the data was coded separately by three researchers, independently of any expression or sentence. Each code was examined and compared with the coding of other researchers. Similar codes were categorized to capture common meanings of the codings. As a common decision of the research team, the categories were grouped under four main themes. These emerging themes were compatible with SEM, the theoretical framework of the research. Theme titles „individual problems", "social problems", "problems arising from the physical environment", and

"problems arising from politics" were determined. Finally, care was taken to ensure that the theme titles were compatible with the content and that the content of the themes was supported with verbatim quotations in their explanations. Quotations that best exemplify the content of each theme have been selected.

**Credibility**

In order to ensure the credibility of the data in this research, expert opinions were taken in creating the items of the semi-structured interview form. In the findings section, participants' opinions are expressed with direct quotes. The data obtained from the participants was submitted for participant confirmation. Afterwards, data triangulation was performed. The data obtained was coded separately by three experts simultaneously and compared with the codes of other researchers. According to Yıldırım and Şimşek (36), it is important to determine the reliability of the coding made from the same data. This inter-coder reliability must be at least 70% in research. According to Miles and Huberman (38), the consensus between coders should be at least 80%. In this study, the inter-coder reliability of analyzes made by different researchers was calculated by using Miles and Huberman's (38) reliability calculation formula (Reliability = Number of Agreements / (Agreement + Number of Disagreements) × 100). The intercoder reliability between three researchers was 0.97.

As a result, both methods supported the credibility of the data obtained. The method is explained in detail to ensure the transferability of the research results in a similar environment. The data obtained was described in detail. However, in order to ensure the confirmability of the research, the interview records were transcribed electronically. The coding made by the researchers, the notes and inferences created during the reporting phase are stored on a hard drive by the responsible researcher.

**Ethical approval and institutional permission**

For this research from Istanbul Rumeli University Ethics Commission (Ethics Commission permit No. 24.03.2022-2022-03 dated 24.03.2022, Article No. 05) ethical permission numbered E-53938333-050-13678 was obtained.

## FINDINGS

According to parents' views, 4 themes emerged as a result of the thematic analysis of the data regarding the problems faced by children with intellectual disabilities in their participation in physical activity. These are individual problems, social problems, problems caused by the physical environment and problems arising from Politics (Table 1).

**Table 1.** Themes and Categories of Parents 'Views

| Themes | Categories | f | Themes | Categories | f |
|---|---|---|---|---|---|
| **Individual problems** | Parents feeling helpless | 30 | **Problems caused by the physical environment** | Limited social activity opportunities | 30 |
| | Parents' concerns about the future | 30 | | Limited sports opportunities | 14 |
| | Parents feeling lonely | 30 | | Limited transportation facilities | 14 |
| | Parents feeling guilty | 30 | | Inappropriate architectural structure of schools | 14 |
| | Parents feeling inadequate | 28 | | Limited equipment and materials | 14 |
| | Insufficiency of financial means | 14 | | | |
| **Social problems** | Social problems faced by parents | 30 | **Problems arising from Politics** | Limited class hours | 30 |
| | Parent's perception that he is not accepted by society | 30 | | Professional competence and competence limitation | 20 |
| | Parent's perception that his child is not accepted by society | 30 | | Inadequacy of the curriculum | 20 |
| | Problems caused by socialization | 30 | | Limited number of teachers | 20 |
| | Communication problems | 30 | | Educators do not like their jobs | 20 |
| | Problems originating from the parent's own family | 15 | | | |

Theme 1 Individual problems*:* According to the findings obtained within the scope of the theme of individual problems, participants have concerns about the opportunities they can provide to their children with intellectual disabilities and their own emotional processes. They feel inadequate, helpless, guilty, and abandoned by their families and society. Parents aim to enable their children with intellectual disabilities to live independently in society. However, they are concerned about their children's health. They state that lack of financial means restricts the access of children with intellectual disabilities to sports education. They think that this situation negatively affects the physical development of the intellectual disabled child.

All participants feel inadequate and helpless because they cannot pay enough attention to their children with intellectual disabilities. Parents stated that they did not have sufficient financial means for the education and training of their children with intellectual disabilities. Parents stated that their children with intellectual disabilities cannot receive adequate sports training in line with the opportunities offered by the state. According to parents, their children need support because their access to sports education is limited. A parent's opinion on this is as follows:

P2: "We are slightly above the minimum wage. I sent him to a public education course. I also sent him to the municipality's course. I even took a private course. I am tired."I want my child to be well, I want him to be self-sufficient, I want him to have no movement restrictions."

All participants said that they were left alone by their families and relatives after their child was diagnosed with intellectual disability. Some participants even emphasized that they could not take care of their other children because they could not get support from their families. According to parents, children with intellectual disabilities need more attention than other children. Therefore, parents devote most of their time to their children with intellectual disabilities. Parents think that they cannot be good parents because they cannot show the necessary attention to their other children. A parent's opinion on this is as follows:

P3: "I have insufficient funds. My other children need me too. I can't get enough. My mother-in-law thinks I'm not a good mother."

Parents emphasized that the development of their children with intellectual disabilities can be supported through sports education, thus contributing to their continued life as an independent individual in society. However, parents emphasized that they had problems accessing sports education for their special children. For this reason, parents stated that they were worried about the future of their children with intellectual disabilities. A parent's opinion on this is as follows:

P10: "It's too far, we can't go. I cannot use public transportation with my child. How will my child reach the level of self-sufficiency?"

Some parents reported that they had to stay strong for their children with intellectual disabilities. However, they said that they could not manage their situation without the help of any medication. For this reason, some parents emphasized that they use antidepressant medications. A parent's opinion on this is as follows:

P7: "My child cannot control his impulses, he is obsessed. We need support. I am sometimes good and sometimes bad. I use antidepressants."

As a result of the analysis, it was seen that some female parents thought that the intellectual dysfunction of their children with intellectual disabilities might be due to them. A parent's opinion on this is as follows:

P5: "Is it my fault? Did I make mistakes while pregnant? I had problems with myhusbund. But I didn't smoke or drink alcohol, but I was very stressed during my pregnancy."

Theme 2 Social problems:Within the scope of the theme of social problems, all participants stated that they and their children were excluded by their peers and society. Parents emphasized that they and their children with intellectual disabilities do not feel like they belong to society. Parents stated that the problems they experienced were caused by the social environment, including their immediate surroundings. Parents stated that they had difficulty in going out, that social support was not provided, and that people looked at them with pity and strangeness when they went out with their children with intellectual disabilities. For this

reason, parents said that they could not see themselves as a part of society. Furthermore, they reported that their children had limited mobility. An excerpt from parents' opinions regarding this is as follows:

P9: "They look at us with pity from outside. Some of my neighbors have reduced communication. Shouldn't we support each other?"

According to some participants, exclusion of children with intellectual disabilities also occurs in the school environment. While some of the participants stated that the teachers and school principals of their children with intellectual disabilities experienced problems, some of them stated that they were satisfied with the teaching of their children with intellectual disabilities.

P6: "My child's first teacher was very good. He was kind and patient with my child. However, our current teacher is impatient with my child."

Parents stated that their children with intellectual disabilities experienced problems due to their inability to socialize with typically developing students, their inability to receive sports training, and their expectation of more attention from their teachers. A parent's opinion on this is as follows:

P7: "I accompany my son. The teacher cannot pay special attention. I expect the teacher to be more patient. I want him to spend more time with my child. Some teachers behave very well. We cannot attend physical education and fine arts classes. The classroom teacher does not want us to participate."

Some participants stated that they could not get their intellectually disabled child accepted by their own family. He especially emphasized that his child with intellectual disabilities wasignored. Some participants emphasized that they were ignored by their neighbors and did not communicate with them. A parent's opinion on this is as follows:

P30: "Even my own parents do not accept it. I look at our genetics and no one has it. But both of my children have it. I want help. I want opportunity. I want sports education for their future."

Theme 3 Problems caused by the physical environment: Within the scope of the theme of problems arising from the physical environment, participants stated that their children with intellectual disabilities could not participate in sports training or could only participate in limited numbers. Parents reported that this was due to the lack of sports activities suitable for their special child or the fact that suitable sports courses were located far away from where they are living. It has also been stated that the tools, equipment and materials to be used in the current courses are insufficient and the course environment cannot be adapted to the student with special needs due to the physical structure of the school.

All participants stated that their children with intellectual disabilities have limited opportunities in sports education and social activities. Some participants reported that they enabled their children to participate in social activities within their own means, because the social activity planning that children participate in at schools is not sufficient. It has been stated that the reason for this is the environment where the schools are located, the lack of transportation to the schools, the architectural structure of the school and the lack of materials to be used in lessons. Parents' opinions on the subject are as follows:

P13: "There are no sports or social activities at the school my child attends. I cannot reach other institutions by public transportation."

Participants claimed that their children encountered indifference in the classroom environment, that the course could not be adapted to the student, that there was a lack of materials, tools and equipment for the course, and that the schools were physically inadequate. Some participants emphasised that their children were not included in the lesson because of their disabilities. Some participants reported that they were left alone with their child with intellectual disability in the special lower class. A parent's opinion on this is as follows:

P7: "I stay alone with my child in the classroom environment. Also, my child does not receive sports training, because there was no suitable material."

Theme 4 Problems arising from Politics:Within the scope of the theme of policy-related problems, participants stated that the curriculum for their child with intellectual disability was inadequate; it has been

suggested that the inefficiency of the lessons, the inadequacy of the lesson time allocated for sports education, and the teacher's inability to adapt the lesson due to the large number of students in the class. For these reasons, some participants claimed that their special children encountered negative attitudes in the classroom environment. Parents' opinions regarding this are as follows:

P1: "Lessons are 20% effective, 80% ineffective. The physical education teacher cannot care about my child."

P3: "There is no sports-related activity. I don't know if the teachers are inadequate or not. My child is being ignored"

P28: "It's hard work, I agree. Sometimes we, as a family, have a hard time. We need teachers who will do this job wholeheartedly. My child goes to school. We cannot get efficiency."

P17: "Classroom teachers give physical education lessons. But he doesn't want us to participate."

## DISCUSSION AND CONCLUSION

The aim of this research is to examine the problems encountered by students with intellectual disabilities in their participation in sports education in terms of parents' opinions. The results of the analysis of the data obtained were grouped under 4 main themes in accordance with SEM: individual problems, social problems, problems caused by the physical environment and problems caused by politics.

Individual problems: According to the literature, the opinions, attitudes, alexithymic states and social skill levels of their parents affect the participation of students with intellectual disabilities and other special needs in physical activities and sports education and parents are aware of the importance of sports education (4, 17, 39).

In this study, parents are aware of the importance of their children's participation in sports education for their development, despite their individual problems (parents feel helpless, worry about the future, feel lonely, feel guilty, feel inadequate, lack of financial means). Parents do not consider the sports education provided by the state to be sufficient for their children with intellectual disabilities, they try to provide sports education support with their own means. Some parents receive information from government institutions such as the municipality and public education courses; some parents try to receive training from paid sports centers by applying for scholarships to various companies. Parents with medium and high financial status receive support from private courses, paid teachers, life coaches or life leaders.

Another point that draws attention here is that sports education is received from people who are not sports educators. As can be understood from all these efforts, according to parents, the positive effects of sports education on their children are too important to be ignored. For this reason, it is thought that it is important to increase state support according to the income level of parents or to increase the number of courses where children with intellectual disabilities can receive free sports training in line with their needs. This application can make it easier for parents who do not have financial means to access sports training for their children with special needs, and increasing the number of free sports courses can also eliminate the transportation problem.

Social problems: Studies have shown that there is a significant and negative relationship between the level of perceived social support and symptoms of depression (40). As in this study, the problems encountered by students with intellectual disabilities in accessing sports education include social problems and social exclusion (41,42).

Under the theme of problems arising from social problems, it has been determined that the social problems faced by the parent are the parent's perception that he is not accepted by the society, problems arising from socialization, communication problems, and problems originating from the parent's own family. Parents try to make their intellectually disabled children and themselves accepted by society. However, the negative attitudes they encounter in their own families and social circles put parents in an even more difficult situation. They are not getting the support they need. He is even ostracized by society. This situation causes parents to become isolated from their social environment and negatively affects the social development of children with

intellectual disabilities. There is discomfort due to social pressure. These negative attitudes have a negative psychological effect, especially on some female parents.

It is necessary to raise awareness about intellectual disability in society and achieve social acceptance. For this, the number of inclusive / integrated social events should be increased. The activities not only integrate typically developing children with children with special needs; parents should also be actively involved. In such activities, guidance from special education, psychology and physical education experts should be provided. Thus, by providing an opportunity for social awareness and acceptance, a tolerant approach can be created within the framework of mutual understanding and empathy.

The source of problems by the physical environment: Studies show that the problems encountered by students with intellectual disabilities in accessing sports education due to the physical environment include inappropriate environ intellectual conditions and lack of transportation (43, 42). The subheadings obtained in this research within the scope of the theme of problems arising from the physical environment are limited social activity opportunities, inadequacy of sports opportunities, inadequacy of transportation facilities, architectural structure of schools, and lack of equipment and materials. It is thought that students with intellectual disabilities have limited access to direct social activities due to the physical environment. It is thought that the number of school types should be increased and the school types should be arranged to include each other in terms of physical structure. This may enable students with typical development and students with intellectual disabilities and other special needs to understand each other and integrate with each other in their free time.

The source of problems by the Politics: In the studies conducted, the problems encountered by students with intellectual disabilities in accessing sports education include problems arising from politics; it is stated that the activities do not match the child's ability, the need for special support, the lack of programming, the lack of trained personnel, the inadequacy of the curriculum and the inability to adapt the curriculum to the field of application (39,42). Columna et al., (44) in their systematic review covering the dates between 2007 and 2018, revealed that parents encounter many obstacles (e.g. lack of programs, lack of time, children's disabilities) that negatively affect the participation of their children with intellectual disabilities and other special needs in physical activities and sports training. Results have been obtained that physical education teachers stated that students with intellectual disabilities cannot receive support from parents regarding sports education (4). This situation is revealed in more detail with the results of this study.

When we look at the results of this research, it was substantiated as insufficiency of lesson hours, professional competence and competency, inadequacy of the curriculum, and the quantity of the number of teachers. According to the results obtained, parents experience problems due to limited access to schools suitable for students with intellectual disabilities, the education system, curriculum, inability to adapt the course, lack of interest, and lack of materials that can be used in the course. Particularly, classroom teachers' lack of interest in sports education can be given as an example of this situation. However, negative attitudes towards special children encountered in the school environment also negatively affect parents. According to the parents, the education system should be restructured, inclusive education should be applied to students with intellectual disabilities after individual education, when their level progresses, educator competencies should be increased, educators should be supervised, and teachers who are sympathetic towards students with intellectual disabilities should be preferred, because parents think that the physical and motor development of students with intellectual disabilities can be supported through sports education. However, parents are of the opinion that the student with intellectual disability cannot receive sports education or cannot receive it at a sufficient level.

As a suggestion to teacher training programs in Turkey, courses on how to teach physical activity skills to individuals with special needs can be included more in physical education teaching programs. An internship requirement may be required for applications to teacher training programs (46). This may provide the teacher candidate with the opportunity to gain knowledge and experience about the teaching profession. The teacher candidate knows the content of this profession and may have the opportunity to evaluate whether it is suitable for him or not before choosing to study in the training program. Again, oral evaluation may be required in teacher training programs. Thus, the communication skills of the teacher candidate could be evaluated and the opportunity to determine why he/she prefers this profession can be provided.

## CONCLUSION

The most important finding obtained from the research is that, according to parents, the reason why their children with intellectual disabilities cannot participate in physical activities and sports training is primarily due to problems arising from society. According to SEM, the factors identified as society-related problems in this research can be evaluated within the exosystem and macro system. Based on this model, which focuses on the individual and examines the effects on the individual, it can be said that the two systems located outside the center have the greatest impact on individuals with intellectual disabilities. Also, it was found that parents of students with intellectual disabilities have a positive attitude towards physical activities and sports education, and they are aware of the importance of their children with intellectual disabilities to participate in physical activities and sports education; however; they face individual problems (financial impossibility, feeling lonely, helpless, inadequate and guilty), social problems (social pressure, lack of acceptance, inability to socialise and communicate), problems arising from the physical environment (limitation of social activity opportunities, inadequacy of sports facilities, inadequacy of transportation facilities, architectural structure of schools, lack of equipment and materials) and problems arising from politics (inadequacy of course hours, professional competence and competence, inadequacy of curriculum, quantity of teachers, educators' dislike of their jobs).

As a suggestion, increasing the number of school types and arranging the school types to include each other in terms of physical structure, organizing school clubs for peer education and including activities where children can work together, organizing teacher training programs, diversification of in-service training, increasing state support according to the income level of parents or increasing the number of courses where children with mental disabilities can receive free sports training in line with their needs, it is recommended to organize events that will increase public awareness.

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# Examining the Self-Efficacy Levels of Tennis Officials

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**Abstract**

Referees are considered the third most important part of competitive sports after players and coaches. Psychological, sociological, and physiological factors may affect the performance of referees. The aim of the study is to examine the self-efficacy levels of tennis officials on selected dimensions. This is a descriptive study that reveals the self-efficacy levels of tennis officials. The research participants comprised 43 female (35%) and 80 male (65%) officials working in international tennis tournaments in 2022 and 2023. "Personal Information Form" which includes demographic information of the officials, and the "Self-efficacy Scale" developed by Myers et al. (33) are the data collection tools for the study. For the data analysis of paired groups, a t-test was used. A one-way analysis of variance (ANOVA) and Tukey's post hoc test were employed for more than two groups. In accordance with the analysis result, no statistically significant difference was found in the self-efficacy levels of the officials based on gender, age, and position in the tournament. It was seen that the mean scores of international officials in the sub-dimensions of game knowledge and communication significantly exceeded those of the national officials. Additionally, it was noted that the scores of the officials in these sub-dimensions improved as the number of years they worked increased. As a result, the increase in the time spent officiating increases the officials' self-efficacy level.

**Keywords:** Self-efficacy, tennis official, referee self-efficacy.

**Özet**

**Tenis Hakemlerinin Öz-Yeterlik Düzeylerinin İncelenmesi**

Hakemler, rekabetçi sporların oyuncular ve antrenörlerden sonra üçüncü en önemli parçası olarak kabul edilir. Psikolojik, sosyolojik ve fizyolojik faktörler hakemlerin performansını etkileyebilmektedir. Araştırma, tenis hakemlerinin öz-yeterlik düzeylerini seçilen boyutlarda incelemeyi amaçlayan tanımlayıcı bir çalışmadır. Araştırmanın katılımcılarını 2022 ve 2023 yıllarında uluslararası tenis turnuvalarında görev yapan 43 kadın (%35) ve 80 erkek (%65) hakemler oluşturmuştur. Veri toplama araçları olarak hakemlerin demografik bilgilerini içeren "Kişisel Bilgi Formu" ve Myers vd. (33) tarafından geliştirilen "Öz-yeterlik Ölçeği" kullanılmıştır. Veri analizinde ikili gruplar için t-testi, ikiden fazla gruplar için ise tek yönlü varyans analizi (ANOVA) ve Tukey (post hoc) testi kullanılmıştır. Yapılan analiz sonuçlarına göre hakemlerin cinsiyet, yaş ve turnuvadaki pozisyonuna göre öz yeterlilik düzeylerinde istatistiksel olarak anlamlı farklılık bulunamamıştır. Uluslararası hakemlerin oyun bilgisi ve iletişim alt boyutlarındaki ortalama puanlarının ulusal hakemlerin puan ortalamalarını önemli ölçüde aştığı

görülmüştür. Ayrıca hakemlerin çalıştıkları yıl arttıkça alt boyutlardaki puanlarının da arttığı gözlemlenmiştir. Sonuç olarak hakemlikte geçirilen sürenin artması, hakemin öz-yeterlik düzeyininin artmasını da sağlar denilebilir.

**Anahtar Kelimeler:** Öz yeterlilik, tenis hakemi, hakem öz yeterliliği.

## INTRODUCTION

Referees are considered the third most important part of competitive sports after players and coaches (9). Sports participants expect high-quality sports refereeing, including players, coaches, and spectators. The cognitive and physical demands required for effective refereeing are challenging (2). It is difficult to measure the performance of referees when comparing athletes and coaches, where wins and losses may significantly influence the assessment (38). Psychological, sociological, and physiological factors may affect the performance of referees. It is crucial to conduct studies on the psychological well-being of referees, who play a significant role in sports competitions, to address the limited number of existing studies (26, 35). One of the determinants affecting referee performance is self-efficacy. There are several studies which were about how self-efficacy affects the referees on different dimensions, such as the relationship between performance and self-efficacy (20), job satisfaction (40), teamwork (12), and team adaptation (13). Referees must perform many duties to avoid making mistakes and succeed under pressure in the matches they officiate (41). Leveaux (29) emphasized the significance of the refereeing profession by stating that referees must make decisions by quickly filtering information from multiple sources. In certain instances, these decisions made by referees can significantly alter the outcome of the competition. Therefore, referees must be alert and highly concentrated at every game moment.

The rapid development of modern amateur and professional sports places a crucial responsibility on referees working in competitions. A referee must make fair decisions and act without prejudice (36). To be a good referee, numerous tasks must be performed under pressure to fulfill the roles successfully in the competition and avoid making mistakes in decision-making (33). Every sport has its categories of referees. In tennis, the referee/supervisor, chief umpire, chair umpire, and line umpire are the officials who help the game run smoothly at any level. The umpires are responsible for upholding the rules of tennis and ensuring that a match is played with fairness and sportsmanship (16). There are two types of certifications for umpires: one is given by national associations, and the other is given by the International Tennis Federation (ITF). Every country has a system to certify umpires, known as "National Umpires," internationally. The ITF administers three certifications to umpires: green, white, and international badges. International badges with bronze, silver, and gold levels are awarded to umpires. As in all other branches, high performance is expected from umpires in tennis.

One factor that plays a crucial role in meeting high-performance expectations and fulfilling referees' duties is self-efficacy (11). Bandura (3) defined self-efficacy as "the belief in one's capabilities to organize and execute the actions necessary to achieve specific goals." Gilson and Feltz (14) interpreted this definition as self-efficacy being not about one's abilities but rather about one's belief in realizing the skills one already possesses. On the other hand, Myers et al. (33) defined self-efficacy as individuals' beliefs about their ability to manage their performance levels in specific situations successfully. Additionally, Spencer (38) stated that this belief reflects an individual's expected performance. Self-efficacy is the belief that one can accomplish a specific task. This belief affects whether or not the person attempts the task-related behaviour, their persistence in that behaviour, their motivation for the behaviour, and ultimately their performance (28). According to self-efficacy theory, perceived self-efficacy influences stress and anxiety through belief that one has personal control of behaviors, thoughts, and emotions. Thus, different people with analogous abilities or the same person under different stipulations may perform poorly, adequately, or exceptionally depending on fluctuations in personal efficacy beliefs (3). From the theoretical perspective, referees' self-perception is an vital decision-making mechanism in terms of their good or bad performance. Therefore, among other things, keeping high self-efficacy levels will help them to perform well. A lack of self-efficacy can lead to inattentiveness, evaluation errors, delayed reactions, and ultimately, stress and burnout (15). Referee self-efficacy is the degree to which an umpire believes they can officiate the match well (33). Another definition of

referee self-efficacy is the belief that referees can perform well in their roles (15). Myers et al. (33) indicated that referee self-efficacy comprises four dimensions: game knowledge, decision-making, pressure, and communication. "Game knowledge (GK) is defined as the referee's confidence in their knowledge of the sport." Decision-making (DM) is defined as a referee having confidence in their decision-making ability. Pressure (PR) is defined as a referee's confidence in their ability to remain uninfluenced by pressure. Communication (CM) is the referee's confidence in communicating effectively.

Referees are actors from whom high performance is always expected. Referees can only perform well by combining many factors, such as knowledge of the rules, communication with players, self-confidence, and self-efficacy. Tennis is among the top five most-watched sports (42, 43). Despite this popularity, there are only a few studies in the literature about tennis officials, specifically about their self-efficacy. The purpose of the study is to examine the self-efficacy levels of tennis officials on selected dimensions. In this respect, answers are sought to the following questions:

a) Is there a difference in the self-efficacy levels of tennis referees in terms of gender?

b) Is there a difference in the self-efficacy levels of tennis referees in terms of age?

c) Is there a difference in the self-efficacy levels of tennis referees in terms of the ITF badge?

d) Is there a difference in the self-efficacy levels of tennis referees in terms of experience?

e) Is there a difference in the self-efficacy levels of tennis referees in terms of position in the tournament?

## METHOD

The research population comprises 1.517 officials registered in the ITF Officiating Portal in 2023. The sample of the research comprises 43 (35.0%) female and 80 (65.0%) male tennis officials determined by the stratified sampling methodology in which the elements of a heterogeneous population are classified into mutually exclusive and exhaustive subgroups (strata) based on one or more important characteristics (10). As a stratification criterion, referees were required to have worked in at least three tournaments in the last year. According to Table 1, the highest participation was seen in the age category of 40-49, with 35 (28.5%) officials. Albeit the participation levels of officials are close to each other, White Badge umpires had the highest participation with 54 (43.9%). In terms of experience, the highest participation was seen in 50 (40.7%) officials who had worked for ten years or more. Of the participants, 28 (22.8%) work as line umpires, 73 (59.3%) work as chair umpires, and 22 (17.9%) work as referees/supervisors.

**Table 1**. Demographic Characteristics of Participants

| Variables | Groups | f | % |
|---|---|---|---|
| **Gender** | Female | 43 | 35,0 |
| | Male | 80 | 65,0 |
| | **Total** | **123** | **100,0** |
| **Age** | 20-29 | 28 | 22,8 |
| | 30-39 | 33 | 26,8 |
| | 40-49 | 35 | 22,5 |
| | 50 and above | 27 | 22,0 |
| | **Total** | **123** | **100,0** |
| **ITF Badge** | National | 43 | 35,0 |
| | White | 54 | 43,9 |
| | International | 26 | 21,1 |
| | **Total** | **123** | **100,0** |
| **Experience** | 0-3 years | 21 | 17,1 |
| | 4-6 years | 26 | 21,1 |
| | 7-9 years | 26 | 21,1 |
| | 10 years and above | 50 | 50,0 |
| | **Total** | **123** | **100,0** |
| **Position** | Line Umpire | 28 | 22,8 |
| | Chair Umpire | 73 | 59,3 |
| | Referee/Supervisor | 22 | 17,9 |
| | **Total** | **123** | **100,0** |

**Research Design**

This research is a descriptive study that reveals the self-efficacy levels of tennis officials. Descriptive research is a model used to analyze a situation, make evaluations based on standards, and uncover potential relationships between events (25).

**Statistical Analysis**

The SPSS 21 software package was used for statistical analysis. A total of 217 referees completed the scale, but 94 data were excluded from the study because they did not meet the stratified sampling criteria. First, whether the data was normally distributed was checked. If the skewness and kurtosis values are between -1.5 and +1.5, the data is considered to have a normal distribution (39). While the skewness and kurtosis values of the scale itself are -0.629 and -0.331, the values of the sub-dimensions are as follows: game knowledge (-0.646 and -0.773), decision making (-0.880 and -0.380), pressure (-0.915 and -0.151), and communication (-0.701 and 0.271). Since the skewness and kurtosis values of the scales remained within acceptable limits, it was assumed that the data were normally distributed. Therefore, a t test was used for the gender variable. Since the variables age, ITF badge, experience, and position in the tournament were more than two groups, the ANOVA test was used. Tukey (post-hoc) was also used to find differences between groups.

**Data Collection Tool**

One of the data collection tools is the "Personal Information Form," which consists of five demographic questions, including age, gender, ITF badge, experience, and position in the tournament. The other data collection tool is the "Referee Self-Efficacy Scale," developed by Myers et al. (33). The data was collected between May 5, 2023, and June 20, 2023, by physically distributing the scales and filling out the online form. The suitability of the number of samples was tested with G power software (version 3.1.9.7). It was determined that 112 referees for the ANOVA with a maximum of 4 groups with an effect size of 0.4 (medium) and for the t-test with a 0.6 effect (medium) size to be applied to pairs, 122 referees would be sufficient (19). The scale measures the referees' confidence level, which refers to the extent to which referees believe they can perform successfully. The scale comprises 13 items and four sub-dimensions, namely, game knowledge (GK), decision-making (DM), pressure (PR), and communication (CM). These are the sub-dimensions. The scale is a 5-point Likert Type. A score of 1 indicates low confidence, while a score of 5 indicates high confidence. The Referee Self-Efficacy Scale was developed for referees in team sports. Since tennis is a sport played in three formats - singles, doubles, and mixed doubles - it was deemed appropriate to apply this measurement tool to tennis officials. The Cronbach's Alpha value of the scale was found to be 0.851. The fact that this coefficient is above 0.70 indicates that the scale is reliable (5).

**Ethical approval and institutional permission**

The ethics committee approval of the study was acquired with the decision of the Ethics Committee of Mehmet Akif Ersoy University, dated 03/05/2023, and numbered 2023/05.

## FINDINGS

In this part of the study, the data regarding the sub-dimensions of the "Referee Self-Efficacy Scale" were analyzed according to the research questions, and the results were tabulated and evaluated.

**Table 2.** Analysis of Tennis Umpires' Views on Self-Efficacy by Gender Variable

| Variables | Groups | N | X | Sd | t | df | p | Cohen's d |
|---|---|---|---|---|---|---|---|---|
| **Game Knowledge** | Female | 43 | 4,54 | ,37 | -,569 | 121 | ,570 | |
| | Male | 80 | 4,59 | ,38 | | | | |
| **Decision Making** | Female | 43 | 4,20 | ,68 | -2,061 | 121 | ,068 | |
| | Male | 80 | 4,42 | ,47 | | | | |
| **Pressure** | Female | 43 | 4,01 | ,84 | -2,259 | 121 | ,042* | ,41 |
| | Male | 80 | 4,32 | ,63 | | | | |
| **Communication** | Female | 43 | 4,33 | ,51 | -1,104 | 121 | ,272 | |
| | Male | 80 | 4,43 | ,45 | | | | |

p<0,05

As shown in Table 2, when analyzing the referee self-efficacy scale based on gender, there were no significant differences found in the mean scores of the officials' opinions regarding game knowledge, decision-making, and communication sub-dimensions. However, a significant difference was found in the pressure dimension, indicating that male tennis referees had higher self-efficacy related to handling pressure than their female counterparts. Cohen's d value indicates that the significant difference between male and female officials is a medium effect size, which means a research finding has moderate significance (6).

**Table 3.** Analysis of Tennis Umpires' Views on Self-Efficacy by Age Variable

| Variables | Groups | N | X | F | p |
|---|---|---|---|---|---|
| **Game Knowledge** | 20-29 years | 28 | 4,47 | 1,12 | 0,344 |
| | 30-39 years | 33 | 4,59 | | |
| | 40-49 years | 35 | 4,65 | | |
| | 50 and above | 27 | 4,55 | | |
| | Total | 123 | 4,57 | | |
| **Decision Making** | 20-29 years | 28 | 4,16 | 2,401 | 0,071 |
| | 30-39 years | 33 | 4,4 | | |
| | 40-49 years | 35 | 4,29 | | |
| | 50 and above | 27 | 4,55 | | |
| | Total | 123 | 4,35 | | |
| **Pressure** | 20-29 years | 28 | 4,07 | 2,49 | 0,064 |
| | 30-39 years | 33 | 4,32 | | |
| | 40-49 years | 35 | 4,04 | | |
| | 50 and above | 27 | 4,47 | | |
| | Total | 123 | 4,21 | | |
| **Communication** | 20-29 years | 28 | 4,2 | 2,043 | 0,112 |
| | 30-39 years | 33 | 4,45 | | |
| | 40-49 years | 35 | 4,42 | | |
| | 50 and above | 27 | 4,49 | | |
| | Total | 123 | 4,39 | | |

$p<0,05$

According to Table 3, the one-way analysis of variance showed no significant difference among the mean scores of game knowledge, decision making, pressure, and communication based on the age variable of tennis umpires, as observed from the sub-dimensions of the referee self-efficacy scale.

**Table 4.** Analysis of Tennis Umpires' Views on Self-Efficacy by ITF Certification Variable

| Variables | Groups | N | X | F | p | Difference (Tukey) | Eta² ($n^2$) |
|---|---|---|---|---|---|---|---|
| **Game Knowledge** | National[a] | 43 | 4,44 | 4,419 | ,014* | C>A | 0,06 |
| | White[b] | 54 | 4,63 | | | | |
| | International[c] | 26 | 4,67 | | | | |
| | Total | 123 | 4,57 | | | | |
| **Decision Making** | National[a] | 43 | 4,19 | 2,484 | 0,088 | | |
| | White[b] | 54 | 4,43 | | | | |
| | International[c] | 26 | 4,44 | | | | |
| | Total | 123 | 4,35 | | | | |
| **Pressure** | National[a] | 43 | 4,08 | 1,151 | 0,32 | | |
| | White[b] | 54 | 4,3 | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | International[c] | 26 | 4,26 | | | | |
| | Total | 123 | 4,21 | | | | |
| **Communication** | National[a] | 43 | 4,21 | 5,309 | ,006* | C>A | 0,08 |
| | White[b] | 54 | 4,48 | | | | |
| | International[c] | 26 | 4,52 | | | | |
| | Total | 123 | 4,39 | | | | |

p<0,05

According to Table 4, based on the ITF badge level of tennis umpires, the analysis reveals that there is no significant difference in the sub-dimensions of decision-making and pressure. However, there is a significant difference in the sub-dimensions of game knowledge and communication sub-dimensions. Post-hoc analysis demonstrates a significant difference between the international umpires and national umpires, favouring the international umpires. For game knowledge and communication sub-dimensions, the Eta Squared (n2) values indicate that the significant difference between International and National referees is a medium effect size, which means a research finding has moderate significance (6).

**Table 5.** Analysis of Tennis Umpires' Views on Self-Efficacy by Experience Variable

| Variables | Groups | N | X | F | p | Difference (Tukey) | Eta² (n²) |
|---|---|---|---|---|---|---|---|
| **Game Knowledge** | 0-3 years[a] | 21 | 4,32 | 6,08 | ,001* | D>A | 0,13 |
| | 4-6 years[b] | 26 | 4,51 | | | | |
| | 7-9 years[c] | 26 | 4,57 | | | | |
| | 10 years and above[d] | 50 | 4,71 | | | | |
| | Total | 123 | 4,57 | | | | |
| **Decision Making** | 0-3 years[a] | 21 | 3,77 | 19,969 | ,000* | D>A, B and C | 0,33 |
| | 4-6 years[b] | 26 | 4,23 | | | | |
| | 7-9 years[c] | 26 | 4,28 | | | | |
| | 10 years and above[d] | 50 | 4,69 | | | | |
| | Total | 123 | 4,35 | | | | |
| **Pressure** | 0-3 years[a] | 21 | 3,5 | 16,057 | ,000* | D>A, B and C | 0,28 |
| | 4-6 years[b] | 26 | 4,11 | | | | |
| | 7-9 years[c] | 26 | 4,14 | | | | |
| | 10 years and above[d] | 50 | 4,6 | | | | |
| | Total | 123 | 4,21 | | | | |
| **Communication** | 0-3 years[a] | 21 | 3,98 | 13,3 | ,000* | D>A, B and C | 0,25 |
| | 4-6 years[b] | 26 | 4,27 | | | | |
| | 7-9 years[c] | 26 | 4,37 | | | | |
| | 10 years and above[d] | 50 | 4,64 | | | | |
| | Total | 123 | 4,39 | | | | |

p<0,05

According to Table 5, the analysis reveals significant differences in self-efficacy across all four dimensions based on the experience levels of tennis umpires. Umpires with 10 years and above experience have significantly higher self-efficacy in game knowledge, decision-making, pressure, and communication compared to those with less experience. For decision-making, pressure, and communication, there is a progressive increase in self-efficacy from those with 0-3 years to those with 4-6 years and 7-9 years of experience. Umpires with 7-9 years of experience also have significantly higher self-efficacy than those with 0-3 years, as do those with 4-6 years of experience when compared to those with 0-3 years. The Eta Squared (n2) values indicate that the difference between groups is a large effect size, which means a research finding has practical significance (6). This suggests that experience may be a contributing factor to increased self-efficacy among tennis umpires.

**Table 6.** Analysis of Tennis Umpires' Views on Self-Efficacy by Position Variable

| Variables | Groups | N | X | F | p |
|---|---|---|---|---|---|
| **Game Knowledge** | Line Umpire | 23 | 4,51 | 0,645 | 0,527 |
| | Chair Umpire | 78 | 4,58 | | |
| | Referee/Supervisor | 22 | 4,63 | | |
| | Total | 123 | 4,57 | | |
| **Decision Making** | Line Umpire | 23 | 4,22 | 1,322 | 0,271 |
| | Chair Umpire | 78 | 4,41 | | |
| | Referee/Supervisor | 22 | 4,29 | | |
| | Total | 123 | 4,35 | | |
| **Pressure** | Line Umpire | 23 | 4,17 | 0,416 | 0,661 |
| | Chair Umpire | 78 | 4,26 | | |
| | Referee/Supervisor | 22 | 4,11 | | |
| | Total | 123 | 4,21 | | |
| **Communication** | Line Umpire | 23 | 4,27 | 1,652 | 0,196 |
| | Chair Umpire | 78 | 4,4 | | |
| | Referee/Supervisor | 22 | 4,51 | | |
| | Total | 123 | 4,39 | | |

$p<0,05$

According to Table 6, the one-way analysis of variance showed no significant difference among the mean scores of game knowledge, decision making, pressure, and communication based on the position variable of tennis umpires. This indicates that there was no significant variation in these sub-dimensions of the referee self-efficacy scale.

## DISCUSSION AND CONCLUSION

The purpose of this study is to examine the self-efficacy levels of tennis officials in various variables. There was no significant difference between genders in terms of self-efficacy. Unlike many other popular sports, it has been a long time since women umpired men's matches and officiated final matches in major tournaments in tennis. Sandra De Janken broke new ground in sports history by officiating the 2001 Roland Garros Men's Singles final (44). The fact that women have been taking part in men's matches for a very long time may have caused them to score high in self-efficacy. When the self-efficacy level was analyzed according to the gender variable, different results were found in the literature. While some studies (11, 24, 27, 37) have stated that the self-efficacy levels of male referees exceed those of female referees in certain aspects, on the other hand, other studies (1, 4, 21) have stated that there is no difference in self-efficacy levels based on gender.

No significant difference was found between the sub-dimensions when examining the self-efficacy level based on the age variable. Diotaiuti et al. (12) 's interpretation that experience is a better predictor of self-efficacy than age is consistent with the study's findings. Despite numerous studies in the literature demonstrating that self-efficacy increases with age (11, 21, 22, 24, 33), the absence of this difference in the current study may be attributed to the fact that while there is an age limit for starting refereeing in other sports, there is no such restriction in tennis.

The results demonstrated that the self-efficacy levels of international officials in terms of in-game knowledge and communication dimensions are higher than those of national officials. In tennis, as in all sports, international referees officiate a large number of higher-profile matches. As a natural result of this, it is thought that international referees' scores in rule knowledge and communication dimensions are higher than national referees. This situation can be interpreted as the background in refereeing and working in high-level tournaments positively influencing the self-efficacy of the officials. In the literature, there are studies supporting the findings of this study (1, 12, 23, 33, 37).

The self-efficacy levels of tennis officials with ten or more years of experience are higher than those of officials with 0-3 years of experience in all sub-dimensions. Furthermore, the self-efficacy levels of tennis officials with ten or more years of experience surpass those of referees with 4-6 years and 7-9 years of experience in decision-making, pressure, and communication. Besides, the self-efficacy levels of tennis officials with 4-6 and 7-9 years of experience surpass those with 0-3 years of experience in decision-making, handling pressure, and communication dimensions. Tennis officials must do a certain number of matches in a year to keep their bagde, for example, a silver badge must officiate 75 matches in a year (38). This means a silver badge must do at least 750 matches in ten years and thus makes the difference. This situation can be interpreted as the time spent refereeing positively affecting the level of referee self-efficacy. In the literature, there are studies supporting the findings of this study (1, 12, 18,21, 30, 31, 33, 37).

When examining the self-efficacy level based on the position variable, no significant difference was found between line umpires, chair umpires, and referees/supervisors. While reviewing the literature, analysis has yet to be found regarding the position of the referees in the competition, such as line umpire or main referee. This study revealed that there was no difference in the self-efficacy levels of tennis officials in different positions of refereeing. This variable can be tested again in different sports, such as assistant referees and main referees in football, main referees and line judges in volleyball, by studying with a larger sample group.

Self-efficacy is one of the most crucial topics when discussing the characteristics of a good referee. In the study, the researchers examined the self-efficacy levels of tennis officials in relation to various variables. The results showed no statistically significant difference in the sub-dimensions of gender, age, and position of the tennis officials in the tournament. However, it was observed that the self-efficacy levels of international officials were significantly higher than those of national officials in terms of experience. This result shows that the longer the officiating period, the higher the level of self-efficacy will be.

The study revealed that rule knowledge and communication skills have a positive effect on the self-efficacy level. From this point of view, referees' development in rule knowledge and communication will help them a lot in becoming good referees. In addition, it has been observed that serving as a referee for many years has a positive impact on the referee's self-efficacy level. In line with this result, it is thought that instilling in new referees the idea that their self-efficacy levels will increase with experience over the years will help them in their development.

Although it provides descriptive information about the officials participating in the research, it is thought that it is not sufficient to generalize to all tennis referees since the sample group is less than 10% of the total officials registered in the ITF portal. In order to generalize the results to all tennis officials, it is recommended that future studies be conducted with a larger sample group.

The fact that the research was conducted in a single sport branch and with a small sample group are to be considered as a limitations of the research. Variables like whether there is an athletic background in that branch and foreign language skills may also be added to the research. Conducting studies with a larger sample group covering different sports branches and variables may provide more descriptive information about the self-efficacy levels of referees.

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# Examination of Perceived Stress Levels of Individuals Who Attending University Education and Participate in University Team

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*Ethical Statement: It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited.*

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**Abstract**

Aim: This study is to determine how the perceived stress levels of individuals who play individual and team sports in university teams are shaped. Method: Scanning method was used in this study. This study has a descriptive and inferential nature. The study was carried out with 159 individuals in the school teams of Kyrgyzstan-Turkey Manas University in the 2021-2022 academic year. The study was shaped on the basis of voluntary participation criteria. In this study, demographic information form prepared by the researcher and Perceived Stress Scale were used to collect data. The obtained data were transferred to computer environment and evaluated with SPSS 25.0 statistical program. By using parametric tests on the data, t-test was used for pairwise group comparisons, ANOVA test was applied for comparing more than two groups, and Post Hoc Turkey multiple comparison test was applied to determine the difference between groups. Findings: In shaping the perceived stress levels of university students; according to the gender variable, women have a higher average than men, according to the age variable, there is a difference in favor of the older ones, according to the type of sport variable in favor of the team sports, according to the competition success variable in favor of the international participants and according to the income level variable, there is a difference in favor of the weak ones but it was concluded that there was no significant difference according to the sports year variable. Conclusion: It was concluded that gender is of great importance in the perceived stress levels of individuals studying at university and participating in school teams.

**Keywords:** Individual sport, Team sport, Perceived stress

**Özet**

**Üniversite öğrenimi gören ve okul takımlarında yer alan bireylerin algılanan stres düzeylerinin incelenmesi**

Amaç: Bu çalışma üniversite okul takımlarında yer alan bireysel ve takım sporu yapan bireylerin algılanan stres düzeylerinin nasıl şekillendiğini belirlemektir. Yöntem: Bu çalışmada tarama yöntemi kullanılmıştır. Bu çalışma betimsel ve çıkarımsal bir niteliğe sahiptir. Çalışma Kırgızistan-Türkiye Manas Üniversitesinde 2021-2022 eğitim öğretim yılında okul takımlarında yer alan 159 birey ile gerçekleştirilmiştir. Çalışma gönüllü katılım kriteri esasına göre şekillendirilmiştir. Bu çalışmada verilerin toplanması için araştırmacı tarafından hazırlanan demografik bilgi formu ve Algılanan Stres Ölçeği kullanılmıştır. Elde edilen veriler bilgisayar ortamına aktarılarak SPSS 25.0 istatistik programı ile değerlendirildi. Verilerde parametrik testler kullanılarak ikili grup karşılaştırmalarında t testi, ikiden fazla grupların karşılaştırılmasında ANOVA testi uygulanmış ve gruplar arası farklılığın tespiti için Post Hoc Tukey çoklu karşılaştırma testi uygulanmıştır. Bulgular: Üniversite öğrencilerinin algılanan stres düzeylerinin şekillenmesinde; cinsiyet değişkenine göre kadınların erkeklerden yüksek ortalamaya sahip oldukları, yaş değişkenine göre yaşı büyük olanlar lehine, spor türü değişkenine göre takım sporu yapanlar lehine, yarışma başarısı değişkenine göre uluslararası katılımcılar lehine ve gelir düzeyi değişkenine göre zayıf olanlar lehine fark olduğu, spor yılı değişkenine göre anlamlı farklılık olmadığı tespit edilmiştir. Sonuç: Üniversite öğrenimi gören ve okul takımlarında yer alan bireylerin algılanan stres düzeylerinde, cinsiyetin büyük önem arz ettiği sonucuna ulaşılmıştır.

**Anahtar Kelimeler:** Algılanan stres, Bireysel spor, Takım sporu.

## INTRODUCTION

Today, in many countries, sports activities are among the most preferred physical activities by individuals. The reason why people attach great importance to sports activities is that it is as old as human history and has a very important place in human life for many years. At the same time, people and sports have become inseparable from each other in social life (6). While the concepts of sports and psychology affect each other, the type of sports branch and the concept of sports; Variables such as being a team, motivation, and individuality are among the reasons for different emotional states in individuals (23).

The phenomenon of stress is a problem frequently encountered in school life, daily life or business life. In this respect, although the phenomenon of stress is a situation that people commonly encounter in their daily lives, when considered conceptually, the concept of stress is defined as "the state of pressure or tension perceived by the individual". Every change movement that people experience in their normal life flows causes stress, sometimes positively and sometimes negatively (7).

The phenomenon of stress causes motivated emotional states to become more active than normal. In case of stress, people have to perceive a threat because a certain threat is present. Factors that cause stress are defined as “stressors”. Some stressors can be meaningful or important to people. Whether the stressors are meaningful or positive depends on the individual's family life and the environment in which he lives. Factors causing stress are listed as stimuli originating from the internal and external environment that change the adaptive capacity of the individual. In addition, stressors consist of demands from the individual or his environment (2). Stress is an important health problem that negatively affects the living standards of individuals, limits their abilities in business life mentally, affects the emotional control of the person for a long time, and causes healthy individuals to encounter various problems in their lives (8).

The phenomenon of stress, which affects people from all walks of life in daily life, is also extremely important in the daily lives of individuals in higher education. In some cases, when stress can be dealt with correctly, it empowers students to be successful, puts the individual into action and creates positive conditions (6).

The phenomenon of stress occurs in university students due to many factors (18, 26) and negatively affects students' lives in many ways (15). At this point, knowing the factors that cause stress in university

students will contribute to minimizing the stress levels of the students and being more successful in their university education.

There is various information in the literature that the optimal level of stress affects the performance of individuals positively, but if it exceeds the optimal level, it will cause anxiety, worry and uncontrollability. Comparing the perceived stress levels of university students engaged in active sports with various demographic variables is expected to yield valuable findings. These results will contribute to the existing literature by shedding light on the sources of stress and identifying areas where stress may be absent. Consequently, the main objective of this study is to investigate the perceived stress levels of individuals involved in both individual and team sports within university school teams.

## METHOD

### Research model

This study is characterized as descriptive research, as it aims to examine the perceived stress levels of individuals involved in both individual and team sports within university school teams. The primary objective is to provide a comprehensive description of the stress levels experienced by these individuals in the context of their sports participation.

The research study utilized the "screening model" as the basis for developing its research model. Screening models are designed to faithfully represent a past or present situation as it actually exists. The objective of the research is to accurately depict the subject under investigation, be it an event, individual, or object, within its original context and without any intention to alter or exert influence on these circumstances (17).

### Participants

The research study involved a sample of 159 participants, consisting of 103 men and 56 women. These individuals were members of the Kyrgyzstan Turkey Manas University school teams and actively participated in both individual and team sports throughout the 2021-2022 academic year.

### Data collection and tools used

The data was gathered through the utilization of Google Forms. The study employed two distinct data collection instruments.

***Diagnostic information form:**

The researcher utilized a "Personal Information Form" to collect data regarding the demographic characteristics of the university students involved in the study. This form included variables such as gender, age, field of study, years of involvement in sports, competition success, and monthly income level.

***Perceived stress scale**

In order to determine the perceived stress levels of the participants; The perceived stress scale developed by Cohen, Kamarck and Mermelstein (4) and adapted into Turkish by Eskin et al. in (10) was used. There are 14 statements to determine perceived stress levels. The scale consisting of 14 statements to determine the perceived stress of the participants, according to Cohen et al., the stress scale was determined as the perception of insufficient self-efficacy, the perception of stress-discomfort, and the total stress perception in the sum of the two. In our research, it will be considered as total stress in accordance with the purpose. Eskin et al.'s total stress scale has been used in many studies with high validity and reliability. In the study, participants were asked to evaluate each item using a 5-point Likert-type scale. The scale ranged from "Never (0)" to "Very often (4)" to indicate the frequency or intensity of their responses. The scale consists of two sub-dimensions, the perception of stress/discomfort and the perception of insufficient self-efficacy. The items “1, 2, 3, 7, 11, 12, 14” in the scale are the items measuring the perception of stress/discomfort, and the items “4, 5, 6, 7, 9, 10, 13” are the items measuring the perception of insufficient self-efficacy, and they are scored in reverse with positive expressions. has the feature. While the perceived stress scale scores range from 0 to 56, a high score indicates the excess of the person's perception of stress.

**Analysis of data**

The IBM SPSS Statistics 25 program was employed for data analysis. Demographic variables of the participants, such as gender, age, branch, sports age, competition success, and income level, were examined in terms of percentage and frequency values. As seen in Table 1, it was concluded that the data showed a normal distribution as a result of the (skewness-kurtosis) test. According to George and Mallery (11), if the skewness and kurtosis values fall within the range of +2 and -2, the distribution can be considered as approximately normal. By using parametric tests in the data, t-test was used for pairwise group comparisons, ANOVA test was applied for comparing more than two groups, and To determine the differences between groups, a Post Hoc Tukey multiple comparison test was applied in the study. This test is commonly used to compare all possible pairs of groups and identify significant differences among them.

**Table 1.** Test of normality

| Scale | Skewness | Kurtosis |
|---|---|---|
| **Perception of stress/discomfort** | -.065 | .961 |
| **Perception of insufficient/self-efficacy** | -.583 | 1.827 |
| **Perceıved stress general** | -.346 | 1.975 |

## FINDINGS

**Table 2.** Frequency distribution of socio-demographic characteristics

| | Demographic Changes | | Frequency | Percentage(%) |
|---|---|---|---|---|
| **Age** | 17-19 years | | 67 | 42.1 |
| | 20-21 years | | 50 | 31.4 |
| | 22-23 years | | 21 | 13.2 |
| | 24 years and over | | 21 | 13.3 |
| | | Total | 159 | 100 |
| **Gender** | Female | | 56 | 35.2 |
| | Male | | 103 | 64.8 |
| | | Total | 159 | 100 |
| **Income rate** | Good | | 41 | 25.8 |
| | Medium | | 88 | 55.3 |
| | Poor | | 30 | 18.9 |
| | | Total | 159 | 100 |
| **Competition success** | School Sport | | 65 | 40.9 |
| | Club Sport | | 55 | 34.6 |
| | National Level | | 21 | 13.2 |
| | International Level | | 18 | 11.3 |
| | | Total | 159 | 100 |
| **Type/Branch of sport** | Team Sport | Basketball | 24 | 15.1 |
| | | Football | 34 | 21.4 |
| | | Volleyball | 29 | 18.2 |
| | | Total | 87 | 54.7 |
| | Individual Sport | Athleticism | 28 | 17.6 |
| | | Wrestling | 17 | 10.7 |
| | | Boxing | 27 | 17 |
| | | Total | 72 | 45.3 |
| **Sport year** | 1-2 years | | 49 | 30.8 |
| | 3-4 years | | 31 | 19.5 |
| | 5-6 years | | 47 | 29.6 |
| | 7 years and over | | 32 | 20.1 |
| | | Total | 159 | 100 |

When the demographic values are examined in Table 2, 35.2% of the research consists of 56 students with female, 64.8% with 103 people and a total of 159 students. According to the age variable; 42.1% were 17-19 years old, 31.4% were 20-22 years old, 13.2% were 23-24 years old and 13.3% were 24 years old and over; According to income level: 25.8% had a good income level with 41 people, 55.3% had a medium income level with 88 people and 18.9% had a low income level with 30 people; according to the success of the competition: 40.9% of them achieved success in school sports with 65 people, 34.6% in club sports with 55 people, 13.2% at the national level with 21 people and 11.3% at the international level with 18 people; 30.8% of them have 1-2 years with 49 people, 19.5% of them have 3-4 years with 31 people, 29.6% have 5-6 years with 47 people and 20.1% have 7 years or more with 32 people. have been determined. According to the type of sport; It was observed that 54.7% of them chose team sports with 87 people, and 21.4% of the general percentage values of their branches were for Football, 14.1% for Basketball and 18.2% for Volleyball. 45.3% of the participants prefer individual sports, which is another type of sports, with 72 people, for the individual sports in question; 17.6% of them chose Athletics, 10.7% Wrestling and 17% Boxing branches.

**Table 3.** T-test results of perceived stress scores by gender

| General and sub-dimensions of the scale | Gender | N | $\bar{x}$ | sd | t | df | p |
|---|---|---|---|---|---|---|---|
| **Perception of stress/discomfort** | Female | 56 | 15.86 | 2.99 | 3.130 | 157 | .001** |
| | Male | 103 | 13.81 | 4.38 | | | |
| **Perception of inadequacy/self-insufficiency** | Female | 56 | 15.09 | 3.50 | 1.959 | 157 | .052 |
| | Male | 103 | 13.82 | 4.12 | | | |
| **Perceived stress general** | Female | 56 | 30.95 | 5.98 | 2.759 | 157 | .003** |
| | Male | 103 | 27.62 | 7.86 | | | |

***p<0.01*

Upon examining Table 3, it was determined that there was no statistically significant difference in the inadequacy/self-efficacy sub-dimension scores of perceived stress levels among the participants based on the gender variable (p>0.05). A significant difference was found in the perceived general stress level and stress/discomfort perception sub-dimension scores of the participants in terms of gender (p<0.05). When the arithmetic values in terms of gender are examined; stress/discomfort sub-dimension ($\bar{x}$=15.86) average and general perceived stress level ($\bar{x}$=30.95) mean women had higher mean values than men.

**Table 4.** T-test results of perceived stress scores by sport type

| General and sub-dimensions of the scale | Type of Sport | N | $\bar{x}$ | sd | T | df | p |
|---|---|---|---|---|---|---|---|
| **Perception of stress/discomfort** | Individual Sport | 72 | 14 | 3.97 | -1.500 | 157 | .136 |
| | Team Sport | 87 | 14.97 | 4.10 | | | |
| **Perception of inadequacy/self-insufficiency** | Individual Sport | 72 | 14.06 | 3.67 | -.604 | 157 | .546 |
| | Team Sport | 87 | 14.44 | 4.19 | | | |
| **Perceived stress general** | Individual Sport | 72 | 28.06 | 6.85 | -1.142 | 157 | .249 |
| | Team Sport | 87 | 29.40 | 7.83 | | | |

When Table 4 is examined, no significant difference was found in the general and sub-dimension scores of the participants' perceived stress level in terms of the sport type variable (p>0.05). In terms of the perceived general level, the arithmetic mean values were higher in team sports ($\bar{x}$=29.4) compared to individual sports, based on the average of the sports type.

**Table 5.** ANOVA results of perceived stress scores by age variable

| | Age | N | $\bar{x}$ | sd | F | p |
|---|---|---|---|---|---|---|
| **Perception of stress/discomfort** | 17-19 Years | 67 | 14.07 | 4.29 | .909 | .438 |
| | 20-21 Years | 50 | 14.76 | 3.55 | | |
| | 22-23 Years | 21 | 15.67 | 4.62 | | |
| | 24 Years and over | 21 | 14.29 | 3.85 | | |
| | Total | 159 | 14.53 | 4.06 | | |
| **Perception of inadequacy/self-insufficiency** | 17-19 Years | 67 | 14.10 | 4.25 | 1.257 | .291 |
| | 20-21 Years | 50 | 14.12 | 3.45 | | |
| | 22-23 Years | 21 | 15.76 | 4.12 | | |
| | 24 Years and over | 21 | 13.62 | 3.84 | | |
| | Total | 159 | 14.26 | 3.95 | | |
| **Perceived stress general** | 17-19 Years | 21 | 31.43 | 8.29 | 1.145 | .333 |
| | 20-21 Years | 21 | 27.90 | 7.11 | | |
| | 22-23 Years | 159 | 28.79 | 7.41 | | |
| | 24 Years and over | 67 | 14.07 | 4.29 | | |
| | Total | 50 | 14.76 | 3.55 | | |

When Table 5 is examined, no significant difference was found in the perceived stress levels in the general and sub-dimensions in terms of the age variable of the participants ($p>0.05$). When the average values of the general perceived stress level are examined; It is observed that the highest value ($\bar{x}$=31.43) is between the 17-19 age group with an average, and the lowest value ($\bar{x}$=10.18) is between the 24 and above age group with an average.

**Table 6.** ANOVA results of perceived stress scores by year of sport

| | Sport Year | N | $\bar{x}$ | sd | F | p |
|---|---|---|---|---|---|---|
| **Perception of stress/discomfort** | 1-2 Years | 49 | 14.43 | 3.83 | 1.126 | .306 |
| | 3-4 Years | 31 | 14.48 | 3.54 | | |
| | 5-6 Years | 47 | 15.32 | 4.25 | | |
| | 7 Years and over | 32 | 13.56 | 4.50 | | |
| | Total | 159 | 14.53 | 4.06 | | |
| **Perception of inadequacy/self-insufficiency** | 1-2 Years | 49 | 13.61 | 4.04 | 1.229 | .301 |
| | 3-4 Years | 31 | 14.65 | 3.37 | | |
| | 5-6 Years | 47 | 15.00 | 3.41 | | |
| | 7 Years and over | 32 | 13.81 | 4.92 | | |
| | Total | 159 | 14.26 | 3.95 | | |
| **Perceived stress general** | 1-2 Years | 49 | 28.04 | 7.23 | 1.251 | .293 |
| | 3-4 Years | 31 | 29.13 | 6.41 | | |
| | 5-6 Years | 47 | 30.32 | 7.10 | | |
| | 7 Years and over | 32 | 27.38 | 8.82 | | |
| | Total | 159 | 28.79 | 7.41 | | |

When Table 6 is examined, no significant difference was found in the perceived stress levels in the general and sub-dimensions of the participants in terms of the sports year variable ($p>0.05$). When the average values of the general perceived stress level are examined; It is observed that the highest value ($\bar{x}$=30.32) is between the average and 5-6 years group, and the lowest value ($\bar{x}$=27.38) is between the 7 years and above group with an average.

**Table 7.** ANOVA results of perceived stress scores according to competition success

| | Competititon Success | N | $\bar{x}$ | sd | F | p |
|---|---|---|---|---|---|---|
| **Perception of stress/discomfort** | School Sport | 65 | 14.58 | 4.23 | .019 | .996 |
| | Club sport | 55 | 14.51 | 3.98 | | |
| | National level | 21 | 14.57 | 3.76 | | |
| | International level | 18 | 14.33 | 4.30 | | |
| | Total | 159 | 14.53 | 4.06 | | |
| **Perception of inadequacy/self-insufficiency** | School Sport | 65 | 14.28 | 4.65 | .193 | .901 |
| | Club sport | 55 | 14.07 | 3.81 | | |
| | National level | 21 | 14.19 | 1.75 | | |
| | International level | 18 | 14.89 | 3.66 | | |
| | Total | 159 | 14.26 | 3.95 | | |
| **Perceived stress general** | School Sport | 65 | 28.86 | 8.47 | .036 | .991 |
| | Club sport | 55 | 28.58 | 7.32 | | |
| | National level | 21 | 28.76 | 4.57 | | |
| | International level | 18 | 29.22 | 6.68 | | |
| | Total | 159 | 28.79 | 7.41 | | |

Upon reviewing Table 7, it was observed that there was no statistically significant difference in the perceived stress levels, both in the general scale and its sub-dimensions, among the participants concerning the variable of competition success (p>0.05). When the average values of the general perceived stress level are examined; It was determined that the highest value ($\bar{x}$=29.22) was at the international level with an average, and the lowest value ($\bar{x}$=28.58) was at the club sports level with an average.

**Table 8.** ANOVA results of perceived stress scores by income level

| | Competititon Success | N | $\bar{x}$ | sd | F | p |
|---|---|---|---|---|---|---|
| **Perception of stress/discomfort** | Good | 41 | 14.32 | 4.30 | .122 | .886 |
| | Intermediate | 88 | 14.53 | 4.14 | | |
| | Weak | 30 | 14.80 | 3.54 | | |
| | Total | 159 | 14.53 | 4.06 | | |
| **Perception of inadequacy/self-insufficiency** | Good | 41 | 13.49 | 4.98 | 1,090 | .339 |
| | Intermediate | 88 | 14.49 | 3.66 | | |
| | Weak | 30 | 14.67 | 3.08 | | |
| | Total | 159 | 14.26 | 3.95 | | |
| **Perceived stress general** | Good | 41 | 27.80 | 8.71 | .528 | .591 |
| | Intermediate | 88 | 29.02 | 7.25 | | |
| | Weak | 30 | 29.47 | 5.91 | | |
| | Total | 159 | 28.79 | 7.41 | | |

When Table 8 is examined, no significant difference was found in the perceived stress levels in the general and sub-dimensions according to the income level of the participants (p>0.05). When the average values of the general perceived stress level are examined; It was observed that the highest value ($\bar{x}$=29.47) was people with low income level, and the lowest value ($\bar{x}$=27.80) was people with good income level on average.

## DISCUSSION AND CONCLUSION

The findings of the research indicated that there was no statistically significant difference in the perceived stress levels among the participants when considering the gender variable in relation to the insufficient/self-efficacy sub-dimension score. When the arithmetic values in terms of gender are examined; It was concluded that the stress/discomfort sub-dimension was average and the overall perceived stress level was average, with women having a higher mean value than men. As a matter of fact, Curun (5), who examined the perceived stress levels of university-educated athletes according to the gender variable, found that the

values of female athletes were significantly higher than the values of male athletes in both sub-dimensions of perception of insufficient self-efficacy and perception of stress/discomfort.

The sub-dimension of perception of insufficient self-efficacy expresses the individual's difficulties in coping with stress in daily life, and the sub-dimension of perception of stress /discomfort expresses the individual's feeling of stress and tension (22). The fact that female athletes reflect their stress more openly than male athletes may have caused female athletes to perceive more stress. In addition, this may be related to gender differences in coping with stress (16) and internally focused negative emotions (3).

Hamad et al. (14), it was found that perceived stress scores differed significantly in favor of women. Özgan et al. (21) with university students, it was reported that female students' perceived stress scores were higher than male students' perceived stress scores. Similarly, in another study conducted with university students, it was concluded that the perceived stress level of female students was higher than that of male students (24). Similarly, in the study conducted by Hancıoğlu (15), it was concluded that the perceived stress scores differed in favor of female students.

The data analysis conducted in the study revealed that there was no statistically significant difference in the perceived stress levels, including both the general scale and its sub-dimensions, among the individuals who participated in the study when considering the age variable. When the average values of the general perceived stress level are examined; It was concluded that the highest value was between the age group of 17-19 with an average, and the lowest value was between the age group of 24 and above with an average. Arnett (1), defined adolescence as a period in which individuals are more likely to experience "stress and storm" compared to other ages, due to both biological and social changes. In our study, it can be interpreted that the interval in which the average value was high coincided with the adolescence period. In a study conducted by Özgan et al. (21), it was determined that there was no significant difference between age and stress symptoms. Similarly, According to Yurtsever (28), it was reported that there was no statistically significant difference between stress symptoms and the age factor. Görgün et al. (12) found that there was no significant difference between the age of the referees and the perceived stress levels in a study they conducted with football referees.

There was no significant difference in the general and sub-dimension scores of the perceived stress level in terms of the sport type variable of the participants. It has been concluded that the arithmetic mean values of the perceived general level are higher than the average of team sports and individual sports according to the type of sport. As a matter of fact, Salar et al. (23) In a study they conducted; It was concluded that there was a statistically significant difference in the athletes' total perceived stress scores and insufficient self-efficacy perception subscale scores in favor of team athletes. This situation supports our study.

The analysis of the data indicated that there was no statistically significant difference in the perceived stress levels, both in the general scale and its sub-dimensions, among the individuals participating in the study based on the variable of sports year. When the average values of the general perceived stress level are examined; It was concluded that the highest value was between the average and 5-6 years group, and the lowest value was between the average of 7 years and above group. In a study conducted with football referees by Güllü and Yıldız (13), it was reported that lower performance and more stress were seen in referees who had less time to play football before. Kaufman (19) found in his study with runners that being a runner for longer years predicted stress negatively. In the study conducted with the athletes participating in the Turkish Universities Kick Boxing Championship, it was determined that there was a statistically significant difference in the perceived stress levels according to their sports experiences (9).

The analysis of the data revealed that there was no statistically significant difference in the perceived stress levels, both in the general scale and its sub-dimensions, among the individuals participating in the study in relation to the variable of competition success. When the average values of the general perceived stress level are examined; It was determined that the highest value was at the international level with the average, and the lowest value was at the club sports level with the average.

According to the income level of the individuals participating in the research, no significant difference was found in the perceived stress levels in the general and sub-dimensions. When the average values of the general perceived stress level are examined; It has been concluded that the highest value is people with low income level on average, and the lowest value is people with good income level on average. Yıldız (27) and

Sözen, Doğan, Erdoğan, (25) in their study in 2012, concluded that stress levels are not affected by income status.

This situation supports our study. However; Malkoç (20), in his study examining the relationship between the level of rational emotive self-determination, perceived stress and job satisfaction in teachers, stated that the study identified a significant difference in the sub-dimensions of insufficient self-efficacy based on monthly income levels. He said that teachers whose income is below 5000 TL have a higher stress score than those whose income is over 5001 TL.

In shaping the perceived stress levels of university students; According to the gender variable, women have a higher average than men, according to the age variable, there is a difference in favor of the older ones, according to the sport type variable, in favor of the team sports, according to the competition success variable in favor of the international participants and according to the income level variable, there is a significant difference in favor of the weak ones. It was concluded that there was no difference

Suggestions;

It is a fact that women are exposed to more stress throughout their lives while coping with physiological changes such as menstrual period, birth, postpartum and menopause. Therefore, it is important to consciously understand and accept chemical and hormonal changes as part of this natural life cycle. Increasing this level of awareness can help women better cope with the physical and emotional challenges they may face during these periods. It is also important for the society in general to be more aware of these issues, to support women in these life periods, and to take care of their emotional needs and physical health. This can contribute to women living a healthier and happier life and raise social awareness.

In team sports, it is important to strengthen friendships and improve the ability of athletes to work together. Team spirit and collaboration are a critical factor for a team's success. For this purpose, organizing various strengthening events (such as Team Picnics or Meals, Team Camp, Social Activities, Morale Meetings) can increase solidarity, trust and motivation among athletes. It can help team members get to know each other better and positively impact their performance on the field.

Multifaceted studies (Personalized Consultancy and Guidance, Stress Management Training, Financial Support and Scholarships, Social Activities and Events) in order to reduce the perceived stress level of university students with field experts such as pedagogues and psychologists in accordance with their developmental periods such as age, sports year, competition success and income status. (Emotional Support Network) can be done. This type of multifaceted approach can help college students and school team members reduce their stress levels and improve their overall psychological and physical health. It also provides the opportunity to offer personalized support, taking into account the different needs of students.

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# Evaluation of Healthy Eating Attitudes and Sleep Quality in terms of Sports Performance in Fencing Athletes

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**Abstract**

The main purpose of this study is to evaluate the attitudes of adolescent fencing athletes towards healthy eating and their sleep quality in terms of their sports performance. The study was carried out with adolescent fencing athletes who are active in Mersin Province. The study participants included 50 fencing athletes (24 females, 36 males) whose ages ranged from 12 to 18 years. The healthy eating attitudes of the participants were evaluated with the "Attitude Scale for Healthy Nutrition (ASHN)", "Sleep Quality Scale and Sleep Variables Questionnaire (SQS-SVQ)" and sports performance with the "Vertical Jump Test". Obtained results indicated that vertical jump performance was affected by the positive nutrition of the fencing athletes significantly ($p<0.05$). However, when the vertical jump scores of the athletes were examined, it was determined that the vertical jump performances of the athletes did not differ in terms of their sleep quality ($p>0.05$). To conclude, it is believed that the present study will contribute to the literature by revealing the relationships between adolescent fencing athletes' attitudes toward healthy eating attitudes, sleep quality, and physical performance.

**Keywords:** Healthy Eating Attitude, Sports Performance, Sleep Quality, Fencing Athletes.

**Eskrim Sporcularında Sağlıklı Beslenme Tutumları ile Uyku Kalitesinin Spor Performansı Açısından Değerlendirilmesi**

**Özet**

Bu araştırmanın temel amacı; eskrim sporcularının sağlıklı beslenmeye ilişkin tutumları ve uyku kalitelerini spor performansları açısından değerlendirmektir. Araştırma, Mersin İl'inde aktif sporcu olan eskrim sporcuları ile yürütülmüştür. Araştırmaya 12-18 yaş aralığında (24 kız ve 26 erkek) olan toplam 50 eskrim sporcusu dahil edilmiştir. Katılımcıların sağlıklı beslenme tutumları "Sağlıklı Beslenmeye İlişkin Tutum Ölçeği" ile, uyku kaliteleri "Uyku Kalitesi ve Uyku Değişkenleri Ölçeği" ile, spor performansları ise "Dikey Sıçrama Testi" ile değerlendirilmiştir. Elde edilen bulgular, sporcuların dikey sıçrama performanslarının olumlu beslenme alışkanlıklarından anlamlı düzeyde etkilendiğini göstermektedir ($p<0,05$). Ancak, sporcuların dikey sıçrama puanları incelendiğinde, sporcuların dikey sıçrama performanslarının uyku kalitelerine göre farklılaşmadığı tespit edilmiştir ($p>0,05$). Sonuç olarak, mevcut çalışma ile eskrim sporcularının sağlıklı beslenmeye ilişkin tutumları, uyku kaliteleri ve fiziksel performansları arasındaki ilişkilerin birlikte ele alınarak açıklanmasının alan yazına önemli katkılar sağlayacağı düşünülmektedir.

**Anahtar Kelimeler:** Sağlıklı Beslenme Tutumu, Spor Performansı, Uyku Kalitesi, Eskrim Sporcuları.

## INTRODUCTION

Nowadays, one of the factors that form the basis of a healthy society is the acquisition of good eating habits and adequate and balanced nutrition by adolescents (1). As in other groups, adolescents who are active in sports are also fed irregularly due to unhealthy eating habits and lack of nutritional information (2,3,4). Moreover, it has been observed that participation in sport and physical activity is gradually increasing with environmental and social changes around the world and in our country. The relationship between exercising and eating well is an important issue, in particular for those who are involved in physical activity (5). Nutrition plays an important role in improving the performance of the athlete, reducing the likelihood of injury, accelerating the recovery process after injury and providing balance in towards weight loss or gain (6). In fact, good nutrition positively affects sports performance by improving physical and psychological well-being (7).

A regular and balanced diet has a positive effect on exercise performance (8). Given that eating is an important part of exercising, much attention needs to be paid to nutrition in regular training (9). The planned dietary programme should provide carbohydrates, vitamins, minerals, adequate fat and the energy and vital activities the athlete needs for training (10). As is the case in other branches of sport, nutrition is also of great importance in fencing. However, there are very few studies on the nutritional attitudes and habits of fencers (11).

### Nutrition in Fencing Athletes

Fencing is a high-intensity type of sport that is based on a professional combination of specific technical skills, the ability to make tactical decisions and physical performance (12). Fencing, which was considered an Olympic branch with the first Modern Olympic Games, is a defence and attack sport based on historical duels (13). In studies of fencing athletes, researchers have highlighted that the energy and nutrient intake of fencers is below the required levels (14,15,16). Inadequate nutrient intake and energy consumption negatively affect the growth and health of fencers (17).

A study by Ghloum and Hajji (11) aimed to determine the nutrient intakes of Kuwaiti national team fencers, compare their nutrient intakes with international norms, and identify the nutritional habits/knowledge necessary to improve their performance. Dietary records were collected from 15 national team fencers. The results showed that the fencers consumed less carbohydrate than their total calorie intake. They also consumed more saturated fat than recommended and more protein than recommended. Similarly,

the results of a study of modern pentathlon athletes, including adolescent fencers, reported that the carbohydrate and calcium intakes of the athletes were inadequate (16). As a result, the researchers concluded that fencing athletes should be informed about healthy and adequate diets in order to properly meet their nutritional needs.

**Sports Performance and Sleep Quality in Fencing Athletes**

Speed is a very decisive factor for the performance of a fencing athlete. In addition to movements designed to hit an opponent, dynamic movements such as stepping and jumping depend on muscle strength, and power (18), in particular, the neuromuscular function of the lower extremities (19,20). Therefore, leg strength is very important in fencing performance. Jumping is a performance measurement method that depends on the coordination and contraction speed of the leg muscles (21). Although vertical jumping is one of the basic movement skills, it is defined as a multi-joint movement requiring complex motor coordination (22). In the vertical jump, the contact of the feet with the ground is interrupted, the force received from the legs and the explosive force are combined, and the jumping distance of the person rising upwards is formed by pushing off from the ground (23). The primary aim of vertical jumping is to reach the highest possible height (24).

In addition to sensory, psychological, neurological, joint and muscular factors affecting speed, sleep rhythm and routine eating habits are among the factors affecting the speed of the athlete (25). Sleep is one of the key factors in improving the health and performance of athletes (26). It has been shown that sleep directly affects athletic performance as well as healthy nutrition (27,10,28).

Many studies have investigated the physiological and psychological effects of sleep on athletic performance (29,30,31). Sleep quality is very critical in terms of the body's resistance and regeneration, especially in people who exercise (32). Increased sleep quality in athletes has been observed to improve cognitive performance, physical performance, muscle growth, metabolism and psychological health, rapid post-training recovery and reduced risk of injury with increased concentration (33). It has also been reported that athletes need more sleep (9-10 hours) after intense training (34).

Sleep has important effects on performance that cannot be ignored, especially in sports such as fencing, which require high levels of aerobic and anaerobic conditioning (35, 36). Therefore, improving fencers' sleep quality not only improves performance but also prevents injuries (37). However, sleep is often ignored by athletes, despite the fact that it is known to be the most effective way to recover after training (26). Furthermore, there is limited research on the effects of sleep quality on performance in fencing athletes (37).

In conclusion, it is known from the literature and previous studies that unhealthy eating attitudes and irregular sleep are quite common, especially in adolescents. It is also known that the positive effects of healthy eating attitudes and sleep quality on athletic performance are very important. However, there is no study investigating the effect of healthy eating attitudes and sleep quality on fencing performance. This study aims to provide an important contribution to the literature by evaluating the effects of healthy eating attitudes and sleep quality on sport performance in fencing athletes aged 12 to 18 years. In this direction, the hypotheses tested in the current study are as below.

1) Sport performances of fencing athletes (vertical jump distance) differ according to gender.

2) The sport performances of fencing athletes (vertical jump distance) differ according to their attitudes towards healthy nutrition (information on nutrition, emotion for nutrition, positive nutrition and malnutrition).

3) Sport performances of fencing athletes (vertical jump distance) differ according to their sleep quality.

## METHOD

### Type of Research and Participants

The type of study conducted is a relational study. The sample of the study consisted of 50 fencing athletes aged between 12 and 18 who were active in Mersin Fencing Sports Club. Within the scope of the research, the participants were selected using the quota sampling method. The descriptive statistics of the participants are shown in Table 1.

**Table 1.** Descriptive statistics for athletes

| | N | % |
|---|---|---|
| **Gender** | | |
| Girl | 24 | 48,0 |
| Boy | 26 | 52,0 |
| **Age** | | |
| 12-13 age | 15 | 30,0 |
| 14-15 age | 24 | 48,0 |
| 16-18 age | 11 | 22,0 |
| **Education** | | |
| Middle school | 16 | 32,0 |
| High school | 31 | 62,0 |
| Other (Graduate) | 3 | 6,0 |
| **Doing other sports before fencing** | | |
| No | 22 | 44,0 |
| Yes | 28 | 56,0 |
| **Duration of Fencing** | | |
| 4 years and below | 16 | 32,0 |
| 5-6 year | 23 | 46,0 |
| 7 year and above | 11 | 22,0 |
| **Fencing Branch** | | |
| Epee | 48 | 96,0 |
| Foil | 2 | 4,0 |
| **Training Duration (weekly)** | | |
| 5 hours and below | 12 | 24,0 |
| 6-7 hours | 25 | 50,0 |
| 8 hours and above | 13 | 26,0 |

Table 1 showed that 48% of the athletes included in the study were girls and 30% were boys. It was found that 30% (n=15) of the athletes were 12-13 years old, 48% (n=24) were 14-15 years old and 22.0% (n=11) were 16-18 years old. It was also seen that 32% (n=16) of the athletes had a secondary school education, 62.0% (n=31) had a high school education and 6% (n=3) were university graduates.

It can be seen that 44% (n=22) of the athletes did not interested in any other sport before fencing and 56% of them were interested in another sport. Regarding the duration of fencing, 32% (n=16) of the athletes have been fencing for 4 years or less, 46% (n=23) for 5-6 years and 22% (n=11) for 7 years or more. On the other hand, 96% (n=48) of the fencers were active in Epee branch and 4% (n=2) were active in Foil branch. It was also found that 24% (n=12) of the athletes trained for 5 hours or less, 50% (n=25) for 6-7 hours and 26% (n=13) for 8 hours or more per week.

**Data Collection Tools**

**Demographic Information Form**

The demographic information form included information on participants' gender, age, education, previous sport, duration of fencing, fencing branch, health status as well as anthropometric measurements (height, weight, percentiles).

**Attitude Scale for Healthy Nutrition (ASHN)**

Attitude Scale for Healthy Nutrition (ASHN) was developed by Tekkurşun-Demir and Cicioğlu (38) to assess athletes' attitudes towards nutrition. The scale consists of 21 items and 4 sub-dimensions which are Information on Nutrition (IN), Emotion for Nutrition (EN), Positive Nutrition (PN) and Malnutrition (MP). The scores that can be obtained from the scale range from 21-105. The scale is scored as a 5-point Likert type "strongly disagree", "disagree", "neutral", "agree", "strongly agree". Positive statements on the scale were scored as 1, 2, 3, 4 and 5, and negative statements were scored as 5, 4, 3, 2 and 1 (38). The scores obtained from the scale are presented in Table 1.1.

**Tablo 1.1.** Evaluation of Attitude Scale for Healthy Nutrition (ASHN)

| | Very Low | Low | Middle | High | Ideal |
|---|---|---|---|---|---|
| **ASHN** | 0-21 | 22-42 | 43-63 | 64-84 | 85-105 |

The Cronbach's alpha internal consistency coefficients of the scale are 0.90 for IN, 0.84 for EN, 0.75 for PN and 0.83 for MP. For this study, the Cronbach's alpha internal consistency coefficients are 0.74 for IN, 0.81 for EN, 0.77 for PN and 0.85 for MP.

**Sleep Quality Scale and Sleep Variables Questionnaire (SQS-SVQ)**

Sleep Quality Scale and Sleep Variables Questionnaire (SQS-SVQ) was developed by Meijer and Van den Wittenboer (39) and the validity and reliability studies were carried out by Önder, Masal, Demirhan, Horzum and Beşoluk (40). The scale consists of 7 items to asses sleep quality and 8 items determine parental control, total sleep time, midpoint of sleep and sleep efficiency. In the scale, the TIB value should be calculated for the calculation of total sleep time (TST). TIB is calculated using the following formula [TIB= (24:00- item13) + item9]. The formula used to calculate TST is [TST= TIB-item14-item15]. Scale items are scored on a range of 1-3 points. Scores that can be obtained from the scale vary between 7-21. A high score on the scale indicates poor sleep quality, while a low score indicates good sleep quality. In the present study, only the first 7 items were used to assess sleep quality. The Cronbach's alpha internal consistency coefficient of the scale is 0.72, and the Cronbach's alpha internal consistency coefficient for this study was 0.76.

**Physical Performance Measurement (Vertical Jump Test)**

The physical performance of young fencers was measured using the My Jump2 application. In the My Jump2 application, the athlete's vertical jump performance is recorded using the video recording function of the iPhone under the observation of the researcher. Thus, distance of vertical jump and duration can be calculated by recording athletes' videos (41).

Before starting the jump test, each athlete warmed up with 5 minutes of running and 10 minutes of branch-specific warm-up to prepare for the vertical jump test. The athletes were then taken individually to the vertical jump test. When the athletes felt ready, they jumped to the highest point they could jump and then the distance of the jump was measured. When a vertical jump was performed, a person's legs and body were positioned parallel to ground level, and power was used from legs, arms and body to make a vertical jump. After the jump, the athlete landed on the mat and the jump distance was measured using the My Jump2 programme. The vertical jump distance was recorded in centimetres (cm). Each athlete repeated the jump twice and the best distance was recorded as the jump distance.

**Data Analysis**

The data of the study were analysed using SPSS26.0 (Statistical Package for Social Sciences) program. Means and standard deviations were calculated for all variables in the study. The relationships between variables were analysed using Spearman correlation analysis. The effect of athletes' attitudes towards healthy nutrition and sleep quality scores on vertical jump distance was assessed by multivariate regression analysis.

**Procedure**

Firstly, the necessary permissions were obtained from the researchers who developed/adapted the scales to be used in the study. Then, the ethical permissions were obtained to conduct the research, following the approval of the Ethics Committee of the Scientific Research and Publication Ethics Committee of the Eastern Mediterranean University, dated 31.12.2021 and numbered 2021/05.

Secondly, parents of athletes aged under 18 were asked for permission to participate in the study using the 'Family Consent Form' and coaches using the 'Club Consent Form'. Athletes who agreed to participate in the study were informed in detail about the purpose of the study and the procedure. All participants were then asked to agree to participate voluntarily in the research using the Informed Voluntary Consent Form. Participants were also informed that their answers would remain confidential and would only be used for scientific research.

Participants took an average of 10 minutes to complete the scales. After completing the scales, the height of the athletes was measured in centimetres (cm) using an ultrasonic height meter (Langen Messtab 5003) without shoes and socks. Leg lengths were also measured without shoes and socks by the researcher using a tape measure, referencing the length between the wrist bone and pelvis.

Athletes' body weight was measured using a scale on an empty stomach before training. A vertical jump test was then performed on each athlete to measure physical performance. The vertical jump distances of the athletes were measured using the "My Jump2" programme. Each athlete repeated the jump twice and the best distance was recorded by the researcher as a vertical jump distance score.

**FINDINGS**

The research tested the hypothesis "*Sport performances of fencing athletes (vertical jump distance) differ according to gender*" by using independent samples t-test analysis. The obtained results showed the significant differences in the vertical jump distances in terms of gender ($p<.05$). Accordingly, the vertical jump distances of male athletes were significantly higher than those of female athletes (Table 2).

**Table 2.** Comparison of vertical jump distances in terms of gender of athletes

| | Gender | n | X | StD | p |
|---|---|---|---|---|---|
| **Vertical Jump Distance (cm)** | Girl | 24 | 27,77 | 5,35 | 0,024* |
| | Boy | 26 | 33,58 | 10,05 | |

*p< 0,05

Furthermore, the hypotheses "*The sport performances of fencing athletes (vertical jump distance) differ according to their attitudes towards healthy nutrition (information on nutrition, emotion for nutrition, positive nutrition and malnutrition)*" and "*Sport performances of fencing athletes (vertical jump distance) differ according to their sleep quality*" were tested by multiple regression analysis. The results showed that the total variance explained was 60.9% and the positive nutrition sub-dimension predicted vertical jump distance ($\beta=0.53$; $p<.05$).

On the other hand, another result from the multiple regression analysis did not support the hypothesis "*Sport performances of fencing athletes (vertical jump distance) differ according to their sleep quality*". It was found that the athletes' sleep quality scores were not a significant predictor of their vertical jump distances. In other words, the athletes' sleep quality has no significant effect on their athletic performance (Table 3).

**Table 3.** Evaluation of the sub-dimensions of the attitude scale for healthy nutrition and sleep quality in terms of vertical jump distance

| | Std. β | t | $R^2$ | p |
|---|---|---|---|---|
| | | | Cor. $R^2$ | |
| **(Constant)** | | -3,897 | | 0,000** |
| **Information on Nutrition** | 0,13 | 0,859 | | 0,395 |
| **Emotion for Nutrition** | 0,19 | 1,281 | | 0,208 |
| **Positive Nutrition** | 0,53 | 2,052 | | 0,047* |
| **Malnutrition** | -0,61 | -1,651 | 0,680 | 0,106 |
| **Sleep Quality** | 0,12 | 0,866 | 0,609 | 0,392 |

**p< 0,001; *p< 0,05

## DISCUSSION AND CONCLUSION

The meeting of nutritional needs during adolescence is very important in terms of growth and development. Athletes whose nutritional needs are adequate, balanced and met according to individual requirements have healthy bodies and performance. Adequate nutritional intake is very important in adolescent athletes to improve sports performance and minimise sports injuries, as well as health, growth and development (39,40).

### Evaluation of Athletes' Vertical Jump Performances by Gender

In the current study, the vertical jump distance was found to be statistically different ($p<0.05$) in vertical jump distance in terms of gender. In other words, it was found that the vertical jump distance of male athletes was higher than that of female athletes. Accordingly, the average vertical jump distance of adolescent female athletes was 27.77±5.35, while the average vertical jump distance of adolescent male athletes was 33.58±10.05. Similar results were found in a study by Kurihara et al (42) on adolescents between the ages of 12 and 17. The researcher reported a mean jump distance of 36.6±5.6 for females and 44.7±8.9 for males. On the other hand,

Supporting the findings of the present study, a study investigating the effect of gender and exercise habits on speed and anaerobic power in adolescent athletes reported that male athletes had higher vertical jump values compared to female athletes (43). However, a study by Çetinkaya (44) investigating the differences between the vertical jump test and gender in adolescent basketball players aged 11-18 years found that there was no significant difference between male and female adolescent athletes in the vertical jump test. A study by Laurson et al (45) of 529 adolescents aged 10-18 years demonstrated that male adolescents had higher vertical jump values than female adolescents. High muscle mass is effective in the force produced during the vertical jump (46). Therefore, the better performance of males in vertical jump tests may be explained by the developmental process and muscle mass in adolescence.

### Evaluation of Athletes' Vertical Jump Performances According to Their Attitudes Towards Healthy Nutrition

The hypothesis "*The sport performances of fencing athletes (vertical jump distance) differ according to their attitudes towards healthy nutrition (information on nutrition, emotion for nutrition, positive nutrition and malnutrition)*" was tested by multivariate regression analysis. The results indicated that the adolescent fencers' positive nutrition attitudes scores significantly predicted their vertical jump distances ($p<0.05$).

Inadequate energy intake during periods of intense training in adolescent athletes can lead to muscle wasting, impair growth and development, and increase the risk of injury. In addition, the recovery time of athletes who suffer from injuries during training or competition may be prolonged if their nutritional intake is inadequate and irregular (47). A study investigating the relationship between healthy eating attitudes and athletic performance in active adolescents explored healthy eating attitudes and anthropometric measures (running test, grip strength and vertical jump). The results indicated that a healthy diet had a positive effect

on performance tests and that good eating attitudes and physical activity contributed to physical health, especially in male participants (48). This finding also supported the results of the present study.

**Evaluation of Vertical Jump Performance in Athletes in terms of Sleep Quality**

The third hypothesis "*Sport performances of fencing athletes (vertical jump distance) differ according to their sleep quality*" tested by multiple regression analysis demonstrated that fencers' sport performance did not differ by sleep quality.

It has been emphasised that one of the most important factors that has a positive effect on the performance of athletes is sleep duration and quality of sleep (29). Adolescent athlete who trains 4-6 hours a day needs 10-12 hours of sleep (31). A meta-analysis study has shown that poor sleep, frequency of sleep disruption, sleeping late and waking up early are common habits among adolescents and have serious implications for learning, school performance and neurobehavioural functioning (49).

Studies that have investigated the relationship between sleep quality and athletic performance in adolescents have reported different findings. For instance, studies in the literature have reported a decrease in the jump height of participants in vertical jump tests performed during the period of poor sleep quality (50,51). Similarly, another study investigating the relationship between sleep quality and vertical jump reported a significant 2.8 cm decrease in vertical jump height in adolescent athletes with poor sleep quality. Thus, it can be explained that the decrease in athletic performance in many sports (basketball, football, volleyball, etc.) that require regular jumping movements, due to a decrease in lower extremity strength (52). Another study evaluating sleep duration and athletic performance in athletes reported that the teams that finished the competition faster had longer sleep durations than the teams that finished the competition slower. The researchers found that athletes who spent more time in bed and slept longer finished the competition in a higher place and had better athletic performance (53). Therefore, it can be seen that the results of adolescent sleep studies in the literature vary, although it is known that improving sleep quality before and after training in adolescents improves athletic performance (54). These differences may be due to variables such as the age of the participants, the method of measuring sleep quality (single measurement) or the characteristics of the exercise performed by the athlete.

The research has some limitations. The first limitation is the research sample. The present research only included fencers between the ages of 12 and 18. In future studies, it is important to study with groups of different ages and fencing branches in terms of generalisability of the research. The lack of determination of the athletes' knowledge on nutrition, dietary status and eating attitudes before the study is another limitation of the study. Therefore, the determination of the athletes' previous level of nutritional knowledge and their food consumption status may allow a more detailed evaluation of their healthy eating attitudes. Finally, the lack of classification of the anthropometric measurements (waist/hip ratio) of the athletes in terms of risk groups and their body composition (fat mass, fat-free mass, bone mass) are other limitations of the study. In future studies, the measurement of body composition may provide more detailed information about the effects on athletic performance.

In conclusion, the present study shows that healthy eating habits and the avoidance of malnutrition are highly effective in improving sports performance in athletes. In addition, the results of the study emphasise that increasing healthy eating attitudes in adolescent athletes will positively contribute to sleep quality. There is no previous study in the literature that shows the effect of attitudes towards healthy eating and sleep quality on the sport performance of adolescent fencing athletes. Thus, identifying the variables affecting sport performance in fencing athletes would be considered a contribution to the literature. However, further studies are needed to identify other possible dynamics that may affect the athletic performance of fencing athletes.

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# Investigation of the Relationship between Recreational Spor Well-Being and Leisure Satisfaction of University Community Members*

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*Ethical Statement: It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited.*
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**Abstract**

Sports has an important meaning in human life. Acquiring this meaning attached to sports is possible by devoting serious time. Recreational activities are known to improve health, but it is assumed that this health will also make leisure time more enjoyable. Accordingly, the purpose of this relational survey research is to evaluate the link between university community members' pleasure with their leisure time and recreational well-being. The research employed descriptive scanning methodology. In the study, "Recreational Sports Well-Being Scale" and "Leisure Satisfaction Scale" were used to determine the recreational sports well-being and leisure satisfaction levels of the participants. The universe of the research is "Selçuk University Student Communities". A total of 298 people were included in the research.The results show that there is a substantial relationship between leisure time satisfaction and the length of time spent engaging in recreational activities and sports. On the other hand, it has been determined that the income variable is one of the most effective factors in terms of well-being and leisure satisfaction. In conclusion; leisure satisfaction and recreational sport well-being are moderately positively related. It can be stated that the gains of female participants and participants with high perceived income from recreational sports activities contribute more positively to their well-being levels.

**Keywords:** Recreational Sports Well-Being, Leisure Satisfaction, University Communities.

**Özet**

**Üniversite Topluluk Üyelerinin Rekreasyonel Spor İyi Oluş ile Serbest Zaman Tatmin İlişkisinin İncelenmesi**

İnsan yaşamında sporun önemli bir anlamı vardır. Spora yüklenen bu anlamın kazanılması ise ciddi anlamda zamanın ayrılması ile mümkün olabilir. Rekreasyonel sporların iyi oluşa katkı sağladığı bilinmekle birlikte bu iyi oluşun serbest zaman tatminini beraberinde getirmesi beklenen bir durumdur. Bu noktadan hareketle oluşturulan bu ilişkisel tarama araştırmasının amacı; üniversite topluluk üyelerinin rekreasyonel iyi oluş ile serbest zaman tatmini arasındaki ilişkinin incelenmesidir. Araştırmada, betimsel tarama deseni kullanılmıştır. Araştırmada katılımcıların rekreasyonel spor iyi oluş ve serbest zaman tatmin düzeylerini belirlemek için "Rekreasyonel Spor İyi Oluşu Ölçeği" ve "Boş Zaman Doyumu Ölçeği" kullanılmıştır. Araştırmanın evrenini "Selçuk Üniversitesi Öğrenci Toplulukları" oluşturmaktadır. Araştırmaya toplam 298 kişi dahil edilmiştir. Elde edilen bulgulara göre; Rekreasyonel faaliyetlere katılım süresi ile rekreasyonel spor iyi oluş ve serbest zaman tatmini arasında anlamlı farklılık bulunmaktadır. Öte yandan gelir değişkeni iyi oluş ve serbest zaman tatmini noktasında en etkili unsurdur. Sonuç olarak; serbest zaman tatmini ve rekreasyonel spor iyi oluş orta düzeyde pozitif yönde ilişkilidir. Kadın katılımcıların ve gelir algısı yüksek olan katılımcıların rekreasyonel sportif aktivitelerinden elde ettikleri kazanımların iyi oluş düzeylerine daha olumlu katkı sağladığı söylenebilir.

**Anahtar Kelimeler:** Rekreasyonel Spor İyi Oluş, Serbest Zaman Tatmini, Üniversite Toplulukları.

## INTRODUCTION

One of the most important aims of recreation and leisure services is to contribute to individuals' satisfaction and pursuit of happiness (8). Happiness is the expression of a subjective state of mind characterized by pleasure and satisfaction, which reflects one's general subjective well-being (87). Happiness, one of the most fundamental goals of human life, plays an important role in self-actualization and satisfaction (20). The first studies in this field focused on the importance of work in the lives of adults. Examining the relationships between job satisfaction and life satisfaction attracted the attention of most of the early studies (11). Early advocates of the importance of leisure recognized the potential of leisure to compensate for negative work experiences or to add positive experiences that could not be obtained through work. Wilensky (91) described leisure as having a regenerative effect when people use it to supplement unsatisfying work experiences. Kando & Summers (37) argued that leisure can provide not only positive experiences not sufficiently encountered in work life but also opportunities to recover from negative experiences in work life. A review of the empirical literature provides several perspectives on the relationships between work, leisure, and psychological health. Separately, both leisure satisfaction (40) and job satisfaction (89) have been shown to be positively related to psychological health (68). The positive relationship between leisure satisfaction and psychological health mirrors other studies reporting significant positive relationships between leisure satisfaction and quality of life variables (40).

Additional factors such as the importance of a well-rounded life, the declining importance of work as aprimary source of life satisfaction, and other areas of social life have been identified as important sources of life satisfaction (13, 54). These other areas include family, health, marriage, socioeconomic status, and leisure satisfaction, which is one of the main interests of this study(41, 58, 72, 74, 88).

Leisure satisfaction is defined as the positive perceptions or feelings that an individual creates, elicits or gains as a result of their participation in leisure activities and choices. It is the degree to which the individual is currently satisfied or content with their overall leisure experiences and situations. This positive feeling of satisfaction results from the fulfilment of the individual's felt or unfelt needs (8, 78, 79). These needs have been modelled as psychological, educational, social, relaxation, physiological and aesthetic in early research (8, 83) and continue tobe supported by current research (14, 63, 73, 94). On the other hand, a significant number of studies frequently emphasise the existence of a positive correlation between leisure time activities and well-being (16, 51, 55, 59, 71).

Well-being or well-being is the responses and interpretations that individuals give to their life experiences (66). Well-being describes a subjective cognitive evaluation and emotional feelings about

life (19). The concept of well-being is derived from two old philosophical concepts. The first one is hedonism proposed by Aristippus and the second one is eudaimonia (psychological well-being), also called self-actualisation, proposed by Aristotle (75). At this point, subjective well-being as proposed by Aristippus emerges as a hedonic-based concept. The purpose of life is manifested as the need to be satisfied and to escape from pain. Its commonmeasurement structure consists of dimensions such as life satisfaction, positive emotions and negative emotions (19). Eudaimonic well-being is based on self-actualisation. As suggested by Aristotle, it is emphasised that the key to well-being lies in self-actualisation. The common measurement structure is self-acceptance, positive relationships with others, autonomy, environmental mastery and personal development (76).

Generally, terms such as well-being, life satisfaction, welfare, happiness or quality of life are used interchangeably (49). According to the United Nations' "2018 World Wellbeing Report", Turkey's wellbeing ranked 69th among 155 countries between 2014 and 2016. Well-being indices include the assessment of gross domestic product (GDP), social support, expected physical health, freedom of choice in life, generosity and government corruption (33). According to the "2022 World Prosperity Report", Turkey's prosperity ranked 112th among 146 countries between 2019 and 2021 (62). As it is known, well-being is largely related to public health. In the field of public health, recreational physical activity, in other words, recreational sport is recognisedas an important factor contributing to both physical and mental health (69).

Leisure is an important part of a balanced lifestyle and is often described as essential for well-being (17). It is suggested that leisure activities support well-being through various psychological and physical mechanisms (90). For example, the DRAMMA model (64) states that leisure activities improve well-being by allowing individuals torelax away from the stress of daily life and participate in activities that meet various psychological needs (autonomy, mastery, meaning, commitment). Furthermore, participation in recreational sports promotes physical health, which is associated with greater life satisfaction. Illness is often associated with lower well-being (75), and improving physical health helps prevent chronic diseases by keeping diseases at bay (26). In addition to influencing well-being through psychological mechanisms, recreational sports also lead to physiological responses that enhance well-being. Viewed through a neurological lens, various forms of physical activity are known to increase levels of norepinephrine, serotonin and dopamine in the brain, all of which are associated with feelings of happiness (61). Studies also show that recreational sports promote positive emotions (38).

Studies on well-being, happiness and quality of life in relation to recreational physical activities have been conducted among the elderly (70), disabled people (60), students (32), adults (34), women (43), adolescents(23), immigrants (86), walkers and dancers (50), but not enough studies have been conducted on university students (53).

University life is called the most important part of a person's life and is also described as a period of transition or adaptation to adulthood in which the ethical values acquired in childhood are compared with the set of values acquired while growing up (67). University students who become young adults experience many changes in every aspect of their lives. These changes include entering into a new social environment, searching for identity, anxiety about the future, searching for a suitable job and in some cases preparing for marriage (77). Given these challenges and pressures, well-being and leisure satisfaction may emerge as a source of concern. Therefore, it is important to examine the issues of well-being and leisure satisfaction within the scope of recreational sports, especially in young individuals. Examining recreational sports well-being and leisure time satisfaction in young individuals will contribute to the recreation and well-being literature.

The aim of this relational survey research, which is based on this point, is to determine the relationship between recreational well-being and leisure time satisfaction of university community members. With in the scope of the research, answers to the following questions were sought.

- Does gender, perceived income level and weekly participation time in sportive recreation activities have a significant effect on the mean recreational sport well-being scores of university community members?
- Is there a significant difference between the gender, perceived income level and weekly participation time in sportive recreation activities and the level of leisure time satisfaction of university community members?
- What is the relationship between recreational sports well-being and leisure satisfaction levels of university community members?

## METHOD

### Research design

This study aims to determine the relationship between the recreational well-being and leisure satisfaction of university community members, so the study was modeled according to the relational survey model.

### Universe and sample

The population of the study consists of "Selçuk University Student Communities". According to the information obtained from the web page of the relevant university, there are 187 student communities in total and 5230 students who are members of these societies. In this study in which simple random sampling method was used, 298 community members were reached. The number of members of the relevant student communities varies from semester to semester. Therefore, no clear inference can be made about the population. The number of members of the relevant student communities varies from semester to semester. Therefore, no clear inference can be made about the population. In this context, in order to reach the entire population, data were collected with the heads of the societies over a period of 3 months and as a result, 298 members were reached (97, 98).

### Data collection tools

The research form created by the researchers for the participants, "Recreational Well-Being" and "Leisure Time Satisfaction" scales were used as data collection tools. In the participant form, there are questions about the independent variables of gender, perceived income level and weekly participation time in sportive recreation activities of the relevant group.

The "Recreational Sport Well-Being" scale, developed by Pi et al. (69) and Turkish validity and reliability study by Koç (44), consists of 4 sub-dimensions and 14 items. The sub-dimensions are "Physical and Mental Health" (items 1,2,3 and 4), "Life Satisfaction" (items 5,6,7 and 8), "Family Relationship Development" (items 9,10,11) and "Positive Emotion" (items 12,13,14). The scale has a 5-point scale and the internal consistency coefficient was determined as 0.86 for the whole scale in the study conducted by Koç (44). In the analysis conducted for our study, the internal consistency coefficient was determined as 0.86.

"Leisure Time Satisfaction" scale, which was developed by Beard & Ragheb (8) and Turkish validity and reliability study was conducted by Karlı et al. (39), consists of 51 items and 6 sub-dimensions. The sub-dimensions are respectively "Education" (17,18,19,20,21,22,23,24,25th item), "Physiological" (41,21,43,44,45,46th item), "Aesthetic" (48,49,50,51st item), "Relaxation" (37,38,39,40. Item), "Social" (26,27,28,29,30,31,32,35. Item) and "Psychological" (1,2,3,5,6,7,9,9,12.Item) The scale has a 5-point scale and the internal consistency coefficient was calculated by Karlı et al. (39), the internal consistency coefficient was determined as 0.92 for the whole scale. In the analysis conducted for our research, the internal consistency coefficient was determined as 0.87.

### Analysing the data

After the participant form, "Recreational Well-Being" and "Leisure Time Satisfaction" scale used in this article were entered into a single form, they were virtualised with the help of "Google Forms" and sent to the community members via e-mail and "Whatsapp". A total of 298 members were returned.

Since 7participants marked more than one independent variable and 14 participants left most of the questions blank or made more than one marking, the data obtained from a total of 21 participants were excluded from the analysis. The analyses with the remaining 277 data were included in the analysis in the "Jamovi" package programme. In order to test the homogeneity of the data and to decide which analyses to be performed, the results of the "Skewness-Proportionality" test were examined. According to the test results, since all values were between ±2 values (95), Anova test was performed for "Leisure Time Interest"and independent variables with more than two options. After the assumptions were met as explained indetail in the findings section, MANOVA test was performed for "Recreational Sport Well-Being" and independent variables.

**Ethical approval and institutional permission**

Ethics committee permission for this research was received from the Social and Human Scientific Research Ethics Committee with the decision numbered 2023/265 on 09/06/2023.

**FINDINGS**

MANOVA test was performed to examine whether the independent variables of gender, perceived income level and duration of weekly participation in sportive recreation activities have a significant effect on the composite mean scores of physical and mental health, life satisfaction, family relationshipdevelopment and positive emotional states, which are sub-dimensions of recreational sport well-being. Information on gender, perceived income level and weekly participation time in sportive recreation activities are given in Table 1.

When Table 1 was analysed, it was seen that women's averages of physical and mental health (x=3.05),life satisfaction (x=3.06), family relationship development (x=3.01) and positive emotion (x=3.04) were higher than men (x( physical and mental health)= 2.99; x( life satisfaction)= 2.96, x( family relationship development= 2.92 and x( positive emotion)= 2.99). When analysed in terms of perceived income variable, it was seen that the group withgood income (x=4.04) was higher than the group with normal (x=3.93) and low income (x=2.55), the group with normal income (x=4.03) was higher than the group with good income (x=4.01) and low income (x=2.51), in the dimension of family relationship development, the normal group (x=4.01) washigher than the good group (x=3.98) and the low group (x=2.45), and finally, in the dimension of positiveemotion, the group with good income (x=3.98) was higher than the normal group (x=3.93) and the lowgroup (x=2.56).

In terms of the weekly sportive recreation participation time variable, the physical and mental health averages of the group participating for 120-179 minutes (x=3.22) were higher than the other groups (x (240 and over)=3.05; x( 180-249 minutes) =2.98; x( 10-119 minutes) =2.70); at the point of life satisfaction, the average of the group participating 120-179 minutes (x=3.23) is higher than the other groups (x (240 and over)=3.18; x( 180-249 minutes) =2.91; x( 10-119 minutes) =2.53); at the point of developing family relationship, the average ofthe group participating with 120-179 minutes weekly (x=3.22) is higher than the other groups (x (240 and over)=3.14; x( 180-249 minutes) =2.92; x( 10-119 minutes) =2.28) and finally, at the point of developing positive emotions, it was determined that the average of the group (x=3.21) participating with a weekly durationof 120-179 minutes was higher than the other groups (x (240 and over)=3.13; x( 180-249 minutes) =3.00; x( 10-119 minutes) =2.52).

**Table 1.** Descriptive findings of independent variables

| Dependent Variable | Independent Variable | n | x | s |
|---|---|---|---|---|
| | **Gender** | | | |
| Physical and Mental Health | Woman | 127 | 3.05 | 0.86 |
| | Male | 150 | 2.99 | 0.85 |
| Life Satisfaction | Woman | 127 | 3.06 | 0.87 |
| | Male | 150 | 2.96 | 0.86 |
| Family Relationship Development | Woman | 127 | 3.01 | 0.91 |
| | Male | 150 | 2.92 | 0.97 |
| Positive Emotion | Woman | 127 | 3.04 | 0.92 |
| | Male | 150 | 2.99 | 0.83 |
| | **Perceived Income** | | | |
| Physical and Mental Health | Low | 186 | 2.55 | 0.56 |
| | Normal | 50 | 3.93 | 0.44 |
| | Good | 41 | 4.04 | 0.46 |
| Life Satisfaction | Low | 186 | 2.51 | 0.52 |
| | Normal | 50 | 4.03 | 0.40 |
| | Good | 41 | 4.01 | 0.42 |
| Family Relationship Development | Low | 186 | 2.45 | 0.65 |
| | Normal | 50 | 4.01 | 0.50 |
| | Good | 41 | 3.98 | 0.43 |
| Positive Emotion | Low | 186 | 2.56 | 0.63 |
| | Normal | 50 | 3.93 | 0.45 |
| | Good | 41 | 3.98 | 0.43 |
| | **Weekly Participation in Sportive Recreation** | | | |
| Physical and Mental Health | 60-119 | 45 | 2.70 | 0.55 |
| | 120-179 | 74 | 3.22 | 0.79 |
| | 180-239 | 84 | 2.98 | 0.90 |
| | 240 and above | 74 | 3.05 | 0.96 |
| Life Satisfaction | 60-119 | 45 | 2.53 | 0.43 |
| | 120-179 | 74 | 3.23 | 0.91 |
| | 180-239 | 84 | 2.91 | 0.92 |
| | 240 and above | 74 | 3.18 | 0.82 |
| Family Relationship Development | 60-119 | 45 | 2.28 | 0.70 |
| | 120-179 | 74 | 3.22 | 0.85 |
| | 180-239 | 84 | 2.92 | 0.94 |
| | 240 and above | 74 | 3.14 | 0.96 |
| Positive Emotion | 60-119 | 45 | 2.52 | 0.62 |
| | 120-179 | 74 | 3.21 | 0.90 |
| | 180-239 | 84 | 3.00 | 0.86 |
| | 240 and above | 74 | 3.13 | 0.87 |

Some assumptions were tested before the MANOVA test conducted to test the significance of this difference over the composite scores. First of all, the normality assumption of the scores of the independent variables belonging to the dependent variables was checked with the Skewness-Normality test. as a result of the test, it was determined that all values were between ±2 values. The assumption of normality of the multivariability of the dependent variables was checked with the "Q-Q plot" graph and it was found that the conditions were met. In order to test the equality of covariance matrices, it was tested with "Box's M test" and since there was no significant difference between the covariance matrices ($X2 = 9.98$; $p > .05$), the condition was met. After the assumptions were met, MANOVA test results for the independent variables are presented in Table 2.

**Table 2.** MANOVA test results for independent variables

| Source | Dependent Variable | Sum of Squares | sd | Mean Squares | F | p |
|---|---|---|---|---|---|---|
| Gender | Physical and Mental Health | 0.20 | 1 | 0.20 | 0.59 | 0.44 |
| | Life Satisfaction | 0.78 | 1 | 0.78 | 2.43 | 0.12 |
| | Family Relationship Development | 0.55 | 1 | 0.55 | 1.25 | 0.26 |
| | Positive Emotion | 0.14 | 1 | 0.14 | 0.37 | 0.54 |
| Perceived Income | Physical and Mental Health | 110.22 | 1 | 110.22 | 329.14 | <.001 |
| | Life Satisfaction | 117.78 | 1 | 117.78 | 366.84 | <.001 |
| | Family Relationship Development | 122.89 | 1 | 122.89 | 279.17 | <.001 |
| | Positive Emotion | 102.37 | 1 | 102.37 | 260.65 | <.001 |
| Rec. Duration of Participation | Physical and Mental Health | 0.94 | 1 | 0.94 | 2.81 | 0.09 |
| | Life Satisfaction | 0.14 | 1 | 0.14 | 0.46 | 0.49 |
| | Family Relationship Development | 1.63 | 1 | 1.63 | 3.72 | 0.05 |
| | Positive Emotion | 0.20 | 1 | 0.20 | 0.51 | 0.47 |
| Error | Physical and Mental Health | 91.42 | 273 | 0.33 | | |
| | Life Satisfaction | 87.65 | 273 | 0.32 | | |
| | Family Relationship Development | 120.17 | 273 | 0.44 | | |
| | Positive Emotion | 107.22 | 273 | 0.39 | | |

*p<.017 (Bonferroni Correction) (96)

As a result of the MANOVA test, it was determined that there was no significant difference in the combined mean scores of female and male participants' physical and mental health, life satisfaction, family relationship development and positive emotion levels (F(4-270) =0.85; p>0.05; Pillai's Trace= 0.01).

As a result of the test for perceived income status, a significant difference was found in the mean combined scores of physical and mental health, life satisfaction, family relationship development and positive emotion levels (F(4-270) =203.02; p<0.05; Pillai's Trace= 0.75). As a result of the test performed for the variable of weekly participation time in recreational activities, it was determined that there was no significant difference in the mean combined scores of physical and mental health, life satisfaction, developing family relationships and positive emotion levels (F(4-270) =2.13; p>0.05; Pillai's Trace= 0.07).

**Table 3.** ANOVA test results for perceived income variable

| Dependent Variable | Independent Variable Perceived Income | n | x | ss | F | p | Difference (Tukey) |
|---|---|---|---|---|---|---|---|
| Education | 1-) Low | 186 | 3.26 | 0.47 | 144.55 | <.001 | 3>1 |
| | 2-) Normal | 50 | 4.04 | 0.25 | | | |
| | 3-) Good | 41 | 4.02 | 0.28 | | | |
| Physiological | 1-) Low | 186 | 3.23 | 0.58 | 84.2 | <.001 | 3>1 |
| | 2-) Normal | 50 | 3.95 | 0.32 | | | |
| | 3-) Good | 41 | 3.96 | 0.35 | | | |
| Aesthetics | 1-) Low | 186 | 3.30 | 0.62 | 64.3 | <.001 | 3>1 |
| | 2-) Normal | 50 | 4.02 | 0.38 | | | |
| | 3-) Good | 41 | 3.97 | 0.40 | | | |
| Relaxation | 1-) Low | 186 | 3.24 | 0.64 | 83.6 | <.001 | 3>2>1 |
| | 2-) Normal | 50 | 3.96 | 0.37 | | | |
| | 3-) Good | 41 | 4.07 | 0.34 | | | |
| Social | 1-) Low | 186 | 3.25 | 0.45 | 142.8 | <.001 | 3>1 |
| | 2-) Normal | 50 | 4.01 | 0.31 | | | |
| | 3-) Good | 41 | 3.95 | 0.21 | | | |
| Psychological | 1-) Low | 186 | 3.14 | 0.47 | 181.4 | <.001 | 3>1 |
| | 2-) Normal | 50 | 4.02 | 0.27 | | | |
| | 3-) Good | 41 | 3.95 | 0.27 | | | |

As a result of the ANOVA test between perceived income status and leisure time satisfaction; a significant difference was found between all sub-dimensions of the scale and perceived income ($p<0.05$). As a result of the "Post-Hoc Tukey" test performed to measure between which groups the significant difference occurred; in the educational sub-dimension, the group with good perceived income status (x=4.02) and the group with low perceived income status (x=3.26); in the physiological sub- dimension, between the group with good perceived income (x=3.96) and the group with low perceived income (x=3.23); in the aesthetic sub-dimension, between the group with good perceived income (x=3.97) and the group with low perceived income (x=3.30); in the relaxation sub-dimension, between the group with good perceived income (x=4.07) and the group with normal (x=3.96) and low perceived income (x=3.24); in the social sub-dimension, between the group with good perceived income (x=3.95) and the group with low perceived income (x=3.25) and finally, in the psychological sub-dimension, a significant difference was found between the group with good perceived income (x=3.95) and the group with low perceived income (x=3.14).

**Table 4.** ANOVA test results for the variable of weekly sportive recreation participation time

| Dependent Variable | Independent Variable Weekly Participation in Sportive Recreation | n | $\bar{x}$ | ss | F | p | Differance Tukey |
|---|---|---|---|---|---|---|---|
| Education | 1-) 60-119 | 45 | 3.26 | 0.48 | 5.06 | <.001 | 2>3>1 |
| | 2-) 120-179 | 74 | 3.62 | 0.52 | | | |
| | 3-) 180-239 | 84 | 3.54 | 0.56 | | | |
| | 4-) 240 and above | 74 | 3.53 | 0.s56 | | | |
| Physiological | 1-) 60-119 | 45 | 3.09 | 0.59 | 7.68 | <.001 | 2>3>4>1 |
| | 2-) 120-179 | 74 | 3.59 | 0.56 | | | |
| | 3-) 180-239 | 84 | 3.55 | 0.62 | | | |
| | 4-) 240 and above | 74 | 3.48 | 0.60 | | | |
| Aesthetics | 1-) 60-119 | 45 | 3.27 | 0.56 | 4.22 | <.001 | 2>1 |
| | 2-) 120-179 | 74 | 3.65 | 0.63 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3-) 180-239 | 84 | 3.53 | 0.71 | | | |
| | 4-) 240 and above | 74 | 3.56 | 0.59 | | | |
| Relaxation | 1-) 60-119 | 45 | 3.14 | 0.71 | 4.39 | <.001 | 2>4>3>1 |
| | 2-) 120-179 | 74 | 3.59 | 0.68 | | | |
| | 3-) 180-239 | 84 | 3.53 | 0.61 | | | |
| | 4-) 240 and above | 74 | 3.56 | 0.65 | | | |
| Social | 1-) 60-119 | 45 | 3.12 | 0.41 | 14.44 | <.001 | 2>4>3>1 |
| | 2-) 120-179 | 74 | 3.67 | 0.51 | | | |
| | 3-) 180-239 | 84 | 3.48 | 0.52 | | | |
| | 4-) 240 and above | 74 | 3.55 | 0.52 | | | |
| Psychological | 1-) 60-119 | 45 | 3.13 | 0.45 | 8.00 | <.001 | 2>1 |
| | 2-) 120-179 | 74 | 3.56 | 0.51 | | | |
| | 3-) 180-239 | 84 | 3.40 | 0.60 | | | |
| | 4-) 240 and above | 74 | 3.47 | 0.62 | | | |

As a result of the ANOVA test performed between weekly participation time in sportive recreation activities and leisure time satisfaction; a significant difference was found between all sub-dimensions of the scale and perceived income ($p<0.05$). When the relationship of the significant difference between the groups was examined; between the group with 120-179 minutes of participation in the educational sub-dimension (x=3.62) with the group with 180-239 minutes of participation (x=3.54) and the group with 60-119 minutes of participation (x=3.26); between the group with 120-179 minutes of participation in the physiological sub-dimension and all other groups (x( 180-239 minutes) =3.55; x=( 240 and over) =3.48; x( 60-119 minutes) =3.09); in the aesthetic sub-dimension, between 120-179 minutes of participation (x=3.65) and 60-119 minutes of participation (x=3.27); in the relaxation sub- dimension, between the group with 120-179 minutes of participation (x=3.59) and all other groups (x (240 and over)=3.56; x= (180-239 minutes)=3.53; x (60-119 minutes)=3.14); in the social sub-dimension, between the group participating 120-179 minutes (x=3.67) and all other groups (x (240 and over)=3.55; x= (180-239 minutes)=3.55; x (60-119 minutes)=3.12); finally, in the psychological sub-dimension, there was a difference between the group participating 120-179 minutes (x=3.56) and the group participating 60-119 minutes (x=3.13).

**Table 5.** Relationship test between recreational sports well-being and leisure time satisfaction

| | n | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. R.S.İ.O. Physical and MentalHealth | 277 | Spearman | - | | | | | | | | | |
| | | p value | | | | | | | | | | |
| 2. R.S.İ.O. Life Satisfaction | | Spearman | 0.62 | - | | | | | | | | |
| | | p value | <.001 | | | | | | | | | |
| 3. R.S.İ.O. Family Relationship Development | | Spearman | 0.60 | 0.60 | - | | | | | | | |
| | | p value | <.001 | <.001 | | | | | | | | |
| 4. R.S.I.O. Positive Emotion | | Spearman | 0.60 | 0.63 | 0.58 | - | | | | | | |
| | | p value | <.001 | <.001 | <.001 | | | | | | | |
| 5. SZTÖ Education | | Spearman | 0.50 | 0.52 | 0.58 | 0.51 | - | | | | | |
| | | p value | <.001 | <.001 | <.001 | <.001 | | | | | | |
| 6. SZTÖ Physiological | | Spearman | 0.41 | 0.42 | 0.43 | 0.40 | 0.53 | - | | | | |
| | | p value | <.001 | 0,06 | <.001 | <.001 | <.001 | | | | | |
| 7. SZTÖ Aesthetics | | Spearman | 0.40 | 0.43 | 0.40 | 0.40 | 0.46 | 0.42 | - | | | |
| | | p value | <.001 | 0,46 | <.001 | 0,03 | <.001 | <.001 | | | | |
| 8. SZTÖ Relaxation | | Spearman | 0.41 | 0.42 | 0.45 | 0.44 | 0.44 | 0.41 | 0.40 | - | | |
| | | p value | <.001 | <.001 | <.001 | 0,38 | <.001 | <.001 | <.001 | | | |
| 9. SZTÖ Social | | Spearman | 0.44 | 0.54 | 0.52 | 0.47 | 0.54 | 0.46 | 0.45 | 0.36 | - | |
| | | p value | <.001 | <.001 | <.001 | 0,09 | <.001 | <.001 | <.001 | <.001 | | |
| 10. SZTÖ Psychological | | Spearman | 0.54 | 0.58 | 0.51 | 0.57 | 0.58 | 0.52 | 0.47 | 0.44 | 0.51 | - |
| | | p value | <.001 | 0,62 | <.001 | 0,23 | <.001 | <.001 | <.001 | <.001 | <.001 | |

As a result of the correlation analysis carried out to determine the relationship between "Recreational Sports Well-Being" and "Leisure Time Satisfaction"; the correlation between RSIQ "Life Satisfaction" and SZTÖ "Aesthetic" (r=0.46, p>0,05) (96) and SZTÖ "Psychological" (r=0.62, p>0,05) sub-dimensions; no significant relationship was found between RHI "Positive" and SZTÖ "Social" (r=0.38, p>0,05) and SZTÖ "Psychological" (r=0.23, p>0,05) (96) sub-dimensions. On the other hand, it was determined that there was a moderate positive relationship between the related measurement tools.

## DISCUSSION AND CONCLUSION

In this study, which aimed to examine the relationship between recreational sport well-being and leisure time satisfaction perceptions of university community members, no significant difference was found between gender variable and recreational sport well-being and leisure time satisfaction (Table 2), and it was determined that the recreational sport well-being levels of female participants were higher than male participants (Table 1). It is thought that this situation may be due to the fact that female participants are more aware of the psychological, physical and social benefits obtained as a result of participation in recreational sporting activities. According to a study conducted by Gümüşay et al. (30), no significant difference was found between gender variable and recreational sport well-being and it was determined that female participants had a higher level of recreational sport well-being than male participants. In a study conducted by Kermen et al. (42) to determine whether the concepts of psychological well-being and life satisfaction are affected by the concept of social anxiety, no significant difference was found between the gender variable and the level of psychological well-being, and it was revealed that male participants had a higher level of well-being than female participants. In a study conducted by Ertürk et al. (25), a significant difference was found between gender variable and psychological well-being level and it was determined that female participants had a higher level of psychological well-being than male participants. There are studies (1, 5, 6, 9, 18, 22, 31, 35, 46, 81).

A significant difference was found between the perceived income status variable and the participants' leisure time satisfaction and recreational sport well-being (Table 2, Table 3). When

descriptive findings are analysed, it is seen that the group with low level of recreational sport well-being is the group with low perceived income (Table 1). Looking at the mean leisure time satisfaction of the participants, it was determined that the group with the lowest mean was the participants with low perceived income level (Table 3). It can be said that these findings in the study may be due to the fact that participants with low perceived income level cannot benefit more from recreational-oriented sportive activities than participants with normal or good perceived income level due to economic constraints and this situation affects their leisure time satisfaction in general. According to a study conducted by Tunç (84), a significant difference was found between the income levels of the participants and psychological well- being, and it was revealed that the psychological well-being levels of the participants with low income levels were higher than the participants with other income groups. In a study conducted by Dost (21) on university students in Turkey and South Africa, it was determined that the subjective well-being of the participants differed according to the perceived income status variable. According to another study conducted by Geçgin & Sahranç (27), a significant difference was determined between the perceived income status of the participants and psychological well-being, and it was determined that the psychological well-being levels of the participants with low perceived income status were lower than the participants with other income status perceptions. In the study conducted by Gökbulut & Bal (29) to determine the relationship between mental well-being and healthy awareness, a significant difference was determined between the income levels of the participants and their mental well-being, and it was determined that the participants with poor income levels were lower than the participants with medium and good income levels. According to a study conducted by Elmas et al. (24) to determine the relationship between university students' physical activity level and psychological well-being levels, no significant difference was found between the income level variable of the participants and the level of psychological well-being. In a study conducted by Ardahan & Yerlisu Lapa (3) to examine the leisure time satisfaction levels of university students according to income and gender variables, a significant difference was found between the income level and leisure time satisfaction levels of the participants, and it was determined that as the income level increased, the level of leisure time satisfaction increased. In a study conducted by Yaman et al. (92) to examine the leisure time satisfaction levels of youth centre employees in terms of various variables, a significant difference was found between the participants' perceived income level variable and the level of leisure time satisfaction, and it was determined that as the perceived income level increases, the level of leisure time satisfaction increases. According to a study conducted by Sevil & Şimşek (80), no significant difference was found between the income status of the participants and their level of leisure satisfaction. There are studies in the literature that confirm the findings of the research and contrary to the research (2, 7, 10, 15, 28, 45, 47, 48, 56, 57, 65, 82, 85, 93).

While a significant difference was found between the variable of weekly participation time in sportive recreational activities and leisure time satisfaction (Table 4), no significant difference was found between recreational sport well-being (Table 2). Considering the descriptive findings, it was determined that individuals who participated in weekly sportive recreational activities between 120-179 minutes had higher recreational sport well-being and leisure time satisfaction levels compared to other participants (Table 1, Table 4). It is thought that this situation that emerged in the research findings may be due to the fact that individuals who participate in weekly sportive recreational activities in the range of 120-179 minutes benefit more from the outputs of sportive recreational activities within the scope of possible leisure time in physical, psychological, social and educational terms and have a higher awareness in this regard than other individuals. As a result of the correlation analysis performed to

determine the relationship between the measurement tools, it was determined that there was a moderate positive relationship between the "Recreational Sports Well-Being Scale" and the "Leisure Time Satisfaction Scale" (Table 5). According to the study conducted by Argan et al. (4) aiming to create a theoretical model to examine the relationship between well-being, leisure satisfaction, life satisfaction and happiness, a significant relationship was found between well-being and leisure satisfaction. According to a study conducted by Brown et al. (12) to determine the effect of leisure satisfaction on psychological well-being, leisure satisfaction was found to be an important predictor of well-being. According to a study conducted by Liu (52) to determine the relationship between the personalities, leisure satisfaction and subjective well-being of serious leisure participants, it was found that there was a positive relationship between leisure satisfaction and subjective well-being and that leisure satisfaction positively affected subjective well-being. In a study conducted by Ito et al. (36) to determine whether leisure time satisfaction of university students affects their subjective well-being, it was determined that leisure time satisfaction positively affected the subjective well-being levels of the participants.

As a result, while there was no significant difference between gender variable and recreational sport well-being, there was a significant difference between perceived income status and leisure time satisfaction and recreational sport well-being. It can be said that the perceived income status of the participants is a factor affecting individuals' leisure time satisfaction and recreational sporting well-being. It can be stated that leisure time satisfaction and recreational sport well-being are two concepts that can positively affect each other.

University community member students were preferred as the sample in the study and different samples can be preferred for future research. The extent to which various demographic factors (such as age, educational status) mediate the relationship between recreational sport well-being and leisure satisfaction can be addressed. Since the research was designed according to quantitative method principles, different methods may be preferred in future research. For example, mixed methods principles may be preferred to investigate in depth the relationship between recreational sports well-being and leisure satisfaction. This may make it easier to determine the exact reasons for the findings in the research.

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# Examination of Pre-Service Physical Education Teachers' Beliefs on Physical Education Profession

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**Abstract**

This research examines pre-service physical education teachers' (PPETs') beliefs on the physical education profession (BPEP). A convergent mixed-method research design was administered. The data was collected using the descriptive information form, PPET-BPEP, and open-ended questions. The study included 218 pre-service physical education teachers studying Physical Education Teacher Education (PETE) and pedagogical formation certificate programs. Non-parametric tests were used for quantitative data and content analysis for qualitative data. While gender did not differ significantly between the programs, there was a significant difference in the "value of PE profession" sub-domain. The professional beliefs of those whose first career choice was PE and sports teaching and those who wanted to become PE and sports teachers after graduation were found to be statistically significantly higher than those of others. Those whose first career choice is PE and sports teaching tend to this profession for reasons such as their athlete identity, dream job, role model effect, and the desire to make children love and teach sports. Those who want to be a PE and sports teacher after graduation stated that their reasons for choosing this profession are making children love sports, loving children and taking care of them, explaining the importance of the profession, and wanting to be involved in sports, as well as some of the features of the profession. The study results are essential as show that PPETs' high professional beliefs indicate that they can carry out their duties and responsibilities willingly and confidently when appointed.

**Keywords:** Pre-service teachers, Physical education and sports, Beliefs, Sense of calling, Value of physical education

**Özet**

**Beden Eğitimi Öğretmen Adaylarının Beden Eğitimi Mesleğine İlişkin İnançlarının İncelenmesi**

Bu çalışma, beden eğitimi öğretmen adaylarının beden eğitimi ve spor (BES) öğretmenliği mesleğine ilişkin inançlarını incelemektedir. Çalışmada, eş zamanlı karma yöntemler araştırması deseni uygulanmıştır. Verilerin toplanmasında tanımlayıcı bilgi formu, Beden Eğitimi Öğretmenliği Mesleki İnanç Ölçeği ve açık uçlu sorular kullanılmıştır. Çalışmaya BES öğretmenliği ve pedagojik formasyon sertifika programında öğrenim gören 218 öğretmen adayı katılmıştır. Nicel veriler için parametrik olmayan testler, nitel veriler için ise içerik analizi kullanılmıştır. Programlar arasında cinsiyet değişkeni açısından anlamlı bir farklılık bulunmazken, beden eğitimine verilen değer alt boyutunda anlamlı bir farklılık bulunmuştur. İlk kariyer tercihi BES öğretmenliği olanların ve mezun olduktan sonra BES öğretmeni olmak isteyenlerin mesleki inançları diğer gruplardan istatistiksel olarak anlamlı şekilde yüksek bulunmuştur. İlk kariyer tercihi BES öğretmenliği olanlar sporcu kimliği, hayallerindeki meslek, rol model etkisi, çocuklara sporu sevdirme ve

öğretme isteği gibi nedenlerle bu mesleğe yönelmektedir. Mezun olduktan sonra BES öğretmeni olmak isteyenler tercih nedenlerini hayallerindeki meslek olması ile birlikte çocuklara sporu sevdirmek, çocukları sevmek ve onlarla ilgilenmek, mesleğin önemini anlatmak ve sporla iç içe olmak istemek ile mesleğin bazı özellikleri olarak belirtmişlerdir. Çalışma sonuçları; BES öğretmen adaylarının mesleki inançlarının yüksek olmasının atandıklarında görev ve sorumluluklarını istekle ve inançla gerçekleştirebileceklerini göstermesi bakımından önem arz etmektedir.

**Anahtar Kelimeler:** Öğretmen adayı, Beden eğitimi ve spor, İnanç, Çalışma arzusu, Beden eğitimine verilen değer

## INTRODUCTION

Belief is a person's assessment of the correctness of a statement. The foundational elements of belief systems are one's background and experiences (37). Beliefs that form the basis of an individual's behaviour and perspective on life are attitudes that are highly accepted and ingrained in people's lives (5). People's beliefs and attitudes are closely related to one another (33). Professional beliefs are an individual's thoughts and evaluations about a profession (31). Aktag and Walter (4) emphasize that teachers' professional beliefs are among the most critical factors affecting their professional success. Teachers' professional beliefs can affect their academic and professional lives (45). Additionally, perspectives of the teaching profession and the motivations to choose it are strongly correlated (10). According to Ustuner et al. (46), those who have favourable opinions of the teaching profession are more likely to choose it for internal motives. In addition, teachers' beliefs in the profession significantly affect their permanence (16) and professional development (15).

Beliefs are one of the valuable cognitive structures necessary for us to study and understand teachers' decisions and practices (8) and are the main determinants of teachers' actions toward students (34). Teachers' beliefs affect their teaching behaviours and practices and students' learning outcomes (9, 11, 41, 48). Fan et al. (18) proposed two-domains conceptual framework to explain professional belief: the sense of calling and the value of PE. To this conceptualization, a sense of calling is the belief that one is predisposed to choose a career in PE. Understanding this belief - what matters to teachers, what motivates them, and why they do - can be invaluable for creating policies and reforms that can truly make a difference (19). Teachers with a strong sense of calling are more devoted to their schools, more effective, and feel a sense of great personal achievement (22). The value of PE, another domain, is the belief in how proper and valuable PE lessons are for students (18). Despite the fact that research on the devaluation of the PE profession (25, 36), it is uncertain what effect this situation has on teacher candidates. Understanding the PPETs' sense of calling and the value of PE can help us better understand their career motivations (18). Indeed, understanding pre-service teachers' beliefs is essential to teacher education research (26). Teacher education should include strategies that help pre-service teachers explain their deeply ingrained beliefs and provide them with chances to reflect and reshape those beliefs (42). The self-efficacy beliefs towards the teaching profession (23, 40), perceived roles at school (32), intended program outcomes (3), and professional attitudes (1) have been investigated in several research in the field of PE and sports. There are, however, few researches on PE and sports teacher's beliefs about the PE profession (6, 15, 28, 44, 48). O'Sullivan (35) asserts that more attention should be paid to what pre-service teachers know, practice, and value regarding teaching.

According to Pajares (37), beliefs are formed early in life and are resistant to change. Therefore, knowing pre-service teachers' beliefs is crucial before they enter undergraduate education. Because these beliefs shape their later ideas (24). However, Pajares (37) also states that pre-service teachers' current thoughts can be changed through experiences. At this point, examining which system, institutions, and by whom the teacher candidates are trained becomes crucial. The teacher training system in Turkey changes frequently (43). In the Turkish education system, field-specific undergraduate education provides preparation for the teaching profession, including general culture, field education, and pedagogical formation courses. However, the need for teachers that arise from time to time in Turkey has been met with various teacher education certificate programs (2). One of these programs is the pedagogical formation education certificate program the Council of Higher Education allows. These programs ensure that professional staff other than those who graduated from the teaching program can also become teachers (14). Pedagogical formation is one of the controversial issues in the Turkish education system. Teacher education in a short time with pedagogical formation brings many concerns.

It is seen to be crucial to ascertain potential PE and sports teachers' beliefs on the PE profession given the impact of beliefs on professional careers. The first step in changing PPETs' ideas about their profession through discussion of different perspectives on PE as a profession should be to appropriately identify such beliefs (18). Consequently, this study's objective is to investigate the professional beliefs of PPETs' beliefs on the PE profession studying in Physical Education Teacher Education (PETE) programs and pedagogical formation certificate programs.

## METHOD

### Research Design

A convergent mixed-method research design was administered in this research. In this design, the researcher collects both closed-ended/quantitative and open-ended/qualitative data, integrates the datasets, and uses datasets to get at conclusions (12).

### Participants

Participants of the research are students studying at Mugla Sıtkı Kocman University Faculty of Sport Sciences PETE program and Education Faculty Pedagogical Formation Education program. A total of 218 pre-service teachers, 81 (37.2%) female and 137 (62.8%) male, participated in the study. 117 (53.7%) of the participants are registered in PETE, and 101 (46,3%) of them are registered in the Pedagogical Formation Education program (Coaching Education - 40, Sport Management - 34, Recreation - 27). The mean age of the pre-service teachers was determined as 22.88±3.37.

**Table 1.** Demographic information of the participants

| Program | Grade Level | | | | | Total | |
|---|---|---|---|---|---|---|---|
| | 1st grade | 2nd grade | 3rd grade | 4th grade | Graduated | N | % |
| PETE | 30 | 19 | 22 | 46 | - | 117 | 53.7 |
| Coaching Education | - | - | - | 16 | 24 | 40 | 18.3 |
| Sport Management | - | - | - | 14 | 20 | 34 | 15.6 |
| Recreation | - | - | - | 13 | 14 | 27 | 12.4 |

### Data Collection Tools

To collect data for the study, descriptive information form, Pre-service Physical Education Teacher's Beliefs about the PE Profession, and open-ended questions were used.

Descriptive Information Form: This form was used to collect information on the participants' gender, age, program, and grade level.

Pre-Service Physical Education Teachers' Beliefs about the Physical Education Profession (PPET-BPEP): It was developed by Fan et al. (18) and adapted to Turkish by Ugras and Dindar (45). As a result of EFA, it was found that the scale had a two-domain structure ("sense of calling" and "value of physical education profession"), and the total variance explained by the scale was 81.59%. The scale is scored with a 7-point Likert. The values ($\chi^2$/sd (3.37), GFI (0.91), CFI (0.96), AGFI (0.90), NFI (0.95), IFI (0.96), RMSEA (0.07)) were determined by the CFA analysis to be within acceptable limits. The Cronbach alpha coefficient was determined to be 0.96 in the "sense of calling" and 0.97 in the "value of PE profession "domain.

Open-ended questions: Two questions were asked to gain an in-depth understanding of the PE profession's sense of calling and value. Question 1: "Was your first choice as a profession to be a PE and sports teacher? If yes, why? If not, what was your previous career choice?" Question 2: "Do you want to be a PE and sports teacher when you graduate? If yes, why? If not, what profession do you intend to do? Why?

### Research Ethics

Ethics committee approval was obtained from Mugla Sıtkı Kocman University Social and Human Sciences Research Ethics Committee on 22.03.2023 with protocol number 230030 and decision number 42.

**Data Collection**

Research data were collected through an online form in the spring semester of the 2022-2023 academic year after the approval of the ethics committee. The aim of the research and the data collecting tools were explained to the participants.

**Analysis of Data**

The SPSS 22.0 program was used to evaluate the quantitative data, while content analysis was used to assess the qualitative data. The data were checked for normal distribution using the Kolmogorov-Smirnov test. It was decided to use the non-parametric Mann-Whitney U test for pairwise comparisons because the data were not normally distributed. The statistical significance value was determined as $p<0.05$. The content analysis identified themes for the responses to the open-ended questions, and the themes' respective responses were illustrated with examples.

## RESULTS

In this section of the study, the results obtained from the data analysis were presented in tables, and explanations were made regarding the tables.

**Table 2.** Normal distribution test results

| Scale | Kolmogorov-Smirnov | | |
|---|---|---|---|
| | Statistic | df | Sig. |
| Sense of Calling | .149 | | |
| Value about PE Profession | .272 | 218 | .000 |
| Total Scale | .152 | | |

It was found that the data weren't normally distributed based on the results of the tests, ($p<0,05$). It was chosen to utilize non-parametric tests in the study because of this.

**Table 3.** Descriptive data on PPETs' beliefs about the PE profession

| Scale | Program | N | M | SD |
|---|---|---|---|---|
| Sense of Calling | PETE | 117 | 5.49 | 1.45 |
| | Pedagogical Formation | 101 | 5.48 | 1.46 |
| Value about PE Profession | PETE | 117 | 6.41 | .91 |
| | Pedagogical Formation | 101 | 6.66 | .54 |
| Total Scale | PETE | 117 | 5.99 | 1.01 |
| | Pedagogical Formation | 101 | 6.12 | .79 |

Table 3's findings show that both programs' PPETs' beliefs on the PE profession are favourable, both in terms of the scale's sub-domains and overall scale.

**Table 4.** U-Test results of PPETs' beliefs about the PE profession to gender

| Scale | Gender | N | Mean Rank | Sum Ranks | U | p |
|---|---|---|---|---|---|---|
| Sense of Calling | Female | 81 | 105.36 | 8534.50 | 5213.5 | .454 |
| | Male | 137 | 111.95 | 15336.50 | | |
| Value about PE Profession | Female | 81 | 111.62 | 9041.50 | 5376.5 | .691 |
| | Male | 137 | 108.24 | 14829.50 | | |
| Total Scale | Female | 81 | 107.69 | 8722.50 | 5401.5 | .743 |
| | Male | 137 | 110.57 | 15148.50 | | |

The results of the U test for the PPETs' beliefs on the PE profession by gender are displayed in Table 4. The result showed that there was no statistically significant difference in gender ($p>0.05$).

**Table 5.** U-Test results of PPETs' beliefs about the PE profession to program

| Scale | Program | N | Mean Rank | Sum Ranks | U | p |
|---|---|---|---|---|---|---|
| Sense of Calling | PETE | 117 | 109.44 | 12804.00 | 5901.0 | .987 |
| | Pedagogical Formation | 101 | 109.57 | 11067.00 | | |
| Value about PE Profession | PETE | 117 | 101.80 | 11910.50 | 5007.5 | **.044*** |
| | Pedagogical Formation | 101 | 118.42 | 11960.50 | | |
| Total Scale | PETE | 117 | 106.79 | 12494.00 | 5591.0 | .493 |

| | | | | |
|---|---|---|---|---|
| | Pedagogical Formation | 101 | 112.64 | 11377.00 |

*p<0.05

Results of the U test, comparing PPETs' beliefs on the PE profession according to the program, are given in Table 4. The data revealed that, while there was no statistically significant difference between the sense of calling sub-domain and the total scale, the value of the PE profession sub-domain showed a statistically significant difference in favor of those who studying in the pedagogical formation certificate program (p<0.05).

**Table 6.** U-test results of PPETs' beliefs about the PE profession to first profession preferences

| Scale | Preference | n | Mean Rank | Sum Ranks | U | p |
|---|---|---|---|---|---|---|
| Sense of Calling | PE teaching | 140 | 132.39 | 18535.00 | 2255.00 | **.000*** |
| | Other | 78 | 68.41 | 5336.00 | | |
| Value about PE Profession | PE teaching | 140 | 112.60 | 15764.00 | 5026.00 | .312 |
| | Other | 78 | 103.94 | 8107.00 | | |
| Total Scale | PE teaching | 140 | 129.71 | 18159.00 | 2631.00 | **.000*** |
| | Other | 78 | 73.23 | 5712.00 | | |

*p<0.05

The results in Table 6 compare the PPETs' beliefs on the PE profession according to their first profession preferences. Accordingly, it was determined that the PPETs' whose first career choice was PE and sports teaching got statistically higher scores than the others in the sense of calling sub-domain and total scale (p<0.05).

The results in Table 6 are also related to the answers to the first open-ended question asked in the study. The reasons why the PPETs' answered yes to the PE and sports teaching profession are as follows: (a) having an athlete identity, (b) dream job, (c) role model effect, and (d) desire to make children love and teach sports.

(a) Having an athlete identity: P42: "Yes, because my athletic identity attracted me in this direction." P129: "Yes. As someone who has devoted my years to sports, I think PE and sports teaching is suitable for me." P193: "Being involved in sports since I was a child has influenced my choice of this profession."

(b) Dream job: P208: "Yes, I want to do my job. Because that's my dream since I was a kid." P3: "If I teach PE and sports, I will be happy in my job; this is my dream job." P31: "Yes, because it was my dream to be a teacher."

(c) Role model effect: P168: "Yes. Because my high school PE and sports teacher influenced me to become a PE and sports teacher." P61: Yes. I took my PE and sports teacher as a model; thanks to him, my love for this profession has increased, and I want to teach good things to my students." P75: "Yes, I wanted to do this profession, thanks to my coach and teachers."

d) Desire to make children love and teach sports: P149: "Yes, because I like to communicate with children and motivate them physically and mentally." P181: "Yes, I wanted to bring the sport into children's life due to the sporting impossibilities where I live." P207: Yes, because I want to care for children, contribute to their physical and mental health, and raise awareness.

PPETs' whose first professional preference is not PE and sports teaching stated that their first choice of profession was: athlete, coach, academician, policeman, military service, stewardess, architect, psychologist, lawyer, veterinarian, and shipmaster.

**Table 7.** U test results of PPETs' beliefs about the PE profession concerning the desire to be a PE teacher

| Scale | Desire | N | Mean Rank | Sum Ranks | U | p |
|---|---|---|---|---|---|---|
| Sense of Calling | PE teacher | 159 | 127.71 | 20305.50 | 1795.50 | **.000*** |
| | Other | 59 | 60.43 | 3565.50 | | |
| Value about PE Profession | PE teacher | 159 | 110.72 | 17605.00 | 4496.00 | .625 |
| | Other | 59 | 106.20 | 6266.00 | | |
| Total Scale | PE teacher | 159 | 125.55 | 19962.50 | 2138.50 | **.000*** |
| | Other | 59 | 66.25 | 3908.50 | | |

*p<0.05

The results in Table 7 compare PPETs' beliefs about the PE profession with regard to the desire to be a PE teacher. According to the results, the thoughts about the PE profession who want to be PE and sports teachers after graduation were statistically higher in the sense of calling sub-domain and in the full scale ($p<0.05$).

Answers to the second open-ended question asked in the research are connected to the findings in Table 7. Those who answered yes indicated the following as reasons: (a) want to endear sport to children, (b) love and want to take care of children, (c) dream job, (d) want to explain the importance of the profession, (e) want to be involved in sports, (f) some features of the profession.

(a) Want to endear sport to children: P99: "I want to endear sports to large masses by transferring the education and knowledge I have acquired." P93: "Yes, I want to make children love sports; this is the biggest reason." P66: "Yes. I want to make my students love sports and explain its importance."

(b) Dream job: P182: "Yes, because I want to realize my dream. I want to realize what I put in my mind." P29: "Yes, because that was my dream, and to say that I succeeded and became a teacher." P47: "Yes, I will because I want to live my dream job."

(c) Love and want to take care of children: P50: "Yes, I want to touch the lives of children to guide them and make a contribution to them." P117: "Yes, I love children, and it feels good to contribute to them." P74: "Yes, I can touch some children's lives."

(d) To explain the profession's importance: P32: "Yes, I want to be a PE and sports teacher because I want to teach sports and how important sports are." P129: "Yes, I want. I know that teaching is a critical responsibility to instil sports in people at a young age and to ensure that they do not break away from sports in their later life, and I want to be a PE and sports teacher because I want to teach this to my students with love." P54: "Yes, because for health, success, etc., all roads pass through movement, that is, PE. It is important to create a youth and society that cares about sports."

(e) Want to be involved in sports: P145: "Yes, because I want to be constantly involved in sports and improve myself in this field." P6: "Yes, because I have been involved in sports all my life." P203: "Yes, because I have been involved in sports since I was little."

(f) Some features of the profession: P5: "Yes. In terms of working hours, I find teachers' working time more efficient." P187: "I think and want to become a teacher since the teaching profession will be guaranteed and the title will add prestige." P178: "Yes, because I will have a guaranteed salary, and besides that, I can do extra work."

It was determined that the PPETs' who did not want to be PE and sports teachers after graduation had thoughts such as running their gym, being a coach, progressing in their sports career, becoming an academician, policeman, or soldier, and dealing with trade. In this research, the reasons PPETs' do not want to be a teacher; are difficulty in assignments, low salary, not feeling like belonging to this profession, and thinking that the profession is not given enough importance.

## DISCUSSION

This study aimed to examine the pre-service PE and sports teachers' beliefs on the PE profession. The first findings from the quantitative data revealed that PPETs' studying in both programs have positive professional opinions about PE. This result is consistent with many research findings (6, 28, 45).

Regarding the gender variable, there was no statistically significant difference between the PPETs' beliefs on the PE profession ($p>0.05$). Many studies support this finding (6, 17, 20, 28). However, study results also report a difference between occupational belief levels regarding gender variables (27, 49). It is known that professional beliefs are affected by professional development, educational process, and professional experience (38). Therefore, this difference in the findings may be due to the professional education, expertise, and development characteristics of the participant group included in the research.

It was found that there was a statistically significant difference between the groups in the value of the PE profession sub-domain and the total scale when the professional beliefs were evaluated concerning the programs. This difference was shown to be in favor of the PPETs' studying in the pedagogical formation

certificate program ($p<0.05$). In fact, PPETs' educated in relation to the teaching profession in a teacher education program are expected to have deeper insights into the PE profession than those enrolled in a pedagogical formation certificate program. However, the result obtained in this study showed the opposite. There is no research finding in the literature examining the PPETs' beliefs studying in the PE and sports teaching program and the pedagogical formation certificate program. However, the participants in the PE and sports teaching program are from different grade levels, but those in the pedagogical formation certificate program are graduates or seniors, which may account for the differences between the groups. Cermik et al. (13) reported that external influences decreased while internal and altruistic factors increased during graduation. Also, it is known that PPETs' beliefs about PE teaching are affected by the teaching experience process (26). This may cause the thoughts of senior and graduate candidates to be more positive.

According to another finding, it was determined that the professional belief levels of the PPETs' who decided PE and sports teaching as their first professional preference and wanted to be a PE teacher after graduation were higher than the other candidates in the sense of calling sub-domain and in the full scale. In addition, it was shown that PPETs', whose first choice of profession is PE, tended to the teaching profession for reasons such as having an athlete identity, dream job, role model effect, and a desire to make children love and teach sports. PPETs' who want to be a PE and sports teacher after graduation, on the other hand, explain the reasons for their preference were to make children love sports, dream job, love and want to care for children, explain the importance of the profession, want to be involved in sports and as some of the characteristics of the profession. In the previous studies, it was determined that the teaching profession was chosen for reasons such as "dream job," "love working with children," "being useful to society," "being intertwined with sports," and "the effect of PE and sports teacher" (6), "work with children" and "benefit to society" (21), "love children," "establish positive relationships with children," "opportunity to instill values in children" and "love of profession" (49) "family effect," "teacher effect," "peer effect" and "teaching experience" (39). Kiremitci et al. (29) found that PPETs' professional beliefs were affected mainly by internal factors, and their field motivations were developed. Bergmark et al. (10) found that teacher candidates have many internal, external, and altruistic reasons that affect their career choice. One of the professional preferences of PPETs' is to see the teaching profession as their ideal profession (30). Bavli (7) stated that PPETs' mostly want to work in a sports-related field. Zounhia et al., (50) determined that the factors affecting the career choice of PPETs' are intrinsic (e.g., I stay fit while teaching PE and sports) and altruistic (e.g., I like working with children). The findings are similar to the studies in the literature in connection with choosing the teaching profession.

On the other hand, it is seen that some of the PPETs' do not want to be PE and sports teachers; instead, they want to do other professions for some reason. These reasons are; difficulty in assignments, low salary, feeling that they do not belong to the profession, and thinking that the profession is not given enough importance. In Aslan's study (6), the factors that negatively affect belief in the profession are unsatisfactory salary, counting on the spot, negative perception of the profession in society, working conditions, inadequate field education, making no headway, disappointment caused by the program, and difficulty in appointment as a teacher. Zach (49) stated that novice teachers have decided to leave the profession owing to the low salary. The teaching profession is the main factor in education. The factors that cause negative thoughts toward a profession are the problems of the individual, the society, and the states that direct the community with their economic and educational policies (6). For this reason, for PPETs' to practice their profession when they graduate and to have a high commitment to the profession, the education of PPETs' should be given due importance.

## CONCLUSION

As a result, it was determined that the prospective teachers' beliefs about the teaching profession were positive. In contrast, the level of professional confidence did not cause a difference in gender, grade, and program variables; it caused a distinction in favor of formation in respect of the program.

This research contributed to the literature by examining the beliefs of PPETs' studying in different programs with both quantitative and qualitative data. It is thought that the data obtained from the research contribute by expanding the literature on PE and sports teacher professional belief studies. However, the study also has some limitations.

The first is that the research was conducted with students studying at one university in Turkey. Including PPETs' looking at different universities in future studies is recommended. In addition, cross-sectional data were used to determine the situation in professional beliefs. In future studies, the PPETs' views can be resolved before they enter the undergraduate program. Their professional ideas can be examined regularly throughout their undergraduate education, and thus any changes can be monitored. Professional beliefs are not static; they can be affected by many factors. Therefore, meetings, seminars, and educational activities can be organized to increase the professional thoughts of teacher candidates, and the reasons for common beliefs can be investigated for teacher candidates with standard professional views.

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# The Examination of Communication Skills and Self-Efficacy of Coaches*

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**This research was produced from the PhD Thesis prepared in the Department of Sports Management at Selçuk University, Institute of Health Sciences.*

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**Abstract**

This study was conducted to examine the communication skills and self-efficacy levels of individuals working as coaches. The population of this study, which was conducted using a descriptive research model, consisted of coaches working actively in Turkiye, while the sample group consisted of a total of 697 coaches, 203 women and 494 men, on a voluntary basis. The data were obtained by using "Personal Information Form", "General Self-Efficacy Scale" and "Communication Skills Assessment Scale". Independent Samples t test, One Way ANOVA test, Person correlation analysis were used to reach statistical results. It was concluded that the self-efficacy score averages of the coaches participating in the study were higher than the averages of communication skills sub-dimensions. While there was a statistical difference between the education level of the male coaches participating in the study and the communication principles and basic skills sub-dimensions of communication skills, no difference was found in other sub-dimensions.While there was no statistical difference in the communication skills sub-dimensions and the education level of female coaches, a significant difference was found in general self-efficacy scores. Significant differences were found in the coaching levels of male coaches participating in the study and in the sub-dimension of general self-efficacy and communication. In addition, significant differences were found in the coaching levels of female coaches and in the sub-dimensions of self-expression, active listening and non-verbal communication and willingness to communicate. As a result, there is a parallelism between the self-efficacy and communication skills of the coaches participating in the study. In other words, it can be said that as the competence of male and female coaches in their jobs increases, their communication skills also increase. This research was produced from the doctoral thesis of the corresponding author.

**Keywords:** Coach, Communication skills, Self-efficacy

**Özet**

**Antrenörlerin İletişim Becerileri ile Öz yeterliliklerinin İncelenmesi**

Bu çalışma, antrenör olarak çalışan bireylerin iletişim becerilerini ve öz yeterlilik düzeylerini incelemek amacıyla yapılmıştır. Betimsel araştırma modeli kullanılarak gerçekleştirilen bu çalışmanın evrenini Türkiye'de aktif olarak çalışan

antrenörler, örneklem grubunu ise gönüllülük esasına göre 203 kadın ve 494 erkek olmak üzere toplam 697 antrenör oluşturmuştur. Veriler "Kişisel Bilgi Formu", "Genel Öz Yeterlilik Ölçeği" ve "İletişim Becerilerini Değerlendirme Ölçeği" kullanılarak elde edilmiştir. İstatistiksel sonuçlara ulaşmak için Independent Samples t testi, One Way ANOVA testi, Person korelasyon analizi kullanılmıştır. Araştırmaya katılan antrenörlerin öz yeterlilik puan ortalamalarının iletişim becerileri alt boyut ortalamalarına göre daha yüksek olduğu sonucuna ulaşılmıştır. Araştırmaya katılan erkek antrenörlerin eğitim düzeyleri ile iletişim becerilerinin iletişim ilkeleri ve temel beceriler alt boyutları arasında istatistiksel olarak fark bulunurken, diğer alt boyutlarda fark bulunmamıştır. Kadın antrenörlerin eğitim düzeyleri ile iletişim becerileri alt boyutlarında istatistiksel olarak fark bulunmazken, genel öz yeterlilik puanlarında anlamlı fark bulunmuştur. Araştırmaya katılan erkek antrenörlerin koçluk düzeyleri ile genel öz yeterlilik ve iletişim alt boyutlarında anlamlı farklılıklar bulunmuştur. Ayrıca kadın antrenörlerin antrenörlük düzeylerinde ve kendini ifade etme, aktif dinleme ve sözsüz iletişim ve iletişim kurma istekliliği alt boyutlarında anlamlı farklılıklar bulunmuştur. Sonuç olarak, çalışmaya katılan antrenörlerin öz yeterlilikleri ile iletişim becerileri arasında bir paralellik olduğu görülmektedir. Başka bir deyişle, kadın ve erkek antrenörlerin mesleklerindeki yetkinlikleri arttıkça iletişim becerilerinin de arttığı söylenebilir. Bu araştırma sorumlu yazarın doktora tezinden üretilmiştir.

**Anahtar Kelimeler:** Antrenör, İletişim becerileri, Öz yeterlilik

## INTRODUCTION

Athletes' communication with their coaches is an issue between two individuals and falls within the scope of interpersonal communication. Therefore, the behaviors of individuals towards each other in situations where they are ready, laughing, physical expressions, gestures, facial expressions, verbal and non-verbal expressions include the type of interpersonal communication (27). The approach of coaches to athletes should aim to establish a productive and healthy cooperation with the athlete, because the behaviors of the coaches strengthen the communicative bond and help to eliminate the factors that may negatively affect the performance of the athletes (20).

Considering that both the observable and perceived coach behaviors in the coach-athlete relationship affect the athlete's performance in some way, it is stated that examining the coach-athlete relationships in terms of perceived behaviors will provide important information for successful or effective coaching (6). In addition, it is important for coaches to have high self-efficacy beliefs of coaches since they affect the success and motivation of athletes.

Communication is the process of transferring the messages that people attach meaning to the other party and understanding these messages. In short, it can be defined as the production and transmission of information to the other party and its evaluation.In this respect, verbal expressions, gestures, signs used by individuals in communication, as well as vibrations, signals and smells that animals use can be counted as communication (17). Communication is establishing a dialogue, using gestures and facial expressions, giving written and verbal messages using symbols, and sometimes listening. Not communicating during the day is also a message, an attitude, and it contains a meaning (29). The concepts such as movement, sound, word sequence and attitude that people can comprehend are the facts of communication (4). Effective communication occurs when more than one party exchanges information (33). In daily life, there is no process in which communication is not used. For this reason, it is a tool that individuals can use to come to an agreement within the framework of certain rules (15).

The concept of self-efficacy, which was first introduced by Albert Bandura in 1977, was included in Social Learning Theory (36). Social learning theory,also known as Social Cognitive Theory, emerged by combining cognitive learning theory and behavioral theory (16). With the addition of cognitive dimension by Albert Bandura to the Social Learning Theory put forward by Miller and Dolard in 1941, its boundaries expanded and the theory became more effective in explaining learning (11).

Schunk and Rise (1986) define the concept of self-efficacy as individuals' personal judgement about their performance abilities in a particular activity. It is also defined as individuals' beliefs in their ability to organize and execute action plans necessary to manage possible situations (28).

Self-efficacy is not a perceived or observable skill. It is the inner belief that an individual feels about what he/she can do when he/she asks the question of what he/she can do with his/her skills in certain situations.

Self-efficacy is not a belief in capacity or specific performance. However, it is the belief about what they can do in overcoming situations and changing conditions, using their abilities and skills. Self-efficacy is not simply a means of inference about an individual's performance, not causal characteristics. What is meant by the belief of self-efficacy is the capacity of the person to be able to do it. Self-efficacy is not the same as self-esteem. Self-esteem is generally our beliefs about ourselves and how we feel. Self-efficacy is not an inherited trait (31).

While communicating with athletes, coaches should transform the thoughts (ideas, emotions, intentions) they want to convey into a message suitable for communication and they should do this through a channel. If the athlete understands the content or intention of the message, he/she interprets it and reacts accordingly (30). Athletes receive support from their coaches, club administrators, spectators, teammates andtheir families on the long and tiring road to high performance. A positive communication that these people will establish in their approach to the athlete is possible with positive thinking, confidence, reinforcing and even rewarding the right behaviors. Effective communication is based on knowing the importance of verbal as well as non-verbal messages and using them correctly and appropriately. It is also important that the messages sent for effective communication are perceived correctly (25). Coaches' behaviors affect athletes positively and negatively, and athletes of coaches who give more tactics, encourage and communicate well are more successful (21).

## MATERIALS AND METHODS

### Ethics Committee Decision

For this study, permission dated 07.11.2016 and numbered 39 was obtained from Selçuk University Faculty of Sport Sciences Ethics Committee.

### Study group

In order to obtain the research data, 697 coaches (203 females, 494 males) from individuals working in different branches in different geographical regions of Turkey were determined as the study group. Information about the personal characteristics of the study group is given in Table 1.

**Table 1.** Personal characteristics of the Study group

| Variables | Groups | n | % |
|---|---|---|---|
| **Gender** | Female | 203 | 29,1 |
| | Male | 494 | 70,9 |
| **Education Level** | Primary-Secondary education | 17 | 2,4 |
| | High School | 147 | 21,1 |
| | Undergraduate | 441 | 63,3 |
| | Postgraduate | 92 | 13,2 |
| **Coaching Level** | 1st Level | 129 | 18,5 |
| | 2nd Level | 302 | 43,3 |
| | 3rd Level | 227 | 32,6 |
| | 4th Level | 28 | 4 |
| | 5th Level | 11 | 1,6 |

Table 1 shows that 29.1% of the coaches participating in the study are women and 70.9% are men, and that the coaches mostly receive education at the undergraduate level and have 1-3 levels of coaching.

### Data Collection Tools

#### *General Self-efficacy Scale*

The scale, which is expressed as a valid and reliable measurement tool in determining the general self-efficacy of adults, was developed by Sherer et al. in 1982. The adaptation study of the scale to Turkish society was conducted by Yıldırım and İlhan (2010). The scale, which consists of 17 items in total, is in a Likertformat in which answers ranging from "not at all" to "very well" can be given on a five-point scale to the question "How well does it describe you". The reliability of the scale was calculated as (Cronbach's alpha = .80).

*Communication Skills Scale (CSS)*

The "Communication Skills Scale" (CSS) used in this study was developed by Korkut (24) based on the Communication Skills Assessment Scale (CSAS) previously developed by Korkut 1996. A 5-point Likert-type scale was used to express the level of agreement with the items in the scale. The scale consists of 25 items and a four-factor structure. These factors are named as Communication Principles and Basic Skills, Self-Expression, Active Listening and Nonverbal Communication and Willingness to Communicate. Cronbach's alpha coefficient was calculated for the internal consistency reliability of the scale and the internal consistency coefficient of the 25-item scale was calculated as .88. The internal consistency coefficients for the sub-factors of the scale were found to be .79 for Communication Principles and Basic Skills, .72 for Self-Expression, .64 for Active Listening and Nonverbal Communication and .71 for Willingness to Communicate.

**Data Analysis**

The data obtained from the scales used in the study were coded in the computer environment and statistical analyses were performed using the SPSS 22.0 package program. Kolmogorov-Smirnov normality tests were performed to determine whether the research data were normally distributed. Kurtosis-Skewness values were examined for the data sets that did not show normal distribution, and since the values were between +1.5 / -1.5, it was determined that the data showed normal distribution. Independent Samples t test was used to compare paired groups, One Way ANOVA was used for multiple groups, Post Hoc LSD test was used to determine between which groups the difference was, and Person correlation analysis was used to determine the relationship between two variables.

## FINDINGS

In this section, the comparisons of the data obtained from the scales in terms of the variables of gender, branch status, age, education level, years of coaching and coaching level, and the findings showing the relationship between coaches' communication skills and self-efficacy are given in tables and explanations under the table.

**Table 2.** Comparison of the self-efficacy and communication skills scores of coaches by gender

| | Gender | n | mean. | sd | t | P |
|---|---|---|---|---|---|---|
| **General Self-efficacy** | Female | 203 | 63,72 | 10,24 | -,472 | ,637 |
| | Male | 494 | 64,13 | 10,29 | | |
| **Communication Principles and Basic Skills** | Female | 203 | 40,44 | 6,02 | -,990 | ,323 |
| | Male | 494 | 40,94 | 5,91 | | |
| **Self-Expression** | Female | 203 | 16.74 | 2.89 | -.835 | ,404 |
| | Male | 494 | 16.94 | 2.69 | | |
| **Active Listening and Non-Verbal Communication** | Female | 203 | 24,53 | 3,86 | ,042 | ,967 |
| | Male | 494 | 24,52 | 4,00 | | |
| **Willingness to Communicate** | Female | 203 | 19,92 | 3,39 | -1,125 | ,261 |
| | Male | 494 | 20,24 | 3,45 | | |

As can be seen from Table 2, there was no statistically significant difference in the sub-dimensions of the self-efficacy and communication skills of the coaches participating in the study in terms of gender ($p>0.05$). Considering the general self-efficacy scores of the coaches, it was found that the mean of women was (63.72±10.24) and the mean of men was (64.13±10.29). In the sub-dimension of communication principles and basic skills, the mean of women was (40.44±6.02) and the mean of men was (40.94±5.91). In the self-expression sub-dimension, the mean of women was (16.74±2.89) and the mean of men was (16.94±2.69), and in the Active Listening and Nonverbal Communication sub-dimension, the mean of women was (24.53±3.86) and the mean of men was (24.52±4.0). In the Willingness to Communicate sub-dimension, the mean of women was (19.92±3.39) and the mean of men was (20.24±3.45).

**Table 3.** Comparison of male coaches' self-efficacy and communication skills scores by education level

| | | KT | sd | KO | F | p | Difference |
|---|---|---|---|---|---|---|---|
| **General Self-efficacy** | Between groups | 197,841 | 3 | 65,947 | ,622 | ,601 | |
| | In-group | 51985,125 | 490 | 106,092 | | | |
| | Total | 52182,966 | 493 | | | | |
| **Communication Principles and Basic Skills** | Between groups | 338,608 | 3 | 112,869 | 3,280 | ,021 | 3-1,4-1<br>3-2,4-2 |
| | In-group | 16860,447 | 490 | 34,409 | | | |
| | Total | 17199,055 | 493 | | | | |
| **Self-Expression** | Between groups | 39,128 | 3 | 13,043 | 1,813 | ,144 | |
| | In-group | 3524,170 | 490 | 7,192 | | | |
| | Total | 3563,298 | 493 | | | | |
| **Active Listening and Non-Verbal Communication** | Between groups | 117,702 | 3 | 39,234 | 2,474 | ,061 | |
| | In-group | 7771,634 | 490 | 15,860 | | | |
| | Total | 7889,336 | 493 | | | | |
| **Willingness to Communicate** | Between groups | 88,727 | 3 | 29,576 | 2,501 | ,059 | |
| | In-group | 5795,607 | 490 | 11,828 | | | |
| | Total | 5884,334 | 493 | | | | |

Groups: 1st group: primary school, 2nd group: high school, 3rd group: university, 4th group: postgraduate

Table 3 shows the comparison of male coaches' scores obtained from the sub-dimensions of general self-efficacy and communication skills scale in terms of education level. While there was no difference in the general self-efficacy scores of male coaches in terms of education level, a significant difference was found in the communication principles and basic skills sub-dimension ($p<0.05$). In the sub-dimension of communication principles and basic skills, it was determined that the scores obtained by male coaches with university and postgraduate education were higher than those with primary and high school education.

**Table 4.** Comparison of female coaches' their self-efficacy and communication skills scores by education level

| | | KT | sd | KO | F | p | Difference |
|---|---|---|---|---|---|---|---|
| **General Self-efficacy** | Between groups | 546,437 | 3 | 182,146 | 2,755 | ,007 | 2-1<br>3-1<br>4-1 |
| | In-group | 20650,115 | 199 | 103,769 | | | |
| | Total | 21196,552 | 202 | | | | |
| **Communication Principles and Basic Skills** | Between groups | 7,671 | 3 | 2,557 | ,070 | ,976 | |
| | In-group | 7310,428 | 199 | 36,736 | | | |
| | Total | 7318,099 | 202 | | | | |
| **Self-Expression** | Between groups | 20,632 | 3 | 6,877 | ,587 | ,624 | |
| | In-group | 2332,057 | 199 | 11,719 | | | |
| | Total | 2352,690 | 202 | | | | |
| **Active Listening and Non-Verbal Communication** | Between groups | 57,233 | 3 | 19,078 | 1,287 | ,280 | |
| | In-group | 2949,309 | 199 | 14,821 | | | |
| | Total | 3006,542 | 202 | | | | |
| **Willingness to Communicate** | Between groups | 32,846 | 3 | 10,949 | ,952 | ,416 | |
| | In-group | 2287,893 | 199 | 11,497 | | | |
| | Total | 2320,739 | 202 | | | | |

Groups: 1st group: primary school, 2nd group: high school, 3rd group: university, 4th group: postgraduate

Table 4 shows the comparison of the scores obtained by female coaches from the sub-dimensions of the general self-efficacy and communication skills scale in terms of the education variable. While there was no difference in the sub-dimension scores of the female coaches' communication skills scale in terms of education

level, a significant difference was found in the general self-efficacy scores ($p<0.05$). In general self-efficacy scores, it was determined that female trainers with primary school education achieved lower scores than other groups.

**Table 5.** Comparison of self-efficacy and communication skills scores of male coaches by coaching levels

| | | KT | sd | KO | F | p | Difference |
|---|---|---|---|---|---|---|---|
| **General Self-efficacy** | Between groups | 655,924 | 4 | 163,981 | 2,556 | ,018 | 3-1<br>4-1 |
| | In-group | 51527,042 | 489 | 105,372 | | | |
| | Total | 52182,966 | 493 | | | | |
| **Communication Principles and Basic Skills** | Between groups | 224,085 | 4 | 56,021 | 1,614 | ,170 | |
| | In-group | 16974,970 | 489 | 34,714 | | | |
| | Total | 17199,055 | 493 | | | | |
| **Self-Expression** | Between groups | 49,737 | 4 | 12,434 | 1,731 | ,142 | |
| | In-group | 3513,560 | 489 | 7,185 | | | |
| | Total | 3563,298 | 493 | | | | |
| **Active Listening and Non-Verbal Communication** | Between groups | 115,599 | 4 | 28,900 | 1,818 | ,124 | |
| | In-group | 7773,737 | 489 | 15,897 | | | |
| | Total | 7889,336 | 493 | | | | |
| **Willingness to Communicate** | Between groups | 75,018 | 4 | 18,755 | 1,579 | ,009 | 4-1, 5-1<br>4-2, 5-2 |
| | In-group | 5809,316 | 489 | 11,880 | | | |
| | Total | 5884,334 | 493 | | | | |

Groups: 1st group: 1st level, 2nd group: 2nd level, 3rd group: 3rd level, 4th group: 4th level, 5th group: 5th level

Table 5 shows the comparison of male coaches' scores obtained from the sub-dimensions of general self-efficacy and communication skills scale in terms of coaching level. While there was no difference in the communication skills scale communication principles and basic skills, self-expression, active listening and non-verbal communication sub-dimensions of male coaches in terms of coaching level, there was a significant difference in the willingness to communicate sub-dimension and general self-efficacy scores ($p<0.05$). In general self-efficacy scores, it was determined that male coaches with coaching levels 3 and 4 achieved higher scores than those with levels 1 and 2. In the sub-dimension of willingness to communicate, it was determined that male coaches with levels 4 and 5 coaching levels obtained higher scores than those with levels 1 and 2 coaching levels.

**Table 6.** Comparison of female coaches' self-efficacy and communication skills scores by coaching levels

| | | KT | sd | KO | F | p | Difference |
|---|---|---|---|---|---|---|---|
| **General Self-efficacy** | Between groups | 166,169 | 2 | 83,085 | ,790 | ,455 | |
| | In-group | 21030,382 | 200 | 105,152 | | | |
| | Total | 21196,552 | 202 | | | | |
| **Communication Principles and Basic Skills** | Between groups | 5,002 | 2 | 2,501 | ,068 | ,934 | |
| | In-group | 7313,097 | 200 | 36,565 | | | |
| | Total | 7318,099 | 202 | | | | |
| **Self-Expression** | Between groups | 54,163 | 2 | 27,081 | 3,310 | ,039 | 3-2 |
| | In-group | 1636,517 | 200 | 8,183 | | | |
| | Total | 1690,680 | 202 | | | | |
| **Active Listening and Non-Verbal Communication** | Between groups | 138,221 | 2 | 69,110 | 4,819 | ,009 | 3-2 |
| | In-group | 2868,321 | 200 | 14,342 | | | |
| | Total | 3006,542 | 202 | | | | |
| **Willingness to Communicate** | Between groups | 95,738 | 2 | 47,869 | 4,303 | ,015 | 3-1<br>3-2 |
| | In-group | 2225,001 | 200 | 11,125 | | | |
| | Total | 2320,739 | 202 | | | | |

Groups: 1st group: 1st level, 2nd group: 2nd level, 3rd group: 3rd level

Table 6 shows the comparison of the scores obtained by the female coaches from the sub-dimensions of the general self-efficacy and communication skills scale in terms of the coaching level variable. While there was no difference in the general self-efficacy and communication principles and basic skills sub-dimension of the female coaches in terms of coaching level, a significant difference was found in the sub-dimension scores of active listening and non-verbal communication, self-expression and willingness to communicate ($p<0.05$). In the sub-dimension of self-expression, it was determined that female coaches with coaching level 3 obtained higher scores than those with level 2. In the sub-dimension of active listening and non-verbal communication, it was determined that female coaches with coaching level 3 obtained higher scores than those with level 2. In the sub-dimension of willingness to communicate, it was determined that female coaches with coaching level 3 obtained higher scores than those with levels 1 and 2.

**Table 7.** Comparison of male coaches' self-efficacy and communication skills scores

| | | CCBS | SE | ALNVC | WTC |
|---|---|---|---|---|---|
| **General Self-efficacy** | r | ,349** | ,460** | ,347** | ,379** |
| | p | ,000 | ,000 | ,000 | ,000 |
| **Communication Principles and Basic Skills** | r | | ,764** | ,800** | ,751** |
| | p | | ,000 | ,000 | ,000 |
| **Self-Expression** | r | | | ,773** | ,806** |
| | p | | | ,000 | ,000 |
| **Active Listening and Non-Verbal Communication** | r | | | | ,740** |
| | p | | | | ,000 |

n=494, **p<0.01

Table 7 shows the relationship between male coaches' communication skills and self-efficacy. Accordingly, a moderately positive relationship was found between male coaches' communication skills and self-efficacy beliefs. Therefore, it can be said that when coaches' self-efficacy increases, their communication skills also increase. Strong positive relationships were found between the sub-dimensions of the communication skills scale of male coaches. Therefore, it can be said that when communication skills increase in one dimension, other dimensions also increase.

**Table 8.** The relationship between self-efficacy and communication skills sub-dimensions of female coaches.

| | | CCBS | SE | ALNVC | WTC |
|---|---|---|---|---|---|
| **General Self-efficacy** | r | ,371** | ,447** | ,425** | ,341** |
| | p | ,000 | ,000 | ,000 | ,000 |
| **Communication Principles and Basic Skills** | r | | ,687** | ,746** | ,756** |
| | p | | ,000 | ,000 | ,000 |
| **Self-Expression** | r | | | ,753** | ,659** |
| | p | | | ,000 | ,000 |
| **Active Listening and Non-Verbal Communication** | r | | | | ,745** |
| | p | | | | ,000 |

n=203, **p<0.01

Table 8 shows the relationship between communication skills and self-efficacy of female coaches. Accordingly, a moderately positive relationship was found between communication skills and self-efficacy beliefs of female coaches. Therefore, it can be said that when coaches' self-efficacy increases, their communication skills also increase. A strong positive relationship was found between the sub-dimensions of

the communication skills scale of female coaches. Therefore, it can be said that when communication skills increase in one dimension, it increases in other dimensions.

## CONCLUSION AND DISCUSSION

697 coaches actively working in 32 sports branches from 24 cities of Turkiye participated voluntarily in this study conducted to reveal the relationship between communication skills and self-efficacy of coaches.

As a result of the analyses, it was determined that there was no significant difference in the sub-dimensions of the self-efficacy and communication skills of the coaches in terms of the gender variable. In his study on coaches, Köksal (26) found that there was no difference between the self-efficacy of male and female coaches. Similarly, in the study conducted by Hodges and Carron (22), it was stated that there was no difference between gender variable and self-efficacy. Bozkurt (10) examined the self-efficacy levels of athletes and found that there was no difference in terms of gender. In their study, Telef and Karaca (32) found that the general self-efficacy of the participants did not differ significantly according to gender. Canpolat and Çetinkalp (12) determined that self-efficacy beliefs did not differ in terms of gender in their study. Gülbahçe (19) found in their study that the communication skills of girls and boys participating in the communication skills training program were affected by many factors such as age, intelligence, psychosocial maturity, while gender was not an effective factor. Edward (14) compared male and female adolescents in the Communication Skills Scale applied to 471 female and 377 male adolescents and found that there was no significant difference between them in terms of gender.

The results of the above studiesare in parallel with the results of our study. Therefore, it can be said that there is no parallelism between the gender variable and self-efficacy of coaches.

No statistically significant difference was found between the educational level variable and self-efficacy scores of male coaches participating in the study. In terms of the education level of female coaches, it was determined that those with primary school education achieved lower scores than other groups in general self-efficacy scores. In the sub-dimensions of communication principles and basic skills, which are among the sub-dimensions of communication skills of male coaches, it was determined that the scores of male coaches with university and postgraduate education were higher than those with primary and high school education. There was no significant difference between the education level of female coaches and any of the sub-dimensions of communication skills. In his study, Toklu (35) indicated that the self-efficacy levels of tennis coaches did not change in terms of education level. In the study conducted by Cengiz et al. (13), it was stated that the self-efficacy beliefs of taekwondo coaches did not differ in terms of education level. Abakay (1) examined the communication skills of coaches in terms of athlete perceptions and found that communication skills increased as the level of education increased. Tutuk et al. (34) found that the communication skills perceived by students increased as the years of education increased.Afyon and Işıkdemir (5) did not find a relationship between the communication skills of coaches and their education level in their study.

While statistically significant differences were found between the coaching levels and self-efficacy scores of the male coaches participating in the study, no difference was found in the female coaches. In male coaches, on the other hand, significant differences were found in the dimension of willingness to communicate, which is one of the sub-dimensions of communication skills. In female coaches, significant differences were found in the sub-dimensions of self-expression, active listening-non-verbal communication and willingness to communicate. Studies in the sports environment show that techniques based on successful experiences are effective in increasing both self-efficacy beliefs and performance (18). In his study, Barut (9) states that those with high levels of expertise in sports also have high self-efficacy scores. An individual's experiences affect self-efficacy judgments through cognitive information processing (8).If individuals gain the belief that they have the necessary competencies to achieve success, they become more resilient when they face difficulties (7). The results of this study are partially similar to the results of our study. It can be thought that as the coaching level increases, self-efficacy scores also increase. In two different studies conducted by Abakay and Kuru (3) and Abakay and Kuru (2), it was concluded that as the years of playing sports of male and female football players increase, their communication skills with the coach also increase. It is considered as a normal result that the increase in experience has positive effects on communication skills for both athletes and coaches.

Kabadayı (23) stated in his study conducted with coaches who have 4th and 5th level coaching certificates that they generally perceive the communication skills of the coaches as high.

The results of the above studies support the results of our study. Accordingly, it can be thought that the increase in coaching level will contribute to the coaches to have more effective communication skills.

The relationship between self-efficacy and communication skills of male and female coaches was analyzed by correlation analysis. As a result of the statistical analysis, it can be said that when the general self-efficacy of male and female coaches increases, their communication skills also increase. In the correlations between the sub-dimensions of the communication skills scale, it was seen that all features had strong positive relationships. Therefore, it is thought that an increase in communication skills in one dimension may lead to the increase in other dimensions.

In the light of this study, the following recommendations can be made. Considering that women in our country have difficulty in finding a place for themselves as coaches due to the socio-cultural role given to women in the family and the social structure, encouraging measures can be taken for female coaches to gain more place in the relevant field. It is observed that self-efficacy and communication skills of coaches increase as their education level increases. The minimum level of education required in coaching courses can be increased. Working opportunities and areas of coaches should be increased and permanent and effective communication skills and self-efficacy belief can be increased with the necessary arrangements to be made in training programs. Coaches should be supported to improve themselves by participating in not only national but also international training programs, seminars, courses and panels. In order to increase the effective communication between coaches and their athletes, it can be effective to spend quality time and to prepare environments where sharing is increased. Coach exchange programs can be organized through agreements with coaches from countries that have achieved international success.

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# The Relationship Between Organizational Social Capital, Organizational Identity and Organizational Trust Levels of Academicians in Sports Education Institutions

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** This study was produced from the doctoral thesis titled "The Relationship Between Organizational Social Capital, Organizational Identification and Organizational Trust Levels of Academicians in Institutions Providing Sports Education" published in 2020.*

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**Abstract**

This study was conducted to reveal whether there is a relationship between the organizational social capital and organizational identification perceptions of academics in institutions providing sports education and their levels of organizational trust. In the analysis of the data,in order to reveal the relationship between the organizational social capital, organizational identification and organizational trust levels of academicians, the Pearson Moments Product Correlation Coefficient (r) technique was used. As a result of the research, it was found that the highest perceptions of the academicians in institutions providing sports education about social capital are bridging social capital, the lowest organizational social capital is followed by unifying social capital and linking social capital dimensions; In general, it was judged that academicians' perceptions of bridging, unifying and bonding social capital regarding their institutions are at a "moderate" level, that is, they are not satisfied with their communication in these dimensions of organizational social capital (linking, linking, bridging). It was determined that the highest perceptions of the academicians in sports education institutions regarding organizational identification are in the emotional organizational identification dimension, followed by the cognitive organizational identification dimension, in general, the emotional identification of the academicians about their institutions is high, and their cognitive identification is at the "medium" level. It has been determined that the highest perceptions of the academicians in institutions providing sports education about organizational trust are trust in the manager, followed by the trust in the organization dimension, and the dimensions of trust in the administrator and trust in the organization, in general, are at the "medium" level. It has been determined that there are medium and high-level positive relationships between the dimensions of the academicians in institutions providing sports education, organizational social capital, organizational identification and organizational trust in general..

**Keywords:** Academician, institutions providing sports education, organizational social capital, organizational identification, organizational trust.

**Özet**

**Spor Eğitimi Veren Kurumlardaki Akademisyenlerin Örgütsel Sosyal Sermaye, Örgütsel Özdeşleşme ve Örgütsel Güven Düzeyleri Arasındaki İlişki**

Bu çalışma, Spor eğitimi veren kurumlardaki akademisyenlerin, örgütsel sosyal sermaye ve örgütsel özdeşleşme algıları ile örgütsel güven düzeyleri arasında bir ilişki olup olmadığını ortaya koymak amacıyla yapılmıştır. Verilerin analizinde, akademisyenlerin örgütsel sosyal sermaye, örgütsel özdeşleşme ve örgütsel güven düzeyleri arasındaki ilişkiyi ortaya çıkarmak için de Pearson Momentler Çarpım Korelasyon Katsayısı (r) tekniğinden yararlanılmıştır. Araştırma sonucunda, spor eğitimi veren kurumlardaki akademisyenlerin sosyal sermayeye ilişkin en yüksek algılarının, köprü kurucu sosyal sermaye boyutunda olduğu, en düşük örgütsel sosyal sermayeleri ise birleştirici sosyal sermaye ve bağ kurucu sosyal sermaye boyutlarının izlediği; genel olarak akademisyenlerin kurumlarına ilişkin köprü kurucu, birleştirici ve bağ kurucu sosyal sermaye algılarının "orta" düzeyde olduğu yani bu örgütsel sosyal sermaye boyutlarında (birleştirici, bağ kurucu, köprü kurucu) iletişimlerinden memnun olmadıkları yargısına varılmıştır. Spor eğitimi veren kurumlardaki akademisyenlerin örgütsel özdeşleşmeye ilişkin en yüksek algılarının, duygusal örgütsel özdeşleşme boyutunda olduğu, bunu bilişsel örgütsel özdeşleşme boyutunun izlediği, genel olarak akademisyenlerin kurumlarına ilişkin duygusal özdeşleşmelerinin yüksek, bilişsel özdeşleşmelerinin ise "orta" düzeyde olduğu belirlenmiştir. Spor eğitimi veren kurumlardaki akademisyenlerin örgütsel güvene ilişkin en yüksek algılarının yöneticiye güven boyutunda olduğu, bunu örgüte güven boyutunun izlediği, genel olarak yöneticiye güven ve örgüte güven boyutlarının "orta" düzeyde olduğu belirlenmiştir. Spor eğitimi veren kurumlardaki akademisyenlerin, genel olarak örgütsel sosyal sermaye, örgütsel özdeşleşme ve örgütsel güvenin, boyutları arasında orta ve yüksek düzeyde pozitif yönlü ilişkiler olduğu tespit edilmiştir.

**Anahtar Kelimeler:** Akademisyen, Spor Eğitimi Veren Kurumlar, Örgütsel Sosyal Sermaye, Örgütsel Özdeşleşme, Örgütsel Güven.

## INTRODUCTION

The working life is not only the focus of human existence, but humans are also the focus of working life. The value placed on human resources plays a significant role in ensuring the proper and orderly progression of human-centered working life (14). To achieve the goals of organizations, adapt to the rapid developments and changes brought about by the era, and sustain their continuity in a competitive world, organizations must effectively utilize one of the most important elements, human resources (48). When it comes to increasing the productivity of organizations and enabling their development, the organizational social capital, identification, and trust of the employees comprising the organization are of great importance.

For the effective and efficient functioning of human resources within an organization, the establishment of organizational trust and organizational identification is crucial. Consequently, the enhancement of organizational social capital is of utmost importance for the development of the organization.

Social capital plays a significant role in maintaining and supporting the current state of an organization (34). For university organizations, social capital can be considered an investment in developing social relationships (27). Social capital makes it possible to achieve unattainable or difficult goals (30). This is achieved through organizational identification and a sense of trust. Members who identify with the organization tend to see themselves as representatives of the organization in their interactions with others outside the organization, prioritizing the interests of the organization in opportunities related to work and strategic decisions (29).

The fundamental factors that propel organizations to such a position, creating significant value with their existence and management styles, and offering a variety of opportunities and services to all stakeholders, especially their own employees, are the organizational trust they establish with the internal and external environment. The reality is that employees at all levels have a sense of identification with these organizations.

In this context, the phenomenon of professional identification, which will create an opportunity for each individual working in the organization to utilize their total skills, knowledge, and abilities close to full capacity, is largely determined by the high levels of organizational trust and identification of individuals

within the organization. The interplay of these two concepts will lead to an increase in the organization's social capital. Organizational trust, identification, and social capital concepts are crucial not only for the organization but also for the organizational environment with which the organization interacts and for the employees. In today's context, these concepts are recognized as the most significant assets that organizations possess (17).

In the relevant literature, numerous studies have been conducted on the levels of academician's organizational social capital (15), organizational identification levels (15, 10, 21), and levels of organizational trust (44, 26, 24, 1, 5, 2, 18, 33, 13). However, specific research aimed at determining the relationship between organizational social capital, organizational identification, and organizational trust levels, as well as investigations into whether such a relationship exists among academicians in institutions providing sports education, have not been encountered in the current literature.

In light of this information, the research aims to determine the perceptions of organizational social capital, organizational identification, and organizational trust levels among academicians in institutions contributing to the human resources for sports within the challenging atmosphere of the academic world. The primary goal is to explore whether there is a relationship between organizational social capital, organizational identification, and organizational trust levels. The research, in this form, is expected to contribute to both state and private universities' sports-related departments being one step ahead in the increasingly competitive environment. It is anticipated that the findings will provide insights to managers in these departments regarding effective organizational management, the implementation of contemporary management principles and functions, and adopting an approach that instills trust in employees, ultimately enhancing satisfaction and performance levels in terms of identification and social capital. The study is also anticipated to offer guidance on the necessary steps to be taken in this direction.

## METHOD

### Research Model

The research employed both relational survey and descriptive survey (questionnaire) methods to clarify the current situation.

### Population and Sample

The population of the research consists of academicians (Professors, Associate Professors, Assistant Professors, Lecturers, and Research Assistants) working in 44 Schools of Physical Education and Sports affiliated with state universities, 34 Faculties of Sports Sciences, 5 Departments of Physical Education and Sports Teaching affiliated with Education Faculties, and 1 School of Sports Sciences and Technology in Turkey, as specified in Table 5 of the 2018 Student Selection and Placement System (OSYS) Higher Education Programs and Quotas Guide.

In order to obtain reliable data, the sampling method was not employed, and the study was conducted on the general population based on voluntary participation. This approach, referred to as a "self-sampling universe" (11), has been considered as the research universe.

The research employed face-to-face interviews and postal surveys as survey administration methods (8). Although attempts were made to administer surveys to all academicians, surveys were not conducted for academicians who were not present at the time of administration or those who chose not to participate. At the end of this process, it was determined that academicians from 32 Faculties of Sports Sciences (n=411), 25 Schools of Physical Education and Sports (n=267), and 3 Departments of Physical Education and Sports Teaching affiliated with Education Faculties (n=17) participated in the data collection process of the study. Thus, the sample group of the study consisted of a total of 695 academicians [Professors (n=32), Associate Professors (n=123), Assistant Professors (n=184), Lecturers (n=234), Research Assistants (n=122)], distributed according to the universities and units where the participating academicians worked, as detailed in Table 1. University.

**Table 1.** Percentage and Frequency Distribution of Academicians Answering the Survey.

| University and Units | n | % |
|---|---|---|
| Selcuk University SBF | 43 | 6,2 |
| Kocaeli University SBF | 31 | 4,5 |
| Atatürk University Faculty of Education Department of Physical Education and Sports | 29 | 4,2 |
| İnönü University SBF | 25 | 3,6 |
| Akdeniz University SBF | 23 | 3,3 |
| Eskisehir Technical University SBF | 23 | 3,3 |
| Manisa Celal Bayar University SBF | 23 | 3,3 |
| Ondokuz Mayıs University i SBF | 23 | 3,3 |
| Pamukkale University SBF | 21 | 3,0 |
| Mersin University BESYO | 19 | 2,7 |
| Kırıkkale University SBF | 19 | 2,7 |
| Niğde Ömer Halisdemir University SBF | 19 | 2,7 |
| Hitit University SBF | 18 | 2,6 |
| Fırat University SBF | 18 | 2,6 |
| Kahramanmaraş Sütçü İmam University SBF | 15 | 2,2 |
| Balıkesir University BESYO | 15 | 2,2 |
| Muş Alparslan University BESYO | 14 | 2,0 |
| Cumhuriyet University SBF | 13 | 1,9 |
| Kastamonu University BESYO | 13 | 1,9 |
| Uludağ University SBF | 13 | 1,9 |
| Çanakkale Onsekiz Mart University SBF | 13 | 1,9 |
| Süleyman Demirel University SBF | 12 | 1,7 |
| Mehmet Akif Ersoy University SBF | 11 | 1,6 |
| Erzincan Binali Yıldırım University BESYO | 11 | 1,6 |
| Bingöl University BESYO | 11 | 1,6 |
| Yozgat Bozok University BESYO | 11 | 1,6 |
| Kütahya Dumlupınar University BESYO | 10 | 1,4 |
| Muğla Sıtkı Koçman University SBF | 10 | 1,4 |
| Gaziantep University SBF | 10 | 1,4 |
| Kafkas University Sarıkamış BESYO | 10 | 1,4 |
| Ordu University BESYO | 9 | 1,3 |
| Van Yüzüncü Yıl University BESYO | 9 | 1,3 |
| Aksaray Üniversitesi SBF | 9 | 1,3 |
| Afyon Kocatepe University SBF | 8 | 1,2 |
| Çukurova University BESYO | 8 | 1,2 |
| Adnan Menderes University SBF | 8 | 1,2 |
| Karamanoğlu Mehmetbey University BESYO | 8 | 1,2 |
| Batman University BESYO | 8 | 1,2 |
| Harran University BESYO | 8 | 1,2 |
| Uşak University SBF | 7 | 1,0 |
| Hatay Mustafa Kemal University BESYO | 7 | 1,0 |
| Bartın University SBF | 7 | 1,0 |
| Marmara University SBF | 7 | 1,0 |
| Tokat Gaziosmanpaşa University SBF | 6 | 0,9 |
| Alanya Alaaddin Keykubat University SBF | 6 | ,9 |
| Gazi University SBF | 6 | ,9 |
| Trabzon University SBF | 5 | ,7 |

| | | |
|---|---|---|
| Necmettin Erbakan University Ahmet Keleşoğlu Faculty of Education, Department of Physical Education and Sports | 5 | ,7 |
| Şırnak University BESYO | 5 | ,7 |
| Siirt University BESYO | 4 | ,6 |
| Ağrı İbrahim Çeçen University BESYO | 4 | ,6 |
| Dicle University BESYO | 4 | ,6 |
| Mardin Artuklu University BESYO | 3 | ,4 |
| Ardahan University BESYO | 3 | ,4 |
| Tekirdağ Namık Kemal University BESYO | 3 | ,4 |
| Bayburt University BESYO | 3 | ,4 |
| Orta Doğu Teknik University Faculty of Education, Department of Physical Education and Sports | 3 | ,4 |
| Sinop University SBF | 3 | ,4 |
| Bitlis Eren University BESYO | 2 | ,3 |
| Bolu Abant İzzet Baysal University SBF | 1 | ,1 |
| **Total** | 695 | 100,0 |

As seen in Table 1, the number of participating academicians is 695 in total, consisting of 411 from 32 Faculties of Sports Sciences, 267 from 25 Schools of Physical Education and Sports, and 17 from 3 Departments of Physical Education and Sports Teaching affiliated with Education Faculties.

**Data Collection Tools**

To gather information about the personal characteristics of teaching staff and to create independent variables related to the subject of the study, a Personal Information Form created by the researcher was utilized. For determining the teaching staff's perceptions of organizational social capital, the "Educator Organizational Social Capital Scale," developed by Eker (15), was employed. To identify the teaching staff's perceptions of organizational identification, the "Educator Organizational Identification Scale," originally developed by Mael and Ashforth (28) and adapted to Turkish by Eker (15) with additional statements, was used. Lastly, to measure the teaching staff's levels of organizational trust, the "Organizational Trust Scale," developed by Nyhan and Marlowe (32) and adapted to Turkish by Gürce (20), was employed.

Faculty Member Organizational Social Capital Scale

"The Educator Organizational Social Capital Scale" was developed by Eker (15) to determine teaching staff's perceptions of organizational social capital.

"The Educator Organizational Social Capital Scale" consists of a total of 16 items and 5 statements. These statements are rated on a five-point Likert scale as follows: "strongly disagree=1," "disagree=2," "undecided=3," "agree=4," "strongly agree=5."

This scale consists of three sub-dimensions, namely, unifying organizational social capital, bonding organizational social capital, and bridging organizational social capital. The first seven questions of the scale measure the unifying dimension of organizational social capital (1, 2, 3, 4, 5, 6, 7), the next six questions measure the bonding dimension (8, 9, 10, 11, 12, 13), and the last three questions measure the bridging dimension (14, 15, 16).

The Cronbach's alpha reliability coefficient was calculated for each factor in the scale. For unifying organizational social capital, the Cronbach's alpha reliability coefficient is .946; for bonding organizational social capital, it is .924; for bridging organizational social capital, it is .749. The Cronbach's alpha reliability coefficient for the overall scale is 0.913 (15).

Faculty Member Organizational Identification Scale

"The Educator Organizational Identification Scale" is based on the "Organizational Identification Scale" developed by Mael and Ashforth (28), which originally contains 6 statements. "The Educator Organizational Identification Scale" was developed by Eker (15) for determining educators' perceptions of organizational identification by adding new statements. The scale consists of a total of 10 items and 5 statements. Each statement is accompanied by a five-point agreement scale: "strongly disagree=1," "disagree=2," "undecided=3," "agree=4," "strongly agree=5" (15).

"The Educator Organizational Identification Scale" consists of two sub-dimensions: cognitive organizational identification and emotional organizational identification. The first six questions of the scale measure the cognitive dimension of organizational identification (1, 2, 3, 4, 5, 6), and the next four questions measure the emotional dimension (7, 8, 9, 10). The Cronbach's alpha reliability coefficient was calculated for the two factors. For Factor 1, Cognitive Organizational Identification, the Cronbach's alpha reliability coefficient is 0.906; for Factor 2, Emotional Organizational Identification, it is 0.810. The Cronbach's alpha reliability coefficient for the overall scale is 0.913 (15).

**Organizational Trust Scale**

In this study, the "Organizational Trust Scale," consisting of 12 questions developed by Nyhan and Marlowe (32) and adapted to Turkish by Gürce (20), was utilized.

The measurement of the statements was conducted using a 5-point Likert Scale. The scale includes the options: 1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, 5=Strongly Agree (20).

The 5-point Likert-type Organizational Trust Scale consists of two sub-dimensions: trust in the manager and trust in the organization. The first factor, trust in the manager, assesses individuals' confidence in the competence, ability, and truthfulness of their managers. The factor loadings for the first 8 items (1, 2, 3, 4, 5, 6, 7, 8) gathered under the trust in the manager factor range from .76 to .57. The second factor, trust in the organization, evaluates perceptions related to the organization treating individuals fairly and perceptions of trust within the organization. The factor loadings for the 4 items (9, 10, 11, 12) gathered under the trust in the organization factor range from .86 to .67 (20).

**Data Analysis**

The distributions of academics' levels of organizational social capital, organizational identification, and organizational trust were determined by calculating the arithmetic means and standard deviations of the responses provided by academics to the scales. The normal distribution of sub-dimensions of organizational social capital, organizational identification, and organizational trust scales was tested using the Kolmogorov-Smirnov and Shapiro-Wilk tests. According to the test results, it was found that all variables exhibited a normal distribution ($p > 0.05$).

To reveal the relationship between academics' organizational social capital, organizational identification, and organizational trust levels, the Pearson Product-Moment Correlation Coefficient (r) technique was employed. In interpreting the correlation coefficient, a result between 0.70 and 1.00 is considered a high level of correlation, between 0.30 and 0.70 is considered a moderate level, and between 0.00 and 0.30 is considered a low level of correlation (9).

The data obtained were analyzed using the SPSS (Statistical Package for Social Sciences for Windows Release 23.0) program, tested at a significance level of 0.05, with other significance levels specifically indicated. The results were presented in tables in accordance with the purpose of the research.

## FINDINGS

The participants in the study consisted of 72.7% (n=505) males and 27.3% (n=190) females. When examining their distribution based on the variable of the department where they work, it was observed that 59.1% (n=411) worked in the Faculty of Sports Sciences, 38.4% (n=267) in the School of Physical Education and Sports, and 2.4% (n=17) in the Departments of Physical Education and Sports Teaching affiliated with the Faculty of Education. Regarding the distribution based on the department where they work, 42.3% (n=294) were in Physical Education and Sports Teaching, 28.9% (n=201) in Coaching Education, 19.3% (n=134) in Sports Management, and 9.5% (n=66) in Recreation departments.

In terms of age distribution, it was observed that 1.0% (n=7) were 25 years and under, 11.1% (n=77) were 26-30 years old, 17.8% (n=124) were 31-35 years old, 20.1% (n=140) were 36-40 years old, 21.4% (n=149) were 41-45 years old, 14.5% (n=101) were 46-50 years old, and 14.0% (n=97) were 51 years and above. Additionally, in terms of academic title, it was observed that 4.6% (n=32) were professors, 17.7% (n=123) were associate professors, 26.5% (n=184) were assistant professors, 33.7% (n=234) were lecturers, and 17.6% (n=122) were research assistants. When examining the distribution based on professional seniority, it was observed that 23.5% (n=163) had 1-5 years of experience, 14.8% (n=103) had 16-20 years, 19.1% (n=133) had 6-10 years, 11.7% (n=81) had 11-15 years, 15.3% (n=106) had 21-25 years, and 15.7% (n=109) had 26 years and above.

Regarding marital status, 71.7% (n=498) were married, 23.3% (n=162) were single, and 5.0% (n=35) were separated/divorced/widowed. Additionally, when examining the variable of having administrative duties, 69.8% (n=485) did not have administrative duties, while 30.2% (n=210) did have administrative duties (dean, vice dean, school director, vice director, department chair, department vice chair).

To interpret the scores obtained by the academicians participating in the research from the applied scales and the sub-dimensions of the scales, the formula for Range Width (a) = Range / Number of Groups to be Created (40) was used. Based on this, the frequency of observations and their boundary values are presented in Table 2 below.

**Table 2.** Observations and Boundary Values for Organizational Social Capital Scale, Organizational Identification Scale, and Organizational Trust Scale.

| Weight | Options | Border |
|---|---|---|
| 1 | I strongly disagree | 1,00-1,80 |
| 2 | I do not agree | 1,81-2,60 |
| 3 | I'm undecided | 2,61-3,40 |
| 4 | I agree | 3,41-4,20 |
| 5 | Absolutely I agree | 4,21-5,00 |

"In the examination of the scales used in the research, the value table provided in Table 2 will be utilized."

**Table 3.** n, Mean (X), and Standard Deviation (ss) Values for the Subscale Scores of Academicians on the Organizational Social Capital Scale.

| | **n** | $\overline{X}$ | **ss** |
|---|---|---|---|
| Integrative Organizational Social Capital | 695 | 3,68 | 0,99 |
| Bonding Organizational Social Capital | 695 | 3,68 | 0,83 |
| Bridging Organizational Social Capital | 695 | 3,95 | 0,76 |

The research revealed the mean scores for the dimensions of Organizational Social Capital Scale among the participating academicians: for Unifying Organizational Social Capital, X = 3.68; for Bonding Organizational Social Capital, X = 3.68; for Bridging Organizational Social Capital, X = 3.95.

**Table 4.** Number of Observations (n), Mean (X), and Standard Deviation (s) Values for Sub-Dimensions of Academics' Organizational Identification Scale

| | **n** | $\overline{X}$ | **ss** |
|---|---|---|---|
| Cognitive Organizational Identification | 695 | 3,38 | 0,89 |
| Emotional Organizational Identification | 695 | 3,82 | 0,75 |

The academic staff participating in the research exhibited mean scores of 3.38 for Cognitive Organizational Identification and 3.82 for Emotional Organizational Identification, as measured by the Organizational Identification Scale.

**Table 5.** Number (n), Mean (X), and Standard Deviation (ss) Values for Sub-Dimensions of Academics' Organizational Trust Scale

| | **n** | $\overline{X}$ | **ss** |
|---|---|---|---|
| Trust the Manager | 695 | 3,56 | 1,00 |
| Trust in the Organization | 695 | 3,32 | 1,03 |

The academics participating in the study had mean scores of 3.56 for Trust in the Supervisor and 3.32 for Trust in the Organization on the Organizational Trust Scale.

**Table 6.** Pearson Multiplication Moment Correlation Results to Determine the Relationship Between Academicians' Organizational Social Capital Scale, Organizational Identification Scale and Organizational Trust Scale Sub-Dimensions

| | | | Faculty Member Organizational Identification Scale | | Organizational Trust Scale | |
|---|---|---|---|---|---|---|
| | Variable | | Cognitive Organizational Identification | Emotional Organizational Identification | Trust the Manager | Trust in the Organization |
| Faculty Member Organizational Social Capital Scale | Cohesive Organizational Social Capital | r | .513 | .377 | .815 | .687 |
| | | p | 0.00** | 0.00** | 0.00** | 0.00** |
| | Bonding Organizational Social Capital | r | .450 | .301 | .559 | .642 |
| | | p | 0.00** | 0.00** | 0.00** | 0.00** |
| | Bridging Organizational Social Capital | r | .434 | .442 | .420 | .370 |
| | | P | 0.00** | 0.00** | 0.00** | 0.00** |
| | Bridging Organizational Social Capital | r | | | .581 | .614 |
| | | p | | | 0.00** | 0.00** |
| | Emotional Organizational Identification | r | | | .403 | .363 |
| | | p | | | 0.00** | 0.00** |
| A moderate and high level positive relationship was detected between all scale sub-dimensions (P < 0.001). | | | | | | |

## DISCUSSION

Organizational social capital encompasses the structural dimension due to the relationships among members, which is gained through mutual communication within the organization's internal environment and external environment. It includes the social assets and resources acquired as a result of individuals' interactions. It consists of three dimensions: structural, relational due to mutual trust among members, and cognitive due to the shared values and goals among members, forming the overall network of relationships (45). As a social open system, the school organization gains even more significance when considering its immediate environment (49).

The unifying dimension of organizational social capital characterizes relationships among individuals from different social classes. Unifying social capital, resulting from the relationships between vertical networks in society, generally encompasses individuals' relationships with others who possess power and authority (15). The bonding dimension of organizational social capital involves connections among individuals with similar characteristics, such as ethnic background, education, age, socio-economic status, or political views (47). It arises from the internal bonds among individuals comprising a community and becomes a public good that individuals within that community benefit from to achieve common goals (37). The bridging dimension of organizational social capital consists of weak ties observed in heterogeneous group relationships and includes formal and informal relationships between groups with different professional, ethnic, and socio-economic backgrounds (15). In the institutions providing sports education, the academics participating in the study have the highest perceptions of bridging social capital (X=3.95), while their lowest perceptions of organizational social capital are in the unifying social capital (X=3.68) and, with the same ratio, in the bonding social capital (X=3.68) dimensions (Table 3).

Given that employees' perceptions of interpersonal communication in their organizations play a significant role in their attitudes and behaviors toward the organization (50), it can be argued that academics' perceptions should be higher. In this context, when the results of past and present studies are examined, teachers' perceptions of social capital can be considered as an aspect that needs improvement.

Our research results are consistent with other studies conducted for teachers, which are stakeholders in the education sector (16, 15, 19, 6, 3), and a study on teachers' social capital perception examined from the perspective of school administrators (39). Similar findings have been reached.

There are existing studies (19, 12) in the relevant literature that do not align with our research results, finding that the organizational social capital levels of teachers are high. It can be argued that teachers at different levels participating in these studies are satisfied with the decisions related to organizational social relationships, formed through communication among different social groups and internal connections.

Organizational identification supports the utility of social identity as an enhancer of performance in organizational settings. It closely examines the relative importance of different social identity foci in organizational environments (38).

The cognitive dimension of organizational identification involves an individual defining themselves in conjunction with the organization they belong to. This perspective on membership leads the individual to attribute the successes or failures of the organization to themselves, prompting the individual to make efforts toward the organization's positive outcomes (23).

The emotional dimension of organizational identification signifies emotional attachment to a group. It is associated with pride in being part of the group, and it is crucial for an individual to form a positive image of their group or develop a positive social identity (36).

The academic staff in sports education institutions participating in the research showed the highest perceptions of emotional organizational identification ($\bar{X}$ =3.82), followed by cognitive organizational identification ( $\bar{X}$ =3.38) (Table 4).

Academicians who exhibit a high level of emotional attachment to their institutions have positive effects on organizational members, and it is evident that increasing the level of organizational identification will have positive outcomes for the organization. As the level of organizational identification increases, there is a positive increase in job performance, and members who embrace the organization's goals as their own and strive to achieve the best performance to reach these goals play a significant role in achieving success (41).

Many studies in the relevant literature partially or fully support the research results. In these studies, Akpınar (4), Nergiz (31), Yaşa (47), and Koyuncu (25) concluded that social capital is at a moderate level, while Başar (7) and Eker (15) found it to be high in their studies with academicians.

Organizational trust is defined as "the degree of employees' trust in management and their belief in what management tells them." According to this definition, the source of organizational trust is the behavior of upper-level and middle-level managers (42).

The dimension of trust in the manager within organizational trust encompasses interpersonal trust within the organizational structure; employees' trust in their managers is shaped by the manager's demonstrated ethical and fair behaviors (22).

The dimension of trust in the organization within organizational trust can be expressed as the level of trust employees have in their organizations. Trust in the organization can be described as the increased trust individuals have in themselves and their organization when they see themselves as an integral part of the institution to which they belong (35).

The academicians from sports education institutions participating in the research have the highest perceptions regarding organizational trust in the dimension of trust in the manager ( $\bar{X}$ =3.56), followed by trust in the organization ( $\bar{X}$ =3.38), as determined in Table 5.

According to these results, it can be concluded that academicians are emotionally attached to their managers, identify with the institution, and will continuously seek organizational success within the

organization. It is also suggested that honesty, intention, and transparency in organizations would increase performance and efficiency. The high level of these factors forms a significant part of the reasons for their commitment to the institution. However, it is noted that they do not have a high sense of moral obligation related to staying in the organization. In other words, they may not fully devote themselves to their institutions and lack a sense of commitment, justice, equality, and loyalty.

The high level of trust in the manager is considered to be related to each other in the same direction, as the manager represents the organization. Trust in the organization is initiated by trust in the manager. Employees determine the level of trust in the organization based on their interactions with the manager. In some cases, even if employees have full trust in their managers in terms of competence, helpfulness, and respect, they may not trust the organization. Given these factors, it can be said that the result obtained in the research is encouraging.

There are many studies in the relevant literature that fully support or support the research results. Applying to academics in this way; (26, 44, 2, 18, 13) and the improvements made towards the perception of trust perceived by physical education teachers in Ulucan (43), similar sections were reached.

**CONCLUSION**

Table 6 presents the results of the regression analysis conducted to determine the effects of the levels of organizational identification and organizational trust of academics in sports education institutions on the level of organizational social capital.

The sub-dimensions of the organizational identification scale (cognitive organizational identification, emotional organizational identification) and the sub-dimensions of the organizational trust scale (trust in the manager and trust in the organization) together show a significant relationship with the level of organizational social capital. These variables together explain approximately 68% of the total variance in organizational social capital. On the other hand, it is understood that, among the predictor variables, only emotional organizational identification, trust in the manager, and trust in the organization are significant predictors of organizational social capital. In other words, as emotional organizational identification increases, levels of organizational social capital increase, and as trust in the manager and trust in the organization levels increase, levels of organizational social capital also increase. No research examining the effects of organizational identification and organizational trust levels on the level of organizational social capital was found in the relevant literature.

The study revealed that academicians in institutions providing sports education have high perceptions regarding trust in their supervisors, cooperation, communication, unity of purpose, honesty and openness with colleagues, collaboration, mutual assistance, trust, exchange of ideas, and informal meetings. In this context, the results indicate high perceptions regarding the allocation of time and effort to social projects, contributions to organizing social activities, and participation in ceremonies, meetings, and social events. The findings suggest that increasing emotional attachment, perceiving the institution as excellent, embracing, owning, seeing it as a family, and believing in the accuracy of their intermediate-level communication with the institution would enhance their identification with the organization.

The study indicates that academicians in institutions providing sports education have high perceptions regarding trust in their supervisors, cooperation, communication, unity of purpose, honesty and openness with colleagues, collaboration, mutual assistance, trust, exchange of ideas, and informal meetings. In this context, there is a high perception of contributing time and effort to social projects, contributing to the organization of social activities, and participating in ceremonies, meetings, and social events. From these results, it can be interpreted that having confidence in their managers, perceiving them as competent, capable of making correct and logical decisions, trusting in the accuracy of their words, having confidence in their managers, perceiving the institution as just, and having trust in their colleagues would increase the level of trust in the institution, considering working in the organization as a duty, and believing it is right to show trust in the institution.

The study reveals that academicians in institutions providing sports education have high perceptions regarding their organization, perceiving it as excellent, aligning their goals with the organization's goals, enhancing their image in society, commitment, ownership, considering it as a family, feeling responsible for

success and failure. In this context, it is believed that increasing identifications such as considering managers as competent, capable of making correct decisions, having comprehension skills, making logical decisions, trusting in the accuracy of their words, having trust in their managers, perceiving the institution as just, trust among colleagues, considering working in the organization as a duty, and believing it is right to show trust in the institution would enhance organizational identification.

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# Investigation of the Effects of Recreational Football on Some Functional Movement Skills in Older Men

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**Abstract**

This study aimed to examine the effects of recreational football on functional movement skill (FMST) levels of elderly men. 57 (65.05 ± 2.5) elderly men who participated in the study were randomly divided into the football group (FG, n= 28) and the control group (CG, n= 29). Data were collected with the FHTT scale and investigeted via mixed design ANOVA. The data were analyzed considering the significance level of p<.05. There was no statistically significant difference between the groups in the deep squatting movement (p>.096), and there was a statistical difference between the times (p<.002). Statistically significant differences were observed between groups, between times and group*time interaction at high stepping, respectively (p<.008, p<.001, p<.035). Statistically significant differences were observed between groups in a single-line move and in group*time interaction, respectively (p<.008, p<.006). There was a statistically significant difference between the groups in shoulder mobility (p<.001). There was no statistically significant difference between the times and in the group*time interaction, respectively (p>.98, p>.44). Statistically significant differences were observed between groups, between times and in group*time interaction in active straight leg raising, respectively (p<.004, p<.001, p<.035). There was no statistically significant difference between the groups in trunk stability movement (p>.089). There was a statistically significant difference between the times and in the group*time interaction (p<.024). Statistically significant difference was observed between groups and between times in rotational stability movement, respectively (p<.001, p<.001). There was no statistically significant difference in the groups*time interaction (p>.065). Statistically significant differences were observed in FHTT total scores between groups, between times and in the interaction of groups*time, respectively (p<.001, p<.001, p<.001, p<.001). The results show that recreational football is effective on FHTT and is a powerful exercise option in improving mobility, which is important for elderly individuals to maintain their quality of life.

**Keywords:** Elderly, Recreational Football, Functional Movement

**Özet**

**Yaşlı Erkeklerde Rekreasyonel Futbolun Bazı Fonksiyonel Hareket Becerileri Üzerine Etkilerinin İncelenmesi**

Bu çalışma rekreasyonel futbolun yaşlı erkeklerin fonksiyonel hareket beceri (FHTT) düzeyleri üzerinde etkilerini incelemeyi amaçlamıştır. Çalışmaya katılan 57(65.05 ± 2.5) yaşlı erkek rastgele futbol grubu (FG, n= 28) ve kontrol grubuna (KG, n= 29) ayrılmıştır. Ölçümler, Ön test-son test eşleştirilmiş kontrol gruplu desen araştırma

tekniğine göre yapıldı. Veriler FHTT ölçeğiyle toplandı ve karma desen ANOVA aracılığıyla incelendi. Veriler p<.05 anlamlılık düzeyi dikkate alınarak incelendi. Derin çömelme hareketinde gruplar arasında istatistiksel olarak anlamlı bir fark olmadığı (p>.096), zamanlar arasında istatistiksel fark olduğu görülmüştür (p<.002). Yüksek adımlamada gruplar arasında, zamanlar arasında ve grup*zaman etkileşiminde sırasıyla istatistiksel olarak anlamlı fark görülmüştür (p<.008, p<.001, p<.035). Tek çizgide hamle de gruplar arasında ve grup*zaman etkileşiminde sırasıyla istatistiksel olarak anlamlı fark görülmüştür (p<.008, p<.006). Omuz hareketliliğinde gruplar arasında istatistiksel olarak anlamlı fark görülmüştür (p<.001). Zamanlar arasında ve grup*zaman etkileşiminde sırasıyla istatistiksel olarak anlamlı fark görülmemiştir (p>.98, p>.44). Aktif düz bacak kaldırmada gruplar arasında, zamanlar arasında ve grup*zaman etkileşiminde sırasıyla istatistiksel olarak anlamlı fark görülmüştür (p<.004, p<.001, p<.035). Gövde stabilite hareketinde gruplar arsında istatistiksel olarak anlamlı fark olmadığı görülmüştür (p>.089). Zamanlar arasında ve gruplar*zaman etkileşiminde sırasıyla istatistiksel olarak anlamlı fark görülmüştür (p<.024, p<.024). Rotasyonel stabilite hareketinde gruplar arasında ve zamanlar arasında sırasıyla istatistiksel olarak anlamlı fark görülmüştür (p<.001, p<.001). Gruplar*zaman etkileşiminde istatistiksel olarak anlamlı bir fark görülmemiştir (p>.065). FHTT toplam puanlarında gruplar arasında, zamanlar arasında ve gruplar*zaman etkileşiminde sırasıyla istatistiksel olarak anlamlı fark görülmüştür (p<.001, p<.001, p<.001). Katılımcılar herhangi bir ağrı bildiriminde bulunmamışlardır. Sonuçlar rekreasyonel futbolun FHTT üzerinde etkili olduğunu ve yaşlı bireylerin yaşam kalitelerini sürdürmelerinde önemli olan mobiliteyi geliştirmede güçlü bir egzersiz seçeneği olduğunu göstermektedir.

**Anahtar Kelimeler:** Yaşlı, Rekreasyonel Futbol, Fonksiyonel Hareket

## INTRODUCTION

The process of aging is developmental and involves detrimental mechanisms that affect our capacity to perform a range of functions within its cycle. According to Matteson (10), aging is a slow but dynamic process involving many internal and external influences, including genetic programming, physical and social environment. In this context, every period of life is important and aging should be viewed from a life course perspective.

The World Health Organization (WHO) ranks inadequate physical activity as the fourth leading cause of premature death and approximately 3.2 million people die each year due to sudden causes (18). WHO states that elderly individuals aged 64 years and older should engage in at least 180 minutes of multicomponent physical activity per week for quality aging. However, globally, one out of every 4 people cannot reach the recommended level of physical activity (19); in the Ministry of Health "Chronic Diseases Risk Factors Survey, it is stated that 87% of women and 77% of men in Turkey do not perform sufficient physical activity." (12). In this context, factors such as the perception of the elderly formed in the socio-cultural context, gender approach, urbanization, research and implementation problems limit participation in physical activity (13,16).

The World Health Organization (18) reported that healthy aging refers to the age- appropriate development and maintenance of functional functions. However, this process is closely related to both intrinsic and extrinsic variables and the interaction between them. Groessl et al. (8) state that mobility is a marker of an individual's health status and quality of life. In this context, Cook et al. (2) created a functional movement screening test (FHTT) to determine the functional movement capacities and limitations of all individuals in general and the elderly population in particular; to create exercise prescriptions and to monitor the development of movement patterns in case of injury or change in fitness levels.

Functional Movement Screening Test (FMST) has been used as an important data tool in the field of sports, mainly for the young population and in performance-oriented research in different sports disciplines. In this context, the global popularity of recreational soccer, the richness of the game's content (e.g., dual task involving motor and skill), the ease of adaptation to communities, and the characteristics of being a group activity are assumed to be a powerful functional mobility tool for older men. This study aimed to examine the effects of recreational soccer practice on functional movement components in older men. This study is limited to 65-74 years old male participants who have been inactive for the last two years, sedentary, without health risks and also referred to as young old age. This research hypothesizes that recreational soccer practice will be effective in the development of each movement pattern and inter-pattern coordination in older adults.

## METHOD

### Participants and workflow

The population of the study consisted of sedentary men between the ages of 65-75 (±2 years), and the sample consisted of 66 volunteer male participants living in Eskişehir who had not smoked and exercised regularly in the last two years. In addition, exclusion criteria include cardiovascular diseases, musculoskeletal problems, and conditions that cause movement restrictions such as hyper blood pressure. Participants were reached by snowball sampling technique and divided into two groups as FG (n=33) and CG (n=32) by drawing lots (Fig.1).

All participants were asked for a medical report stating that they were not medically unfit to participate in the study and were informed about the potential risks and discomforts related to the experimental process before giving their written informed consent for participation. Ethics Committee Report was obtained from Kütahya Dumlupınar University Ethics Committee before the study. The study was conducted in accordance with the "Helsinki Declaration of Ethical Principles for Medical Research on Humans".

### Implementation procedure

Participants received recreational soccer for a total of 14 weeks, two sessions per week, each session lasting 60 minutes. The implementation group was divided into two groups, Tepebaşı (n=16) and Odunpazarı (n=16) Wise Feet groups, taking into account their physical activity, sports background and transportation to the facilities. The number of participants (4x4,5x5,6x6 and 7x7) for each team for each session was determined based on the number of participants. The field dimensions are 20x40 meters and are arranged depending on the number of participants.

### Functional movement screening test (FHTT)

For this study, the Functional Movement Screening Test (FMST) developed by Cook and Burton (2) and consisting of deep squat, high step, single line lunge, shoulder mobility, active straight leg raises, trunk stability push-up and rotational stability movement pattern, respectively, was used (3,6,12). Fawcett (6) reported in his reliability study on older adults that the FMS total score was quite high (ICC=0.89, p<.00) but the individual score was in the poor to excellent range (ICC=0.2-0.89). Additionally, Onate et al. (14) by; It was similar to the result of the reliability study they conducted for the young, active sample group (ICC = 0.92). Participants were asked to comply with pre-test instructions such as not consuming alcohol 24 hours before the test, not exercising heavily, not eating or drinking excessive fluids 3 hours before the test, and on the day of the test, participants were asked to wear exercise clothes or comfortable clothes that would not limit movement.

Each participant was given two attempts for each movement before moving on to the next movement. For scoring, observation was done from both anterior and sagittal views. The scoring of each movement was expressed as a value between 0 and 3. A score of zero was given if the participant felt or expressed pain during the movement tested. A score of 1 was given for failure to complete the movement or loss of balance; a score of 2 was given for completion of the movement with compensatory movement strategies; and a score of 3 was given for full completion of the movement without any pain or compensatory movement strategies. When in doubt, the lowest score was given and interpretation was avoided.

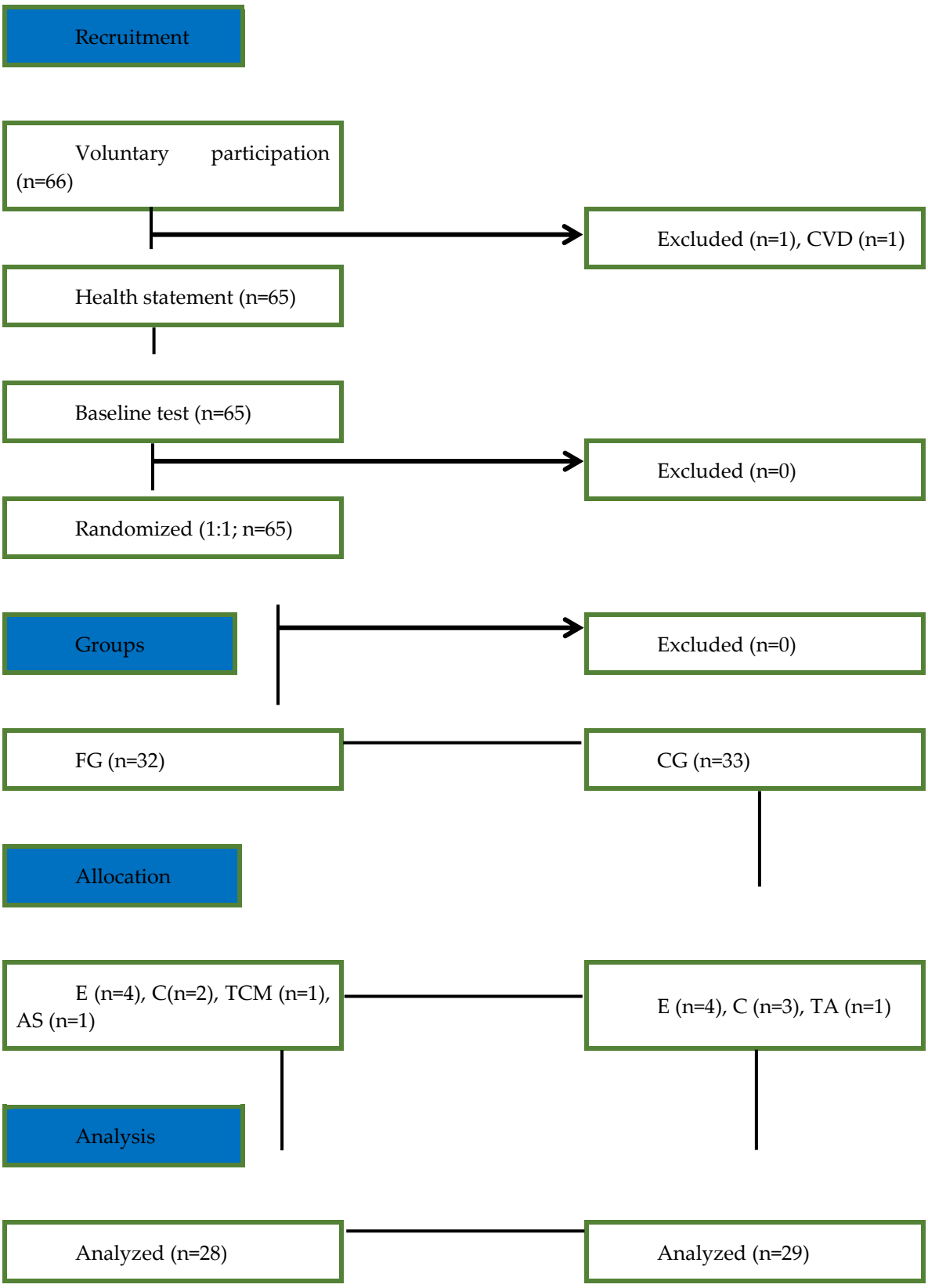


**Figure 1.** Sample and Work Flow Chart

Abbreviation: E, Excluded; TCM, Take care is mother; AS, Ankle sprain; C, Covid+; TA,Travel abroad

The highest score after two trials was recorded on the FHTT recording form, but for movements measured bilaterally, including high stepping, single line lunge, shoulder mobility, pain control test, active straight leg raises and rotational stability, the lowest raw score between the left and right side was recorded as the final score for that test. An FHTT certified exercise specialist performed scoring. Participants were given

the opportunity to familiarize themselves with the FHTT movements and scoring. For each score (0, 1, 2 or 3), a photograph of the movement was visually displayed. This test followed the FHTT test administration process applied by Cook et al. (2).

**Data analysis**

The normality of the data was tested by Kolmogorov-Smirnov, homogeneity was tested by "skewness", and "kurtosis" analyzes. After it was determined that the data showed normal distribution, it was decided to perform parametric analyzes. Intergroup, pre-post test time differences and group-time interactions of FHTT data were analyzed by two-way ANOVA. Group and time comparisons of the data were compared with Bonferroni post hoc test. Partial eta square ($\eta^2p$) was calculated to determine the effect size of two-way ANOVA. In these calculations, $\eta^2p$ values in the range of 0-0.009 were accepted as insignificant effect size, 0.01-0.0588 as small effect size, 0.0589-0.1379 as medium effect size and values greater than 0.1379 as large effect size (1,17). Cohen's d effect sizes of the measurements were calculated to determine the magnitude of pairwise comparisons between time and between groups. The significance of effect sizes was determined as Cohen's d insignificant (<0.2), small (≥0.2), moderate (≥0.5) and large (≥0.8) (1,17). Statistical analyses were performed using R studio (version 4.2.1) and IBM SPSS program (version 2022).

## FINDINGS

The findings, the seven sequential movement patterns that make up the FHTT battery and the FHTT total scores are given respectively.

**Table 1.** Two-way ANOVA Results for Deep Squat Values

| Variables | Sum of Squares | df | Mean Square | F | p | $\eta^2p$ |
|---|---|---|---|---|---|---|
| **Groups** | 0.424 | 1 | 0.424 | 2.814 | 0.096 | 0.025 |
| **Time** | 1.511 | 1 | 1.511 | 10.039 | 0.002 | 0.084 |
| **Groups ∗ Time** | 0.458 | 1 | 0.458 | 3.046 | 0.084 | 0.027 |

When Table 1 is examined, there is no statistically significant difference between the groups in the two-way ANOVA for deep squat values. There is a statistically significant difference between times. There is no statistically significant difference between groups and time interaction.

**Table 2.** Two-way ANOVA Results for High Stepping Values

| Variables | Sum of Squares | df | Mean Square | F | P | $\eta^2p$ |
|---|---|---|---|---|---|---|
| **Groups** | 1.825 | 1 | 1.825 | 7.345 | 0.008 | 0.063 |
| **Time** | 3.232 | 1 | 3.232 | 13.010 | 0.001 | 0.106 |
| **Groups ∗ Time** | 1.127 | 1 | 1.127 | 4.536 | 0.035 | 0.040 |

When Table 2 is examined, there is a statistically significant difference between the groups in the two-way ANOVA for high stepping values. There is a statistically significant difference between times. There is a statistically significant difference between groups and time interaction.

**Table 3.** Two-way ANOVA Results for Single Line Lunge Values

| Variables | Sum of Squares | df | Mean Square | F | p | $\eta^2p$ |
|---|---|---|---|---|---|---|
| **Groups** | 1.816 | 1 | 1.816 | 7.208 | 0.008 | 0.062 |
| **Time** | 0.753 | 1 | 0.753 | 2.989 | 0.087 | 0.026 |
| **Groups ∗ Time** | 2.016 | 1 | 2.016 | 8.003 | 0.006 | 0.068 |

When Table 3 is examined, there is a statistically significant difference between the groups in the two-way ANOVA for the single line lunge values. There is no statistically significant difference between times. There is a statistically significant difference between groups and time interaction.

**Table 4.** Two-way ANOVA Results for Shoulder Mobility Values

| Variables | Sum of Squares | df | Mean Square | F | p | $\eta^2p$ |
|---|---|---|---|---|---|---|
| **Groups** | 3.268 | 1 | 3.268 | 13.536 | 0.001 | 0.110 |
| **Time** | 4.321e-5 | 1 | 4.321e-5 | 1.790e-4 | 0.989 | 1.627e-6 |
| **Groups ✻ Time** | 0.140 | 1 | 0.140 | 0.582 | 0.447 | 0.005 |

When Table 4 is examined, there is a statistically significant difference between the groups in the two-way ANOVA for shoulder mobility values. There is no statistically significant difference between times and groups * time interaction.

**Table 5.** Two-way ANOVA Results for Active Straight Leg Raise Values

| Variables | Sum of Squares | df | Mean Square | F | p | $\eta^2p$ |
|---|---|---|---|---|---|---|
| **Groups** | 1.503 | 1 | 1.503 | 8.870 | 0.004 | 0.075 |
| **Time** | 3.928 | 1 | 3.928 | 23.181 | 0.001 | 0.174 |
| **Groups ✻ Time** | 0.770 | 1 | 0.770 | 4.545 | 0.035 | 0.040 |

When Table 5 is examined, there is a statistically significant difference between the groups in the two-way ANOVA for active straight leg raising values. There is a statistically significant difference between times. There is a statistically significant difference between groups and time interaction.

**Table 6.** Two-way ANOVA Results for Trunk Stability Push-Up Values

| Variables | Sum of Squares | df | Mean Square | F | p | $\eta^2p$ |
|---|---|---|---|---|---|---|
| **Groups** | 0.327 | 1 | 0.327 | 2.946 | 0.089 | 0.026 |
| **Time** | 0.581 | 1 | 0.581 | 5.236 | 0.024 | 0.045 |
| **Groups ✻ Time** | 0.581 | 1 | 0.581 | 5.236 | 0.024 | 0.045 |

When Table 6 is examined, there is no statistically significant difference between the groups in the two-way ANOVA for trunk stability push-up values. There is a statistically significant difference between times and groups* time interaction.

**Table 7.** Two-way ANOVA Results for Rotational Stability Values

| Variables | Sum of Squares | df | Mean Square | F | p | $\eta^2p$ |
|---|---|---|---|---|---|---|
| **Groups** | 3.473 | 1 | 3.473 | 16.314 | 0.001 | 0.129 |
| **Time** | 2.583 | 1 | 2.583 | 12.134 | 0.001 | 0.099 |
| **Groups ✻ Time** | 0.759 | 1 | 0.759 | 3.564 | 0.062 | 0.031 |

When Table 7 is examined, there is a statistically significant difference between the groups in the two-way ANOVA for rotational stability values. There is a statistically significant difference between times. There is no statistically significant difference between groups and time interaction.

**Table 8.** Two-Way ANOVA Results of FHTT Total Scores

| Variables | Sum of Squares | df | Mean Square | F | p | $\eta^2p$ |
|---|---|---|---|---|---|---|
| **Groups** | 86.031 | 1 | 86.031 | 49.993 | 0 .001 | 0.312 |
| **Time** | 69.586 | 1 | 69.586 | 40.437 | 0 .001 | 0.269 |
| **Groups ∗ Time** | 33.235 | 1 | 33.235 | 19.313 | 0 .001 | 0.149 |

When Table 8 is examined, there is a statistically significant difference between the groups in the two-way ANOVA conducted for the total score values. There is a statistically significant difference between times. There is a statistically significant difference between groups and time interaction.

## DISCUSSION AND CONCLUSION

In this context, it is thought that the difference seen between the football group and the control group in the deep squat movement pattern may be the result of changes in glenohumeral and thoracic spine mobility, closed kinetic chain dorsiflexion of the ankles, mobility in the lower extremities and muscular-nervous system due to the effects of exercise practice. Soccer is a sport discipline in which the foot extremities are highly functional. While playing soccer, one leg often assumes the balance function of the body while the other leg is activated in different positions for the purposeful use of the ball. It is thought that these natural conditions may be due to the improvement in the stability of the stance leg or the mobility of the lunge leg of the football group participants.

The single line lunge movement pattern may be the result of possible cumulative improvements in the relative symmetry between stability and mobility around both hips, stance leg leg knee or ankle stability, hip adductor and abductor interaction and thoracic spine region due to the effects of exercise practice. Shoulder mobility pattern difference between groups are thought to be a result of the active renewal of the starting, inter-set and finishing sections in the recreational football practice and the activism experienced in the whole game. Active straight leg raising values, it can be said that due to the development of flexibility in the muscle and joint structures involved in the hip movement mechanism, which is frequently used in the application process.

Trunk stability push-up result of the improvements may be strength, flexibility, postural connections and learning practice in the muscle and joint structures involved in the lower and upper extremity mechanisms frequently used in the application process. The rotational stability movement is thought that this development may be a result of changes in learning, balance, coordination, skill experience and strength in the structures involved in the realization of movement.

The FHTT total score consists of the average of the sums of the scores of each of the seven sequential movements. In this context, the statistical results seen in the FHTT total scores of the intervention group are taken into consideration as a significant variable as an evaluation and norm value in research.

When the studies conducted within the scope of this study were examined, Fawcett (6) found that the reliability of the FHTT total score for adults aged 50 years and over was quite high (ICC=.89, $p<.05$, FHTT total score= 11.7 for male participants). It was also reported that there was a significant negative correlation between FHTT scores across age groups (12.3± 1.9 in the 50-54 age group, 12.6 ± 2.3 in the 55-59 age group, 10.2 ± 2.4 in the 60-64 age group and 10.6 ± 3.4 in the 65 and over age group)(6). Again, Perry and Kohle (15) reported that the average FHTT total score in healthy male individuals with an average age of 50.91 (sd=10.8) was 12.98 ± (sd=2.67) in the 60-64 age group and 12.56 (sd=3.27) in the 65 and over age group and that the exercise program was effective in increasing FHTT scores. Mitchell et al. (11) reported that the total FHTT score was 13.4 ± 2.3 in the 60-64 age group, 11.4 ± 2.4 in the 65-69 age group and 11.1 ± 2.6 in the 70-74 age group. Farrell et al. (5) reported that the total FMS scores of elderly male and female participants were 11.7 ± 2.8 and 11.9 ± 2.3, respectively, and that FMS performance was associated with key health markers. Hermosa et al. (9) suggest that exercise practitioners can use the modified FMS as a screening tool to improve physical fitness performance in older adults, as proficiency in the deep squat is associated with several commonly used measures of physical fitness, thus, practitioners may benefit from understanding the positive relationship between movement patterns and physical fitness.

Followay et.al. (7) reported that physically active older adults showed statistically significantly higher functional movement skill scores compared to inactive older adults in the deep squat [ (t (27) = 5.328, p < 0.001, g = 6.801); hurdle step (t (27) = 5.534, p < 0.001, g = 4.709) and in-line lunge (t (27) = 5.337, p < 0.001, g = 6.846). In this context, Çambel (4) stated that 8 weeks of plates and yoga exercise with 25 female participants (Plates, n=13; Yoga, n=12) aged between 35-46 years made a statistically significant difference on their functional mobility respectively (p<.05, p<.05). It is seen that there are similarities between the results of the literature and the results of this study.

The literature shows that age-related functional movement limitations (e.g., neuromuscular system changes in the elderly) increase the likelihood of falls and traumas as a result of falls in the elderly population. In this study, there was a significant difference between the FHTT pre-test and post-test of the football group, and between the football group and the control group post-test, indicating that there were significant increases in the FHTT total scores of the football group due to the exercise effect. In addition, no positive symptoms were detected in the pain control scans of the participants and two participants in the treatment group experienced temporary muscle strain.

The results of this study show that (1) recreational soccer positively affects motor control, mobility, stability limitations or asymmetries. (2) it contributes to the ability of the elderly population to perform their daily functions effectively by contributing to basic movement competence; (3) coordination and balance practices provide readiness in the face of events and phenomena due to the dual task structure of soccer; and (4) FHTT total score can be one of the preliminary markers in the creation of exercise protocol.

In this context;

The relationship between body composition variables of elderly individuals and exercise parameters such as weekly exercise frequency, duration of sessions and rest intervals can be investigated by creating different designs.

Using different measurement tools such as GPS, the effects of recreational soccer on physiological parameters as well as physical and motor parameters in elderly individuals can be investigated.

It may be useful to determine asymmetric differences in muscles by examining the effects of recreational soccer practice on ankle, hip and other extremities in elderly individuals.

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# Determining the most important game-related statistics in Euroleague basketball competitions: A five-year follow-up

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*Ethical Statement: It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited.*

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**Abstract**

The purpose of this study was to investigate the game-related statistics in the Play-Off and Final Four rounds of the Euroleague basketball competitions held between 2014 and 2018. In the study, the game-related statistics of 60 teams that participated in the Euroleague Play-Off and Final Four rounds between 2014 and 2018 were evaluated. The independent samples t-test was used to compare the game-related statistics of the two groups. The linear discriminant analysis was used to determine the important game-related statistics between the teams that qualified and those that were eliminated. The results of the study showed that there was a statistically significant difference between the game-related statistics of the two groups in the Play-Off competitions. This difference was seen in the free throw percentage, fouls committed, and performance efficiency scores. As a result of the discriminant analysis, it was found that foul, three-point field-goal percentage, performance efficiency score, turnover, free-throw percentage, and two-point field-goal percentage are important game-related statistics in qualifying the Play-Off round. When the game-related statistics of the two groups in the Final Four were compared, it was seen that only three-point field-goal percentage was an effective variable in becoming the champion. According to the results of the discriminant analysis, turnover, defensive rebound, and total rebound are important game-related statistics to being an Euroleague champion. In conclusion, it is thought that being the Euroleague champion in the Euroleague, it is necessary to have a lower number of turnovers and a defensive game.

**Keywords:** Basketball, Euroleague, Game-related statistics.

**Özet**

**Eurolig basketbol müsabakalarında oyun ilişkili en önemli istatistiklerin belirlenmesi: Beş yıllık bir takip**

Bu araştırmanın amacı 2014-2018 yılları arasında gerçekleştirilen Eurolig basketbol müsabakalarının Play-Off ve Final Four turlarındaki oyun ilişkili istatistiklerin belirlenmesidir. Araştırmada 2014-2018 yılları arasındaki 5 sezonda Eurolig müsabakalarında Play-Off ve Final Four turunda yer almış 60 takım incelenmiştir. Araştırma verileri Eurolig'in resmî sitesinden elde edilmiştir. Takımlar başarılı ve başarısız takımlar olmak üzere iki gruba

ayrılmıştır. Başarılı takımlar ve başarısız takımların oyun içi değişkenlerinin karşılaştırılmasında bağımsız örnekler t testi kullanılmıştır. Takımlar arasındaki önemli oyun içi değişkenlerin belirlenmesinde ise doğrusal discriminant analizi kullanılmıştır. İstatistiksel analizler SPSS 22.0 yazılım programı kullanılarak yapılmış ve anlamlılık düzeyi $p<0.05$ olarak belirlenmiştir. Play-Off müsabakalarında başarılı ve başarısız takımların oyun içi değişkenleri karşılaştırıldığında, serbest atış yüzdesi, rakibe yapılan faul ve performans verimlilik puanları arasında istatistiksel açıdan anlamlı bir fark olduğu tespit edilmiştir ($p<0.05$). Diskriminant analizi sonucunda ise, faul, üç sayılık atış yüzdesi, performans verimlilik puanı, top kaybı, serbest atış yüzdesi ve iki sayılık atış yüzdesinin Play-Off turundan Final Four turuna çıkmada önemli oyun içi değişkenler olduğu tespit edilmiştir. Final Four'da şampiyon olan ve elenen takımların oyun içi değişkenleri karşılaştırıldığında, yalnızca üç sayılık atış yüzdesinin şampiyon olma da etkili değişken olduğu görülmüştür. Diskriminant analizi sonuçlarına göre, top kaybının, savunma ribaundunun ve toplam ribaundun Final Four'da şampiyon olmak için önemli oyun içi değişkenler olduğu tespit edilmiştir. Sonuç olarak, Eurolig'de şampiyon olmak için daha düşük sayıda top kaybı gerçekleştirmek ve daha defansif bir oyun sergilemek gerektiği düşünülmektedir.

**Anahtar Kelimeler:** Basketbol, Eurolig, Oyun ilişkili istatistikler.

## INTRODUCTION

The analysis of basketball competitions is the process of bringing together and making sense of the events and performance elements that occur during a game. This provides a new perspective for both coaches and clubs on issues such as the level of conditioning, mental, technical, and tactical skills of athletes and teams, their shortcomings, the identification of the causes of their failure, and the development of training programs related to these (Smith ve ark., 1997). Since basketball is not an individual sport, evaluating team performance and bringing together and analyzing the factors that affect this performance has been the focus of many studies. The collection and analysis of data related to the performance elements of athletes and teams in basketball is a recent trend (2,4-6,9,10,12-15). The history of competition analysis in basketball dates back to 1946. In this year, the National Basketball Association (NBA) began to track variables related to assists, fouls committed, and points for the first time. In the 1977-1978 season, new variables such as turnovers, steals, and blocks were also included in competition analysis (1). Today, the following important game-related statistics are used in basketball in relation to team performance: assist, block, defensive rebound, offensive rebound, total rebound, free-throw percentage, fouls committed, fouls perceived, turnover, steal, two-point field-goal percentage, three-point field-goal percentage, and performance efficiency score. These statistics provide a new perspective for both coaches and clubs on issues such as the level of conditioning, mental, technical, and tactical skills of athletes and teams, their shortcomings, the identification of the causes of their failure, and the development of training programs related to these.

In recent years, as the world of sports has globalized and has a large economy, basketball has taken its rightful place among the most watched organizations. Euroleague is the second most popular and watched organization in closed sports organizations after the NBA (5). Being successful in the Euroleague, which has such a large economic power and viewing rate, is the dream of every club, every coach, every athlete, and every fan. Therefore, the analysis of game-related statistics related to the Euroleague has been the focus of many studies (2,5,10,12,14).

In this study, it was aimed to determine the impact of game-related statistics related to the Euroleague competitions in the years 2014-2018 on the success of teams and to determine the most effective game-related statistics in the Play-Off /Final Four rounds. In this way, it was aimed to be a guide for clubs, coaches, and athletes in identifying their shortcomings, developing areas that need to be improved, new tactical understandings, and developing training programs.

## METHOD

### Data collection

The game-related statistics for the Euroleague matches in the years 2014-2018 were obtained from the Euroleague's official website (8). The game-related statistics for a total of 60 matches of 40 teams that participated in the Euroleague Play-Off and Final Four rounds in 2014-2018 were examined. Players who played less than 5 minutes in these matches were not included in the research. In the analysis, the data set was divided into two groups: teams that qualified for the Play-Off round and teams that were eliminated, and teams that won the Final Four and teams that lost.

### Statistical Analysis

Independent samples t-test was used to compare the game-related statistics of the two groups. In addition, discriminant analysis was used to decide which game-related statistics contributed more to the differences between the two groups. Discriminant analysis is a method that develops discriminant functions between group mean factors to distinguish groups with common features (11). The structure coefficient is used in the interpretation of the discriminant functions obtained. If the structure coefficient obtained for any game-related statistic is greater than |0.30|, it means that it effectively contributes to the distinction between groups (17). Discriminant analysis is divided into two types: linear discriminant analysis, which assumes that the covariance matrices between groups are homogeneous, and quadratic discriminant analysis, which assumes that the covariance matrices between groups are not homogeneous (11). In this study, the Box'M test showed that the covariance matrix of the group was homogeneous ($F=1.076$, $p>0.05$). Therefore, linear discriminant analysis was used in the study. Statistical analyses were performed using SPSS 22.0 software program.

### Ethical approval and institutional permission

This study was officially approved by the Balikesir University Clinical Research Ethics Committee with the number 2021/74 on 10 March 2021.

## FINDINGS

**Table 1:** Comparison of game-related statistics of teams that passed and eliminated the Play-Off round in the Euroleague between 2014-2018

| Variables | Eliminated | Qualified | T | p | Effect size |
|---|---|---|---|---|---|
| Two-point field-goal percentage | 50,4 ± 17,67 | 53,86 ± 17,95 | -1,935 | 0,054 | 0,194 |
| Three-point field-goal percentage | 36,81 ± 17,47 | 39,96 ± 18,09 | -1,527 | 0,128 | 0,177 |
| Free-throw percentage | 73,13 ± 22,52 | 77,7 ± 20,91 | -1,979 | **0,049*** | **0,210** |
| Offensive rebound | 1,09 ± 0,94 | 1,13 ± 1,05 | -0,439 | 0,661 | 0,040 |
| Defensive rebound | 2,06 ± 1,31 | 2,27 ± 1,4 | -1,557 | 0,120 | 0,155 |
| Total rebound | 2,87 ± 1,87 | 3,08 ± 1,96 | -1,068 | 0,286 | 0,109 |
| Assist | 1,78 ± 1,56 | 1,87 ± 1,7 | -0,520 | 0,603 | 0,055 |
| Steal | 0,71 ± 0,48 | 0,79 ± 0,54 | -1,377 | 0,169 | 0,157 |
| Turnover | 1,27 ± 0,88 | 1,17 ± 0,83 | 1,122 | 0,262 | 0,117 |
| Blocks in favor | 0,53 ± 0,45 | 0,61 ± 0,46 | -1,315 | 0,190 | 0,176 |
| Blocks against | 0,56 ± 0,41 | 0,55 ± 0,44 | 0,278 | 0,781 | 0,023 |
| Fouls committed | 2,17 ± 0,84 | 2,16 ± 0,93 | 0,186 | 0,852 | 0,011 |
| Fouls received | 2,1 ± 1,48 | 2,43 ± 1,72 | -2,067 | **0,039*** | **0,206** |
| Performance efficiency score | 7,05 ± 5,53 | 9,11 ± 6 | -3,630 | **0,001*** | **0,357** |

***p<0,05**

A comparison of the game-related statistics of teams that qualified and eliminated the Play-Off round in the Euroleague between 2014-2018 showed that there was a significant difference in the free-throw percentage, fouls received, and performance efficiency score variables ($p<0.05$), while there was no statistically significant difference in other game-related statistics ($p>0.05$; Table 1).

**Table 2:** Discriminant analysis structure coefficients (SC) from game-related statistics and tests of statistical significance for Play-Off

| **Discriminant Function Coefficients** | | | **Structure Coefficients (SC)** |
|---|---|---|---|
| **Variables** | **Function 1 (Eliminated)** | **Function 2 (Qualified)** | |
| Two-point field-goal percentage ($X_1$) | ,608 | ,621 | **0.315** |
| Three-point field-goal percentage ($X_2$) | ,427 | ,450 | **0.462** |
| Free-throw percentage ($X_3$) | ,447 | ,454 | **0.331** |
| Offensive rebound ($X_4$) | 3,754 | 3,759 | 0.045 |
| Defensive rebound ($X_5$) | 7,815 | 7,775 | 0.083 |
| Assist ($X_6$) | 5,615 | 5,636 | -0.021 |
| Steal ($X_7$) | 1,454 | 1,909 | 0.031 |
| Turnover ($X_8$) | -3,662 | -4,413 | **-0.347** |
| Blocks in favor ($X_9$) | 4,308 | 4,964 | 0.125 |
| Blocks against ($X_{10}$) | -3,835 | -2,661 | 0.240 |
| Fouls committed ($X_{11}$) | 4,014 | 3,336 | **-0.582** |
| Fouls received ($X_{12}$) | 7,434 | 7,145 | 0.087 |
| Performance efficiency score ($X_{13}$) | -4,296 | -4,203 | **0.423** |
| Total rebound * | | | 0.084 |
| (Constant) | -49,429 | -50,404 | |
| Wilks' Lambda | 0.786 | | |
| Eigenvalue | 0.273 | | |
| Chi-Square | 10.015 | | |
| p | 0.693 | | |
| Canonical Correlation | 0.463 | | |
| Reclassification (%) | 78.0 | | |
| *** This variable is not used in the analysis.** | | | |

The results of the discriminant analysis are represented in Table 2. According to Table 2, the discriminant function for determining (separating) the group based on the data has significant separation ($p<0.05$). In addition, the correct classification rate of the discriminant function was found to be 78,0%. Considering the discriminant function coefficients, the discriminant function can be written as follows:

Y1 =-49.429 + 0.608 X1 + 0.427 X2 + 0.447 X3 + 3.754 X4 + 7.815 X5 + 5.615X6 +1.454 X7 – 3.662 X8 + 4.308 X9 – 3.835 X10 + 4.014 X11 + 7.434 X12 – 4.296 X13

Y2 =-50,404 + 0.621 X1 + 0.450 X2 +0.454 X3 +3.759 X4 + 7.775 X5 +5.636X6 +1.909 X7 – 4.413 X8 + 4.964 X9 – 2,661 X10 + 3.336 X11 + 7.145 X12 – 4.203 X13

The game-related statistics that contributed to qualifying of the Play-off round was found as; fouls committed (SC=-0.582), three-point field-goal percentage (SC= 0.462), performance efficiency score (SC= 0.423), Free-throw percentage (SC= 0.331), turnover (SC=-0.347), two-point field-goal percentage (SC= 0.315).

**Table 3:** Comparison of game-related statistics of losing and winning teams in the Euroleague Final Four between 2014-2018

| Variables | Eliminated | Qualified | t | p | Effect size |
|---|---|---|---|---|---|
| Two-point field-goal percentage | 55,22 ± 20,81 | 55,3 ± 21,3 | -0,021 | 0,983 | 0,004 |
| Three-point field-goal percentage | 41,58 ± 20,8 | 52,99 ± 20,57 | -2,671 | **0,009*** | **0,552** |
| Free-throw percentage | 77,46 ± 22,33 | 74,81 ± 25,18 | 0,620 | 0,536 | 0,111 |
| Offensive rebound | 1,33 ± 1,08 | 1,19 ± 0,91 | 0,664 | 0,507 | 0,140 |
| Defensive rebound | 2,23 ± 1,44 | 2,4 ± 1,36 | -0,720 | 0,472 | 0,121 |
| Total rebound | 3,07 ± 2,08 | 3,18 ± 2,04 | -0,318 | 0,751 | 0,053 |
| Assist | 2 ± 1,59 | 2,13 ± 1,63 | -0,444 | 0,658 | 0,080 |
| Steal | 0,99 ± 0,78 | 0,84 ± 0,56 | 0,949 | 0,345 | 0,220 |
| Turnover | 1,44 ± 1,02 | 1,19 ± 0,79 | 1,467 | 0,144 | 0,274 |
| Blocks in favor | 0,89 ± 0,82 | 1,06 ± 0,89 | -0,728 | 0,469 | 0,199 |
| Blocks against | 0,83 ± 0,83 | 0,77 ± 0,75 | 0,306 | 0,760 | 0,076 |
| Fouls committed | 2,33 ± 0,99 | 2,63 ± 1,41 | -1,597 | 0,112 | 0,246 |
| Fouls received | 2,55 ± 1,76 | 3,22 ± 4,36 | -1,485 | 0,139 | 0,201 |
| Performance efficiency score | 8,23 ± 6,74 | 9,33 ± 7,4 | -0,945 | 0,346 | 0,155 |

***p<0,05**

A comparison of the game-related statistics of the teams that won and lost the Euroleague Final Four between 2014-2018 showed that there was only a significant difference in three-point field-goal percentage ($p<0.05$), while there was no statistically significant difference in other game-related statistics ($p>0.05$; Table 3).

**Table 4:** Discriminant analysis structure coefficients (SC) from game-related statistics and tests of statistical significance for Final Four

| **Discriminant Function Coefficients** | | | **Structure Coefficients (SC)** |
|---|---|---|---|
| **Variables** | **Function 1 (Eliminated)** | **Function 2 (Qualified)** | |
| Two-point field-goal percentage ($X_1$) | ,049 | ,099 | 0,025 |
| Three-point field-goal percentage ($X_2$) | ,179 | ,134 | 0,076 |
| Free-throw percentage ($X_3$) | ,078 | ,047 | 0,118 |
| Offensive rebound ($X_4$) | -,320 | ,596 | 0,105 |
| Defensive rebound ($X_5$) | 3,952 | 2,312 | **0,456** |
| Assist ($X_6$) | -,047 | ,977 | -0,046 |
| Steal ($X_7$) | 3,601 | ,656 | 0,129 |
| Turnover ($X_8$) | 6,397 | ,054 | **0.575** |
| Blocks in favor ($X_9$) | 3,561 | ,436 | 0,087 |
| Blocks against ($X_{10}$) | 8,599 | 5,725 | 0,211 |
| Fouls committed ($X_{11}$) | 4,582 | 3,519 | 0,087 |
| Fouls received ($X_{12}$) | -1,852 | -,160 | 0,190 |
| Performance efficiency score ($X_{13}$) | -,845 | -,603 | 0,127 |
| Total rebound * | | | **0,374** |
| (Constant) | -26,389 | -12,871 | |
| Wilks' Lambda | 0.441 | | |
| Eigenvalue | 1.267 | | |
| Chi-Square | 28.235 | | |
| p | 0.008 | | |
| Canonical Correlation | 0.748 | | |
| Reclassification (%) | 95.3 | | |

*** This variable is not used in the analysis.**

According to Table 4, the discriminant function for determining (separating) the group based on the data has significant separation ($p<0.05$). In addition, the correct classification rate of the discriminant function was found to be 95,3%. Considering the discriminant function coefficients, the discriminant function can be written as follows;

Y1 =-26.389 + 0.049 X1 + 0.179 X2 + 0.078 X3 – 0.320 X4 + 3.952 X5 – 0.047X6 + 3.601 X7 + 6.397 X8 + 3.561 X9 + 8.599 X10 + 4.582 X11 – 1.852 X12 – 0.845 X13

Y2 =-12.871 + 0.099 X1 + 0.134 X2 +0.047 X3 + 0.596 X4 + 2.312 X5 +0.977 X6 + 0.656 X7 + 0.054 X8 + 0.436 X9 + 5.725 X10 + 3.519 X11 – 0.160 X12 – 0.603 X13

The game-related statistics that contributed to the passing of the round as a result of the Euroleague Final Four matches held between 2014-2018 were determined as; turnover (SC= 0.575) and defensive rebound (SC= 0.456).

**DISCUSSION AND CONCLUSION**

The results of the analysis showed that the teams that qualified for the Euroleague Play-Off round in 2014-2018 had a higher free-throw percentage, fouls received, and performance efficiency score than the teams that were eliminated in the Play-Off round (Table 1). However, the number of fouls committed by the teams was the most important game-related statistic in distinguishing between the teams that qualified and were eliminated in the Euroleague Play-Off round in 2014-2018. Other important game-related statistics in distinguishing between the teams that qualified and were eliminated in the Play-Off round were three-point field-goal percentage, performance efficiency score, turnover, free-throw percentage, and two-point field-goal percentage, respectively (Table 2).

Doğan and Ersöz (2019) studied the game-related statistics that contribute to the qualifying of the Play-off round and found that the most important variable is the three-point field-goal percentage. They also found that the variables of assists, blocks in favor, and defensive rebounds are also effective in the distinction (5). In some studies, on national leagues, the three-point field-goal percentage was also determined as the most important variable in distinguishing between winning and losing teams (3,7). In this study, the three-point field-goal percentage was determined as the second most important game-related statistic in qualifying for the Play-off round. In addition, we found that game-related statistics such as two-point field-goal percentage and free-throw percentage are also important in qualifying for the Play-off round. With this result, it can be said that the shooting percentage is very important in qualifying for the Play-off round. In order to keep the field goal percentage high and the number of fouls low, a game style should be preferred in which the whole team is involved in the game, each player contributes to the team, and each player plays for a certain period of time, so that the players are always in good condition (not tired-because as fatigue increases, the percentages decrease and the number of fouls increases).

The three-point field-goal percentage of the Euroleague champions in 2014-2018 is higher than that of the eliminated teams (Table 3). However, the turnover was determined as the most important game-related statistic in distinguishing between the Euroleague champions and the eliminated teams in 2014-2018. Another important game-related statistic in distinguishing between the champions and the eliminated teams in the Final Four is the defensive rebound (Table 4).

Doğan and Ersöz (2019) studied the game-related statistics that contribute to winning the Final Four and found that the most important variable is the three-point field-goal percentage. They also found that the variables of two-point field-goal percentages and offensive rebounds were also effective in the distinction. In this study, the three-point field-goal percentage was also determined as the most important game-related statistic in winning the Final Four round. In addition, defensive rebound was also found to be one of the most important variables. With this result, it is thought that teams can reach the championship by paying attention to defensive rebounds and increasing the three-point field-goal percentage (5).

The results of the study show that teams that qualify for the Play-Off round have a high field goal percentage, including free throw percentage, three-point field-goal percentage, and two-point field-goal percentage. In addition, it is necessary to reduce the number of fouls, which is the most important game-related statistic in qualifying for the Play-Off round. In the Final Four round, the most important variables for winning are three-point field-goal percentage and defensive rebound. It is thought that the coaches of the teams participating in the Play-Off round and the Final Four will contribute to their promotion to the Final Four or to the championship by preparing the mental, technical, and tactical preparations of the players, pre-match preparations, and team in-game plans in the light of this information.

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# Investigation of the Effect of Physiotherapists' Basic Psychological Needs in Leisure on Life Satisfaction with Structural Equation Model

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**Abstract**

This study aimed to examine the effect of physiotherapists' basic psychological needs in leisure on life satisfaction. Relational screening method was used in our study which was conducted according to the general screening model. The data were collected using the personal information form developed by the researchers in the first part, the Basic Psychological Needs Scale in Leisure Activity (BPNSLA) in the second part, and the Life Satisfaction Scale in the third part. The data were analysed with AMOS 21.0 and SPSS 25.0 package programmes. According to the result of the Independent Sample T-test between the Basic Psychological Needs in Leisure Activity and Life Satisfaction of the participants, a statistically significant difference was detected in favour of male participants only in the variable of relatedness, and according to the result of the Anova test between professional experience variables and Basic Psychological Needs in Leisure activity and Life Satisfaction, a statistically significant difference was detected in the total score of Basic Psychological Needs in Leisure activity, competence and relatedness sub-dimensions. Moreover, according to the result of the Independent Sample T-Test between marital status variables and Basic Psychological Needs in Leisure Activity and Satisfaction with Life, a statistically significant difference was detected in all variables except the relatedness variable to Basic Psychological Needs in Leisure Activity, and according to the result of the ANOVA test between Weekly Leisure variable and Basic Psychological Needs in Leisure Activity and Satisfaction with Life, a statistically significant difference was detected only in the autonomy sub-dimension of Basic Psychological Needs in Leisure Time ($p<0.05$). As a result, in the model created to investigate the effect of Basic Psychological Needs in Leisure Activity on life satisfaction, it was concluded that autonomy, competence and relatedness did not have a statistically significant effect on life satisfaction, but there was statistical significance in various variables.

**Keywords:** Leisure, Leisure Satisfaction, Life Satisfaction.

**Özet**

**Fizyoterapistlerin Serbest Zaman Temel Psikolojik İhtiyaçlarının Yaşam Doyumuna Etkisinin Yapısal Eşitlik Modeliyle İncelenmesi**

Bu çalışmada, Fizyoterapistlerin Serbest Zaman Temel Psikolojik İhtiyaçlarının Yaşam Doyumuna Etkisinin İncelenmesi amaçlanmıştır. Genel tarama modeline göre yürütülen çalışmamızda ilişkisel tarama yöntemi kullanılmıştır. Veriler ilk bölüm araştırmacılar tarafından geliştirilen kişisel bilgi formu, ikinci bölümde Vlachopoulos ve Mchailidou (29) tarafından geliştirilen, Türkçe uyarlaması Güneş (10) tarafından yapılan Serbest Zamanda Temel Psikolojik İhtiyaçlar Ölçeği (SZTPİÖ); üçüncü bölümde Diener ve ark. (8) tarafından geliştirilen, Türkçe uyarlaması Köker (12) tarafından gerçekleştirilen Yaşam Doyumu Ölçeği kullanılarak toplanmıştır. Veriler Google Form aracılığı ile katılımcılara gönderilmiş isteyen bireylerin doldurması sağlanmıştır. Toplamda 260 katılımcı formları doldurmuş olup aykırı uç değer gösteren 7 form değerlendirmeye alınmamış, toplamda 253 form değerlendirmeye alınmıştır. Veriler AMOS 21.0 ve SPSS 25.0 paket programları ile çözümlemeleri yapılmıştır. Katılımcıların Serbest Zamanda Temel Psikolojik İhtiyaçlar ve Yaşam Doyumları arasında yapılan Bağımsız Örneklem T testi Sonucuna göre sadece ilişkili olma değişkeninde erkek katılımcılar lehine istatistiksel olarak anlamlı farklılık olduğu, mesleki tecrübe değişkenleri ile Serbest Zamanda Temel Psikolojik İhtiyaçlar ve Yaşam Doyumları arasında yapılan Anova testi sonucuna göre Serbest Zamanda Temel Psikolojik İhtiyaçlar toplam puanı, yeterlilik ve ilişkili olma alt boyutlarında istatistiksel olarak anlamlı farklılık olduğu, medeni durum değişkenleri ile Serbest Zamanda Temel Psikolojik İhtiyaçlar ve Yaşam Doyumları arasında yapılan Bağımsız Örneklem T Testi sonucuna göre sadece Serbest Zamanda Temel Psikolojik İhtiyaçların ilişkili olma değişkeni dışında tüm değişkenlerde istatistiksel olarak anlamlı farklılık olduğu ve Haftalık Boş Zaman Süresi değişkenleri ile Serbest Zamanda Temel Psikolojik İhtiyaçlar ve Yaşam Doyumları arasında yapılan Anova testi sonucuna göre sadece Serbest Zamanda Temel Psikolojik İhtiyaçların özerklik alt boyutunda istatistiksel olarak anlamlı farklılık olduğu görülmektedir ($p<0.05$). Sonuç olarak Serbest Zamanda Temel Psikolojik İhtiyaçların yaşam doyumu üzerindeki etkisi araştırılmak üzere oluşturulan modelde özerklik, yeterlilik ve ilişkili olmanın yaşam doyumu üzerinde istatistiksel olarak anlamlı bir etkisinin olmadığı fakat çeşitli değişkenlerde ise istatistiksel olarak anlamlılığın olduğu sonucuna ulaşılmıştır.

**Anahtar Kelimeler:** Serbest Zaman, Serbest Zaman Doyumu, Yaşam Doyumu.

## INTRODUCTION

Individuals start to be in need for various reasons from the moment they start to exist. The basis of these needs can be psychological or physiological. The inadequacy of individuals due to physiological or psychological needs is expressed as needs (7). In another expression, needs are the lack of the necessary conditions for individuals to maintain their development and to provide a harmonious relationship with their environment (2). Among basic psychological needs, physical needs are the needs of the individual such as eating, drinking and sleeping. Psychological needs, on the other hand, are the needs of the individuals such as loving, being loved, being respected and self-actualisation (13). Individuals' fulfilment of their basic psychological needs in the periods that they can spare for themselves outside working hours is thought to create a positive emotional state in individuals. In particular, it is believed that the satisfaction achieved as a result of meeting basic psychological needs will contribute positively to the individual's life satisfaction and play an essential role in forming a psychologically healthy situation (6). The concept of life satisfaction is a concept that varies according to the state of the difference that emerges as a result of comparing what the individual has achieved with what he/she wants to achieve (16). It can also be expressed as a holistic cognitive evaluation of an individual's life (18). Life satisfaction covers the whole life of an individual and many different dimensions of this life. In other words, it can be said as satisfaction towards all experiences rather than satisfaction towards a certain situation. In addition to being expressed as the dominance of positive emotions over negative emotions in daily relationships, it also indicates the state of well-being in dimensions such as happiness, morale, etc. (22). Life satisfaction, which is defined as the whole quality of life and the level of positive development, also indicates satisfaction with one's life (24). As a result, life satisfaction can be expressed as the degree to which individuals' expectations from life are fulfilled. Life satisfaction should not

be considered as a single satisfaction or time in an individual's life. Life satisfaction can also be expressed as a situation that is realised as the total of the situations encountered by the individual throughout his/her life. In other words, it can also be explained as the formation of an emotional state in which positive emotions in daily life prevail over negative emotions (1).

The definitions and research have shown a relationship between life satisfaction and the fulfilment of basic psychological needs. If these needs cannot be fulfilled, some deficiencies and inadequacies may occur in individuals. In particular, in our study, individuals' own free time periods in working life or busy daily life, the fulfilment of basic psychological needs of some demographic variables and their contribution to life satisfaction were determined as the subject of study.

## METHOD

### Research Design

Our study, which was conducted according to the general screening model, was conducted with the relational screening method. The relational survey model was a research approach that explained the change of two or more variables together (11).

### Research Group

The research group of this study consisted of physiotherapists working in Ankara in 2022. The data were sent to the participants via Google Forms and the volunteer participation was essential. In total, 260 participants were reached and 7 forms showing outlier values were not used in the evaluation, 253 forms filled in completely and accurately were used for analysis.

### Data Collection Tool

### Personal Information Form

In the first part of the study, a personal information form consisting of four items was developed by the researchers was used.

### Basic Psychological Needs Scale in Leisure Activity (BPNSLA)

The "Basic Psychological Needs Scale in Leisure Activity" developed by Vlachopoulos and Mchailidou (29) and adapted into Turkish by Güneş (10) consisted of 12 items and 3 sub-dimensions (competence, autonomy and relatedness). The Basic Psychological Needs Scale in Leisure Activity was a 5-point Likert-type scale ranging from "Completely Disagree" (1) to "Completely Agree" (5). Cronbach's alpha internal consistency coefficient of the scales was reported to be between 0.73 and 0.80 in sub-dimensions and the total score (29). In our study, cronbach's alpha internal consistency coefficient for the scale was found to be 0.85. As a result of the CFA analysis, the 5th item with a factor load below 0.40 was excluded from the analysis, and as a result of the CFA analysis performed again, it was found that the values of the Fit Indices were $\chi 2$/df: 1,721, RMSEA: ,53, GFI: ,94, AGFI: ,91, CFI: ,95, SRMR: ,044. According to these results, it was concluded that all goodness of fit values showed excellent fit (21).

### Life Satisfaction Scale (LSS)

The Satisfaction with Life Scale developed by Diener et al. (8) had a 7-point Likert-type rating between 1=strongly disagree and 7=strongly agree, consisting of five items and one dimension. High scores obtained from the scale indicated that the life satisfaction of the participant was high. In the exploratory factor analysis conducted during the development process of the scale, it was concluded that it explained 66% of the total variance. The cronbach alpha internal consistency coefficient of the scale was 0.87 and the test-retest reliability coefficient was 0.82. In the Turkish adaptation of the scale by Köker (12), the internal consistency coefficient was found to be 0.86 and the test-retest reliability coefficient was 0.73. In our study, cronbach's alpha internal consistency coefficient was found to be 0.51. As a result of the CFA analysis, the 5th item with a factor load below 0.40 was excluded from the analysis, and as a result of the CFA analysis performed again, it was determined that the Fit Indices values were $\chi 2$/df: 1,441, RMSEA: ,42, GFI: ,98, AGFI: ,92, CFI: ,92, SRMR: ,039. According to these results, it was concluded that all goodness of fit values showed excellent fit (21).

**Data Analysis**

The data obtained in this study were analysed in AMOS 21.0 and SPSS 25.0 package programmes. Statistically, percentage, frequency and reliability coefficient calculations were performed. Structural equation modelling (path) analysis was applied to look at the effect between variables. Independent sample t-test was applied in the analysis of binary variables and ANOVA test was applied in the analysis of more than two variables.

**FINDINGS**

**Table 1.** Demographic Information of the Participants

| **Variables** | | **f** | **%** |
|---|---|---|---|
| **Gender** | Female | 70 | 27,7 |
| | Male | 183 | 72,3 |
| | Total | 253 | 100,0 |
| **Professional experience** | 1 year or less | 82 | 32,4 |
| | 2-3 years | 93 | 36,8 |
| | 4-5 years | 39 | 15,4 |
| | 6 years or more | 39 | 15,4 |
| | Toplam | 253 | 100,0 |
| **Marital status** | Married | 56 | 22,1 |
| | Single | 197 | 77,9 |
| | Total | 253 | 100,0 |
| **Weekly leisure** | 15 hours or less | 71 | 28,1 |
| | 16-20 hours | 79 | 31,2 |
| | 21-25 hours | 26 | 10,3 |
| | 26-30 hours | 33 | 13,0 |
| | 34 hours and more | 44 | 17,4 |
| | Total | 253 | 100,0 |

Table 1 showed the frequency table indicating the demographic characteristics of the physiotherapists who participated in the study. It was seen that male participants were in the majority in the gender variable (72,3%); those with 2-3 years of professional experience were in the majority in the professional experience variable (26,2%); single participants were in the majority in the marital status variable (77,9%) and participants with 16-20 hours of weekly leisure were in the majority (31,2%).

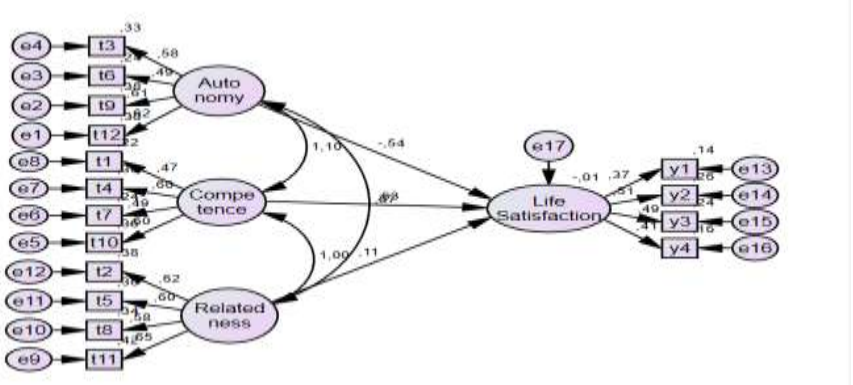


**Figure 1.** Path Diagram of the Proposed Model for the Effect of Basic Psychological Needs in Leisure Activity on Life Satisfaction

**Table 2.** Results related to the research model

| Effect | Tahmin (β) | Standart Error | t | p | Result |
|---|---|---|---|---|---|
| **Autonomy → Life Satisfaction** | -,537 | ,241 | -1,193 | ,233 | Kabul Değil |
| **Competence → Life Satisfaction** | ,629 | ,254 | 1,353 | ,176 | Kabul Değil |
| **Relatedness → Life Satisfaction** | ,114 | ,227 | ,253 | ,800 | Kabul Değil |

p<0,05*

A model was created to investigate the effect of basic psychological needs in leisure activity on life satisfaction. As a result of the analysis, it was observed that autonomy, competence and relatedness did not have a statistically significant effect on life satisfaction (p>0.05). Considering the beta values, an increase of 1 unit in the autonomy variable caused a non-significant decrease of -,537 in the negative direction (β: -,537 p>0.05). An increase of 1 unit in the competence variable caused a non-significant increase of ,629 in the positive direction (β: ,629 p>0.05). A 1-unit increase in the relatedness variable caused a non-significant increase of ,1142 in the positive direction (β: ,114 p>0.05). This explained 1% of the change in life satisfaction ($R^2$0.010).

**Table 3.** Goodness of Fit Results of the Research Mod

| | Structural Equation Model Values | Suggested Values | Excellent Fit | References |
|---|---|---|---|---|
| **χ2/df** | 1,903 | ≤ 5 | 0≤ χ2≤ 3 | Meydan and Şeşen, 2015:37 |
| **RMSEA** | ,060 | ≤ 0.08 | 0≤ RMSEA≤ ,05 | Simon et al. 2010: 234-243. |
| **GFI** | ,91 | ≥0.80 | ≥0.90 | Simon et al. 2010: 234-243. |
| **AGFI** | ,88 | ≥0.80 | 0.95≤ AGFI≤1,00 | Shevlin et al. 2000:181-185. |
| **CFI** | ,89 | ≥0.80 | 0.90≤ CFI≤ 1,00 | Dehon et al. 2005: 799-810. |
| **SRMR** | ,056 | ≤ 0.10 | 0≤SRMR≤0,05 | Schermelleh-Engel et al. 2003:23-74 |

According to Table 3, it was seen that χ2/df and GFI values had excellent fit, and AGFI, CFI and SRMR values had acceptable fit in the fit index values of the model.

**Table 4.** Independent Sample T-Test Results between Basic Psychological Needs in Leisure Activity and Satisfaction with Life and Gender Variables

| Scale and sub-dimensions | Group | n | $\bar{X}$ | SD | t | p |
|---|---|---|---|---|---|---|
| **Autonomy** | Female | 70 | 3,2286 | ,66586 | -1,115 | ,266 |
| | Male | 183 | 3,3361 | ,69370 | | |
| **Competence** | Female | 70 | 3,0429 | ,65934 | -1,882 | ,061 |
| | Male | 183 | 3,2268 | ,70842 | | |
| **Relatedness** | Female | 70 | 3,0607 | ,74871 | -2,125 | ,035* |
| | Male | 183 | 3,2842 | ,74807 | | |
| **BPNSLA** | Female | 70 | 3,1107 | ,60188 | -1,963 | ,051 |
| | Male | 183 | 3,2823 | ,62968 | | |
| **Life Satisfaction** | Female | 70 | 2,0371 | ,63729 | -,424 | ,672 |
| | Male | 183 | 2,0710 | ,53982 | | |

p<0,05*

According to Table 4, the Independent Sample T-test result between the participants' gender variables and Basic Psychological Needs in Leisure Activity and Life Satisfaction showed a statistically significant difference in favour of male participants only in the variable of relatedness (p<0.05).

**Table 5.** Anova Analysis Results According to Basic Psychological Needs in Leisure Activity and Life Satisfaction and Professional Experience Variable

| Dimensions | Experience | N | $\bar{X}$ | SD | F | p | Tamhane |
|---|---|---|---|---|---|---|---|
| **Autonomy** | (a)1 years or less | 82 | 3,3171 | ,70716 | 1,402 | ,243 | - |
| | (b)2-3 years | 93 | 3,3925 | ,66390 | | | |
| | (c)4-5 years | 39 | 3,2500 | ,81918 | | | |
| | (d)6 years or more | 39 | 3,1346 | ,51887 | | | |
| **Competence** | (a)1 years or less | 82 | 3,2530 | ,66724 | 5,491 | ,001* | a,b>d |
| | (b)2-3 years | 93 | 3,2742 | ,64802 | | | |
| | (c)4-5 years | 39 | 3,1795 | ,89028 | | | |
| | (d)6 years ormore | 39 | 2,7756 | ,52814 | | | |
| **Relatedness** | (a)1 years or less | 82 | 3,2713 | ,71708 | 4,539 | ,004* | a,b>d |
| | (b)2-3 years | 93 | 3,3414 | ,70111 | | | |
| | (c)4-5 years | 39 | 3,2244 | ,86943 | | | |
| | (d)6 years or more | 39 | 2,8333 | ,72623 | | | |
| **BPNSLA** | (a)1 years or less | 82 | 3,2805 | ,59483 | 4,558 | ,004* | a,b>d |
| | (b)2-3 years | 93 | 3,3360 | ,59391 | | | |
| | (c)4-5 years | 39 | 3,2179 | ,80514 | | | |
| | (d)6 years or more | 39 | 2,9145 | ,45221 | | | |
| **Life Satisfaction** | (a)1 years or less | 82 | 1,9780 | ,45651 | 1,305 | ,273 | - |
| | (b)2-3 years | 93 | 2,0581 | ,56073 | | | |
| | (c)4-5 years | 39 | 2,1692 | ,65941 | | | |
| | (d)6 years or more | 39 | 2,1385 | ,67925 | | | |

p<0,05*

According to Table 5, according to the result of the ANOVA test between the participants' professional experience variables and Basic Psychological Needs in Leisure Activity and Life Satisfaction, a statistically significant difference was detected in the total score of Basic Psychological Needs in Leisure Activity, competence and relatedness sub-dimensions (p<0.05). When we look at the Tamhane test conducted to determine the source of the difference, it was revealed that the scores of the participants with 1 year or less and 2-3 years of professional experience were higher than the scores of the participants with 6 years or more of professional experience in all three variables.

**Table 6.** Independent Sample T-Test Results between Basic Psychological Needs in Leisure Activity and Satisfaction with Life and Marital Status Variables

| Scale and sub-dimensions | Group | n | $\bar{X}$ | SD | t | p |
|---|---|---|---|---|---|---|
| **Autonomy** | Married | 56 | 3,2411 | ,64661 | -,806 | ,421 |
| | Single | 197 | 3,3249 | ,69788 | | |
| **Competence** | Married | 56 | 2,9509 | ,77668 | -2,766 | ,006* |
| | Single | 197 | 3,2398 | ,66329 | | |
| **Relatedness** | Married | 56 | 3,0089 | ,82842 | -2,425 | ,016* |
| | Single | 197 | 3,2830 | ,72152 | | |
| **BPNSLA** | Married | 56 | 3,0670 | ,66161 | -2,295 | ,023* |
| | Single | 197 | 3,2826 | ,60839 | | |
| **Life satisfaction** | Married | 56 | 2,2107 | ,72706 | 10,333 | ,000* |
| | Single | 197 | 2,0193 | ,50733 | | |

p<0,05*

According to Table 6, according to the results of the Independent Sample T-Test between the marital status variables of the participants and Basic Psychological Needs in Leisure Activity and Life Satisfaction, a statistically significant difference was detected in all variables except the autonomy sub-dimension of Basic

Psychological Needs in Scale Leisure Activity (p<0.05). It was concluded that the scores of single participants were higher than married participants in the total score of Basic Psychological Needs in Leisure Activity, competence and relatedness variables; and the scores of married participants were higher than single participants in life satisfaction scores.

**Table 7.** Anova Analysis Results According to Basic Psychological Needs in Leisure Activity and Satisfaction with Life Scales and Weekly Leisure Variable

| Dimensions | Weekly leisure | N | $\overline{X}$ | SD | F | p | Tamhane |
|---|---|---|---|---|---|---|---|
| **Autonomy** | (a)15 hours or less | 71 | 3,3345 | ,65047 | 2,662 | **,033*** | b>d,e |
| | (b)16-20 hours | 79 | 3,4335 | ,56714 | | | |
| | (c)21-25 hours | 26 | 3,4231 | ,68106 | | | |
| | (d)26-30 hours | 33 | 3,0455 | ,83023 | | | |
| | (e)31 hours or more | 44 | 3,1591 | ,77025 | | | |
| **Competence** | (a)15 hours or less | 71 | 3,1972 | ,64492 | 1,291 | ,274 | - |
| | (b)16-20 hours | 79 | 3,1867 | ,60641 | | | |
| | (c)21-25 hours | 26 | 3,2885 | ,68078 | | | |
| | (d)26-30 hours | 33 | 2,9318 | ,84842 | | | |
| | (e)31 hours or more | 44 | 3,2386 | ,80866 | | | |
| **Relatedness** | (a)15 hours or less | 71 | 3,2570 | ,75825 | ,669 | ,614 | - |
| | (b)16-20 hours | 79 | 3,2215 | ,67580 | | | |
| | (c)21-25 hours | 26 | 3,2885 | ,79590 | | | |
| | (d)26-30 hours | 33 | 3,0303 | ,84953 | | | |
| | (e)31 hours or more | 44 | 3,2727 | ,78839 | | | |
| **BPNSLA** | (a)15 hours or less | 71 | 3,2629 | ,57090 | 1,454 | ,217 | - |
| | (b)16-20 hours | 79 | 3,2806 | ,52657 | | | |
| | (c)21-25 hours | 26 | 3,3333 | ,67577 | | | |
| | (d)26-30 hours | 33 | 3,0025 | ,78713 | | | |
| | (e)31 hours or more | 44 | 3,2235 | ,69391 | | | |
| **Life Satisfaction** | (a)15 hours or less | 71 | 2,0986 | ,58931 | ,988 | ,415 | - |
| | (b)16-20 hours | 79 | 2,0380 | ,57831 | | | |
| | (c)21-25 hours | 26 | 2,1769 | ,49421 | | | |
| | (d)26-30 hours | 33 | 2,1152 | ,55908 | | | |
| | (e)31 hours or more | 44 | 1,9364 | ,55702 | | | |

p<0,05*

According to Table 7, according to the result of the ANOVA test between the participants' Weekly Leisure variables and Basic Psychological Needs in Leisure Activity and Life Satisfaction, a statistically significant difference was detected only in the autonomy sub-dimension of Basic Psychological Needs Scale in Leisure Activity (p<0.05). When we look at the Tamhane test performed to determine the source of the difference, it was revealed that the scores of the participants with 16-20 hours of leisure per week were higher than the scores of the participants with 26-30 hours and 31 hours and more leisure per week.

## DISCUSSION AND CONCLUSION

A model was created to investigate the effect of Basic Psychological Needs in Leisure Activity on life satisfaction. As a result of the analysis, autonomy, competence and relatedness did not show a statistically significant effect on life satisfaction (p>0.05). In a study conducted by Çivitçi (5) with psychological counselling and guidance students, no difference was found between life satisfaction and autonomy sub-dimension, and in another study, it was stated that the increase in the autonomy sub-dimension score reflected positively on life satisfaction (3).

According to the Independent Sample T-test result between gender variables and Basic Psychological Needs in Leisure Activity and Life Satisfaction, a statistically significant difference was detected in favour of male participants only in the variable of relatedness sub-dimension (p<0.05). Özmaden et al. (17), in their study

with sports sciences students, concluded that as a result of the analysis between the leisure psychological needs of the participants and the gender variable, a situation occurred in favour of female participants in the autonomy sub-dimension. Yasul (31) concluded in a thesis study that there was no statistically significant difference in terms of gender variable in the Autonomy, Relatedness, and Competence sub-dimensions of the basic psychological needs scale. Sarı et al. (20) reported that there was no significant difference between basic psychological needs in terms of gender. In another study, Waters et al. (30) found that the scores of basic psychological needs of male individuals were higher than the total scores of female individuals. Moreover, Cihangir Çankaya (4) found that autonomy and competence needs did not show a significant difference in terms of gender, while the need for relatedness showed a significant difference in favour of females. When the studies were evaluated, it was seen that the results were different from each other. In the comparison between female and male teacher candidates by Recepoğlu (19), it was concluded that females had higher life satisfaction than males. In another study conducted by Liang et al. (14), no difference was detected in terms of gender variables in Japan, but in the same study, male participants in China and Korea had higher life satisfaction scores than female participants. When the studies were examined, the results showed differences and this difference was thought to be due to the demographic characteristics of the participants.

According to the result of the ANOVA test between the participants' professional experience variables and Basic Psychological Needs in Leisure Activity and Life Satisfaction, a statistically significant difference was detected in the total score of Basic Psychological Needs in Leisure Activity, competence and relatedness sub-dimensions ($p<0.05$). When we look at the Tamhane test conducted to determine the source of the difference, it was revealed that in all three variables, the scores of the participants with 1 year and less and 2-3 years of professional experience were higher than the scores of the participants with 6 years and more professional experience. In the study conducted by Ünal (28), it was concluded that experience did not affect life satisfaction. Gürer and Kılınç (9) found that there was no significant difference in the experience in their study on Basic Psychological Needs in Leisure Activity, but concluded that the mean scores were good. Toy (25) concluded that life satisfaction increased as the professional experience increased in the study on wrestler athletes. Our research findings differ from the findings of similar studies in the literature. In another study, it was reported that there was a significant positive relationship between sports experience and life satisfaction (26). Tabuk (23) found that there was a positive relationship between the duration of professional sportsmanship and life satisfaction.

According to the result of the ANOVA test between the participants' Weekly Leisure variables and Basic Psychological Needs in Leisure Activity and Life Satisfaction, a statistically significant difference was detected only in the autonomy sub-dimension of Basic Psychological Needs in Leisure Activity ($p<0.05$). When we look at the Tamhane test performed to determine the source of the difference, it was revealed that the scores of the participants with 16-20 hours of leisure time per week were higher than the scores of the participants with 26-30 hours and 31 hours or more of leisure time per week.

According to the results of the Independent Sample T-Test between the marital status variables of the participants and Basic Psychological Needs in Leisure Activity and Life Satisfaction, a statistically significant difference was detected in all variables except the autonomy variable of the Basic Psychological Needs Scale in Leisure Activity ($p<0.05$). It was concluded that the scores of single participants were higher than married participants in the total score, competence and relatedness variables of Basic Psychological Needs in Leisure Activity, and the scores of married participants were higher than single participants in life satisfaction scores. Ünal (27) concluded that the life satisfaction of married participants was higher than single participants in his study on deskbound working individuals. Ünal et al. (28) reported that being married was a factor that increased life satisfaction in their study on doctors. In another study, Linn et al. (15) reported that the life satisfaction of married individuals was higher than single individuals. Studies showed that being married had a positive contribution on life satisfaction.

**Recommendations**

As a result of the results obtained in the study, the following suggestions can be given:

The addition of participants who continue their lives in different regions, including various professional groups, may help to provide different levels of feedback in comparisons related to Basic Psychological Needs and Life Satisfaction in Leisure Activity.

Various informative studies can be performed for individuals to use their leisure more qualified and more consciously.

**Ethical Text**

"In this article, the journal writing rules, publication principles, research and publication ethics, and journal ethical rules were followed. The responsibility belongs to the authors for any violations that may arise regarding the article. "

Ethics Committee approval dated 19.04.2023 and decision number 16 was obtained from Aydın Adnan Menderes University Institute of Social Sciences Ethics Committee for this study."

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# Investigation of the Relationship Between the Tactical Skills Used by Football Players and Their Maximum Performance Levels*

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**Abstract**

This study was conducted to investigate the relationship between the tactical skills used by amateur and professional league football players and their excellent performance levels. A total of 906 licensed football players, including 671 male and 235 female athletes, who play at amateur and professional levels in football leagues, participated in the research. Three different forms were used as data collection tools: Personal Information Form, Tactical Skills in Sports and Excellent Performance in Sports Scale. According to the findings of the study, 25.9% of the football players participating in the study were female and 74.1% were male. While the mean age of female football players was 20.06±3.18 years, the average age of male football players was determined as 23.34±5.62 years. In the study, a significant difference was found between the sub-dimensions of tactical skills in sports and the total scores of male and female football players. Similarly, it has been observed that male athletes have higher scores than female athletes in excellent performance scores. According to the years of playing licensed football, there were significant differences in all sub-dimensions of the tactical skills of the football players, between the athletes who played football between 1-5 years and all other groups who played football for more years ($p<0.05$). Based on the findings obtained in the research, it has been observed that there is a difference in terms of the tactical skills used by football players according to the year of playing football, and while tactical skills and excellent performance scores in sports differ according to gender, they do not differ in terms of status (amateur-professional). As a result, it seems that increasing the number of years of licensed football playing in amateur and professional league football players is very important in terms of tactical skills. From this point of view, it can be said that increasing the experience period of both male and female football players by trying to reduce the age of starting sports to earlier ages will make a significant contribution to tactical skills, which are very important for performance in football.

**Keywords:** Football, Tactics, Skill, Excellent Performance.

**Özet**

**Futbolcuların Kullandıkları Taktiksel Beceriler ile Mükemmel Performans Düzeyleri Arasındaki İlişkilerin Araştırılması**

Bu çalışma, amatör ve profesyonel lig futbolcularının kullandıkları taktiksel beceriler ile mükemmel performans düzeyleri arasındaki ilişkilerin araştırılması amacıyla yapılmıştır. Araştırmaya, Türkiye Futbol liglerinde amatör ve profesyonel düzeyde aktif olarak oynayan 671 erkek ve 235 kadın sporcu olmak üzere 906 lisanslı futbolcu katılmıştır. Veri toplama araçları olarak, kişisel bilgi formu, Sporda Taktiksel Beceriler Envanteri ve Sporda Mükemmel Performans Ölçeği olmak üzere üç farklı form kullanılmıştır. Araştırmada elde edilen bulgulara göre, çalışmaya katılan sporcuların %25.9'u kadın, %74.1'i ise erkektir. Kadın futbolcuların yaş ortalamaları 20.06±3.18 yıl iken, erkek futbolcuların yaş ortalamaları 23.34±5.62 yıl olarak belirlenmiştir. Araştırmada kadın ve erkek futbolcuların, sporda taktiksel beceri alt boyutları ile toplam puanları arasında anlamlı farklılık bulunmuştur. Benzer şekilde mükemmel performans puanlarında da erkek sporcuların kadın sporculara göre yüksek puana sahip oldukları görülmüştür. Lisanslı futbol oynama yıllarına göre futbolcuların sporda taktiksel beceriler alt boyutlarının tümünde, 1-5 yıl arasında futbol oynayan sporcular ile daha fazla yıl futbol oynayan diğer tüm gruplar arasında anlamlı düzeyde farklar bulunmuştur ($p<0.05$). Araştırmada elde edilen bulgulardan yola çıkarak, futbolcuların kullandıkları taktiksel beceriler açısından, futbol oynama yılına göre farklılaşma olduğu, sporda taktiksel beceriler ve mükemmel performans puanlarının cinsiyete göre farklılaşırken, statü (amatör-profesyonel) açısından farklılaşmadığı görülmüştür. Sonuç olarak, amatör ve profesyonel lig futbolcularında lisanslı olarak futbol oynama yılının artmasının taktiksel beceriler açısından oldukça önemli olduğu görülmektedir. Bu noktadan hareketle, hem kadın hem de erkek futbolcularda, spora başlama yaşının daha erken yaşlara indirgenmesine çalışılarak deneyim sürelerinin artırılmasının, futbolda performans için oldukça önemli bir yeri olan taktiksel becerilere önemli katkılar sağlayacağı söylenebilir.

**Anahtar Kelimeler:** Futbol, Taktik, Beceri, Mükemmel Performans.

## INTRODUCTION

Football, due to its unpredictable, random and complex nature (7), requires a permanent tactical-strategic attitude from its players to solve problem situations that arise within the person-task-environment relationship. In this context, the cognitive processes underlying decision-making allow the player to propose solutions to problem situations that arise from the game (14;16). As a result of the game achieved after every match in football, the psychological and physiological needs of football players increase. This situation causes the football player to push his physical and psychological upper limits every day. Based on this, today's football is always open to improvement physically and mentally in order to achieve what seems impossible, and when they succeed in achieving what they want, "what can be done differently?" and "how can the competition be won? It is a branch that makes you think about questions (22).

Since teamwork is required in football, effective application of technical and tactical skills during the match, as well as working as a team, also affects success. From this perspective, for a successful competition to be achieved, a football player with a high performance level must have strong tactical skills and technique, be effective in instant thinking and decision-making skills, be prone to team work, and be physically competent (1).

Tactics are all the organized work implemented to achieve the goals of the game. In this respect, the role and meaning of tactical training in sports sciences is very important. Tactical training has a high place in both individual sports branches and team sports (2). Tactical Skills are a very important element to achieve success in today's modern football (20).

Tactical skills in football refer to the athlete's ability to take the right action at the right time during the match and the ability to quickly adapt to new game transitions and ball circulation. Properly applied and directed tactical skills are a strategy and tactics used to challenge the opponent. Strategy is a plan, such as instructions and specific positioning, used to face different game situations, while tactics are a timely adaptation to new game configurations and circulation of the ball (9).

In order to achieve ideal performance in football, there are high performance items that indicate the development of the individual's emotional and mental factors as well as the excellent performance level that the individual will exhibit. Some of these items can be listed as providing motivation and setting the goal, having a positive, realistic attitude, being self-confident, determined, being concentrated and focused on work, being able to show willpower in difficult conditions, and having a sense of responsibility (12). From this point of view, this study was conducted to examine the tactical skills used by football players and their excellent performance levels.

## METHOD

### Research Model

This study was designed in a descriptive survey model as it aims to investigate the tactical skills and excellent performance levels of male and female football players playing in Turkish Football Leagues and to reveal the relationship between them as it exists. Descriptive survey models in research aim to describe an existing situation as it exists. In the survey model, an attempt is made to describe the research subject as it is (11).

### Participants

The population of the research consists of licensed Professional and Amateur football players in the Turkish Football Leagues in the 2021-2022 football season, and the sample consists of 906 football players, including 671 male and 235 female athletes between the ages of 18-38, playing football in the same season. After receiving ethics committee approval, the football players participating in the research were given their consent on a voluntary basis.

### Data Collection Tools

In this research, three different forms were used as data collection tools: personal information form, Tactical Skills Inventory in Sports (TACSIS) and Excellent Performance in Sports Scale (PPS-S).

Tactical Skills Inventory in Sports (TACSIS) was developed by Elferink-Gemser et al. (3). The Turkish adaptation of this scale was made by Yarayan et al (23). TACSIS consists of 4 sub-dimensions and 22 items: Positioning and Decision Making (PDM), Having Knowledge of Ball Movements (HKBM), Knowing Your Opponents (KYO) and Acting in Changing Situations (ACS). Confirmatory factor analysis index values of the scale, x2/sd(x2=603.89, sd=164)=2.97, RMSEA=0.094, RMR=0.64, SRMR=0.73, CFI=0.94, NFI =0.91, NNFI=0.93, IFI=0.94, while internal consistency coefficients vary between 0.70 and 0.93 (23).

Performance Perfectionism Scale for Sport (PPS-S): The scale developed by Hill, Appleton and Mallinson (10) was adapted to Turkish by Esentaş et al. (2020). The Spearman-Brown value of the scale was calculated as 0.83 and the Guttman value was 0.80. It was found that the model reached excellent and sufficient fit indices ($\chi$2/sd=2.21, RMSEA=0.07, GFI=0.97, AGFI=0.92, NFI=0.96, CFI=0.97, AGFI=0.92) (4).

### Data Collection and Statistical Analysis

Research data were collected from the football players participating in the study on a voluntary basis through online forms. The evaluation of the data obtained in the research was made in the licensed SPSS 22.0 program. Independent Sample t-test was used to determine the difference between two groups, and one-way ANOVA Test was used to determine whether there was a difference between multiple groups. Tukey HSD was used to determine the group that created the difference, and Pearson correlation tests were applied to determine the relationships between variables. When evaluating the results, the significance level was accepted as $p<0.05$.

### Ethical approval and institutional permission

Ethical approval of the research was provided by the approval of Mugla Sitki Kocman University Health Sciences Ethics Committee dated 03.12.2021 and numbered 23. The data collection process of the study started after receiving ethics committee approval and lasted approximately 3 months.

## FINDINGS

The findings obtained in this research are shown in the tables below.

**Table 1:** Age, gender, status and licensed football playing times distribution of the Participants

| Variables | | N | % |
|---|---|---|---|
| **Gender** | Female | 235 | 25.9 |
| | Male | 671 | 74.1 |
| **Status** | Professional | 150 | 16.6 |
| | Amateur | 756 | 83.4 |
| **Licensed Active Year Range** | 1-5 years | 148 | 16.3 |
| | 6-10 years | 318 | 35.1 |
| | 11-15 years | 252 | 27.8 |
| | 16-20 years | 115 | 12.7 |
| | 21 years and above | 73 | 8.1 |
| | Total | 906 | 100 |
| | | X | Sd |
| **Age (years)** | Female | 20.06 | 3.18 |
| | Male | 23.34 | 5.62 |

It was determined that 25.9% of the football players participating in the research were female and 74.1% male. In the research, the average age of female football players is 20.06±3.18 years, while the average age of male football players is 23.34±5.62 years. Of the athletes participating in the research, 16.6% are professionals and 83.4% amateurs. It was observed that 8.1% of the football players have been playing football with a license for at least 21 years or more, and 35.1% have been playing football for a license period of 6-10 years.

**Table 2:** Comparison of Tactical Skills and Excellent Performance in Sports by Gender

| Variables | Gender | N | Mean±SD | t | P |
|---|---|---|---|---|---|
| **PDM** | Female | 235 | 36.19±7.91 | -6.239 | 0.000* |
| | Male | 671 | 39.50±6.65 | | |
| **HKBM** | Female | 235 | 16.52±3.85 | -7.708 | 0.000* |
| | Male | 671 | 18.47±3.12 | | |
| **KYO** | Female | 235 | 20.11±4.75 | -6.607 | 0.000* |
| | Male | 671 | 22.19±3.91 | | |
| **ACS** | Female | 235 | 16.25±3.95 | -5.561 | 0.000* |
| | Male | 671 | 17.79±3.53 | | |
| **TACSIS** | Female | 235 | 89.09±18.83 | -7.182 | 0.000* |
| | Male | 671 | 97.97±15.31 | | |
| **PPS-S** | Female | 235 | 16.41±6.47 | -2.241 | 0.025* |
| | Male | 671 | 17.61±7.29 | | |

*$p<0.05$

A significant difference was found between the tactical skills sub-dimensions and total scores of the male and female football players participating in the research. Similarly, it was observed that men had higher scores than women in terms of perfect performance ($p<0.05$).

**Table 3:** Comparison of Tactical Skills and Excellent Performance in Sports by Status

| Variables | Status | N | Mean±SD | t | P |
|---|---|---|---|---|---|
| **PDM** | Professional | 150 | 38.39±7.50 | -.482 | 0.630 |
| | Amateur | 756 | 38.69±7.07 | | |
| **HKBM** | Professional | 150 | 17.46±3.65 | -1.963 | 0.064 |
| | Amateur | 756 | 18.06±3.38 | | |
| **KYO** | Professional | 150 | 21.33±4.38 | -1.028 | 0.304 |
| | Amateur | 756 | 21.72±4.22 | | |
| **ACS** | Professional | 150 | 17.06±3.89 | -1.197 | 0.232 |
| | Amateur | 756 | 17.46±3.66 | | |
| **TACSIS** | Professional | 150 | 94.25±17.66 | -1.134 | 0.257 |
| | Amateur | 756 | 95.95±16.56 | | |
| **PPS-S** | Professional | 150 | 16.99±6.53 | -.587 | 0.557 |
| | Amateur | 756 | 17.37±7.22 | | |

*p<0.05

There was no significant difference between the sub-dimensions and total scores of tactical skills in sports of professional and amateur football players participating in the study. Although the excellent performance scores were higher in amateur football players than in professionals, there was no significant difference (p>0.05).

**Table 4:** Comparison of Football Players According to Years of Licensed Football Playing

| Variables | | Sum of Squares | Mean Square | F | P |
|---|---|---|---|---|---|
| **PDM** | Between Groups | 4609.923 | 1152.481 | 24.961 | 0.000* |
| | Within Groups | 41599.923 | 46.171 | | |
| | Total | 46209.847 | | | |
| **HKBM** | Between Groups | 1042.079 | 260.520 | 24.327 | 0.000* |
| | Within Groups | 9649.056 | 10.709 | | |
| | Total | 10691.135 | | | |
| **KYO** | Between Groups | 1378.801 | 344.700 | 20.773 | 0.000* |
| | Within Groups | 14950.811 | 16.594 | | |
| | Total | 16329.613 | | | |
| **ACS** | Between Groups | 583.710 | 145.927 | 11.109 | 0.000* |
| | Within Groups | 11835.244 | 13.136 | | |
| | Total | 12418.954 | | | |
| **TACSIS** | Between Groups | 25737.113 | 6434.278 | 25.420 | 0.000* |
| | Within Groups | 228057.549 | 253.116 | | |
| | Total | 253794.662 | | | |
| **PPS-S** | Between Groups | 239.163 | 59.791 | 1.185 | 0.316 |
| | Within Groups | 45460.758 | 50.456 | | |
| | Total | 45699.921 | | | |

*p<0.05

When the football players participating in the research are evaluated according to their years of licensed football playing; A significant difference was found between the sub-dimensions and total scores of tactical skills in sports. (p<0.05). When looking at the perfect performance scores, there was no difference according to the years of licensed football playing (p>0.05).

**Table 5:** Evaluation of Football Players Participating in the Research According to Their Licensed Football Playing Years

| | (I) Football Age | (J) Football Age | Mean Difference (I-J) | P |
|---|---|---|---|---|
| PDM | 1-5 | 6-10 | -3.526 | 0.00* |
| | | 11-15 | -5.291 | 0.00* |
| | | 16-20 | -6.374 | 0.00* |
| | | 21 and above | -7.924 | 0.00* |
| | 6-10 | 1-5 | 3.526 | 0.00* |
| | | 11-15 | -1.765 | 0.02* |
| | | 16-20 | -2.848 | 0.00* |
| | | 21 and above | 4.398 | 0.00* |
| | 11-15 | 1-5 | 5.291 | 0.00* |
| | | 6-10 | 1.765 | 0.02* |
| | | 16-20 | -1.083 | 0.62 |
| | | 21 and above | -2.633 | 0.03* |
| | 16-20 | 1-5 | 6.374 | 0.00* |
| | | 6-10 | 2.848 | 0.00* |
| | | 11-15 | 1.083 | 0.62 |
| | | 21 and above | -1.550 | 0.55 |
| | 21 years and above | 1-5 | 7.924 | 0.00* |
| | | 6-10 | 4.398 | 0.00* |
| | | 11-15 | 2.633 | 0.03* |
| | | 16-20 | 1.550 | 0.55 |
| KYO | 1-5 | 6-10 | -1.970 | 0.00* |
| | | 11-15 | -3.098 | 0.00* |
| | | 16-20 | -3.366 | 0.00* |
| | | 21 and above | -4.223 | 0.00* |
| | 6-10 | 1-5 | 1.970 | 0.00* |
| | | 11-15 | -1.128 | 0.009* |
| | | 16-20 | -1.396 | 0.015* |
| | | 21 and above | -2.253 | 0.00* |
| | 11-15 | 1-5 | 3.098 | 0.00* |
| | | 6-10 | 1.128 | 0.009* |
| | | 16-20 | -0.267 | 0.977 |
| | | 21 and above | -1.125 | 0.23 |
| | 16-20 | 1-5 | 3.366 | 0.00* |
| | | 6-10 | 1.396 | 0.015* |
| | | 11-15 | 0.267 | 0.977 |
| | | 21 and above | -0.857 | 0.624 |
| | 21 years and above | 1-5 | 4.223 | 0.00* |
| | | 6-10 | 2.253 | 0.00* |
| | | 11-15 | 1.125 | 0.23 |
| | | 16-20 | 0.857 | 0.624 |
| HKBM | 1-5 | 6-10 | -1.937 | 0.00* |
| | | 11-15 | -2.694 | 0.00* |
| | | 16-20 | -2.874 | 0.00* |
| | | 21 and above | -3.847 | 0.00* |
| | 6-10 | 1-5 | 1.937 | 0.00* |
| | | 11-15 | -.757 | 0.048* |
| | | 16-20 | -0.937 | 0.066 |
| | | 21 and above | -1.910 | 0.00* |
| | 11-15 | 1-5 | 2.694 | 0.00* |
| | | 6-10 | .757 | 0.48 |
| | | 16-20 | -0.179 | 0.988 |
| | | 21 and above | -1.152 | 0.062 |
| | 16-20 | 1-5 | 2.874 | 0.00 |
| | | 6-10 | 0.937 | 0.066 |
| | | 11-15 | 0.179 | 0.988 |
| | | 21 and above | -0.973 | 0.273 |
| | 21 years and above | 1-5 | 3.847 | 0.00* |
| | | 6-10 | 1.910 | 0.00* |
| | | 11-15 | 1.152 | 0.62 |
| | | 16-20 | 0.973 | 0.273 |

**Table 5 (Continued):** Evaluation of Football Players Participating in the Research According to Their Licensed Football Playing Years

| | (I) Football Age | (J) Football Age | Mean Difference (I-J) | P |
|---|---|---|---|---|
| ACS | 1-5 | 6-10 | -1.493 | 0.00* |
| | | 11-15 | -2.205 | 0.00* |
| | | 16-20 | -2.429 | 0.00* |
| | | 21 and above | -2.243 | 0.00* |
| | 6-10 | 1-5 | 1.493 | 0.00* |
| | | 11-15 | -0.71 | 0.137 |
| | | 16-20 | -0.94 | 0.124 |
| | | 21 and above | -0.75 | 0.502 |
| | 11-15 | 1-5 | 2.205 | 0.00* |
| | | 6-10 | 0.71 | 0.137 |
| | | 16-20 | -0.22 | 0.982 |
| | | 21 and above | -0.04 | 1.000 |
| | 16-20 | 1-5 | 2.429 | 0.00* |
| | | 6-10 | 0.94 | 0.124 |
| | | 11-15 | 0.22 | 0.982 |
| | | 21 and above | 0.19 | 0.997 |
| | 21 years and above | 1-5 | 2.243 | 0.00* |
| | | 6-10 | 0.75 | 0.502 |
| | | 11-15 | 0.04 | 1.000 |
| | | 16-20 | -0.19 | 0.997 |
| TACSIS | 1-5 | 6-10 | -8.927 | 0.00* |
| | | 11-15 | -13.290 | 0.00* |
| | | 16-20 | -15.044 | 0.00* |
| | | 21 and above | -18.239 | 0.00* |
| | 6-10 | 1-5 | 8.927 | 0.00* |
| | | 11-15 | -4.363 | 0.01* |
| | | 16-20 | -6.117 | 0.004* |
| | | 21 and above | -9.311 | 0.00* |
| | 11-15 | 1-5 | 13.290 | 0.00* |
| | | 6-10 | 4.363 | 0.01* |
| | | 16-20 | -1.754 | 0.864 |
| | | 21 and above | -4.948 | 0.133 |
| | 16-20 | 1-5 | 15.044 | 0.00* |
| | | 6-10 | 6.117 | 0.004* |
| | | 11-15 | 1.754 | 0.864 |
| | | 21 and above | -3.194 | 0.665 |
| | 21 years and above | 1-5 | 18.239 | 0.00* |
| | | 6-10 | 9.311 | 0.00* |
| | | 11-15 | 4.948 | 0.133 |
| | | 16-20 | 3.194 | 0.665 |

When the football players participating in the research are evaluated according to their years of licensed football playing; It was observed that there was a significant difference ($p<0.05$). In all sub-dimensions of tactical skills in sports and the total TACSIS score compared to the scores of athletes who played football for 1-5 years and all other groups who played football for more years.

**Table 6.** Relationships between tactical skills and excellent performance levels in female football players

| Variables | | PDM | HKBM | KYO | ACS | TACSIS |
|---|---|---|---|---|---|---|
| | P | .849* | | | | |
| **HKBM** | r | .000 | | | | |
| | N | 235 | | | | |
| | P | .818* | .795* | | | |
| **KYO** | r | .000 | .000 | | | |
| | N | 235 | 235 | | | |
| | P | .748* | .704* | .755* | | |
| **ACS** | r | .000 | .000 | .000 | | |
| | N | 235 | 235 | 235 | | |
| | P | .957* | .910* | .917* | .859* | |
| **TACSIS** | r | .000 | .000 | .000 | .000 | |
| | N | 235 | 235 | 235 | 235 | |
| | P | .072 | .057 | .027 | .003 | .049 |
| **PPS-S** | r | .272 | .385 | .685 | .968 | .453 |
| | N | 235 | 235 | 235 | 235 | 235 |

*p<0.05

When the relationships between tactical skills and excellent performance levels in female football players are examined; it is seen that all sub-dimensions of tactical skills used by football players are in significant relationship with each other (p<0.05). There was no relationship between tactical skills and excellent performance levels (p>0.05).

**Table 7.** Relationships between tactical skills and excellent performance levels in male football players

| Variables | | PDM | HKBM | KYO | ACS | TACSIS |
|---|---|---|---|---|---|---|
| | P | .793* | | | | |
| **HKBM** | r | .000 | | | | |
| | N | 671 | | | | |
| | P | .773* | .724* | | | |
| **KYO** | r | .000 | .000 | | | |
| | N | 671 | 671 | | | |
| | P | .628* | .580* | .696* | | |
| **ACS** | r | .000 | .000 | .000 | | |
| | N | 671 | 671 | 671 | | |
| | P | .939* | .868* | .900* | .800* | |
| **TACSIS** | r | .000 | .000 | .000 | .000 | |
| | N | 671 | 671 | 671 | 671 | |
| | P | .018 | -.014 | .032 | -.054 | .001 |
| **PPS-S** | r | .643 | .721 | .413 | .160 | .989 |
| | N | 671 | 671 | 671 | 671 | 671 |

*p<0.05

When the relationships between tactical skills and excellent performance levels in male football players are examined; It is seen that all sub-dimensions of tactical skills used by football players are in significant relationship with each other (p<0.05). There was no relationship between tactical skills and excellent performance levels (p>0.05).

## DISCUSSION AND CONCLUSION

This study was carried out to determine the tactical skills used by amateur and professional league football players and their excellent performance levels and to examine the relationships between these variables. There are significant differences between athletes playing football in different years in terms of the duration of active licensed football players.

In the research, it is seen that there is a significant difference between male and female football players in terms of tactical skills sub-dimensions and total scores in sports, and that men have higher scores than women in terms of perfect performance scores. In terms of years of licensed football playing; It was found that there was a significant difference in all sub-dimensions of tactical skills in sports and the total PPS-S score between the scores of athletes who played football for 1-5 years and all other groups who played football for more years. All sub-dimensions of tactical skills used by male and female football players have a significant relationship with each other; It was concluded that there was no relationship between tactical skills and excellent performance levels.

Müniroğlu et al. (15) examined professional football players' views on "Tactics in Football"; while 58% of football players say they completely agree with the statement "Tactics are very important in winning a match", 42% tend to agree. According to this result; Football players stated that they attach importance to tactics and that they think that tactical understanding is an important factor in achieving success. As a result, it has been revealed that the football players care about tactics and think that tactics have a very effective importance in winning the match.

González-Víllora et al. (8) in their study on "Review of tactical evaluation tools for young players in football and evaluation of tactics in team sports"; by compiling the studies conducted in the last 20 years, they stated that teaching-learning processes that are more tactically focused in younger age groups are much more beneficial for the tactical development of children.

In the study conducted by Low et al. (13) on tactical skills in football players; they emphasize that playing with a high-pressure game strategy against deep defense in football players of different ages and at different levels can lead to lower distance traveled on the physically and physiologically effective playing field, lower player speed and lower heart rates, as well as the tactical skills of the football players.

In the study by Figueira et al. (5), in which they aimed to determine the effects of playing football with different age groups on physical and tactical performance, they stated that young football players playing in different age groups developed positively both physically and technically when they trained and competed with different age groups. Forsman et al. (6) in their study on the effect of perception competence on the development of tactical skills, technical skills, motivation, speed and agility in young football players, they stated that there is a positive relationship between the levels and changes in perceived competence and motivation. and the perceived competence and speed and agility levels.

Rechenchosky et al. (19) in their study examining the tactical efficiency of football players playing in different positions, found that young attacking players were less able to apply the principle of "depth mobility" compared to "going inside", "offensive coverage", "width and length" and "attacking unity". They stated that they were efficient, and regarding the defensive aspects, they stated that they achieved "concentration" more efficiently than other principles. In the study by Popovych et al. (17) where they examined the basic characteristics of football players' tactical thinking types, they found that the tactical thinking levels of offensive players were higher than other players. It has been observed that defensive players have less predictability and analytical thinking than offensive players and goalkeepers. In the study conducted by Praça et al. (18), they stated that football players with higher tactical skills revealed significantly higher density and total connection values, and there were also differences in the frequency of defensive tactical principles. Silva et al. (21) stated in their study that national level players are more sensitive to field changes, however, they exhibit more variability in small and medium fields than regional level players.

In our research, when looked at in terms of years of licensed football playing; It was found that there was a significant difference in all sub-dimensions of tactical skills in sports and TACSIS score between the scores of athletes who played football for 1-5 years and all other groups who played football for more years.

As a result, it seems that increasing the number of years of licensed football playing in amateur and professional league football players is very important in terms of tactical skills. From this point of view, it can be said that increasing the experience period of both male and female football players by trying to reduce the age of starting sports to earlier ages will make a significant contribution to tactical skills, which are very important for performance in football.

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# Life Gets Even More Beautiful, During Extended 90 + Minutes

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*Ethical Statement: It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited.*

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**Abstract**

In the 2022 Qatar World Cup, FIFA increased additional time by adding every moment when the ball isn't played to the play time as an allowance for time lost. This also increased the number of goals scored during additional time. This research studies the impact of goals scored during additional time on match results caused by this extension in the second half of matches in Turkish Male Football Super League. Quantitative and qualitative methods were used. 250 matches played on weeks 1st–30th of 2022–2023 season of Turkish Spor Toto Male Football Super League were analyzed with document analysis, a qualitative research method. The matches, results, additional time, and goals scored during additional time were recorded. Then matches were separated into two equal-numbered groups including before and after the 2022 Qatar World Cup. The 125 matches on weeks 1st–14th and the 125 matches on weeks 14th–30th were analyzed for the number of total goals, total additional time, and the number of total goals scored during additional time with causal-comparative research model as a quantitative research method. In this research, Frequencies Analysis chosen from statistical analyses, Paired Sample t-Test and Pearson Correlation Analysis were used. According to the results, especially after the 2022 Qatar World Cup, the matches aren't only ninety minutes for footballers any more. The matches may approach two hours with extended additional time. As a conclusion of this research, teams can be suggested to consider this situation and properly organize training plans and programs.

**Keywords:** Football, Goal, Ninety plus, Life, Super League

**Özet**

**Hayat Bir Başka Güzelleşir, Uzayan 90 +'larda**

2022 Katar Dünya Kupasında, maçlarda topun oyunda olmadığı her anın, normal süreye kayıp zaman olarak eklenmesi konusunda FIFA tarafından hakemlere verilen talimatla, duraklama süreleri artmıştır. Bu durum, duraklamalarda atılan gollerin sayısının da artmasını sağlamıştır. Yapılan bu araştırmanın amacı; Türkiye Erkek

Futbol Süper Lig maçlarının ikinci yarısında, normal oyun süresine eklenen kayıp zaman için verilen ek sürenin uzamasıyla, bu sürede atılan gollerin, maç sonuçlarına etkisini ortaya koymaktır. Araştırmada, nicel ve nitel araştırma yöntemleri kullanılmıştır. Nitel araştırma yöntemi olan doküman analizi ile Türkiye Spor Toto Erkek Futbol Süper Liginin 2022–2023 sezonunda 1.–30. haftaları arasındaki 250 maç incelenmiştir. Yapılan maçlar, sonuçlar, duraklama süreleri ve duraklamalarda atılan goller kaydedilmiştir. Daha sonra bu maçlar, 2022 Katar Dünya Kupası'ndan önce ve sonra oynananlar olmak üzere eşit sayıda iki gruba ayrılmıştır. Ligin 1.–14. haftaları arasındaki 125 maç ile 14.–30. haftaları arasındaki 125 maç, nicel araştırma yöntemi olan nedensel karşılaştırma modeli kullanılarak; toplam gol sayıları, toplam duraklama süreleri ve duraklamalarda atılan toplam gol sayıları açısından incelenmiştir. Araştırmada, istatistiksel analizlerden Frekans Analizi, Eşleştirilmiş t-Testi ve Pearson Korelasyon Analizi yapılmıştır. Analizlerden elde edilen bulgulara göre, özellikle 2022 Katar Dünya Kupası'ndan sonra, futbolcular için maçların artık doksan dakikadan ibaret olmadığı görülmektedir. Maçlar, uzayan duraklama süreleriyle birlikte iki saate yaklaşmaktadır. Araştırmanın sonucu olarak; takımların bu durumu dikkate alıp, antrenman plan ve programlarını buna göre düzenlemeleri gerektiği söylenebilir.

**Anahtar Kelimeler:** Futbol, Gol, Doksan artı, Hayat, Süper lig

## INTRODUCTION

Johan Huizinga (1872–1945), a Dutch history professor, defined the term of play as "a voluntary action or activity associated with the conscience of being different from ordinary life with stress and happiness, automatically having a purpose, performed in definite time and place limits, freely consented but under completely commanding rules" in 'Homo Ludens: Proeve eener Bepaling van het Spel-element der Cultuur' (8) he wrote and published in Dutch for the first time in 1938 (10).

Football is an area where moral practices became concrete in some way successively. It is meaningful that French author and philosopher Albert Camus (1913–1960) who is also the Nobel Laureate in Literature specifically emphasized morality of football. Camus suggested humanity the simple morals of football instead of confusing and complicated morals of politics (21). He said, "Everything I know about morality and the obligations of men, I owe it to football" by observing all opportunities of existence in Football (4). The worldwide popularity of football results from easiness of following the play, performing the rules and comparatively cheap equipments it requires. Scoring a goal, the purpose of the play, is the most exciting feature of football since it determines which team wins the game (14).

Professionalization process has turned sports activities into an economically performed area from being a play only. As a result, capitalist system values have dominated the sports. Today football has also turned into a business organization under the name of industrial football which was originated as a folk sport. In the new sense of football, rapidly industrializing, not only the soul of football but also its place in social life has started to change (17). Personally, and socially positive results of sports like football mustn't be ignoredthough negative results it concluded like class inequality production specifically that is emphasized by Marxist and critical theory in terms of social order, gender apartheid, exploitation, anesthesia function, culture industry, and power-sport connection. Football is one of the areas in which people are interested as a remedy for isolation in so called modern societies. A person who supports a football team identifies with victories and failures of that team. Muted feelings are expressed by the way of belonging to social groups (21).

Football is a sports branch involving very severe physical activities depending on aerobic and anaerobic performance requiring physical qualities like technical skill, power, agility and endurance (13). As a versatile sports branch, football requires high performance components. A successful match includes activities which are needed to be performed with a level of technique and tactics and very high speed, sprint, shoot, pass in a short time. In order to overcome these loads and maintain performance during the match the football player needs to have developed endurance (16). Football is a play which lasts at least 90 minutes excluding additional time, sometimes even 120 minutes. Players in football matches cover a distance of 10–12 kilometers making a high effort. Thus, football is a long-term endurance sport and requires very well motor skills. The most important factor affecting endurance performance in football is aerobic endurance (19). Thus, during additional time added to the ordinary play time in football, players must preserve their physical and mental

endurance not only personally but also as a team. In the study that includes the analysis of the goals scored by Beşiktaş, Galatasaray, Fenerbahçe and Trabzonspor teams, which completed the 2020-2021 season of Turkish Male Football Super League in the top 4 places, throughout the season; It has been found out that 21 of the total 291 goals scored by these teams, that is approximately 7%, were scored during additional time (90 +). It may be assumed that this could have a direct impact on determining the league rankings (5).

In The Qatar World Cup in 2022 additional time minutes were increased with instructions given by FIFA to the referees by adding every moment when the ball is not played to the ordinary play time as allowance for time lost (22). This also caused an increase in the number of goals scored during additional time. This study aims to research the impact of goals scored during additional time on the match results caused by extension of allowance for time lost which is added to the ordinary play time and called as additional time at the second half of football matches. When the goal, the indispensable purpose of football, is scored during additional time and changes the match result, this may enable to increase the level of joy provided by football.

The hypothesis of the research is that extension of additional time during football matches causes to increase the number of goals scored during this time and change the match result even more.

## METHOD

### Research Model

While a total of 312 minutes (an average of approximately 5 minutes per game) of additional time was given in the 64 matches played in the 2018 Russia World Cup, a total of 447 minutes (an average of approximately 7 minutes per match) of additional time was given in the 64 matches played in the 2022 Qatar World Cup (24, 25). In the Turkish Male Football Super League, at the matches played after the 2022 Qatar World Cup, additional time minutes added to the ordinary match time especially at the second half of the match increased (23). In this research, quantitative and qualitative methods are used. 250 matches played during the 1st–30th weeks of 2022–2023 season of Turkish Spor Toto Male Football Super League were analyzed with the document analysis which is a qualitative research method (12). The matches, results, additional time and goals scored during additional time were recorded. Then these matches were separated into two equal- numbered groups including before and after the 2022 Qatar World Cup. The first 125 matches on the 1st–14th weeks of the league and the last 125 matches on the 14th–30th weeks were analyzed for the number of total goals, total additional time and number of total goals scored during additional time with the causal comparative research model as a quantitative research method (6).

### Collecting Data

Research data were collected from official web sites of the Turkish Football Federation and beIN Sports, the broadcaster (26, 27). The match results, additional time and goals scored during additional time were recorded and demonstrated in tables.

**Table 1:** 2022–2023 Turkish Spor Toto Male Football Super League, the 1st–14th Weeks

| N. | MATCH | SCR.[1] | 90 + DUR.[2] | 90 + G.[3] | N. | MATCH | SCR.[1] | 90 + DUR.[2] | 90 + G.[3] |
|---|---|---|---|---|---|---|---|---|---|
| 1. | İstanbul – Trabzon | 0 – 2 | 4:56 | | 64. | Kasımpaşa – Gaziantep | 1 – 0 | 7:02 | |
| 2. | Sivas – Gaziantep | 1 – 1 | 5:07 | | 65. | Ankaragücü – Başakşehir | 1 – 2 | 6:00 | |
| 3. | Beşiktaş – Kayseri | 1 – 0 | 9:28 | + | 66. | Kayseri – Trabzon | 1 – 2 | 10:05 | |
| 4. | Karagümrük – Alanya | 2 – 4 | 6:01 | + | 67. | Adana Demir – Galatasaray | 0 – 0 | 9:20 | |
| 5. | Giresun – Adana Demir | 2 – 3 | 5:30 | + | 68. | Alanya – Giresun | 1 – 1 | 6:02 | |
| 6. | Antalya – Galatasaray | 0 – 1 | 5:03 | | 69. | Sivas – Hatay | 1 – 2 | 5:00 | |
| 7. | Başakşehir – Kasımpaşa | 4 – 0 | 2:56 | | 70. | Konya – Ümraniye | 1 – 0 | 7:10 | |
| 8. | Ankaragücü – Konya | 0 – 0 | 4:43 | | 71. | Beşiktaş – Fenerbahçe | 0 – 0 | 4:19 | |
| 9. | Fenerbahçe – Ümraniye | 3 – 3 | 7:14 | + | 72. | Karagümrük – İstanbul | 1 – 2 | 4:57 | |
| 10. | Trabzon – Hatay | 1 – 0 | 7:05 | | 73. | Gaziantep – Adana Demir | 1 – 1 | 8:00 | |
| 11. | Kayseri – İstanbul | 1 – 0 | 6:25 | | 74. | İstanbul – Ankaragücü | 1 – 2 | 11:56 | + |
| 12. | Galatasaray – Giresun | 0 – 1 | 8:06 | | 75. | Antalya – Konya | 1 – 1 | 9:48 | + |
| 13. | Adana Demir – Sivas | 3 – 0 | 3:02 | | 76. | Giresun – Beşiktaş | 0 – 1 | 6:49 | |
| 14. | Ümraniye – Antalya | 0 – 1 | 7:14 | | 77. | Ümraniye – Kayseri | 2 – 2 | 5:40 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 15. | Gaziantep – Ankaragücü | 1 – 0 | 6:48 | | 78. | Hatay – Alanya | 1 – 0 | 7:51 | |
| 16. | Alanya – Beşiktaş | 3 – 3 | 8:25 | + | 79. | Fenerbahçe – Karagümrük | 5 – 4 | 10:43 | + |
| 17. | Konya – Başakşehir | 0 – 0 | 4:13 | | 80. | Trabzon – Kasımpaşa | 0 – 0 | 5:30 | |
| 18. | Kasımpaşa – Fenerbahçe | 0 – 6 | 2:14 | + | 81. | Başakşehir – Sivas | 0 – 2 | 8:14 | |
| 19. | Ümraniye – Galatasaray | 0 – 1 | 5:58 | | 82. | Alanya – Antalya | 3 – 2 | 8:00 | |
| 20. | Giresun – Kasımpaşa | 1 – 0 | 4:21 | | 83. | Karagümrük – Hatay | 3 – 0 | 9:02 | + |
| 21. | Hatay – Gaziantep | 1 – 2 | 6:51 | | 84. | Kasımpaşa – Adana Demir | 1 – 4 | 3:00 | |
| 22. | Antalya – Trabzon | 5 – 2 | 8:26 | ++ * | 85. | Konya – Gaziantep | 0 – 1 | 7:00 | |
| 23. | Başakşehir – Kayseri | 2 – 0 | 4:10 | | 86. | Kayseri – Galatasaray | 2 – 1 | 5:20 | |
| 24. | Beşiktaş – Karagümrük | 4 – 1 | 3:18 | | 87. | Başakşehir – İstanbul | 2 – 0 | 3:58 | |
| 25. | Sivas – Alanya | 1 – 1 | 5:01 | + | 88. | Beşiktaş – Trabzon | 2 – 2 | 8:00 | |
| 26. | İstanbul – Konya | 0 – 4 | 2:15 | | 89. | Sivas – Giresun | 3 – 0 | 3:32 | |
| 27. | Fenerbahçe – Adana Demir | 4 – 2 | 6:12 | | 90. | Ankaragücü – Fenerbahçe | 0 – 3 | 4:03 | + |
| 28. | Gaziantep – Antalya | 5 – 2 | 7:01 | | 91. | Antalya – İstanbul | 2 – 1 | 10:00 | + |
| 29. | Karagümrük – Ankaragücü | 4 – 1 | 5:00 | | 92. | Ümraniye – Karagümrük | 1 – 3 | 6:00 | + |
| 30. | Alanya – İstanbul | 0 – 1 | 12:15 | | 93. | Trabzon – Sivas | 1 – 0 | 5:31 | |
| 31. | Adana Demir – Ümraniye | 1 – 0 | 5:53 | | 94. | Fenerbahçe – Başakşehir | 1 – 0 | 6:15 | |
| 32. | Kasımpaşa – Hatay | 1 – 0 | 5:10 | | 95. | Kasımpaşa – Kayseri | 0 – 1 | 7:28 | |
| 33. | Kayseri – Giresun | 3 – 0 | 4:11 | | 96. | Adana Demir – Konya | 1 – 1 | 9:00 | |
| 34. | Trabzon – Galatasaray | 0 – 0 | 6:14 | | 97. | Galatasaray – Alanya | 2 – 2 | 6:47 | + |
| 35. | Konya – Fenerbahçe | 1 – 0 | 6:36 | | 98. | Giresun – Ankaragücü | 1 – 1 | 5:57 | |
| 36. | Beşiktaş – Sivas | 3 – 1 | 4:07 | | 99. | Hatay – Beşiktaş | 2 – 1 | 6:39 | |
| 37. | Ümraniye – Trabzon | 0 – 1 | 5:05 | | 100. | Karagümrük – Galatasaray | 0 – 2 | 3:52 | |
| 38. | Sivas – Karagümrük | 0 – 0 | 6:05 | | 101. | Konya – Kasımpaşa | 1 – 1 | 11:07 | |
| 39. | Başakşehir – Alanya | 2 – 0 | 4:28 | | 102. | Alanya – Gaziantep | 2 – 0 | 3:56 | |
| 40. | Fenerbahçe – Kayseri | 2 – 0 | 5:00 | | 103. | Ankaragücü – Hatay | 4 – 1 | 6:58 | + |
| 41. | Giresun – Konya | 0 – 1 | 8:23 | | 104. | Beşiktaş – Ümraniye | 5 – 2 | 3:03 | |
| 42. | Hatay – Adana Demir | 1 – 1 | 10:35 | + | 105. | Kayseri – Adana Demir | 2 – 2 | 5:00 | |
| 43. | Antalya – Kasımpaşa | 0 – 2 | 10:27 | | 106. | İstanbul – Fenerbahçe | 2 – 5 | 4:03 | |
| 44. | Ankaragücü – Beşiktaş | 2 – 3 | 8:45 | | 107. | Sivas – Antalya | 0 – 2 | 5:57 | |
| 45. | Galatasaray – Gaziantep | 2 – 1 | 6:42 | + | 108. | Başakşehir – Giresun | 3 – 1 | 5:00 | |
| 46. | Alanya – Ankaragücü | 2 – 1 | 4:58 | | 109. | Ümraniye – Alanya | 3 – 1 | 2:57 | |
| 47. | Konya – Hatay | 1 – 0 | 4:01 | | 110. | Kasımpaşa – Ankaragücü | 1 – 1 | 6:09 | |
| 48. | Karagümrük – Giresun | 1 – 1 | 6:37 | + | 111. | Giresun – İstanbul | 3 – 2 | 7:11 | |
| 49. | Sivas – İstanbul | 1 – 1 | 7:37 | | 112. | Galatasaray – Beşiktaş | 2 – 1 | 5:39 | |
| 50. | Gaziantep – Ümraniye | 1 – 1 | 9:45 | | 113. | Gaziantep – Kayseri | 1 – 2 | 6:00 | |
| 51. | Kasımpaşa – Galatasaray | 2 – 3 | 5:54 | | 114. | Antalya – Karagümrük | 4 – 2 | 6:06 | |
| 52. | Kayseri – Antalya | 1 – 0 | 6:36 | | 115. | Trabzon – Konya | 2 – 2 | 11:29 | |
| 53. | Beşiktaş – Başakşehir | 0 – 1 | 8:02 | | 116. | Fenerbahçe – Sivas | 1 – 0 | 8:00 | |
| 54. | Adana Demir – Trabzon | 3 – 2 | 4:43 | + | 117. | Hatay – Başakşehir | 3 – 3 | 4:00 | + |
| 55. | Galatasaray – Konya | 2 – 1 | 11:31 | | 118. | Alanya – Adana Demir | 0 – 0 | 6:06 | |
| 56. | Hatay – Kayseri | 0 – 4 | 2:51 | | 119. | Ankaragücü – Trabzon | 1 – 1 | 7:39 | |
| 57. | Ümraniye – Kasımpaşa | 1 – 2 | 9:08 | + | 120. | Sivas – Ümraniye | 2 – 2 | 4:18 | |
| 58. | Antalya – Adana Demir | 0 – 3 | 4:34 | | 121. | Fenerbahçe – Giresun | 1 – 2 | 6:15 | |
| 59. | İstanbul – Beşiktaş | 2 – 2 | 6:37 | | 122. | Başakşehir – Galatasaray | 0 – 7 | 1:54 | |
| 60. | Trabzon – Gaziantep | 3 – 2 | 12:30 | + | 123. | Karagümrük – Gaziantep | 3 – 3 | 8:16 | |
| 61. | Başakşehir – Karagümrük | 0 – 0 | 6:00 | | 124. | İstanbul – Hatay | 0 – 1 | 6:17 | |
| 62. | Ankaragücü – Sivas | 2 – 1 | 8:43 | | 125. | Kayseri – Konya | 1 – 2 | 7:22 | |
| 63. | Fenerbahçe – Alanya | 5 – 0 | 4:07 | | | TOTAL[4] | 356 | 802 | 25 |

(https://www.tff.org/default.aspx?pageID=1628), (https://beinsports.com.tr/mac-ozetleri-goller/super-lig).

[1] Score: Match result.

[2] 90 + Duration: Additional time were recorded as Minute:Second.

[3] Minutes involving goals scored during additional time were recorded.

[4] Total number of goals scored at matches, total additional time and total number of goals scored during additional time were recorded.

* One team scored 2 goals at once during additional time at 1 match in total.

**Table 2:** 2022–2023 Turkish Spor Toto Male Football Super League, the 14th–30th Weeks

| N. | MATCH | SCR.[1] | 90 + DUR.[2] | 90 + G.[3] | N. | MATCH | SCR.[1] | 90 + DUR.[2] | 90 + G.[3] |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Antalya – Ankaragücü | 0 – 2 | 11:36 | + | 64. | Alanya – Sivas | 0 – 3 | 5:06 | |
| 2. | Ümraniye – Başakşehir | 1 – 3 | 7:00 | + | 65. | Karagümrük – Beşiktaş | 1 – 1 | 6:00 | |
| 3. | Hatay – Giresun | 1 – 1 | 9:28 | | 66. | Kasımpaşa – Giresun | 5 – 1 | 3:46 | |
| 4. | Kasımpaşa – Sivas | 1 – 2 | 9:53 | | 67. | Gaziantep – Hatay | 4 – 1 | 7:26 | |
| 5. | Trabzon – Fenerbahçe | 2 – 0 | 11:23 | + | 68. | Trabzon – Antalya | 2 – 0 | 7:51 | + |
| 6. | Adana Demir – Karagümrük | 2 – 1 | 6:51 | | 69. | Galatasaray – Ümraniye | 3 – 2 | 5:56 | |
| 7. | Gaziantep – Beşiktaş | 1 – 1 | 7:43 | | 70. | Kayseri – Başakşehir | 1 – 0 | 6:00 | |
| 8. | Konya – Alanya | 2 – 2 | 16:31 | + | 71. | Konya – İstanbul | 0 – 1 | 10:32 | |
| 9. | Galatasaray – İstanbul | 2 – 1 | 9:50 | | 72. | Adana Demir – Fenerbahçe | 1 – 1 | 11:07 | |
| 10. | Ankaragücü – Ümraniye | 1 – 2 | 8:32 | | 73. | Ankaragücü – Karagümrük | 0 – 2 | 5:56 | |
| 11. | Başakşehir – Antalya | 2 – 0 | 5:33 | | 74. | Sivas – Beşiktaş | 1 – 0 | 8:54 | |
| 12. | Fenerbahçe – Hatay | 4 – 0 | 7:00 | + | 75. | Antalya – Gaziantep | 1 – 0 | 10:10 | |
| 13. | Alanya – Kayseri | 3 – 1 | 9:08 | | 76. | İstanbul – Alanya | 2 – 1 | 6:56 | |
| 14. | İstanbul – Kasımpaşa | 2 – 1 | 10:38 | | 77. | Hatay – Kasımpaşa | 1 – 0 | 8:57 | + |
| 15. | Karagümrük – Trabzon | 4 – 1 | 10:00 | | 78. | Galatasaray – Trabzon | 2 – 1 | 12:58 | |
| 16. | Sivas – Galatasaray | 1 – 2 | 17:54 | ++ * | 79. | Giresun – Kayseri | 1 – 2 | 9:00 | |
| 17. | Giresun – Gaziantep | 2 – 1 | 9:22 | + | 80. | Fenerbahçe – Konya | 4 – 0 | 3:57 | |
| 18. | Beşiktaş – Adana Demir | 1 – 0 | 6:02 | | 81. | Ümraniye – Adana Demir | 1 – 1 | 8:45 | |
| 19. | Ümraniye – Hatay | 2 – 2 | 10:28 | | 82. | Beşiktaş – Antalya | 0 – 0 | 12:10 | |
| 20. | Antalya – Fenerbahçe | 1 – 2 | 13:26 | | 83. | Alanya – Başakşehir | 1 – 0 | 10:34 | |
| 21. | Kasımpaşa – Alanya | 4 – 1 | 7:58 | + | 84. | Karagümrük – Sivas | 4 – 3 | 9:01 | ++ * |
| 22. | Kayseri – Karagümrük | 2 – 4 | 10:00 | | 85. | Trabzon – Ümraniye | 1 – 2 | 9:05 | |
| 23. | Galatasaray – Ankaragücü | 2 – 1 | 6:45 | | 86. | Kayseri – Fenerbahçe | 1 – 2 | 5:50 | + |
| 24. | Konya – Sivas | 2 – 2 | 7:00 | | 87. | Konya – Giresun | 0 – 0 | 9:20 | |
| 25. | Gaziantep – Başakşehir | 1 – 1 | 8:24 | + | 88. | Beşiktaş – Ankaragücü | 2 – 1 | 7:33 | |
| 26. | Trabzon – Giresun | 3 – 0 | 7:55 | | 89. | Kasımpaşa – Antalya | 3 – 1 | 5:03 | |
| 27. | Adana Demir – İstanbul | 6 – 0 | 6:00 | | 90. | Giresun – Karagümrük | 2 – 2 | 7:55 | |
| 28. | Hatay – Antalya | 0 – 0 | 5:58 | | 91. | Antalya – Kayseri | 4 – 0 | 7:42 | + |
| 29. | Beşiktaş – Kasımpaşa | 2 – 1 | 7:00 | | 92. | Galatasaray – Kasımpaşa | 1 – 0 | 12:02 | |
| 30. | Karagümrük – Konya | 3 – 3 | 10:50 | + | 93. | Ankaragücü – Alanya | 2 – 0 | 5:11 | |
| 31. | Ankaragücü – Kayseri | 2 – 1 | 6:37 | | 94. | Trabzon – Adana Demir | 4 – 1 | 8:33 | + |
| 32. | Giresun – Ümraniye | 0 – 1 | 7:11 | | 95. | Başakşehir – Beşiktaş | 0 – 2 | 7:58 | |
| 33. | Fenerbahçe – Galatasaray | 0 – 3 | 10:45 | + | 96. | İstanbul – Sivas | 3 – 0 | 5:55 | |
| 34. | Başakşehir – Adana Demir | 2 – 1 | 9:34 | | 97. | Konya – Galatasaray | 2 – 1 | 9:32 | + |
| 35. | Alanya – Trabzon | 5 – 0 | 6:52 | | 98. | Kasımpaşa – Ümraniye | 1 – 1 | 6:15 | |
| 36. | İstanbul – Gaziantep | 1 – 1 | 13:51 | + | 99. | Adana Demir – Antalya | 2 – 0 | 6:16 | |
| 37. | Kayseri – Sivas | 4 – 1 | 5:55 | | 100. | Beşiktaş – İstanbul | 3 – 1 | 6:59 | + |
| 38. | Galatasaray – Hatay | 4 – 0 | 4:09 | | 101. | Sivas – Ankaragücü | 2 – 0 | 8:02 | |
| 39. | Antalya – Giresun | 2 – 2 | 13:29 | | 102. | Karagümrük – Başakşehir | 2 – 2 | 5:08 | ++ * |
| 40. | Adana Demir – Ankaragücü | 3 – 1 | 8:06 | | 103. | Alanya – Fenerbahçe | 1 – 3 | 11:41 | + |
| 41. | Konya – Beşiktaş | 1 – 2 | 6:54 | + | 104. | Başakşehir – Ankaragücü | 1 – 0 | 9:12 | |
| 42. | Trabzon – Başakşehir | 1 – 0 | 7:16 | | 105. | Trabzon – Kayseri | 3 – 4 | 10:05 | |
| 43. | Ümraniye – İstanbul | 0 – 2 | 6:22 | | 106. | Galatasaray – Adana Demir | 2 – 0 | 12:58 | + |
| 44. | Kasımpaşa – Karagümrük | 2 – 2 | 14:15 | + | 107. | Ümraniye – Konya | 2 – 2 | 7:34 | + |
| 45. | Gaziantep – Fenerbahçe | 1 – 2 | 11:06 | + | 108. | Giresun – Alanya | 2 – 2 | 9:01 | |
| 46. | Adana Demir – Giresun | 1 – 1 | 12:04 | | 109. | Fenerbahçe – Beşiktaş | 2 – 4 | 6:03 | ++ * |
| 47. | Kasımpaşa – Başakşehir | 1 – 3 | 12:00 | ++ * | 110. | İstanbul – Karagümrük | 0 – 1 | 7:22 | |
| 48. | Galatasaray – Antalya | 2 – 1 | 10:36 | | 111. | Konya – Antalya | 1 – 1 | 10:35 | |
| 49. | Gaziantep – Sivas | 1 – 2 | 6:22 | | 112. | Ankaragücü – İstanbul | 3 – 2 | 11:31 | |
| 50. | Alanya – Karagümrük | 2 – 2 | 8:56 | | 113. | Kasımpaşa – Trabzon | 2 – 0 | 6:28 | |
| 51. | Kayseri – Beşiktaş | 0 – 2 | 5:58 | | 114. | Sivas – Başakşehir | 1 – 1 | 4:55 | |
| 52. | Trabzon – İstanbul | 4 – 0 | 4:55 | | 115. | Beşiktaş – Giresun | 3 – 1 | 5:02 | |
| 53. | Konya – Ankaragücü | 0 – 1 | 5:58 | | 116. | Kayseri – Ümraniye | 3 – 1 | 10:20 | + |
| 54. | Ümraniye – Fenerbahçe | 1 – 2 | 16:16 | | 117. | Karagümrük – Fenerbahçe | 1 – 2 | 6:11 | |
| 55. | Beşiktaş – Alanya | 3 – 0 | 7:02 | | 118. | Antalya – Alanya | 3 – 1 | 4:59 | |
| 56. | Sivas – Adana Demir | 1 – 2 | 4:47 | | 119. | Galatasaray – Kayseri | 6 – 0 | 4:11 | |
| 57. | Hatay – Trabzon | 2 – 1 | 12:31 | | 120. | İstanbul – Başakşehir | 1 – 0 | 9:21 | |
| 58. | Ankaragücü – Gaziantep | 0 – 2 | 9:06 | + | 121. | Adana Demir – Kasımpaşa | 5 – 0 | 5:02 | + |
| 59. | Antalya – Ümraniye | 3 – 2 | 9:29 | + | 122. | Fenerbahçe – Ankaragücü | 2 – 1 | 12:09 | + |
| 60. | Giresun – Galatasaray | 0 – 4 | 6:17 | + | 123. | Giresun – Sivas | 1 – 0 | 8:48 | |
| 61. | İstanbul – Kayseri | 2 – 4 | 7:59 | | 124. | Trabzon – Beşiktaş | 0 – 0 | 5:13 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 62. | Fenerbahçe – Kasımpaşa | 5 – 1 | 6:03 | + | 125. | Karagümrük – Ümraniye | 4 – 2 | 9:11 | |
| 63. | Başakşehir – Konya | 2 – 0 | 9:58 | | | TOTAL[4] | 388 | 1058 | 41 |

(https://www.tff.org/default.aspx?pageID=1628), (https://beinsports.com.tr/mac-ozetleri-goller/super-lig).

[1] Score: Match result.

[2] 90 + Duration: Additional time were recorded as Minute:Second.

[3] Minutes involving goals scored during additional time were recorded.

[4] Total number of goals scored at matches, total additional time and total number of goals scored during additional time were recorded.

* 2 goals were scored during additional time at 5 matches in total. When both teams scored 1 goal reciprocally at 3 of these matches, one team scored 2 goals at once at 2 of these matches.

### Data Analysis

Statistical analyses of research data were carried out with the Statistical Package for the Social Sciences (SPSS) 26.0 package program. Arithmetic average and standard deviation values were calculated with the Frequencies Analysis. Then, Paired Sample t-Test was used to test relevance of the difference between arithmetic averages of two groups. Pearson Correlation Analysis was applied at the end of this test to define the power of relation between parameters determining relevant relation according to $p<0,05$.

## FINDINGS

### Frequencies Analysis

**Table 3:** Frequencies Analysis Results of the First 125 Matches

| Variables | N | Mean | SD |
|---|---|---|---|
| Total Number of Goals | 125 | 2,85 | 1,94 |
| Additional Time | 125 | 6’25’’ | 2’17’’ |
| 90 + Number of Goals | 125 | 0,20 | 0,42 |

When average total number of goals was found out 2,85 according to the Frequencies Analysis of the first 125 matches, average additional time was found out 6’25’’and average number of goals scored during additional time was found out 0,20 in Table 3.

**Table 4:** Frequencies Analysis Results of the Last 125 Matches

| Variables | N | Mean | SD |
|---|---|---|---|
| Total Number of Goals | 125 | 3,10 | 1,56 |
| Additional Time | 125 | 8’28’’ | 2’46’’ |
| 90 + Number of Goals | 125 | 0,33 | 0,55 |

When average total number of goals was found out 3,10 according to the Frequencies Analysis of the last 125 matches, average additional time was found out 8’28’’ and average number of goals scored during additional time was found out 0,33 in Table 4.

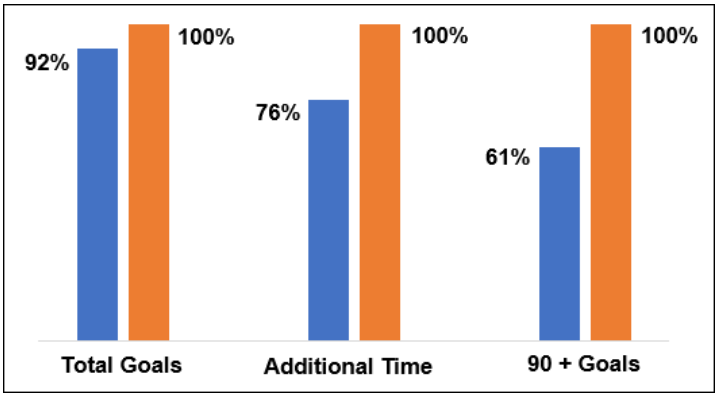


**Figure 1:** Percentage Value Comparison of the First 125 and the Last 125 Matches

Comparative percentage values of total number of goals, total additional time and total number of goals scored during additional time at the first 125 and the last 125 matches were given in Figure1.

1. When total number of goals were 388 at the last 125 matches, they were 356 (92%) at the first 125 matches.

2. When total additional time minutes were 1058 at the last 125 matches, they were 802 (76%) at thefirst 125 matches.

3. When total number of goals scored during additional time were 41 at the last 125 matches, theywere 25 (61%) at the first 125 matches.

**Paired Sample t-Test**

**Table 5:** Paired Sample t-Test Results of the First 125 and the Last 125 Matches

| Compared Parameters | t | p |
|---|---|---|
| Total Number of Goals of the First 125 Matches<br>Total Number of Goals of the Last 125 Matches | -1,109 | 0,270 |
| Additional Time of the First 125 Matches<br>Additional Time of the Last 125 Matches | -6,226 | 0,000* |
| The First 125 Matches 90 + Number of Goals<br>The Last 125 Matches 90 + Number of Goals | -2,093 | 0,038* |

*p<0,05

Below given results were collected according to the Paired Sample t-Test in Table 5:

1. With regards to additional time; relevant relation was found out between the first 125 and the last 125 matches according to p<0,05.

2. With regards to the number of goals scored during additional time; relevant relation was found out again between the first 125 and the last 125 matches according to p<0,05.

**Pearson Correlation Analysis**

The correlation analysis used to examine the relationships between evaluation parameters was based on the Pearson correlation coefficient (r) value. The correlation strength (absolute value of r) was determined using Evans' 1996 guideline. According to this; 0,00–0,19 is expressed as very low, 0,20–0,39 as low, 0,40–0,59 as medium, 0,60–0,79 as high and 0,80– 1,00 as very high correlation (7).

**Table 6: Results of Pearson Correlation Analysis**

| | Correlations | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **1** | Total Number of Goals of the First 125 Matches | 1 | | | | |
| **2** | Additional Time of the First 125 Matches | -0,094 | 1 | | | |
| **3** | The First 125 Matches 90 + Number of Goals | 0,364** | 0,252** | 1 | | |
| **4** | Total Number of Goals of the Last 125 Matches | -0,083 | – | -0,094 | 1 | |
| **5** | Additional Time of the Last 125 Matches | – | -0,062 | – | -0,082 | 1 |
| **6** | The Last 125 Matches 90 + Number of Goals | 0,078 | – | 0,028 | 0,271** | 0,246** |

**p<0,01 and *p<0,05

Below given results were collected according to the Pearson Correlation Analysis in Table 6:

1. At the first 125 matches; a high level of correlation (r=0,364) was found out between total number of goals, and total number of goals scored during additional time.

2. At the last 125 matches; a high level of correlation (r=0,271) was found out between total number of goals, and total number of goals scored during additional time.

3. At the first 125 matches; a low level of correlation (r=0,252) was found out between number of goals scored during additional time, and additional time minutes.

4. At the last 125 matches; a high level of correlation (r=0,246) was found out between number of goals scored during additional time, and additional time minutes.

## DISCUSSION

The value given to the fact that 'goal', the key determinant in football game format, can't be easily achieved, and the instinctive importance given to the effort to reach the goal attribute football a quiet different qualification compared to other sports branches (18). Thus, the joy of a goal in football lasts longer than other sports branches. For example, volleyball or a basketball player can't become happy for so long after a point or a basket, because they have to immediately go back to their positions and defense due to the game rules. Besides, scores of these matches don't consist of little numbers like football.

International Football Association Board (IFAB) published a handbook called Laws of the Game for season 2022–2023. In this handbook, the article number 3 called Allowance for time lost' under Law 7: The Duration of the Match is as follows: *Allowance is made by the referee in each half for all playing time lost in that halfthrough: • substitutions • assessment and/or removal of injured players • wasting time • disciplinary sanctions • medical stoppages permitted by competition rules, e.g. 'drinks' breaks (which should not exceed one minute) and 'cooling' breaks(ninety seconds to three minutes) • delays relating to VAR 'checks' and 'reviews' • any other cause, including any significant delay to a restart (e.g. goal celebrations). The fourth official indicates the minimum additional time decided bythe referee at the end of the final minute of each half. The additional time may be increased by the referee but not reduced* (11).

Aforementioned rules published by IFAB have been followed more carefully after the Qatar World Cup with instructions given by the Turkish Football Federation to the referees. In this regard, this research studied the matches in season 2022–2023 in Turkish Spor Toto Male Football Super League. The match results, additional time durations and goals scored during additional time were analyzed. According to the results obtained, in the matches played after the Qatar World Cup, although average additional time durations in the second half increased 32%, number of goals scored during additional time increased exactly 64%. This double difference had an impact on more match results and points of the teams. Thus, the hypothesis of this research was verified.

When other studies in the literature are viewed, since the topic of this research is very new, no studies on this topic were found. However, there are recent studies on goal analyses of the matches. In the analysis of the goals scored in the 2022 Qatar World Cup, Arı and Apaydın (2023) stated that the teams that advanced to the next round scored more goals as a result of organized attacks due to their tactical game structure, and conceded fewer goals from the defense center, organized attack and free kicks with the help of effective team defense (2). Arı et al. (2022) suggested that in the football season 2021–2022, in Turkish Super League, the first seven teams generally became successful by scoring more goals during the first half of the games and conceding fewer goals in the second half (3). Ağyol and Tanyeri (2022) found out that the goals scored during 2020 Europe Football Championship were more in the second half of the games and they were scored by midfield players with backward passing and as a result of organized offence starting from the midfield (1). Yavuz and Saygın (2021) concluded that teams of the British Premiere League were more successful than other teams in the league in Europe in respect to offence preparation and goal formation parameters (20). Hadi and Göral (2020) suggested that minutes between $46^{th}$–$60^{th}$ are when goals are scored most in 2020 Europe Football

Championship, and teams completing the first half as the leading team and the ones scoring the first goal generally won in all matches (9).

According to the conclusion of this research, especially after the 2022 Qatar World Cup, the matches aren't only ninety minutes for footballers. The matches may last up to two hours with additional time. The teams should consider this and organize training plans and programs. Considering recently extended additional time durations, it can be suggested that teams should put up more concentration, and physical and mental defense resistance in the second half. In addition to this, considering that second half of the games are almost one hour without any breaks, with extended additional time, teams which need goal also need more physical and mental endurance with regards to increasing fatigue, in order to be successful in offence variations.

At the end of this research, football teams may be given some suggestions because of extended additional time. Especially when additional time at the second half of the matches is extended, physical and mental endurance may become insufficient due the impact of increasing tiredness of footballers. Thus, teams may be suggested to appropriately organize training programs, and goalkeepers, who are important elements of teams during additional time, may be suggested to keep their tactical motivation levels high in order that teams can be more successful at offence variations and resist more during defense. In parallel with the topic, researchers may be suggested to analyze lower leagues in Turkey or other countries' leagues for future studies.

## CONCLUSION

In the movie 'Dar Alanda Kısa Paslaşmalar' which was about the impact of football on human life and released in 2000, following lines are like a metaphor on the relation between life and football with regards to duration; *"… life extremely resembles football. Football requires individual skills. It doesn't change. It is another kettle of fish. But it is also a game played collectively which means played as a team. Isn't life like this, too? It doesn't matter how talented you are. If you don't have a good team, it is nonsense. You will fail. Life extremely resembles football; four correct passes 90% make a goal …"* (15). This expression is in fact like a metaphor for the relation between life-football with regards to duration. A football match is 90 minutes and there are +s, just like 90 years and +s possible in human life.

Edwin Buzz Aldrin; the second person to walk on the moon, who got married on his 93rd birthday (90+3), John Bannister Goodenough; winning the Nobel Prize in Chemistry at the age of 96 (90+6), Fauja Singh; running a marathon at the age of 100 (90+10), Ingeborg Syllm-Rapoport; receiving a Doctorate degree at the age of 102 (90+12), Ruth Larsson; skydiving at the age of 103 (90+13), Muazzez İlmiye Çığ; the Sumerologist, still working at the age of 109 (90+19) and Natabay Tinsiew; living until the age of 127 and being the oldest person to have ever lived in the world (90+37) are only a few of these people.

*"This research, which enables us to make an inference between football and life, emerged as follows:"* On the match between Hatay–Kasımpaşa on February 5, 2023, the referee extended the match by six minutes. At 90 + (6:50) minutes the team Hatay won the match 1–0 with the goal scored by 'Christian Atsu Twasam' with a free kick. This goal which brought three points to the team became the last goal of Atsu who died almost ten hours later than the match due to the earthquake in Hatay. The last goal, which came during the extended 90 + minutes bringing felicity, of a person who doesn't know that he is living final hours of his life! If there weren't such an instruction about additional time after the Qatar World Cup in 2022, Atsu wouldn't probably have experienced this happiness during the final hours of his life. And what is more, Atsu was only 31 years old.

Life gets even more beautiful, during extended 90 + minutes…

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# Examination Of The Ability Of Boys in The Last Childhood To Say No According To Their Participation in Recreational Activities

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*Ethical Statement: It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited.*

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**Abstract**

Being able to say no is a very important coping skill for the last childhood period, as it is for every period of life. Participating in recreational activities improves children's ability to say no and increases their sense of curiosity. In this study, the ability of saying no to children who participated in recreational football activities in their last childhood and those who did not participate in any recreational activity was compared. The study group of the research consists of 211 boys in the last childhood period, 105 of whom participated in recreational activities between the ages of 9-11 in Ankara and 106 of whom did not participate in any recreational activities. In the study, Yılmaz and Sözer's (2018) Ability to Say No Scale and Personal Information Form were used. Descriptive statistics were used in the analysis of the data. There was no significant difference between children who participated in recreational fuubol activities and those who did not. In further analysis, it was determined that the children of university graduate fathers had higher ability to say no than the children of high school graduate fathers.

**Keywords:** Recreation, Ability to Say No, Late Childhood, Football

**Özet**

**Son Çocukluk Dönemindeki Erkek Çocuklarının Hayır Diyebilme Becerilerinin Rekreasyonel Etkinliklere Katılım Durumlarına Göre İncelenmesi**

Hayır diyebilme hayatın her döneminde olduğu gibi son çocukluk dönemi için de çok önemli bir baş etme becerisidir. Rekreasyon etkinliklerine katılmak çocukların hayır diyebilme becerisini geliştirmektedir ve merak duygusunu arttırmaktadır. Bu çalışmada son çocukluk döneminde rekreasyonel olarak futbol etkinliğine katılan çocuklar ve herhangi bir rekreasyon etkinliğine katılmayan çocukların hayır diyebilme becerileri karşılaştırılmıştır. Araştırmanın çalışma grubunu Ankara ilinde 9-11 yaş arası rekreatif etkinliklere katılan 105 ve herhangi bir rekreatif etkinliğe katılmayan 106 olmak üzere son çocukluk döneminde yer alan 211 erkek çocuk oluşturmaktadır.

Çalışmada Yılmaz ve Sözer (2018)'in Hayır Diyebilme Becerisi Ölçeği ve Kişisel Bilgi Formu kullanılmıştır. Verilerin analizinde tanımlayıcı istatistiklerden yararlanılmıştır. Rekreasyonel olarak futbol etkinliklerine katılan ve katılmayan çocuklar arasında anlamlı bir farklılık tespit edilmemiştir. İleri analizlerde ise, üniversite mezunu babaların çocuklarının lise mezunu babaların çocuklarına göre hayır diyebilme becerilerinin daha yüksek olduğu belirlenmiştir.

**Anahtar Kelimeler:** Rekreasyon, Hayır Diyebilme Becerisi, Son Çocukluk, Futbol

## INTRODUCTION

Individuals generally tend to want to say yes in order not to disappoint themselves or others throughout their lives. Saying no can be extremely difficult at times. However, gaining the habit of saying no provides important benefits for individuals to draw boundaries with others and set behavioral standards for their own mental health. Being able to say no stands out as an important coping skill in late childhood, as in every period of life (Nery et al., 2023). Ability to say no; It is defined as the rejection of situations, offers, risky behaviors that take place in a process and in which the individual, through his own will and choices, occur against his will or resist such situations. The decision-making, rejection and resistance steps of the ability to say no are included in this process. In the rejection dimension, the word "no" indicates rejecting an offer. In the resistance dimension, the situation of continuing the decision made with the word "no" is described (Aslan and Özcebe, 2008). It is thought that actively participating in leisure time activities in their last childhood years will be important in developing the skills of saying no, which is essential for boys who grew up in the Middle East culture to interpret the rules and norms correctly. It is seen that the ability to say "No" is easily acquired in the first years of life, that is, in infancy. Babies can easily express their emotions through behaviors in such situations (Yılmaz and Sözer's, 2018). When it comes to childhood, children acquire speaking skills, and language development is provided. This allows them to easily say "No" (Nery et al., 2023). With the effect of the culture in which the individual grew up on gender roles, we begin to become a member of society in the last childhood period, and social norms are increasingly taking place in our lives. As a result, some changes begin to take place in our language of communication, and many situations that we did not care about before appear as a source of anxiety. An individual's active participation in the socio-cultural environment and his ability to interpret that environment's values, rules, and norm systems are essential factors affecting his personality (Rose et al., 2009). Leisure time activities allow the individual to be aware of the options presented to him and to use also the elimination option in the stage of making the right choices by evaluating these options in every aspect.

The individual uses the "Skill of Saying No" when choosing the best, the worst and the most beneficial for himself. In fact, the individual not only directs his own life, but also contributes to the democratic functioning of the society he lives in, in the process of determining the goals he has set in his own life and realizing these goals. This makes a very important contribution to both the individual's own personality development and the progress of the society (McCarville & Mackay, 2013). For this reason, the ability of growing up boys in Middle Eastern culture to ability say no in their last childhood season, which will also be reflected in their adulthood, arouses curiosity. It is known that individuals' ability to express themselves and their creativity skills develop with leisure time activities. In addition, thanks to these activities, many features such as helping individuals, sharing, teamwork, determination, responsibility, problem-solving, establishing cause-effect relationships and developing motor skills emerge (Pala & Kolayiş, 2012).

It is thought that participation in leisure activities will affect the ability to say no, including the abilities of asking, making requests, expressing positive and negative emotions, initiating, maintaining and ending a behavior (Lazaruz, 1973). However a limited number of studies have been found in the literature and the aim of this study is to examine the ability of boys who participate in leisure time football activities to say no according to some sociodemographic conditions and to compare with children not participate in any leisure time activities.

Although it is seen that the ability to say no has different reflections in children, adolescents, adults and the elderly, it is seen that this skill develops suddenly in some individuals and emerges depending on various environmental conditions in others. No matter what type this skill develops; It is very important that other individuals do not violate their rights and accordingly they can freely realize their own ideas and behaviors

(Durualp and Aral, 2010). Warnings and norms, including condemnations and prohibitions applied by parents to children who continue to grow and develop, lead to a decrease in children's ability to say "No" over time. Children are taught that saying no is a wrong, problematic and disrespectful way of expression and as a result, it is seen that children remain silent and accept the situation in the face of many situations they do not want in order not to be referred to with negative qualifications (Yılmaz, 2017). It is known that in cultures where sociability and normativeism are at the forefront, being able to say "No" is not welcomed, and in these cultures such behavior hinders reconciliation and is perceived as rude. The essence of this negative situation is that submission in society and family comes before personal needs and desires. However, in societies and cultures where individuals are valued for being an individual, saying “No” is not a blessing, but an ordinary and valid human behavior (Bozkurt, 2020). Based on all this; Starting from childhood, including adulthood and even old age, a society that cannot say “No”, does not see the authority to refuse when it wants, and is far from being an individual, is emerging. To summarize in general; we can list the factors of not being able to say “No” as follows; Fear and uneasiness of hurting the other person's feelings, fear of being left, not accepted or abandoned, tendency to be dependent on a situation or another person, fear of feeling embarrassment, fear of punishment, fear of being seen as a selfish or bad person by the society, not being morally healthy, there are many factors such as the fear of being conscientiously uneasy, and the anxiety of succumbing to the feeling of guilt (Townsed and Cloud, 2002).

Being able to say no is a very important coping skill for the last childhood period, as it is for every period of life. Participating in recreational activities can improve children's ability to say no. However, a limited number of studies on this subject have been found in the literature. The purpose of this study; The aim of this study is to examine the saying no skills of late childhood boys who participate in recreational activities according to some socio-demographic conditions and to compare them with the saying no skills of late childhood boys who do not participate in any recreational activities.

## METHOD

### Research Group

The study group consists of 211 boys in their last childhood, 105 of whom regularly participate in recreational activities and 106 who do not participate in any recreational activities, living in the province of Ankara, between the ages of 9-11. "Purposeful sampling method", which is one of the nonprobabilistic sampling methods, was used in the study.

### Data Collection Tools

In the study, the Personal Information Form and the Ability to Say No Scale were used to reveal the demographic characteristics of the participants. In the 'Personal Information Form' developed by the researchers, questions were asked about age, gender, mother's education level, father's education level and family economic status.

The Ability to Say No Scale: The Ability to Say No Scale (AS), which was developed by Yılmaz (2017) and whose validity and reliability studies were conducted by Yılmaz and Sözer (2018), was used after obtaining necessary permissions. PE is a self-reported scale consisting of 12 items to measure students' ability to say "no". This scale consists of rejection and resistance dimensions with six items each. The rejection dimension includes items that measure whether students can say "no" to requests and behaviors that they do not like or find reliable. In the dimension of resistance, there are statements to determine whether students take a step back in the face of manipulation efforts that they may encounter with the emotions they experience after saying "no". Students are asked to rate each statement in the items on a 5-point Likert scale as “Never”, “Rarely”, “Sometimes”, “Often” and “Always”. The reliability analysis of this study was determined as Cronbach's Alpha 0.77.

### Data Collection

The permission of the University Human Research Ethics Committee was obtained from Selçuk University Faculty of Sport Sciences and then the data were collected face-to-face by the researcher from primary and secondary schools. The participants were explained about the purpose of the study and were informed about the completion of the data collection tools, and their voluntary participation in the study was ensured. After

the data were collected, incomplete or incorrectly completed forms were deleted from the data set by the researcher.

**Data Analysis**

In this study, descriptive statistical analyses (frequency, arithmetic mean, standard deviation, minimum-maximum values) were performed after testing whether the data were normally distributed (testing the assumptions) and homogeneity of variances, and then t-test and analysis of variance (ANOVA) were performed to show the difference between variables to answer the research question. Cronbach Alpha reliability coefficient was calculated for the whole scale and its sub-dimensions. All analyses were performed using IBM SPSS Statistic 22.0 statistical package program.

## FINDINGS

In this section, the findings collected from the research are presented. Findings regarding the descriptive statistics of the demographic characteristics of all participants, descriptive statistics of the participants' ability to say no scale, t-test analysis of the participants' ability to say no scale according to their participation in recreational activities, and ANOVA test analysis of the participants' ability to say no scale according to their father's education level are included.

**Table 1.** Characteristics of Participating Boys

| **Variables** | | **n** | **%** |
|---|---|---|---|
| **Age** | 9 | 46 | %21.8 |
| | 10 | 50 | %23.7 |
| | 11 | 115 | %54.5 |
| **Mother Education** | Primary school | 39 | %18.5 |
| | High school | 80 | %37.9 |
| | University | 77 | %36.5 |
| | Postgraduate | 15 | %7.1 |
| **Father Education** | Primary school | 23 | %10.9 |
| | High school | 80 | %37.9 |
| | University | 84 | %39.8 |
| | Postgraduate | 24 | %11.4 |
| **Participation of Recreation Activities** | Yes | 105 | %49.8 |
| | No | 106 | %50.2 |
| **Total** | | 211 | %100 |

Descriptive statistics of the demographic characteristics of the total participants are given in Table 1. According to the participation status in recreational activities, the number of those who said yes is 105, while the number of those who said no is 106 and there are a total of 211 participants. This table includes participant age groups, parental education levels, and the numbers and percentages of being able to say yes or no.

**Table 2.** Responses of the Scale of Participants' Ability to Say No

| | **N** | **Min.** | **Max.** | $\bar{X}$ | **SS** |
|---|---|---|---|---|---|
| **Rejection** | 211 | 1.00 | 5.00 | 4.10 | .731 |
| **Resistance** | 211 | 1.00 | 5.00 | 3.91 | .892 |
| **Total Point** | 211 | 26.00 | 60.00 | 48.07 | 7.385 |

If we evaluate the "Scale of Saying No" for children over the total score, the minimum score to be taken from the scale is 26, and the maximum score is 60. The mean total value for these data was calculated as '48.07'.

**Table 3.** Responses of Participants' Ability to Say No According to Their Participation in Recreational Activities

| | | N | $\bar{X}$ | SS | t | p |
|---|---|---|---|---|---|---|
| **Rejection** | Participating | 105 | 4.06 | .759 | -.617 | .538 |
| | Unparticipating | 106 | 4.13 | .706 | | |
| **Resistance** | Participating | 105 | 3.93 | .779 | .313 | .725 |
| | Unparticipating | 106 | 3.88 | .994 | | |
| **Total Point** | Participating | 105 | 48.01 | 7.02 | -.111 | .912 |
| | Unparticipating | 106 | 48.13 | 7.75 | | |

p>0.01

In Table 3, according to the t-test analysis results of the participants' ability to say no scale and their participation in recreational activities; No significant difference was detected between those who participated in the activities and those who did not.

**Table 4.** Responses of Participants' Ability to Say No According to Father's Educational Status

| Subscales | Elementrary (n=23) | Collage (n=80) | Bachelor (n=84) | Masterdegree (n=24) | F | P |
|---|---|---|---|---|---|---|
| **Rejection** | 4.01±0.62 | 3.98±0.79 | 4.32±0.59 | 3.79±0.86 | 4.94 | .002 |
| **Resistance** | 3.82±0.70 | 3.93± 0.79 | 3.86±1.06 | 4.09±0.69 | 0.47 | .699 |
| **Total Mean** | 3.92±0.55 | 3.95±0.58 | 4.09 ±0.63 | 3.94±0.68 | 0.95 | .417 |
| **Total Point** | 47.04±06.65 | 47.50±07.04 | 49.11±07.65 | 47.33±08.19 | 0.95 | .417 |

Whether the variances were homogeneous or not was evaluated according to the Levene test result, and since the variances were homogeneous, the analysis was continued with the Tukey test, which is one of the Post-hoc tests. According to the Tukey test results; It has been determined that the children of university graduate fathers have higher ability to say no than the children of high school graduate fathers.

## DISCUSSION AND CONCLUSION

According to the findings of the study, when the ability to say no according to the educational status of the fathers of the children who play soccer recreationally is examined, it is seen that the ability to say no of the children of university graduate fathers is higher. In this section, the findings collected from the research are presented. Findings regarding the descriptive statistics of the demographic characteristics of all participants, descriptive statistics of the participants' ability to say no scale, t-test analysis of the participants' ability to say no scale according to their participation in recreational activities, and ANOVA test analysis of the participants' ability to say no scale according to their father's education level are included. As a result of further analyses, it is seen that there is a significant difference in the ability to say no between the children of high school graduates and the children of university graduates, and that the children of university graduates have higher ability to say no than the children of high school graduates. It is known that the level of parental education has an effect on the child's ability to say no in parental attitudes (Karahan, 2009). In their study, Özyürek and Tezel (2005) found that parents with low levels of education generally exhibited overprotective attitudes, had more limited democratic views compared to other parents, and exhibited a rather harsh attitude in their disciplinary behaviors. Studies have shown that such parents adhere too much to traditional norms. Over time, such attitudes establish a rigid authoritarian structure over the child and hinder the development of their ability to say no (Haddou, 2013).

Similar results were obtained and it was explained that parental education level had a positive effect on children's ability to say no. When similar studies in the literature are examined, there are not many studies within the conceptual framework of the ability to say no. The studies have mostly focused on the dimensions of "assertiveness and the ability to say no to sexual abuse". Leclerc et al. (2011) concluded in their study that one of the most effective strategies is to protect children against sexual abuse by exhibiting the ability to say no instead of protecting themselves by others. Hinton et. al (2020), in their study on the ability to say "no" in adults, stated that many students and early career scientists often accept new tasks and small jobs when they

cannot say "no" and have to overwork at the end of the job. Therefore, they emphasized that learning how and when to say "no" becomes an important part of career development from an early age.

Bozkurt (2020) found a moderate positive relationship between assertiveness and saying no in the resistance dimension, while a good positive relationship was found in the rejection sub-dimension. Depending on age, it is seen that the ability to say no acquired in the early period is beneficial in terms of exhibiting this behavior more easily in the following years (Belgrave et al., 2004). In his study, Yüce (2002) obtained different results according to the grade level depending on the rejection behavior among the sub-dimensions of the ability to say no.

In a study, it was determined that the ability to say no was lower in children whose fathers had never attended school compared to children whose fathers had education (primary school, secondary school, high school) (Özyürek & Tezel Şahin, 2005). This finding supports the results of this study. Father's education is an important chance for a child. The experiences of educated people at school will give them a different perspective (Özyürek & Tezel Şahin, 2005).

This situation will also spread to their children. Each individual bears deep similarities passed down from their parents, and the attitudes and behaviors of parents while raising individuals are reflected in the whole life of children (Karahan, 2009). The father is an important role model. The study consists of male students and it can be said that the father's educational status is reflected in the children's ability to say no due to the fact that boys take their fathers as role models. Bandura (1997), in his study with children between the ages of 5-11, emphasized that the last childhood period is among the critical periods and stated that the learning that takes place in this period is through observation and modeling rather than direct learning (Gürel, 2014). In addition, there are some studies indicating that the educational status of the parents has no effect on the child in terms of the ability to say no (Pamuk, 2016). The reason why there was no significant difference between the participants and non-participants in the study according to other socio-demographic characteristics or between the participants and non-participants in recreational soccer activities can be explained by the lack of sufficient sample size. In addition, this situation also shows the limitation of the study. The research group is limited to boys aged 9-11 who live in Ankara and are in their last childhood. The research is limited to "Purposive sampling method", which is one of the non-probability sampling methods.

**Conclusion**

In the results of the study, it was observed that there was a difference in the rejection sub-dimension of the father's education level variable ($p<0.01$) and the analysis continued with the Tukey test and the results of the Tukey test showed that the children of university graduate fathers had higher ability to say no than the children of high school graduate fathers. In other words, we can say that the higher the fathers' level of education, the higher the children's rejection skills. The results were supported by similar studies. The fact that there was no difference in some variables in the sub-dimensions of rejection and resistance in our study may be due to the low sample group. In line with the results obtained from the study, it is recommended to plan screening and correlational studies with larger sample groups and to support increasing the ability to say no through experimental studies. Additionally, suggestions are needed for studies to be conducted with sample groups including both genders and different types of sports activities.

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# The Association between Physical Activity Levels and Social Media Addiction among Adolescents: A Descriptive Correlational Study

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**Abstract**

The aim of this study is to evaluate the relationship between physical activity levels and social media addiction in adolescents. The study was structured as a descriptive correlational research, comprising a cohort of 160 volunteer students (90 female and 70 male) residing in Ağrı, Turkey. The female students had an average age of 15.5 ± 1.2 years, while the male students had an average age of 15.0 ± 1.4 years. Data collection was conducted using two instruments: the Social Media Addiction Scale for Adolescents and the abbreviated version of the International Physical Activity Questionnaire. Data analysis encompassed correlation and regression techniques, with statistical analysis performed using the SPSS statistical software version 26 (SPSS, Inc., Chicago, IL, USA). The results of the study revealed that there was no significant relationship between the participants' physical activity levels and their social media addiction (Beta = 0.53, $p > 0.05$). It's noteworthy that the R-squared value is negative (-0.07). However, a strong positive correlation was identified between the participants' gender and their overall physical activity levels ($z = -2.41$, $p < 0.05$). This positive correlation was also observed in all sub-dimensions, specifically in walking ($z = -2.16$, $p = 0.02$), vigorous activity ($z = -2.22$, $p = 0.02$), and moderate activity ($z = -2.61$, $p = 0.01$). Furthermore, there was no difference in the mean score distributions of the Social Media Addiction Scale for Adolescents by gender ($F = 1.34$, $p = 0.23$). However, a weak positive correlation was found between social media addiction and the age of the students ($r = 0.362$, $p = 0.01$*). In conclusion, this study does not establish a significant association between social media addiction and physical activity levels in adolescents. However, it highlights a positive correlation between participants' gender and their physical activity levels. These findings may be useful in developing interventions to promote physical activity and reduce social media addiction in adolescents.

**Keywords:** Behavior, Lifestyle, Social Media Impact.

**Özet**

**Ergenlerde Fiziksel Aktivite Düzeyleri ve Sosyal Medya Bağımlılığı Arasındaki İlişki: Tanımlayıcı Korelasyonel Bir Çalışma**

Bu çalışmanın amacı, ergenlerde fiziksel aktivite düzeyleri ile sosyal medya bağımlılığı arasındaki ilişkiyi değerlendirmektir. Çalışma, Ağrı'da ikamet eden 160 gönüllü öğrenciden (90 kız ve 70 erkek) oluşan bir kohortu içeren tanımlayıcı bir korelasyonel araştırma olarak yapılandırılmıştır. Kız öğrencilerin yaş ortalaması 15.5 ± 1.2, erkek öğrencilerin yaş ortalaması ise 15.0 ± 1.4'tür. Veri toplama iki araç kullanılarak gerçekleştirilmiştir: Ergenler için Sosyal Medya Bağımlılığı Ölçeği ve Uluslararası Fiziksel Aktivite Anketi'nin kısaltılmış versiyonu. Veri analizi korelasyon ve regresyon tekniklerini kapsamış ve istatistiksel analiz SPSS istatistik yazılımı sürüm 26 (SPSS, Inc., Chicago, IL, ABD) kullanılarak gerçekleştirilmiştir. Çalışmanın sonuçları, katılımcıların fiziksel aktivite düzeyleri ile sosyal medya bağımlılıkları arasında anlamlı bir ilişki olmadığını ortaya koymuştur (Beta = 0.53, $p > 0.05$). R-kare değerinin negatif (-0.07) olması dikkat çekicidir. Bununla birlikte, katılımcıların cinsiyetleri ile genel fiziksel aktivite düzeyleri arasında güçlü bir pozitif korelasyon tespit edilmiştir ($z = -2.41$, $p < 0.05$). Bu pozitif korelasyon, özellikle yürüme ($z = -2.16$, $p = 0.02$), şiddetli aktivite ($z = -2.22$, $p = 0.02$) ve orta şiddetli aktivite ($z = -2.61$, $p = 0.01$) olmak üzere tüm alt boyutlarda da gözlemlenmiştir. Ayrıca, Ergenler için Sosyal Medya Bağımlılığı Ölçeğinin ortalama puan dağılımlarında cinsiyete göre bir fark bulunmamıştır ($F = 1.34$, $p = 0.23$). Ancak, sosyal medya bağımlılığı ile öğrencilerin yaşları arasında pozitif yönde zayıf bir korelasyon bulunmuştur ($r = 0.362$, $p = 0.01$*). Sonuç olarak, bu çalışmada ergenlerde sosyal medya bağımlılığı ile fiziksel aktivite düzeyleri arasında anlamlı bir ilişki kurulmadığı ortaya konmuştur. Ancak, katılımcıların cinsiyetleri ile fiziksel aktivite düzeyleri arasında pozitif bir korelasyon olduğunu vurgulanmaktadır. Bu bulgular, ergenlerde fiziksel aktiviteyi teşvik etmeye ve sosyal medya bağımlılığını azaltmaya yönelik müdahalelerin geliştirilmesinde faydalı olabilir.

**Anahtar Kelimeler:** Davranış, Yaşam tarzı, Sosyal Medya Etkisi.

## INTRODUCTION

Physical activity can be defined as activities that take place with energy consumption by using our muscles and joints in daily life, increase heart and respiratory rate and result in fatigue at different intensities. In daily life, running, walking, cycling for at least 30 minutes every day, using the stairs instead of the elevator, doing housework, and doing physical activity in the garden develops an active lifestyle (1, 2). Physical activity reduces the risk of chronic disease and early mortality, and makes an important contribution to preventing bone, muscle, and joint diseases. In addition, it has been stated that regular moderate physical activity can prevent the formation of cardiovascular diseases, prevent obesity, improve mood, and increase life satisfaction (3). Lack of physical activity can cause chronic diseases such as obesity, coronary heart disease, non-insulin dependent diabetes, and mental problems (3, 4).

Adolescence represents a pivotal stage in the transition to adulthood, typically coinciding with high school years, during which both social and academic responsibilities concurrently intensify. The literature has documented the potential decrease in physical activity and subsequent reduction in calorie expenditure among young individuals resulting from technological advancements (5). In recent years, there has been a growing recognition that this prevailing trajectory may be disrupted by the adoption of technology as a forward-looking instrument to promote physical activity, exemplified by the emergence of exergaming (4, 6). Nevertheless, it becomes imperative to scrutinize the role of social media, which commands the most substantial portion of individuals' internet usage.

In today's world, characterized by widespread mobile and online presence, social media can be defined as a tool that provides individuals and organizations with an open platform for sharing and communication without boundaries. It facilitates communication among individuals and institutions, fostering free discourse. Online social groups are structured around the use of words, visuals, video recordings, and audio to convey ideas to other group members through media applications and behaviors, collectively constituting the realm of social media (7, 8).

Adolescents use social networks for various reasons such as communication with family and friends, accessing information and entertainment (9). Agosto et al., (10), Ahn (11) and Donmez et al., (12) found that adolescents and young people mostly use social networks to interact with others. The reason why social media is used for interaction purposes is that friendships and communication between children and young people are seen as an important need (13).

Social media addiction is a psychological problem that causes problems such as preoccupation, repetition, and conflict in many aspects of a person's daily life, such as private, work/academic, and social areas (14). With intense use of social media, the occurrence of problems in fulfilling the responsibilities of individuals and the hindrance of this in their life activities lead to disruption of activities in the daily life of individuals, spending more time on social media, and loss of time (15). Students who spend a lot of time on the internet and social media applications can be influenced by these applications and break away from social life (16). In addition, it has been stated that social media negatively affects interpersonal relationships (17), psychological health (18), and private life (19). In light of all these considerations, the aim of this study is to investigate the relationship between social media addiction and physical activity levels in adolescents.

## METHOD

### Research group

The research group consisted of volunteer students (90 female, 70 male) residing in Agri, Turkey. Two scales were used as the data collection tool. The first scale used in the study is the Social Media Addiction Scale for Adolescents (20) and the other is the short form of the "International Physical Activity Questionnaire" (21). Both of these scales are validated and reliable.

### International Physical Activity Questionnaire (IPAQ)

The International Physical Activity Questionnaire (IPAQ) was used to determine the physical activity level of the volunteers (22). The validity and reliability of the questionnaire in Turkish were conducted by Saglam et al. in 2010 (23). In the study, a self-administered short form of 7 questions covering the last 1 week was used to evaluate the level of physical activity. The calculation of the total score of the short form includes the sum of time (minutes) and frequency (days) of walking, moderate-intensity activity, and vigorous activity. The sitting score is calculated separately. The questionnaire includes questions about physical activity that was done for at least 10 minutes in the last week. A score is obtained as "MET-minutes/week" by multiplying the minutes, days, and MET values. Walking time (minutes) was multiplied by 3.3 METs to calculate the walking score. In the calculation, 4 METs for moderate-intensity activity and 8 METs for vigorous activity were taken. Physical activity levels include those who are not physically active (<600 MET-min/week), low physical activity level (low active) (600-3000 METmin/week), and adequate physical activity level (beneficial for health) (>3000 MET-min/week) (22).

### Social Media Addiction Scale for Adolescents

The Social Media Addiction Scale for Adolescents was created by Ozgenel et al. (2019) and consists of 9 items graded on a 5-point Likert scale (Never-1, Rarely-2, Sometimes-3, Often-4, Always-5) (20). There are no reverse scored items in the scale. A minimum score of 9 points and a maximum score of 45 points can be obtained from the scale. To obtain a total score from the scale, the answers given to all items are collected. The higher the total score calculated, the higher the individual's social media addiction is, and the lower the total score, the lower the individual's social media addiction is. The Cronbach Alpha value of the scale was found to be 0.90 and was found to be 0.88 after its use in the study (3).

### Data collection process and analysis of data

The data for this research were collected through face-to-face interviews in March 2023, utilizing self-administered forms. The data acquired in this study were analyzed using the SPSS statistical software version 26 (SPSS, Inc., Chicago, IL, USA). Numbers, percentages, minimum and maximum values, mean and standard deviation were used in the evaluation of the data. However, the conformity of the data to the normal distribution was also examined with the Shapiro-Wilk's test and it was found that the data were not suitable for the normal distribution. In the analysis of the data, percentages, frequencies, chi-square test were used to

examine the relationship between binary categorical variables and Mann Whitney U test was used to determine the relationship between the variables. In our study, "p< 0.05" was considered statistically significant.

**Ethical aspect of research**

Throughout the research, the ethical principles outlined in the Helsinki Declaration were adhered to. Prior to commencing the study, requisite approval was obtained from the Non-Interventional Ethics Committee of Agri Ibrahim Cecen University, with the protocol number E-95531838-050.99-67830. Before starting to answer the survey questions, the students participating in the research were fully informed about the study via the link created for the survey form, and their informed consent was obtained prior to them filling out the survey questions.

**Limitations of the research**

Collecting the research data online and conducting the research in a single institution constitute the limitations of the research.

## FINDINGS

It was determined that 55.6% of the individuals were women, whereas 44.4% were men, with an average age of 15.26 ± 1.35 years. Specifically, female students had an average age of 15.5 ± 1.2 years, while male students had an average age of 15.0 ± 1.4 years (Table 1).

**Table 1.** Descriptive Statistics of Individuals

| Variables | (n:160) | Avarage Age (X±SS) | % |
|---|---|---|---|
| Gender | Woman (n:90) | 15.5 ± 1.2 | 55.6 |
| | Male (n:70) | 15.0 ± 1.4 | 44.4 |
| Total (n:160) | | 15.26 ±1.35 | 100 |

There is no difference between the Social Media Addiction Scale for Adolescents mean score distributions by gender (p >0.05) (Table 2).

**Table 2.** The Relationship Between Individuals' Gender and Social Media Addiction

| | Woman ( n :90) | Male ( n :70) | Total ( n :160) | F | P |
|---|---|---|---|---|---|
| When I don't use social media, I get angry, worried, or sad. | 2.91±1.19 | 2.93±1.00 | 2.92±1.08 | 1.37 | 0.24 |
| There are always activities that I think about doing or will do on social media on my mind. | 2.85±1.45 | 2.48±1.12 | 2.65±1.28 | 0.03 | 0.84 |
| Since I use social media a lot, I don't have time for other activities or hobbies such as movies, theater, music, or sports. | 2.54±1.12 | 2.37±1.17 | 2.45±1.14 | 0.42 | 0.36 |
| While browsing social media, I extend the time by saying "just a little more." | 3.08±1.31 | 3.35±1.17 | 3.23±1.23 | 0.09 | 0.63 |
| Although social media negatively affects my work, school, or family life, I continue to use it. | 2.94±1.28 | 3.17±1.13 | 3.07±1.19 | 0.14 | 0.70 |
| I have a hard time trying to control, reduce or stop my social media use. | 3.57±1.24 | 3.37±1.23 | 3.46±1.23 | 0.05 | 0.82 |
| I use social media more to feel happy. | 2.60±1.00 | 2.80±1.09 | 2.71±1.05 | 0.07 | 0.78 |
| I hide the amount of time I spend on social media from my family or people around me. | 2.34±1.02 | 2.62±1.00 | 2.50±1.01 | 0.04 | 0.82 |
| Because of the time I spend on social media, I have serious conflicts in my relationships with people (family, friends and social environment). | 2.91±1.03 | 3.17±1.05 | 3.06±1.04 | 2.42 | 0.12 |
| Total Score Average | 26.22±3.60 | 25.77±4.44 | 26.07±3.98 | 1.34 | 0.23 |

The mean total score of social media addiction according to the age of the participants is shown in Table 3. Accordingly, a weak positive correlation was found between social media addiction and the age of the students (p<0.05).

**Table 3.** The Relationship Between Individuals' Ages and Social Media Addiction

| Age | SMBI Rating Range | | Mean | SD | r-p |
|---|---|---|---|---|---|
| | Minimum | Maximum | | | |
| 13 (n:16) | 19 | 34 | 24.46 | 3.83 | **0.362** |
| 14 (n:42) | 16 | 32 | 24.96 | 3.32 | **P=0.01*** |
| 15 (n:26) | 12 | 35 | 25.88 | 3.82 | |
| 16 (n:36) | 16 | 35 | 26.78 | 4.37 | |
| 17 (n:40) | 15 | 36 | 27.42 | 4.60 | |
| Total (n:160) | 12 | 36 | 26.07 | 3.98 | |

* p<0,05

The relationship between the physical activity levels of the participants and their social media addiction is shown in Table 4. No relationship was found between the physical activity levels of the participants and social media addiction (p>0.05).

**Table 4.** The Relationship Between Individuals' Physical Activity Levels and Social Media Addiction

| Dependant Variables IPAQ Total Score | Independent Variable | p | R2 | Beta |
|---|---|---|---|---|
| SMASCA Q1 | | **.05** | **1.94** | **.12** |
| SMASCA Q2 | | **.31** | **1.01** | **-.02** |
| SMASCA Q3 | | **.85** | **-.17** | **-.03** |
| SMASCA Q4 | | **.75** | **-.31** | **-.08** |
| SMASCA Q5 | | **.52** | **-.63** | **.07** |
| SMASCA Q6 | | **.53** | **.61** | **.01** |
| SMASCA Q7 | | **.91** | **.11** | **.04** |
| SMASCA Q8 | | **.69** | **.39** | **-.12** |
| SMASCA Q9 | | **.36** | **-.92** | **-.08** |
| **SMASCA TOTAL SCORE** | | **.53** | **-.08** | **-.07** |

SMASCA: Social media addiction scale for adolescents.

Table 5 provides a comprehensive overview of the relationship between gender and physical activity levels among the study participants. The table reveals that males, comprising 70 individuals, generally exhibit higher physical activity scores across all categories compared to females (90 individuals). Specifically, males have notably higher mean scores for walking activity, vigorous activity, moderate activity, and total activity. Statistical analysis using the Z-test demonstrates that these differences are statistically significant ($p < 0.05$) in all categories, indicating that gender plays a substantial role in influencing physical activity levels.

**Table 5.** The Relationship Between Individuals' Gender and Physical Activity Levels

| Physical Activity Scores | Male (n:70) | | Female (n:90) | | Z | p |
|---|---|---|---|---|---|---|
| | Mean±SD | Min-Max | Mean±SD | Min-Max | | |
| **Walking Activity Score (MET-min/wk)** | 518.33±361.98 | 120-1000 | 316.48±268.54 | 120-980 | -2.16 | **0.02** |
| **Vigorous Activity Score (MET-min/wk)** | 1442.30±1224.18 | 200-4200 | 410.35±448.33 | 150-2520 | -2.22 | **0.02** |
| **Moderate Activity Score (MET-min/wk)** | 1116.13±950.81 | 150-3200 | 448.88±461.99 | 150-2520 | -2.61 | **0.01** |
| **Total Score (MET-min/wk)** | 3076.77±1281.23 | 1160-6740 | 1175.73±618.35 | 455-3373 | -2.41 | **0.01** |

*** p<0.05, MET-min/wk: Metabolic equivalent of task per minute per week.**

## DISCUSSION AND CONCLUSION

In this section, the findings regarding the relationship between social media addiction and physical activity levels in adolescents are discussed in line with the literature.

In our study, we observed that there was no significant difference in the mean score distributions of the Social Media Addiction Scale for Adolescents when analyzed by gender ($p > 0.05$). However, it is worth noting that our findings contrast with some previous studies. For instance, Guner et al. (2022) found that female students exhibited a higher and statistically significant level of social media addiction compared to male students ($p < 0.05$) (24). Similarly, studies conducted by Guney and Tastepe (2020), Eryilmaz and Cukurluoz (2018), and Balci and Golcu (2013) on social media addiction among adolescents have consistently reported a higher prevalence of social media addiction among girls (25-27). These studies have highlighted the differences in social media usage patterns between genders, with females often engaging more in social media activities. However, it's important to acknowledge that our study's results align with some previous research that also did not find a significant difference in social media addiction based on gender among adolescents (28-30). These mixed findings indicate that the relationship between gender and social media addiction is complex and may vary depending on various factors, including cultural, social, and individual differences. Future research in this area may benefit from a more in-depth exploration of the underlying factors contributing to these gender-related differences in social media addiction among adolescents.

A weak positive correlation was found between social media addiction and the age of the students ($p < 0.05$). While it was determined that the level of internet addiction is highest in the age group of 15-16 years (31), the findings regarding social media addiction are more complex. It is also noteworthy that there is no consensus among studies regarding the association between age and social media addiction. For instance, some research has indicated that young people (32-34) tend to exhibit problematic social media use, while others have not found any significant relationship (16, 35) or have reported that older users (36) are more prone to problematic social media use. Factors such as increased independence, academic pressure, social connections, and the need for communication can be cited among the reasons for the potential tendency of increasing social media addiction in adolescents with age (37-39). These factors may contribute to the escalation of social media usage as adolescents grow older.

In our study, no relationship was found between the physical activity levels of the participants and their social media addiction ($p > 0.05$). In a study conducted by Huang et al. (2022), similar to our research, no significant relationship was found between problematic use of the Internet/smartphone and the level of

physical activity (40). These findings do not support the commonly held hypothesis that there would be negative associations between different types of social media addiction and levels of physical activity observed over time, nor do they align with previous study results (41, 42). This intriguing observation may be partially explained by the multitask theory (43), suggesting that the use of social media and online gaming might overlap with physical activity. In other words, the potential health-promoting effects of social media (44) or the health-facilitating effects of online gaming (45) could partly contribute to individuals engaging in physical activity, although this remains a speculative possibility.

A strong positive correlation was found between the genders of the participants and their moderate physical activity and total physical activity levels ($p < 0.01$). Similarly, a positive correlation was found between the gender of the individuals, their walking score, and vigorous physical activity ($p < 0.05$). Studies conducted in the literature review support the result. Baydemir et al. (2018) conducted a study on children aged 11-13 years and found that boys had higher physical activity levels than girls (46). Kocak et al. (2002) found significant differences in the physical activity levels of male and female students aged 11-14 (47). Talema and Yang (2000) stated in their study that boys have a higher level of physical activity than girls (48). Coskun and Ozer (2018) stated in their research that physical activity scores for girls at secondary school level are lower than for boys (49). Karaaslan and Celebioglu (2018) found that the physical activity average score of male students is higher than the average score of female students (50). Keskin et al. (2017) found that male students' scores were higher than female students in their research with secondary school students (51). The findings of our study are consistent with the existing body of literature. The heightened level of physical activity observed in males can be attributed to a range of factors, including inherent biological distinctions, prevailing cultural and societal norms, familial and societal pressures, early life experiences, and the prevailing social environment (52).

In conclusion, the study findings suggest that there is no significant association between social media addiction and physical activity levels in adolescents. However, considering the limitations of this study, further investigation is warranted across different regions and age groups to gain a more comprehensive understanding of this relationship. In an era marked by continuous technological advancements and the widespread use of social media, it becomes imperative to delve into the potential underlying factors and consequences of this association and to implement appropriate measures to address any potential adverse effects. In this context, future research should prioritize examining the impact of social media addiction among adolescents engaged in sports participation and consider comparisons with inactive or sedentary individuals or within various sports disciplines for a more nuanced perspective.

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# The Effect of Pilates Exercises Applied to Overweight and Obese Women on Body Composition

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**Abstract**

The aim of this study was to examine the effect of mat pilates exercises applied to sedentary overweight and obese women on body composition. A total of 22 (11 training, 11 control) overweight and obese female individuals aged between 35-65 participated in the study voluntarily. While 45 minutes of mat pilates exercise was applied to the training group 3 days a week for 12 weeks, the control group was not included in any exercise program. Age, height, body weight, waist and hip circumferences of all participants (training + control) participating in the study were determined at the beginning of the study, and waist/hip ratio, body fat percentage (BFP), body fat mass (BFM), body mass index (BMI) were determined by Bioelectrical Impedance Analysis (Bodystat Quadscan 4000) method, lean body mass (LBM) and lean body mass index (LBMI)were measured and the measurements were repeated at the end of the study. SPSS 22.0 IBM statistical package program was used to evaluate the obtained data. While evaluating the study data, descriptive statistical methods (mean, standard deviation) and independent samples t-test for normally distributed variables and Paired Samples t-test for dependent groups were used. Mann-Whitney U test and Wilcoxon Signed Ranks test were applied for the variables that did not show normal distribution. Statistical significance level was accepted as 0,05. According to the research findings, when the pre-test-post-test values of the training and control groups were compared, the waist circumference, BFP, BFM and BMI values at the beginning of the study, and at the end of the study A statistically significant difference was determined in favor of the training group in all parameters except mass LBM and LBMI ($p<0.05$). As a result, it was concluded that regular pilates exercises applied to middle-aged sedentary overweight and obese women had a positive effect on the body composition of individuals.

**Keywords:** Overweight, Obese, Body Composition, Pilates Exercise.

**Özet**

**Fazla Kilolu ve Obez Kadınlara Uygulanan Pilates Egzersizlerinin Vücut Kompozisyonu Üzerine Etkisi**

Bu çalışmanın amacı fazla kilolu ve obez sedanter kadınlara uygulanan mat pilates egzersizlerinin vücut kompozisyonu üzerine etkisinin incelenmesidir. Araştırmaya yaşları 35-65 yaş arası değişen toplam 22 (11 antrenman, 11 kontrol) fazla kilolu ve obez kadın birey gönüllü olarak katılmıştır. Antrenman grubuna 12 hafta boyunca haftada 3 gün 45 dakika mat pilates egzersizi uygulanırken kontrol grubu herhangi bir egzersiz programına dahil edilmemiştir. Araştırmaya katılan tüm katılımcıların (antrenman+kontrol) çalışma başlangıcında yaş, boy uzunluğu, vücut ağırlığı, bel ve kalça çevreleri belirlenerek Biyoelektriksel İmpedans Analizi (Bodystat

Quadscan 4000) yöntemi ile bel/kalça oranı, vücut yağ yüzdesi (VYY), vücut yağ kütlesi (VYK), vücut kütle indeksi (VKİ), yağsız vücut kütlesi (YVK) ve yağsız vücut kütle indeksi (YVKİ) ölçülmüş ve çalışma sonucunda da ölçümler tekrar edilmiştir. Elde edilen verilerin değerlendirilmesinde, SPSS 22.0 IBM istatistik paket programı kullanılmıştır. Çalışma verileri değerlendirilirken tanımlayıcı istatistiksel metotları (ortalama, standart sapma) ile beraber normal dağılım gösteren değişkenlerde bağımsız örneklem t testi (Independent Samples t-test), bağımlı gruplar için eşleştirilmiş t testi (Paired Samples t-test) kullanılmıştır. Normal dağılım göstermeyen değişkenler için ise Mann-Whitney U testi ve Wilcoxon Signed Ranks testi uygulanmıştır. İstatistiksel önem düzeyi 0,05 olarak kabul edilmiştir. Araştırma bulgularına göre antrenman ve kontrol grupları ön test-son test değerleri karşılaştırıldığında çalışma başlangıcında bel çevresi, VYY, VYK ve VKİ değerlerinde, çalışma sonucunda ise YVK ve YVKİ hariç bakılan tüm parametrelerde antrenman grubunun lehine istatistiksel olarak anlamlı bir farklılık belirlenmiştir ($p<0,05$). Sonuç olarak orta yaşlı fazla kilolu ve obez sedanter kadınlara uygulanan düzenli pilates egzersizlerinin bireylerin vücut kompozisyonları üzerinde pozitif yönde etki ettiği söylenebilir.

**Anahtar Kelimeler:** Fazla Kilolu, Obez, Vücut Kompozisyonu, Pilates Egzersizi.

## INTRODUCTION

The rapid advancement of today's technology makes people's lives easier, but it also leads to a sedentary lifestyle. Most individuals work sitting down at work and spend most of their free time eating snacks in front of technological products (25). This situation causes people to get fat by taking more energy into their organisms than they spend and to face many health problems (16). It is known that women are more likely to lead a sedentary lifestyle away from exercise than men (14). As a percentage of body weight, women tend to gain weight more than men. Body fat increases in female individuals at the beginning of puberty with the effect of estrogen hormone, and a series of events including pregnancy and menopause are involved in this increase (31). The World Health Organization (WHO) identifies obesity as excessive fat accumulation in the organism to the level that affects health (9). The causes of obesity include sedentary lifestyle, excessive and malnutrition, metabolic, hormonal, genetic, psychological, psychological, gender, age and socioeconomic cultural factors (28). In order for individuals to continue their lives in a healthy way, it is very important to make exercise a way of life as well as giving importance to eating habits (17).

Overweight and obese individuals should prefer an exercise program that is suitable for them from a wide range of exercise methods for fighting health problems and treatment processes (10). Although Pilates exercise, one of these exercise types, is not generally used to reduce body weight, it is a very important reason of preference for overweight, obese and sedentary individuals who have difficulty in doing other exercises (5). In addition, the fact that it does not require much power during exercise and the ability to reach the desired result in a short time is another reason for preference. The aim of Pilates exercises is to protect general health, improve posture and coordination by increasing body flexibility, muscle strength, dynamic and static balance (6). Studies have reported that regular Pilates exercises with or without equipment improve sleep quality in obese and overweight individuals (11), reduce injuries caused by falls by improving balance (26), and give positive results on body composition by reducing body fat (20).

Therefore, the aim of this study was to determine the effect of mat Pilates exercises on body composition in overweight and obese sedentary women.

## METHOD

The women participating in the study were divided into 2 groups as training group (n:11) and control group (n:11). The study was conducted based on the pretest-posttest model, one of the experimental models. The women in the training group received Pilates training 3 days a week for 45 minutes for a total of 12 weeks, including 4 weeks of adaptation training, while the control group did not receive any exercise and were asked to continue their normal lives. Before starting the study, the subjects were given detailed information about the risks and discomforts that may occur related to the research the consent form was read and signed.

**Measurements Used in the Study**

The measurements of all participants (training + control) were repeated at the beginning and end of the study. It was ensured that the participant was wearing the lightest weight clothing during the measurement and that the measurements were taken in the morning after at least 12 hours of hunger.

*Height and Body Weight Measurement*: The height of the participants was measured using a wall scale in the anatomical position with their feet bare, arms hanging freely from the shoulders to the sides, taking a deep breath and being asked not to lift their toes off the ground in an vertical position, and the measurement point at the top of the head was recorded in cm in this position. Body weight was determined in kg in anatomical posture with a 100 g scale. BMI values were calculated according to the measured height and body weight values and women who were in the overweight and obese category according to WHO's BMI classification for adults (<18.5 kg/m2 underweight, 18.5-<25.0 kg/m2 normal, 25.0-<30.0 kg/m2 overweight, ≥30.0 kg/m2 obese) were included in the study.

*Waist and Hip Circumference Measurement*: Waist circumferences were measured while the participants were standing, abdomen free, feet together and arms parallel to the legs, from the narrowest part of the upper torso to the lowest rib bone and the crystalloid in the horizontal plane with a tape measure. Hip circumferences were measured in the horizontal plane from the highest point on the side of the person being measured. According to WHO, the upper limit for waist/hip ratio in women is ≤ 0.85 cm and the high risk is ≥1.

*Bioelectrical Impedance Analysis (BIA):* A Bioelectrical Impedance Analysis (BIA) device (Bodystat-Quadscan 4000) was used to determine some of the components of each individual's body composition (waist/hip ratio, basal metabolic rate, body fat percentage, body fat mass, body fat mass, body mass index, lean body mass and lean body mass index). First, the predetermined height, body weight, age, waist and hip circumference measurements of each participant were entered into the device. Participants were positioned for the BIA measurement by lying on their backs on the massage table with their arms approximately 30° from their body and their legs approximately 45° apart. Two electrodes were attached to the participant's right hand and wrist; one on the dorsal surface of the hand 1 cm proximal to the 3rd metacarpopharyngeal joint (ground electrode) and one on the dorsal surface of the wrist at the center of the wrist line at the head of the ulna (measurement electrode). Two electrodes were glued on the participant's right foot and ankle; one on the dorsal surface of the foot 1 cm proximal to the 2nd metatarsophalangeal joint (ground electrode) and the other on the dorsal surface of the ankle, centered between the lateral and medial malleolus (measurement electrode). All electrodes were placed on the participant's hands and feet with a distance of at least 5 cm between them. Before the BIA measurement, the participants were kept lying down for 3 minutes to stabilize the BIA values due to postural change (22). As a result of the measurements, waist/hip ratio, basal metabolic rate, body fat percentage, body fat mass, body fat mass, body mass index, lean body mass and lean body mass index values were recorded.

**Pilates Exercise Program for the Training Group**

The women in the training group followed the Pilates exercise program specified in Table 1 below for 45 minutes 3 days a week for 12 weeks. Women in the control group were not included in this program and were asked to continue their daily activities and not to do any regular exercise.

**Table 1.** Pilates exercise program applied to the training group

| Movements | Number of Repeats | Number of Set | Rest Duration (min) |
|---|---|---|---|
| Bridge | 15 | 3 | 1 |
| Corkscrew | 15 | 3 | 1 |
| Tail Wag | 15 | 3 | 1 |
| Toe Tap | 15 | 3 | 1 |
| Side Leg Lift | 15 | 3 | 1 |
| Side Kick | 15 | 3 | 1 |
| Seated Row | 15 | 3 | 1 |

| | | | |
|---|---|---|---|
| Heel Squeeze Prone | 15 | 3 | 1 |
| Prone Hip Extension | 15 | 3 | 1 |
| Prone Back Extension | 15 | 3 | 1 |
| Cat Stretch | 15 | 3 | 1 |
| Spine Stretch | 15 | 3 | 1 |

**Ethical approval and institutional permission**

The permission of Selçuk University School of Physical Education and Sports Ethics. No diet program was applied to all participants in the study.

**Statistical Analysis**

SPSS 22 program was used for statistical analysis while evaluating the data obtained in the study. While evaluating the study data, descriptive statistical methods (Mean, Standard deviation), Independent Samples t-test, Paired Samples t-test for dependent groups were used for variables with normal distribution, while Mann-Whitney U test and Wilcoxon Signed Ranks test, which are non-parametric tests, were applied for variables that do not show normal distribution. Statistical significance level was accepted as $p<0.05$.

## FINDINGS

The mean age of all participants (training + control) was 45.49 ± 9.94 years and the mean height was 159.81 ± 6.82 m. The mean body weight was 85.76 ± 14.59 kg in the pre-test and 85.88 ± 16.27 kg in the post-test.

The body composition values of all women participating in the study according to the research groups at the beginning and end of the study are presented in Table 2.

**Table 2.** Body composition pre/post test values by study groups (Mean ± SD)

| | Group | Pre-test | Post-test | Difference |
|---|---|---|---|---|
| Body Weight (kg) | TG | 82.07±16.96 | 79.04±15.99 | 3.03±2.27 |
| | CG | 89.45±11.38 | 92.72±14.05 | -3.36±4.05 |
| Waist Circumference (cm) | TG | 99.10±11.82 | 97.45±12.75 | 1.64±7.31 |
| | CG | 112.54±1360 | 120.18±13.10 | -7.64±6.53 |
| Hip Circumference (cm) | TG | 113.73±11.93 | 109.82±10.1 | 3.91±2.45 |
| | CG | 123.09±13.02 | 121.64±11.77 | 1.45± 2.88 |
| WHR (cm) | TG | .867±.057 | .873±.069 | -.006±.042 |
| | CG | .913±081 | .982±.035 | -.069±.066 |
| Body Fat Percentage (%) (BFP) | TG | 39.62±6.63 | 38.50±6.50 | 1.11±1.92 |
| | CG | 49.27±6.50 | 50.24±6.26 | -.973±2.26 |
| Body Fat Mass (kg) (BFM) | TG | 33.35±12.21 | 31.16±10.92 | 2.19±2.58 |
| | CG | 44.53±10.41 | 47.53±12.03 | -2.99±3.14 |
| Body Mass Index (kg/m²) (BMI) | TG | 30.85±5.70 | 29.64±5.55 | 1.22±.867 |
| | CG | 36.46±4.56 | 37.25±6.00 | -.790±2.38 |
| Lean Body Mass (kg) (LBM) | TG | 48.64±5.86 | 47.87±6.53 | .772±1.04 |
| | CG | 44.93±4.32 | 45.64±4.08 | -.718±2.28 |
| Lean Body Mass Index (lbs) (LBMI) | TG | 18.33±1.55 | 17.99±1.81 | .336±.420 |
| | CG | 18.25±1.08 | 18.48±.869 | -227±.796 |

**EG: Training Group, CG: Control Group, WHR: Waist-to-Hip Ratio.**

No significant difference was found in the pre-test body weight scores of the participants in the control and training groups ($U= 43.00$; $p>0.05$). There was a statistically significant difference in post-test body weight scores ($t=2.13$; $p<0.05$) (Table 3).

**Table 3.** Comparison of pre-test and post-test body weight (kg) scores of training and control groups

| | Group | x̄± SD | Rank Mean | Sum of Ranks | U | p |
|---|---|---|---|---|---|---|
| Pre-Test | TG | 82.07±16.96 | 9.91 | 109.00 | 43.00 | .250 |
| | CG | 89.45±11.38 | 13.09 | 144.00 | | |

| | Group | x̄± SD | Levene's Test | | df | t | p |
|---|---|---|---|---|---|---|---|
| | | | F | p | | | |
| Post Test | TG | 79.04±15.99 | .048 | .829 | 20 | 2.13 | .046* |
| | CG | 92.72±14.05 | | | | | |

*p<0.05 x̄: Mean, SD: Standard Deviation

Statistically significant differences were found between the pre-test (t=2.47; p<0.05) and post-test (U=10.0; p<0.05) waist circumference values of the training and control groups (Table 4).

**Tablo 4.** Comparison of pretest-posttest waist circumference (cm) values of training and control groups

| | Group | x̄± SD | Levene's Test | | df | t | p |
|---|---|---|---|---|---|---|---|
| | | | F | p | | | |
| Pre-Test | TG | 99.10±11.82 | 0.98 | .758 | 20 | 2.47 | .022* |
| | CG | 112.54±13.60 | | | | | |

| | | x̄± SD | Rank Mean | Sum of Ranks | U | p |
|---|---|---|---|---|---|---|
| Post Test | TG | 97.45±12.75 | 6.91 | 76.0 | 10.0 | .001* |
| | CG | 120.18±13.10 | 26.09 | 177.0 | | |

* p <0.05

When comparing the pre-test values of body composition between the training and control groups in the study, a statistically significant difference was found in BFP, BFM, and BMI values (p<0.05), while there was no statistically significant difference in other parameters (p>0.05). When comparing the post-test values of the training and control groups, a statistically significant difference was observed in all parameters except LBM and LBMI values (p<0.05), as indicated in Table 5.

**Tablo 5.** Pre-test and post-test body composition values of training and control groups

| Grup | | | x̄± SD | Levene's Test | | df | t | p |
|---|---|---|---|---|---|---|---|---|
| | | | | F | p | | | |
| Hip Circumference (cm) | Pre-test | TG | 113.73±11.93 | .00 | .998 | 20 | 1.758 | .094 |
| | | CG | 123.09±13.02 | | | | | |
| | Post-test | TG | 109.82±10.18 | 0.88 | .769 | 20 | 2.517 | .020* |
| | | CG | 121.64±11.77 | | | | | |
| WHR (cm) | Pre-test | TG | .867±.057 | .656 | . 427 | 20 | -1.542 | .139 |
| | | CG | .913±081 | | | | | |
| | Post-test | TG | .873±.069 | 12.059 | .002 | 20 | -4.653 | .000* |
| | | CG | .982±.035 | | | | | |
| BFP (%) | Pre-test | TG | 39.62±6.63 | .014 | .908 | 20 | 3.447 | .003* |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | CG | 49.27±6.50 | | | | | |
| | Post-test | TG | 38.50±6.50 | .045 | .833 | 20 | 4.313 | .000* |
| | | CG | 50.24±6.26 | | | | | |
| BFM (kg) | Pre-test | TG | 33.35±12.21 | .205 | .656 | 20 | 2.311 | .032* |
| | | CG | 44.53±10.41 | | | | | |
| | Post-test | TG | 31.16±10.92 | .182 | .674 | 20 | 3.339 | .003* |
| | | CG | 47.53±12.03 | | | | | |
| BMI (kg/m²) | Pre-test | TG | 30.85±5.70 | 1.163 | .294 | 20 | 2.547 | .019* |
| | | CG | 36.46±4.56 | | | | | |
| | Post-test | TG | 29.64±5.55 | 0.18 | .896 | 20 | 3.088 | .006* |
| | | CG | 37.25±6.00 | | | | | |
| LBM (kg) | Pre-test | TG | 48.64±5.86 | 1.634 | .216 | 20 | 1.694 | .106 |
| | | CG | 44.93±4.32 | | | | | |
| | Post-test | TG | 47.99±1.81 | 2.121 | .161 | 20 | .959 | .349 |
| | | CG | 45.64±4.08 | | | | | |
| LBMI (lbs) | Pre-test | TG | 18.33±1.55 | 2.019 | .171 | 20 | .128 | .900 |
| | | CG | 18.25±1.08 | | | | | |
| | Post-test | TG | 17.99±1.81 | 6.677 | .018 | 20 | -.812 | .427 |
| | | CG | 18.48±.869 | | | | | |

***p <0.05 WHR: Waist-to-Hip Ratio**

When the body weight and waist circumference values of the training (pre-post test) and control (pre-post test) groups were compared, it was determined that there were statistically significant differences in the pre-post test comparison of both the exercise (t=4.423; p<0.05) and control (Z=-2.807; p<0.05) groups according to the body weight values. In the waist circumference values, it was determined that there was no statistically significant difference in the pre-post test comparison of the training group (Z=-668; p>0.05), but there was a statistically significant difference in the pre-post test comparison of the control group (t=-3.880; p<0.05) (Table 6).

**Table 6.** Comparison of Body Weight and Waist Circumference Values of training (pre-test to post-test) and Control (pre-test to post-test) Groups

| | **Group** | **Pre-test** | **Post test** | | | | **t** | **df** | **p** |
|---|---|---|---|---|---|---|---|---|---|
| | | **x̄± SD** | **x̄± SD** | | | | | | |
| Body Weight (kg) | EG | 82.07±16.96 | 79.04±15.99 | | | | 4.423 | 10 | .001* |
| | | | | | **N** | **Mean Rank** | **Sum of Ranks** | **z** | **p** |
| | CG | 89.45±11.38 | 92.72±14.05 | Negative Ranks | 0 | .00 | .00 | -2.807 | .005* |
| | | | | Positive Ranks | 10 | 5.50 | 55.00 | 55.00 | |
| | | | | Ties | 1 | | | | |
| Bel çevresi (cm) | EG | 99.10±11.82 | 97.45±12.75 | Negative Ranks | 8 | 5.06 | 40.50 | -.668 | .504 |
| | | | | Positive Ranks | 3 | 8.50 | 25.50 | | |

| | | | Ties | 0 | | | |
|---|---|---|---|---|---|---|---|
| | | | | | **t** | **sd** | **p** |
| CG | 112.54±13.60 | 120.18±13.10 | | | -3.880 | 10 | .003* |

*** p < 0.05**

When comparing the body composition values of the training (pre-test to post-test) and control (pre-test to post-test) groups, it was found that in the training group, there was a statistically significant decrease in hip circumference, BFM, BMI, LBM, and LBMI values when comparing pre-test to post-test values ($p<0.05$). However, no statistically significant difference was observed in waist to hip ratio (WHR) and BFP values ($p>0.05$). In the control group, no significant differences were found in hip circumference, BFP, BMI, LBM and LBMI values when comparing pre-test to post-test values ($p>0.05$), but there was a statistically significant increase in WHR and BFM values ($p<0.05$), as observed in Table 7.

**Tablo 7.** The body composition values of the training (pre-post test) and control (pre-post test) groups were compared.

| | **Grup** | **Pre-test** | **Post-test** | **t** | **df** | **p** |
|---|---|---|---|---|---|---|
| | | **x̄± SD** | **x̄± SD** | | | |
| Hip Circumference (cm) | EG | 113.73±11.93 | 109.82±10.18 | 5.297 | 10 | .000* |
| | CG | 123.09±13.02 | 121.64±11.77 | 1.677 | 10 | .124 |
| WHR (cm) | EG | .867±.057 | .873±.069 | -.491 | 10 | .634 |
| | CG | .913±081 | .982±.035 | -3.435 | 10 | .006* |
| BFP (%) | EG | 39.62±6.63 | 38.50±6.50 | 1.917 | 10 | .084 |
| | CG | 49.27±6.50 | 50.24±6.26 | -1.425 | 10 | .184 |
| BFM (kg) | EG | 33.35±12.21 | 31.16±10.92 | 2.817 | 10 | .018* |
| | CG | 44.53±10.41 | 47.53±12.03 | 3.157 | 10 | .010* |
| BMI (kg/m²) | EG | 30.85±5.70 | 29.64±5.55 | 4.660 | 10 | .001* |
| | CG | 36.46±4.56 | 37.25±6.00 | -1.103 | 10 | .296 |
| LBM (kg) | EG | 48.64±5.86 | 47.87±6.53 | 2.470 | 10 | .033* |
| | CG | 44.93±4.32 | 45.64±4.08 | 1.042 | 10 | .322 |
| LBMI (lbs) | EG | 18.33±1.55 | 17.99±1.81 | 2.655 | 10 | .024* |
| | CG | 18.25±1.08 | 18.48±.869 | -.947 | 10 | .366 |

*** p <0.05**

## DISCUSSION AND CONCLUSION

Regular and consistent exercise programs carried out in line with goals create more than one benefit for people. The intensity, type, duration and frequency of exercise should be planned in the best way for the exercise to produce the right results. It has been reported that regular and correctly performed activities have a positive effect on weight and metabolism (15). BIA, which is one of the methods used in the evaluation of body composition of obese individuals, is frequently used in the evaluation of body composition because it is

both safe and low cost and gives effective results. In this study, the differences in body composition were determined by using the BIA method of 12-week pilates exercises applied to overweight and obese women. According to the results of the current study; When the pre-test values of the exercise and control groups were compared, a statistically significant difference was found in waist circumference, BMI, BMR and BMI values ($p<0.05$). This is thought to be due to the fact that although all participants in the study were selected from individuals who were overweight and obese according to BMI values, women in the control group were more overweight/obese than women in the exercise group. When the post-test values of the exercise and control groups were compared, a statistically significant difference was determined in favor of the exercise group in body weight, waist circumference, hip circumference, waist/hip ratio, BMI, BMR and BMI values ($p<0.05$).

When the pre-test and post-test values of the exercise groups were compared, it was determined that there was a decrease in all parameters, but there was a statistically significant difference only in body weight, hip circumference, body weight, hip circumference, BMI, BMI, HRV and BMI values ($p<0.05$). As a result of these data, 12-week pilates exercises positively affected the body composition of overweight and obese individuals. In contrast to this situation, when the pre-test-post-test values of the control groups were compared, it was determined that there was an increase in all values, but there was a statistically significant difference only in body weight, waist circumference, waist/hip ratio and BMI values ($p<0.05$).

The results of many studies conducted in the literature to determine the effect of exercise on body composition are in parallel with the results of the present study (19, 7, 2, 32, 8, 23, 29, 24, 26, 3, 4).

Çakmakcı (7) reported a statistically significant difference in waist/hip ratio, BMI and BMI parameters in both exercise groups compared to pre-exercise values as a result of mat pilates and ball exercise program applied to sedentary obese women for 60 minutes 4 days a week for 8 weeks. In another study, when the pre-test and post-test values of mat pilates exercise applied to 66 middle-aged and overweight sedentary women in the menopause period for 6 weeks, 3 days a week for 1 hour were compared, it was determined that a significant decrease occurred in body composition parameters, while there was no significant difference in the control group (2). As a result, the findings of this study support our study and support the effects of Pilates mat exercise program on weight loss and body composition. Dikici (8) divided 65 female obese individuals aged 18-65 years into three groups as low aerobic exercise + diet, high intensity aerobic exercise + diet and diet only. At the beginning and end of the 12-week study, all subjects were subjected to an exercise test on a bicycle ergometry device and measurements were performed with the BIA method. It was found that both training groups had similar statistically significant decreases in BMI, fat mass, muscle mass, waist and hip circumferences compared to the diet only group. n another study examining the effects of a mat pilates program on middle-aged overweight women's body composition and anthropometric measurements, it was reported that a 16-week pilates exercise intervention resulted in statistically significant decreases in women's BMI, fat mass, and muscle mass scores (30). Şavkın and Arslan (26) conducted a study to investigate the impact of pilates exercise on body composition in sedentary overweight and obese women. A total of 37 female participants with a mean age of 43.79 ± 4.88 were included, divided into two groups: 19 in the exercise group and 18 in the control group. Bioelectrical impedance analysis (BIA) was used to determine participants' body composition, and an 8-week pilates exercise program was administered for 90 minutes, three days a week. At the end of the program, the exercise group exhibited statistically significant reductions in body weight, body fat percentage (BFP), BMI, waist, and hip circumference scores, whereas the control group showed significant increases. In another study aimed at observing the effects of aerobic exercises of varying durations and intensities on abdominal obesity, 60 middle-aged obese women volunteered to participate. Divided into three groups, they engaged in a 12-week aerobic exercise program involving high-to-moderate intensity treadmill walking and pedometer-based home exercises. The results of the study revealed that all groups experienced statistically significant reductions in BMI, BFP, body weight, and waist circumference values (3). Başkan et al. (4) examined the effects of a 12-week aerobic combined resistance exercise program on body composition in 50 healthy overweight and obese women aged between 20 to 54 years. The participants engaged in aerobic combined resistance exercises for 30 minutes, three days a week. The study highlighted that such exercises could be effective in terms of weight loss and changes in body composition values. They emphasized that there was a greater weight loss observed within the obese group compared to other groups.

When the above research results are examined, it is emphasized that regular exercises applied to overweight and obese individuals in different age groups have a positive effect on reducing obesity and body composition parameters in obese and overweight individuals. The studies conducted in this context are in parallel with the results of the current study. However, there are studies in the literature that show similarities with the results of the present study as well as studies that do not (13, 21, 29, 1, 18, 12).

Topyıldız (29) applied pilates exercise for 60 minutes 3 days a week for 4 weeks to 50 volunteer women aged 25-60 years who were overweight and found no statistical difference in body weight and lean body weight values, although increases were observed compared to pre-study values. Aktaş (1) reached similar results and investigated the effects of step-aerobic program to be applied for one hour 3 days a week for 6 weeks on the body composition of sedentary and overweight women. As a result of the study in which a total of 22 sedentary volunteer women aged 23-52 years participated, it was concluded that there was no significant difference in terms of body mass index, body fat ratio, waist hip ratio when the pre and post test values were compared. In another study, when the pre-test and post-test values were compared as a result of 8-week mat pilates exercises applied to obese sedentary women, a decrease was observed in the body weight, waist circumference, hip circumference, BMI and BMI values of the experimental group, but this change was not statistically significant. In the control group, it was determined that there were statistically significant increases in waist circumference, hip circumference, body weight and BMI values (18).

Although the results of all the variables examined in the current study are compatible with many studies in the literature, they are not in parallel with the results of the values in the studies mentioned above. This situation is thought to be due to different factors such as the duration of the research, the mean age of the subjects participating in the study, having different physical capacities, the measurement methods applied, the precision of the practitioner, the nutritional habits of the subjects, the type, duration, intensity, intensity, number of repetitions, rest interval, etc. of the exercise applied.

In this study, the effect of regular Pilates exercises on body composition of overweight and obese women was investigated. As a result, it was concluded that regular pilates exercises applied to middle-aged sedentary overweight and obese women had a positive effect on the body composition of individuals. The results we obtained in our study are generally compatible with the literature, although there are contrary opinions. In this context, it can be recommended that overweight and obese individuals should be included in an exercise program suitable for them in addition to their nutrition programs in order to lead a healthy life in their daily lives. Also exercise can improve the standard of living of overweight and obese individuals and it was recommended that they integrate exercise into their daily lives.

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# Analysis of European Union Erasmus+ Sport Projects and Comparison of Turkey and Other European Countries

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**Abstract**

The Erasmus+ Sport project is a European initiative that aims to support various aspects of sport development and inclusion. It covers a wide range of projects focussing on different areas in the field of sport. This study aims to analyse the Erasmus+ Sport projects funded by the European Union and to compare Turkey with other European countries. In our research, a document analysis research method was used. In the first period of Erasmus+ Sport projects, 874 sports projects between 2014 and 2020 were analysed. The data were obtained from the details and results page of the projects funded under the Erasmus+ programme of the European Union Commission. As a result of the document analyses, Italy was the coordinator of the most projects with 188 projects. Spain was the coordinator in 60 projects, Croatia 47, Greece 46, Bulgaria and France 45, Slovenia 40 and Romania 35. Turkey, on the other hand, ranked 18th with 18 projects. Among the institutions applying for projects, non-governmental organisations stand out with 407 projects, followed by universities, sports federations and sports clubs. According to the years, the highest number of projects was finalised in 2020 with 465 projects. A budget of 196,936,797 euros was allocated to 874 projects in total. Turkey has received project support worth 2.068.076 euros with 18 projects from this budget.

**Keywords:** Erasmus+ Sport, Sport Projects, European Union, Türkiye.

**Özet**

**Avrupa Birliği Erasmus+ Sport Projelerinin Analizi ve Türkiye ile Diğer Avrupa Ülkelerinin Karşılaştırılması**

Erasmus+ Spor projesi, spor gelişimi ve kapsayıcılığının çeşitli yönlerini desteklemeyi amaçlayan bir Avrupa girişimidir. Spor alanında farklı alanlara odaklanan geniş bir proje yelpazesini kapsamaktadır. Bu çalışmanın amacı Avrupa Birliği tarafından finanse edilen Erasmus+ Sport projelerini analiz edilmesi ve Türkiye ile diğer Avrupa ülkelerinin karşılaştırılmasıdır. Araştırmamızda inceleme (doküman analizi) araştırma yöntemi kullanılmıştır. Erasmus+ Sport projelerinin ilk dönemi olan 2014-2020 yılları arasında gerçekleştirilen 874 spor projesi ele alınmıştır. Veriler Avrupa Birliği Komisyonu Erasmus+ programı kapsamında finanse edilen projelerin ayrıntıları ve sonuçları sayfasından elde edilmiştir. Yapılan doküman analizleri sonucunda İtalya 188 proje ile en fazla projede koordinatör olmuştur. İspanya 60, Hırvatistan 47, Yunanistan 46, Bulgaristan ve Fransa 45, Slovenya 40 ve Romanya 35 projede koordinatör olmuştur. Türkiye ise 18 projede koordinatör olarak 18. sırada yer almaktadır. Proje başvurusunda bulanan kurumlar arasında sivil toplum örgütleri 407 proje ile ön plana çıkarken,

üniversiteler, spor federasyonları, spor kulüpleri sivil toplum kuruluşlarını takip etmektedir. Yıllara göre bakıldığında en fazla proje 465 proje ile 2020 yılında sonuçlandırılmıştır. Toplamda gerçekleştirilen 874 projeye 196.936.797 avro bütçe verilmiştir. Türkiye bu bütçeden 18 adet projesinden 2.068.076 avro değerinde proje desteği almıştır.

**Anahtar Kelimeler:** Erasmus+ Sport, Spor Projeleri, Avrupa Birliği, Türkiye

## INTRODUCTION

The Erasmus+ Programme is described as a flagship initiative of the European Union that supports a variety of education and training opportunities for individuals and organisations across Europe (3). Erasmus is widely recognised and has gained significant visibility across Europe and is often referred to as the "Erasmus generation" (14). The programme aims to promote European integration and develop a sense of European citizenship among young people (14).

According to the programme guide published by the European Commission, three main activities are carried out under the Erasmus programme (1,4);

Key Activity 1: Learning mobility of individuals

Key Activity 2: Innovative cooperation and exchange of good practices

Key Activity 3: Supporting policy reform.

In addition to the three main activities of the Erasmus programme, there are also Jean Monnet and sport action areas (1).

One of the project titles within the Erasmus+ program is Erasmus+ Sport Projects. Erasmus+ sport projects are initiatives funded by the Erasmus+ programme of the European Union. These projects aim to promote and support various aspects of sport, including athlete development, education, gender equality, rehabilitation and inclusion. The Erasmus+ programme provides financial support to sport-related institutions and organisations to implement these projects (8). Erasmus+ sport projects are open to national institutions responsible for sport at the local, regional and national levels, sports organisations at local, regional, national and international levels, national Olympic committees, sports federations, organisations representing sport for all movements, organisations active in the promotion of physical activity, institutions involved in education, training and youth activities, sports clubs, municipalities, etc. All legal persons/organisations active in the field of sport can apply (13).

The target group of Erasmus Sport Grants is all kinds of institutions and organisations, especially institutions and organisations engaged in sports activities, aiming to promote sports, exercise and healthy lifestyles. The target group, which constitutes the professional dimension of sport, consists of athletes and coaches.

An example of Erasmus+ sport projects is the project "Ecology of Dual Career - Exploring Dual Career Development Environments across Europe". This project focuses on creating dual career development environments that facilitate athletes to combine their competitive sport career with education or work. The project aims to shift the focus from individual student-athletes to exploring the systems and structures that support their dual careers (11).

Another Erasmus+ sport project is the "Dual Careers for Young Athletes" project. This project specifically targets young athletes aged 15-19 and aims to identify barriers, challenges, resources and skills related to their dual careers. The project also examines the roles and perspectives of the support staff of these student-athletes (7).

The Erasmus+ programme also supports projects addressing social issues in the field of sport. For example, the project "Gender inequality in sport: Perceptions and experiences of Generation Z", also known as the GETZ project, aims to raise awareness, educate and empower the next generation of sports leaders to

promote greater gender balance in sport. This project is an Erasmus+-funded project and focuses on addressing gender inequality in sport (10).

Furthermore, Erasmus+ sport projects contribute to sustainable development goals. The programme recognises the importance of education, training and sport in addressing socioeconomic changes and challenges in Europe. The projects funded by Erasmus+ aim to support the implementation of the European policy agenda for growth, employment, equality and social inclusion, including sustainable development goals (8). Increasing Erasmus+ sport funding to contribute to the different sport-related policies of the European Union and future sport entrepreneurs can also help to train such entrepreneurs (5).

In conclusion, Erasmus+ sport projects are initiatives funded by the Erasmus+ programme of the European Union. These projects cover a wide range of topics such as athlete development, education, gender equality, rehabilitation, and inclusion. They aim to create supportive environments for athletes, address social issues in sport and contribute to sustainable development goals. The Erasmus+ programme, through financial support, enables institutions and organisations to implement these projects and create a positive impact in the field of sport.

This study aims to analyse the Erasmus+ Sport projects funded by the European Union and to compare Turkey with other European countries. The importance of this study is to reveal that we are behind other European countries in terms of projects and in this context, to ensure the spread of project culture in our country.

## METHOD

### Research Methodology

In our research, the examination (document analysis) method was used. It is a method in which researchers collect information by analysing existing sources and documents. This method uses sources such as historical data, reports and articles. "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" (9).

### Analysing the Data

The information obtained within the scope of this study was analysed using content analysis. The researcher can describe the material and analyse what is hidden in the data by using content analysis to discover possible facts (2).

Before analysing the data, the targeted years and countries were filtered through the filtering feature on the website where the data were obtained and the necessary data were obtained.

### Population and Sample of the Study

The population of our research is Erasmus+ Projects and the sample is Erasmus+ Sport projects. The data were obtained from the details and results page (https://erasmus-plus.ec.europa.eu/projects) of the projects funded under the Erasmus+ programme of the European Union Commission.

### Scope and Limitations of the Study

In our research, 874 sports projects within the scope of the European Union Commission Erasmus+ and realised between 2014 and 2020, which is the first period of Erasmus+ Sports projects, were examined.

**FINDINGS**

## Table 1. Number of Projects Information of Countries

**Table 1.** Number of Projects Information of Countries

| | Italy | Spain | Croatia | Greece | Bulgaria | France | Slovenia | Romania | Türkiye |
|---|---|---|---|---|---|---|---|---|---|
| **Number of Projects Coordinated** | 188 | 60 | 45 | 45 | 45 | 45 | 40 | 35 | 18 |
| **Number of Partner Projects** | 466 | 269 | 164 | - | 219 | 163 | 195 | 162 | 106 |

The number of projects in the countries is given in Table 1. According to Table 1, Italy has been the coordinator in the highest number of projects with 188 projects. Spain has been the coordinator in 60 projects, Croatia 47, Greece 46, Bulgaria and France 45, Slovenia 40 and Romania 35. Turkey, on the other hand, ranks 18th among all countries as a coordinator in 18 projects.

Again, according to Table 1, the number of projects in which countries are partners is given. In addition to the project coordinator, there are partners from different countries in the projects. There can be more than one partner in a project. Accordingly, Italy is at the top with 466 project partnerships. Spain 269, Bulgaria 219, Slovenia 195, Croatia 164, France 195, Romania 162 and Turkey 106.

**Table 2**. Coordinator Types of Countries according to Projects

| | Italy | Spain | Croatia | Greece | Bulgaria | France | Slovenia | Romania | Türkiye |
|---|---|---|---|---|---|---|---|---|---|
| **Civil Society Establishment** | 77 | 21 | 18 | 14 | 22 | 13 | 13 | 27 | 7 |
| **Sports Club** | 58 | 8 | 13 | 1 | 14 | 7 | 7 | 1 | 4 |
| **University** | 9 | 17 | 3 | 15 | 2 | 3 | 3 | 5 | 4 |

Coordinator types of the countries according to the projects are given in Table 2. According to Table 2, it is seen that non-governmental organisations make the highest contribution to the project production of the countries. After non-governmental organisations, the institutions with the highest number of coordinators are sports clubs and universities.

**Table 3.** Grant Amounts Received by Countries from Projects (Euro)

| Italy | Spain | Croatia | Greece | Bulgaria | France | Slovenia | Romania | Türkiye |
|---|---|---|---|---|---|---|---|---|
| 35.947.048,50 | 15.293.639,55 | 7.901.636,26 | 7.523.457,44 | 7.750.308,56 | 10.609.263,69 | 7.023.100,67 | 3.806.427,88 | 2.068.07600 |

The grant amounts received by the countries from the projects are given in Table 3. A budget of 196.936.797 Euros was given to 874 projects realised in total. Italy received the highest budget from the projects. Italy received 35.947.048 Euro support from the projects. Turkey has received 2.068.076 Euros worth of project support from 18 projects from this budget.

**Table 4.** Number of Projects by Years

| 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | TOTAL |
|---|---|---|---|---|---|---|---|
| 3 | 57 | 117 | 207 | 270 | 359 | 465 | 874 |

The number of projects by year is given in Table 4. According to Table 4, the highest number of projects was finalised in 2020 with 465 projects. 359 projects in 2019, 279 projects in 2018, 207 projects in 2017, 117 projects in 2016, 57 projects in 2015 and 3 projects in 2014.

**Table 5.** Projects Coordinated by Turkey

| Year | Project Subject | Coordinating Organisation | Project Budget (Avro) |
|---|---|---|---|
| **2014** | Fans Against Violence | Turkish Basketball Federation | 393.280,00 |
| **2016** | Strong Kids | Çanakkale Onsekız Mart University | 40.795,00 |
| **2017** | Sport And Physıcal Actıvıty Agaınst Chıldren's Technology Addıctıon | Turkey Federation of Sports for Everyone | 41.830,00 |
| **2017** | Development Of Preschool Physical Activity Program For Strengthening Of Grassroots Sports İn Eu | Sports Volunteers Association | 263.175,00 |
| **2018** | Integrating Disabled People İnto Social Life With The Hypnotherapy-Hydrotherapy Method | İnönü University | 49.140,00 |
| **2018** | Sport Has the Power To Change The Europe! European Sport Volunteers As A Social Leader And Social Innovator | Sports Volunteers Association | 266.260,00 |
| **2018** | Women Empowerment İn Sport | Istanbul Culture and Sport Association | 58.270,00 |
| **2018** | Traditional Games Are Meeting | Karasu Youth, Art and Sports Club Association | 56.950,00 |
| **2019** | Encouraging Students To Pursue Grassroot Sports Activities Outdoor in an Eco-Friendly Manner | Gazi University | 388.853,00 |
| **2019** | Social Inclusion Of Hearing Impaired Youth Through Sport | Esenler Youth and Sports Club Association | 54.070,00 |
| **2019** | Let The Disabled Join The Board | Aktif Youth and Sports Club Association | 59.493,00 |
| **2019** | Darts4Blind | Kahramanmaraş Sütçü İmam University | 58.775,00 |
| **2019** | Sport For All For Sport: Gathering Popularity For Disabled Sport | Pendik Municipality | 53.430,00 |

| | | | |
|---|---|---|---|
| **2019** | Integration Of Refugees Through Sport | Sorgun Youth Association | 50.880,00 |
| **2019** | Experiential Learning For Education Through Sports | Experiential Education Centre Association | 59.950,00 |
| **2019** | Three- Points Shot To Health | Karasu Youth, Art and Sports Club Association | 58.225,00 |
| **2019** | Bocce For Everyone Form 7 To 70 Years | Karasu Youth, Art and Sports Club Association | 56.925,00 |
| **2019** | Combating Hazards Through Olympic Values | Turkish Sports Foundation | 57.775,00 |

The projects coordinated by Turkish institutions are given in Table 5. According to Table 5, the projects in which Turkey took part as a coordinator addressed project titles related to children and sports, disabled people and sports, sport for all, refugees and sports, sport and women, traditional sports and physical activity. The most projects were carried out in 2018 and 2019. With 393 thousand Euros, the project with the highest budget is the Fans Against Violence project realised by the Turkish Basketball Federation.

**DISCUSSION AND CONCLUSION**

In our research, in which we analysed the content of the projects funded in the first period of Erasmus+ Sport projects within the scope of the Erasmus+ programme of the European Union Commission; Turkey was compared with other European countries. The website where the results of the projects are shared and from which we have received the data provides detailed information about the projects carried out within the scope of the Erasmus+ programme. In the study by (6), the same data were analysed and projects related to disability were analysed.

When the findings are analysed, it is seen that we are far behind other European countries in terms of Erasmus sports projects in general. The reason for this can be said to be our inadequacy in project writing, foreign language and project culture.

Turkey has made a financial contribution of 933 million euros to the Erasmus programme to take part in the Erasmus programme, and when we look at the return of this contribution, it was determined that 0.33% was returned within the scope of sports projects (Yazıcı, 2021). As can be understood from this figure, it is seen that we do not even receive 1% of the financial contribution we have given to take part in the programme in terms of sports projects. For this financial contribution to return to our country, sports stakeholders in our country need to write much more and qualified projects.

When we look at the projects carried out in Turkey, only 3 different sports clubs have projects as sports clubs. According to TURKSTAT data, there are 15,828 sports clubs in Turkey and it is seen that these clubs have no initiative on the Erasmus sports project (12). Again, according to YÖK data, there are 208 universities in our country (16). Although many of these universities have Faculties of Sports Sciences and Schools of Physical Education and Sports, it is seen that there are not many initiatives on Erasmus sport projects. According to Table 2, there are 4 universities in our country whose projects are accepted. The course loads of academicians at the university, excessive administrative duties, lack of sufficient human resources may be among the main reasons for the lack of initiatives on the project.

Erasmus sport projects have entered a new period between 2021-2027, and it is necessary to focus on "how we as Turkey can benefit more from the funds in the coming periods". The projects completed through the platform where we access the data should be examined in terms of methodology and form, and targets should be set for successful result-oriented planning in Erasmus sports projects.

As Turkey; the following suggestions can be taken into consideration to get more efficient results from Erasmus sport projects:

- Projects should be designed according to the action titles and priority topics of the European Union Erasmus programme in the new period (2021-2027).

- Project culture should be promoted throughout the country.

- All stakeholders of sport should intensify their cooperation with the National Agency

- Institutions such as the Ministry of Youth and Sports, the Turkish National Olympic Committee, universities and sports federations should make strategic plans for projects.

- Institutions related to sports should establish special units for projects and give importance to projects.

- The Ministry of Youth and Sports should encourage sports clubs to write projects (seminars, project writing training).

- Project-themed courses should be added to the curriculum to popularise project culture in universities.

- The administrative workload of academics in the field of sport should be reduced and measures should be taken to allocate time for project writing.

- Applied project writing training should be given to stakeholders related to sports.

- Investigating why the countries mentioned in our research have fewer or more projects may be the subject of a different study.

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# Investigation of the Relationship between Character Structures and Mental Toughness of High School and University Students Doing Fencing Sports*

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*Ethical Statement: It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited.*

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**Abstract**

Investıgatıon of The Relatıonshıp Between Character Structures and Mental Toughness of Hıgh School and Unıversıty Students Doıng Fencıng Sports. The aim of the research is to examine the relationship between character structures and mental toughness of high school and university students doing fencing sports. Survey model, one of the quantitative research methods, has been used in the study. The sample of the research consisted of 286 active licensed fencing athletes who have competing in the classifications of the Turkish Fencing Federation and studying at high schools and university. Athletes were selected from the population by random sampling method. As a data collection tool in the study Personal Information Form, Sport Character Scale (SCS) and Sport Mental Toughness Questionnaire (SMTQ) has been used. In the data analysis, independent group t-test, one-way analysis of variance (ANOVA) test, Tukey HSD multiple comparison test, Pearson Product-Moment Correlation Coefficient test have been applied. As a result of the research; average of sports character scores of high school and university athletes; gender, age, education level, branch and nationality status variables have found to be significantly different. It has been specified that there wasn't significant difference in the fencing experience period variable. Mental toughness score averages in sports; gender, age, education level, branch, fencing experience period, nationality status have found to be significantly different. It has been determined that there is a low and moderate positive and significant relationship in some sub-dimensions of the Sports Character Scale and Sport Mental Toughness Questionnaire.

**Keywords:** Fencing, character, mental toughness, high school, university

**Özet**

**Eskrim Sporu Yapan Lise ve Üniversite Öğrencilerinin Karakter Yapıları ile Zihinsel Dayanıklılıkları Arasındaki İlişkinin İncelenmesi**

Araştırmanın amacı, eskrim sporu yapan lise ve üniversite öğrencilerinin karakter yapıları ile zihinsel dayanıklılıkları arasındaki ilişkinin incelenmesidir. Araştırmada nicel araştırma yöntemlerinden tarama modeli kullanılmıştır. Araştırmanın örneklemini Türkiye Eskrim Federasyonu klasmanlarında mücadele eden, lise ve üniversitede öğrenim gören faal lisanslı 286 eskrim sporcusu oluşturmuştur. Sporcular evrenden tesadüfi örnekleme yöntemiyle seçilmiştir. Araştırmada veri toplama aracı olarak Kişisel Bilgi Formu, Spor Karakter Ölçeği

(SKÖ) ve Sporda Zihinsel Dayanıklılık Envanteri (SZDE) kullanılmıştır. Verilerin analizinde, bağımsız grup t testi, tek yönlü varyans analizi (ANOVA) testi, Tukey HSD çoklu karşılaştırma testi, Pearson Momentler Çarpım Korelasyon testi uygulanmıştır. Araştırmanın sonucunda; eskrim sporcularının spor karakter puan ortalamaları; cinsiyet, yaş, eğitim durumu, branş ve millîlik durumu değişkenlerinde anlamlı farklılığa rastlanırken, eskrim deneyim süresi değişkeninde anlamlı bir farklılık olmadığı saptanmıştır. Sporda zihinsel dayanıklılık puan ortalamaları; cinsiyet, yaş, eğitim durumu, branş, eskrim deneyim süresi ve millîlik durumu değişkenlerinde anlamlı farklılık tespit edilmiştir. Spor Karakter Ölçeği ile Sporda Zihinsel Dayanıklılık Envanterinin bazı alt boyutlarında düşük ve orta düzeyde pozitif yönlü anlamlı bir ilişki olduğu belirlenmiştir.

**Anahtar Kelimeler:** Eskrim, karakter, zihinsel dayanıklılık, lise, üniversite

## INTRODUCTION

Fencing sport B.C. it dates from the 1190s to the present day. In this process, the sport of fencing was taught to knights for use in war from the games that took place in order to celebrate the victories won in the early days, and then gradually took its modern form today (6).

Character is the behavior of individuals that makes them different from other people, which is unique to a person (24). Character is an important factor in sports branches as well as affecting people's behavior in the social environment. The concept of mental endurance shows the attitudes and behaviors that people have shown in the face of the difficulties they have faced in their lives (27). These two concepts significantly affect the attitudes and behaviors of individuals in the social environment. In sports branches, although it highlights the achievements that individuals have made, in fencing sports it becomes even more important that athletes should be alone when they wear the mask, and they should anticipate the moves they make against each other and apply counter-moves.

It has been emphasized in studies that the personality factor has a great importance in the environment where exercise and sports exist (9, 29). When the effect of the concept of physical education and sports on personality was investigated, it was stated that physical education was effective on character education and sports provided development in terms of socio-cultural characteristics (9). For many years, "Does sports develop character?" question has been the subject of examination, and it has been stated that sports are not only effective in physical but also in socio-cultural and character development of individuals (26). Although the concept of mental resilience is given with different perspectives and different definitions, it has been seen that most of the definitions are not based on any theory and are generally associated as a result of visual results (1). In mental resilience, the psychological discomfort that people may face can pose a significant risk, but it can also be considered as a good result (17).

In this context, the aim of the research is to examine the relationship between the character structures and mental toughness of high school and university students who play fencing, and as a result, to reveal the importance of character and mental toughness in fencing and therefore in athletes.

## METHOD

### Research Model

In this study, the survey model, which is one of the quantitative research methods, was evaluated and the relational survey model, one of the general survey models, was used. Relational survey models are models that determine the presence or degree of change between two or more variables (4).

### Population and Sample

The research population consists of active licensed athletes who took part in the Turkish Fencing Federation classifications in 2020. According to the information provided by the Turkish Fencing Federation, the number of athletes who actively participated in competitions at the high school and university levels in the classifications on the dates of the study was reported as 616. The research sample consisted of 286 fencing

athletes selected by random sampling method from the population. This number represents approximately half of the population.

**Data Collection Tools**

In the research, the "Personal Information Form", "Sport Character Scale" and "Sport Mental Toughness Questionnaire" have been used.

**Personal Information Form**

The personal information form included questions about the gender, age, educational status, branch of fencing sports, duration of fencing attendance, whether they are national athletes.

**Sport Character Scale**

In the research, the Sport Character Scale (SCS), developed by Jang (13) and adapted to Turkish by Görgüt and Tuncel (7), was used to measure the character structures of fencing athletes. The Sport Character Scale consists of five sub-dimensions and 27 items. Confirmatory factor analysis was applied to the 5-point likert type scale and found that the fit indices for the five sub-dimensions (X2/df= 3.97, GFI= 0.88, AGFI= 0.86, CFI= 0.97, NNFI= 0.96, NFI = 0.95, IFI= 0.97, RFI= 0.95, RMR= 0.05, SRMR= 0.05, RMSEA= 0.06) were perfect and it has been determined that it is at an acceptable level of compliance. For reliability, two semi-reliability methods were used.

**Sport Mental Toughness Questionnaire**

In order to measure the mental endurance of fencing athletes, the Sport Mental Toughness Questionnaire developed by Sheard et al. (21) and adapted to Turkish by Altıntaş and Koruç Bayar (2) was used. The scale consists of 3 sub-dimensions and 14 items. According to the confirmatory factor analysis results of the 4-point likert type scale, it was found that the compliance indices (X2/df= 1.98, GFI= 0.90, CFI= 0.91, IFI= 0.91, TLI= 0.88, RMR= 0.04, SRMR= 0.07, RMSEA=0.07) showed good compliance values.

**Data Collection Process**

The scales were applied by the researcher to 286 fencing athletes who participated in the Stars U17, Junior and Senior Epee-Foil-Sabre Turkey Championships held in Ankara between 16-24 November 2020, in line with the permission obtained by the Turkish Fencing Federation Presidency on 06.10.2020. The scales were applied face to face to the athletes on a voluntary basis. The ethics committee approval of the study was approved by the Necmettin Erbakan University Social and Human Sciences Scientific Research Ethics Committee with its decision dated 13.11.2020 and numbered 2020/82.

**Analysis of Data**

SPSS 16.0 statistical package program was used in the analysis of the data. The normality distribution of the data was evaluated with the interval of Kurtosis and Skewness coefficients, it was determined that the values did not exceed +1.5 and -1.5 values, and therefore the data showed a normal distribution (23). Independent group t test was used for binary cluster comparisons, One-Way Analysis of Variance (ANOVA) was used for comparisons of more than two clusters. Tukey multiple comparison test was applied to determine the source of significant differences. Pearson Product-Moment Correlation Coefficient was used to determine whether there is a significant relationship between the score averages of the Sport Character Scale and the Sport Mental Toughness Questionnaire sub-dimensions of the participants participating in the study. The significance level was taken as 0.05 in the research.

## RESULTS

In this section, the findings obtained as a result of the analysis of the data collected from the participants through data collection tools and comments on the findings are given.

Within the scope of this research, the reliability coefficient of the Sport Character Scale and the Sport Mental Toughness Questionnaire were calculated separately. It is 0.82 for the Sport Character Scale, 0.81 for the "Honesty" sub-dimension, 0.78 for the "Anti-social" sub-dimension, 0.76 for the "Compassion" sub-dimension, 0.78 for the "Sportsmanship" sub-dimension, and 0.84 for the "Justice" sub-dimension. It is 0.77 for the Sport Mental Toughness Questionnaire, 0.81 for the "Confidence" sub-dimension, 0.71 for the "Control" sub-dimension, and 0.74 for the "Continuity" sub-dimension.

The normality distribution of the data was evaluated with the interval of Kurtosis and Skewness coefficients, it was determined that the values did not exceed +1.5 and -1.5 values, and therefore the data showed a normal distribution (16).

**Table 1.** Numerical Distribution of Personal Information Belonging to Athletes

| Variable | Group | f | % |
|---|---|---|---|
| **Gender** | Male | 164 | 57,3 |
| | Female | 122 | 42,7 |
| | **Total** | **286** | **100,0** |
| **Age** | 14-15 | 100 | 35,0 |
| | 16-17 | 80 | 28,0 |
| | 18 years and over | 106 | 37,1 |
| | **Total** | **286** | **100,0** |
| **Education Status** | High School Level | 189 | 66,1 |
| | University Level | 97 | 33,9 |
| | **Total** | **286** | **100,0** |
| **Category** | Epee | 103 | 36,0 |
| | Foil | 98 | 34,3 |
| | Sabre | 85 | 29,7 |
| | **Total** | **286** | **100,0** |
| **The Duration of Continued Fencing** | 1-5 years | 144 | 50,3 |
| | 6 years and over | 142 | 49,7 |
| | **Total** | **286** | **100,0** |
| **National Athlete** | Yes | 107 | 37,4 |
| | No | 179 | 62,6 |
| | **Total** | **286** | **100,0** |

**Table 2.** The Average Scores of the Sub-dimensions of the Sport Character Scale according to the Gender Variable of the Athletes t test Results

| | Gender | N | Mean±SD | t | df | p |
|---|---|---|---|---|---|---|
| **Honesty** | Man | 164 | 4,499±0,475 | 0,827 | 284 | 0,417 |
| | Woman | 122 | 4,543±0,422 | | | |
| **Anti-Social** | Man | 164 | 4,484±0,735 | 2,715 | 284 | **0,010*** |
| | Woman | 122 | 4,691±0,557 | | | |
| **Compassion** | Man | 164 | 4,435±0,553 | 1,232 | 284 | 0,228 |
| | Woman | 122 | 4,510±0,486 | | | |
| **Sportsmanship** | Man | 164 | 4,762±0,398 | 1,114 | 284 | 0,284 |
| | Woman | 122 | 4,702±0,512 | | | |
| **Justice** | Man | 164 | 4,569±0,551 | 0,091 | 284 | 0,929 |
| | Woman | 122 | 4,562±0,606 | | | |
| **P<0.05** | | | | | | |

When Table 2 was examined, a statistical difference was found in favor of female athletes in the anti-social sub-dimension of athletes in terms of gender variable ($F(286) = 4.691$; $p<0.05$), while there was no statistically significant difference between participants in all other sub-dimensions.

**Table 3.** The average score of the sub-dimensions of the Sports Character Scale according to the age variable of the athletes Anova and Tukey test results

| | Age | N | Mean±SD | t | df | p | Tukey |
|---|---|---|---|---|---|---|---|
| **Honesty** | A 14-15 | 100 | 4,416±0,545 | 4,356 | 2<br>283<br>285 | **0,014*** | A<C |
| | B 16-17 | 80 | 4,541±0,388 | | | | |
| | C 18 years and over | 106 | 4,597±0,383 | | | | |
| **Anti-Social** | A 14-15 | 100 | 4,608±0,610 | 0,746 | 2<br>283<br>285 | 0,475 | |
| | B 16-17 | 80 | 4,612±0,634 | | | | |
| | C 18 years and over | 106 | 4,509±0,752 | | | | |
| **Compassion** | A 14-15 | 100 | 4,360±0,634 | 3,446 | 2<br>283<br>285 | **0,033*** | A<C |
| | B 16-17 | 80 | 4,497±0,452 | | | | |
| | C 18 years and over | 106 | 4,545±0,447 | | | | |
| **Sportsmanship** | A 14-15 | 100 | 4,713±0,469 | 1,347 | 2<br>283<br>285 | 0,262 | |
| | B 16-17 | 80 | 4,691±0,516 | | | | |
| | C 18 years and over | 106 | 4,792±0,372 | | | | |
| **Justice** | A 14-15 | 100 | 4,466±0,606 | 5,336 | 2<br>283<br>285 | **0,005*** | A<C<br>B<C |
| | B 16-17 | 80 | 4,504±0,658 | | | | |
| | C 18 years and over | 106 | 4,707±0,435 | | | | |
| **P<0.05** | | | | | | | |

When Table 3 was examined, there was no statistically significant difference in the anti-social and sportsmanship sub-dimensions from the Sport Character Scale sub-dimensions according to the age variable of the athletes, while, it was determined that the statistical averages of the scores in favor of the participants aged 18 and over in the honesty and compassion sub-dimensions significantly diference between the participants aged 14-15 and the participants aged 18 and over [Honesty= (F(286) =4,356; p<0.05), Compassion= (F(286) =3,446; p<0.05)]. In the justice sub-dimension, a statistically significant difference was found in favor of participants aged 18 and over (F(286) =5.336; p<0.05) with all other age groups.

**Table 4.** The score of the sub-dimensions of the Sports Character Scale according to the educational status variable of the athletes average t test results

| | Education Status | N | Mean±SD | t | df | p |
|---|---|---|---|---|---|---|
| **Honesty** | High School Level | 189 | 4,486±0,449 | 1,669 | 284 | 0,099 |
| | University Level | 97 | 4,580±0,456 | | | |
| **Anti-Social** | High School Level | 189 | 4,611±0,583 | 1,368 | 284 | 0,172 |
| | University Level | 97 | 4,496±0,816 | | | |
| **Compassion** | High School Level | 189 | 4,433±0,536 | 1,546 | 284 | 0,123 |
| | University Level | 97 | 4,534±0,501 | | | |
| **Sportsmanship** | High School Level | 189 | 4,705±0,487 | 1,790 | 284 | 0,103 |
| | University Level | 97 | 4,797±0,365 | | | |
| **Justice** | High School Level | 189 | 4,492±0,621 | 3,461 | 284 | **0,002*** |
| | University Level | 97 | 4,711±0,437 | | | |
| **P<0.05** | | | | | | |

When Table 4 was examined, a statistical difference was found in favor of athletes with undergraduate education level in the justice sub-dimension of the Sports Character Scale in terms of the educational status variable of athletes (F(286) =3.461; p<0.05), in all other sub-dimensions, there was no statistically significant difference between the participants

**Table 5.** The average scores of the sub-dimensions of the Sports Character Scale according to the branch variable of the athletes in fencing sport are Anova and Tukey test results

| | Category | N | Mean±SD | t | df | p | Tukey |
|---|---|---|---|---|---|---|---|
| **Honesty** | A Epee | 103 | 4,516±0,477 | 2,950 | 2<br>283<br>285 | 0,054 | |
| | B Foil | 98 | 4,443±0,454 | | | | |
| | C Sabre | 85 | 4,605±0,408 | | | | |
| **Anti-Social** | A Epee | 103 | 4,495±0,769 | 3,178 | 2<br>283<br>285 | **0,043*** | A<C<br>B<C |
| | B Foil | 98 | 4,522±0,715 | | | | |
| | C Sabre | 85 | 4,724±0,436 | | | | |
| **Compassion** | A Epee | 103 | 4,415±1,521 | 4,708 | 2<br>283<br>285 | **0,010*** | A<C<br>B<C |
| | B Foil | 98 | 4,396±1,532 | | | | |
| | C Sabre | 85 | 4,611±1,500 | | | | |
| **Sportsmanship** | A Epee | 103 | 4,792±0,390 | 6,268 | 2<br>283<br>285 | **0,002*** | B<A<br>B<C |
| | B Foil | 98 | 4,608±0,568 | | | | |
| | C Sabre | 85 | 4,815±0,323 | | | | |
| **Justice** | A Epee | 103 | 4,598±0,522 | 5,252 | 2<br>283<br>285 | **0,006*** | B<C |
| | B Foil | 98 | 4,425±0,641 | | | | |
| | C Sabre | 85 | 4,690±0,521 | | | | |
| P<0.05 | | | | | | | |

When Table 5 is examined, it shows that there is no statistically significant difference in the honesty sub-dimension of the Sport Character Scale in terms of the branch variable of athletes in fencing sports, while the statistical averages differed significantly in favor of athletes in the sabre branch in the anti-social and compassion sub-dimensions [Anti-social= (F(286) =3,178; p<0.05), Compassion= (F(286) =4,708; p<0.05)] it is determined. In the sportsmanship sub-dimension, it was found that the average scores of athletes in the foil branch differed at a statistically significant level in favor of athletes in the other two branches (F(286) =6.268; p<0.05). In the justice sub-dimension, the average scores of athletes in the foil and sabre branches were in favor of athletes in the sabre branch (F(286) = 5.252; p<0.05) it was determined that it differed at a statistically significant level.

**Table 6.** The average scores of the sub-dimensions of the Sports Character Scale according to the fencing experience duration variable of the athletes t test results.

| | The Duration of Continued Fencing | N | Mean±SD | t | df | p |
|---|---|---|---|---|---|---|
| **Honesty** | 1-5 years | 144 | 4,448±0,626 | 0,230 | 284 | 0,847 |
| | 6 years and over | 142 | 4,471±0,453 | | | |
| **Anti-Social** | 1-5 years | 144 | 4,527±0,696 | 0,811 | 284 | 0,466 |
| | 6 years and over | 142 | 4,625±0,581 | | | |
| **Compassion** | 1-5 years | 144 | 4,348±0,626 | 0,682 | 284 | 0,530 |
| | 6 years and over | 142 | 4,424±0,546 | | | |
| **Sportsmanship** | 1-5 years | 144 | 4,656±0,489 | 0,050 | 284 | 0,961 |
| | 6 years and over | 142 | 4,651±0,517 | | | |
| **Justice** | 1-5 years | 144 | 4,555±0,531 | 0,603 | 284 | 0,579 |
| | 6 years and over | 142 | 4,489±0,617 | | | |
| **P<0.05** | | | | | | |

When Table 6 was examined, there was no statistically significant difference in all sub-dimensions of the Sport Character Scale in terms of the athletes' fencing experience duration variable.

**Table 7.** The average score of the sub-dimensions of the Sports Character Scale according to the nationality status variable of the athletes t test results

| | National Athlete | N | Mean±SD | t | df | p |
|---|---|---|---|---|---|---|
| **Honesty** | Yes | 107 | 4,602±0,382 | 2,613 | 284 | **0,014*** |
| | No | 179 | 4,467±0,484 | | | |
| **Anti-Social** | Yes | 107 | 4,534±0,723 | 0,741 | 284 | 0,473 |
| | No | 179 | 4,595±0,,641 | | | |
| **Compassion** | Yes | 107 | 4,557±0,478 | 2,336 | 284 | **0,025*** |
| | No | 179 | 4,413±0,546 | | | |
| **Sportsmanship** | Yes | 107 | 4,834±0,311 | 3,239 | 284 | **0,004*** |
| | No | 179 | 4,677±0,508 | | | |
| **Justice** | Yes | 107 | 4,663±0,454 | 2,411 | 284 | **0,027*** |
| | No | 179 | 4,508±0,629 | | | |
| **P<0.05** | | | | | | |

When Table 7 was examined, there was no statistically significant difference in the anti-social sub-dimension of the Sport Character Scale in terms of the nationality status variable of athletes; in other sub-dimensions [Honesty= (F(286) =2,613; p<0,05), Compassion= (F(286) =2,336; p<0,05), Sportsmanship= (F(286) =3,239; p<0,05), Justice= (F(286) =2,411; p<0,05)], a statistical difference was found in favor of athletes who are national.

**Table 8.** The average scores of the sub-dimensions of the Sport Mental Toughess Questionnaire according to the gender variable of the athletes t test results

| | Gender | N | Mean±SD | t | df | p |
|---|---|---|---|---|---|---|
| **Confidence** | Male | 164 | 3,192±0,587 | 4,296 | 284 | **0,000*** |
| | Female | 122 | 2,905±0,534 | | | |
| **Continuity** | Male | 164 | 3,327±0,499 | 0,489 | 284 | 0,627 |
| | Female | 122 | 3,299±0,479 | | | |
| **Control** | Male | 164 | 2,262±0,711 | 3,390 | 284 | **0,001*** |
| | Female | 122 | 1,998±0,613 | | | |
| **P<0.05** | | | | | | |

When Table 8 was examined, there was a statistically significant difference in favor of male athletes in the confidence and control sub-dimension of the Sport Mental Toughness Questionnaire in terms of the gender variable of athletes [Confidence= (F(286) =4,296; p<0,05), Control= (F(286) =3,390; p<0,05)], while no statistically significant difference was found between participants in the continuity sub-dimension.

**Table 9.** The average scores of the Sport Mental Toughess Questionnaire sub-dimensions according to the age variable of the athletes Anova and Tukey test results

| | Age | N | Mean±SD | t | df | p | Tukey |
|---|---|---|---|---|---|---|---|
| **Confidence** | A 14-15 | 100 | 2,941±0,517 | 4,433 | 2<br>283<br>285 | **0,013*** | A<C |
| | B 16-17 | 80 | 3,085±0,601 | | | | |
| | C 18 years and over | 106 | 3,179±0,605 | | | | |
| **Continuity** | A Epee | 100 | 3,282±0,430 | 0,379 | 2<br>283<br>285 | 0,685 | |
| | B Foil | 80 | 3,343±0,474 | | | | |
| | C Sabre | 106 | 3,325±0,554 | | | | |
| **Control** | A Epee | 100 | 2,192±0,640 | 0,715 | 2<br>283<br>285 | 0,490 | |
| | B Foil | 80 | 2,178±0,712 | | | | |
| | C Sabre | 106 | 2,087±0,690 | | | | |
| **P<0.05** | | | | | | | |

When Table 9 was examined, no statistically significant difference was found in the continuity and control sub-dimension of the Sport Mental Toughness Questionnaire according to the age variable of the athletes, in

the confidence sub-dimension, it was determined that the mean scores of the participants aged 18 and over and those aged 14-15 differed significantly in favor of the participants aged 18 and over (F(286) =4.433; p<0.05).

**Table 10.** Score averages of Sport Mental Toughess Questionnaire sub-dimensions according to the educational status variable of athletes t test results

| | Education Status | N | Mean±SD | t | df | p |
|---|---|---|---|---|---|---|
| **Confidence** | High School Level | 189 | 3,007±0,562 | 2,576 | 284 | **0,013*** |
| | University Level | 97 | 2,192±0,603 | | | |
| **Continuity** | High School Level | 189 | 3,305±0,450 | 0,481 | 284 | 0,655 |
| | University Level | 97 | 3,335±0,562 | | | |
| **Control** | High School Level | 189 | 2,165±0,661 | 0,551 | 284 | 0,592 |
| | University Level | 97 | 2,118±0,715 | | | |
| **P<0.05** | | | | | | |

When Table 10 was examined, a statistically significant difference was found in favor of athletes with a high school education level in the Sport Mental Toughness Questionnaire confidence sub-dimension in terms of the educational status variable of athletes (F(286) =2,576; p<0,05), while there was no statistically significant difference between participants in the continuity and control sub-dimensions.

Table 11 Average scores of Sport Mental Toughess Questionnaire sub-dimensions according to the branch variable of athletes in fencing sport Anova and Tukey test results

| | Category | N | Mean±SD | t | df | p | Tukey |
|---|---|---|---|---|---|---|---|
| **Confidence** | A Epee | 103 | 2,954±0,554 | 16,297 | 2<br>283<br>285 | **0,000*** | A<C<br>B<C |
| | B Foil | 98 | 2,942±0,495 | | | | |
| | C Sabre | 85 | 3,356±0,610 | | | | |
| **Continuity** | A Epee | 103 | 3,291±0,459 | 9,724 | 2<br>283<br>285 | **0,000*** | A<C<br>B<C |
| | B Foil | 98 | 3,186±0,476 | | | | |
| | C Sabre | 85 | 3,494±0,495 | | | | |
| **Control** | A Epee | 103 | 2,021±0,532 | 12,543 | 2<br>283<br>285 | **0,000*** | A<C<br>B<C |
| | B Foil | 98 | 2,025±0,620 | | | | |
| | C Sabre | 85 | 2,447±0,806 | | | | |
| **P<0.05** | | | | | | | |

When Table 11 was examined, a statistically significant difference was found in the confidence, continuity and control sub-dimensions of the Sport Mental Toughness Questionnaire in terms of the branch variable of the athletes. It has been determined that the statistical score averages of the participants in the sabre branch differ significantly in all sub-dimensions [Confidence= (F(286)=16,297; p<0,05), Continuity= (F(286)= 9,724; p<0,05), Control= (F(286)= 12,543; p<0,05)].

Table 12 Average scores of Sport Mental Toughess Questionnaire sub-dimensions according the duration of continued fencing variable of athletes t test results

| | The Duration of Continued Fencing | N | Mean±SD | t | df | p |
|---|---|---|---|---|---|---|
| **Confidence** | 1-5 years | 144 | 2,978±0,570 | 2,720 | 284 | **0,007*** |
| | 6 years and over | 142 | 3,163±0,580 | | | |
| **Continuity** | 1-5 years | 144 | 3,298±0,466 | 0,588 | 284 | 0,557 |
| | 6 years and over | 142 | 3,332±0,514 | | | |
| **Control** | 1-5 years | 144 | 2,232±0,681 | 2,097 | 284 | **0,037*** |
| | 6 years and over | 142 | 2,065±0,669 | | | |
| **P<0.05** | | | | | | |

When Table 12 was examined, a statistically significant difference was found in favor of participants with a duration of experience of 6 years and over in the Sport Mental Toughness Questionnaire confidence sub-dimension in terms of the fencing experience duration variable of athletes (F(286) =2,720; p<0,05), while a statistically significant difference was determined in favor of participants with a duration of experience of 1-5 years in the control sub-dimension. A statistically significant difference was determined in favor of participants with a duration of experience of 1-5 years (F(286) =2,097; p<0,05). In the continuity sub-dimension, there was no statistically significant difference between the participants according to the fencing experience duration variable.

**Table 13.** Average scores of Sport Mental Toughess Questionnaire sub-dimensions according to the nationality status variable of athletes t test results

| | National Athlete | N | Mean±SD | t | df | p |
|---|---|---|---|---|---|---|
| **Confidence** | Yes | 107 | 3,261±0,549 | 4,494 | 284 | **0,000*** |
| | No | 179 | 2,955±0,571 | | | |
| **Continuity** | Yes | 107 | 3,357±0,502 | 1,118 | 284 | 0,270 |
| | No | 179 | 3,290±0,482 | | | |
| **Control** | Yes | 107 | 2,128±0,639 | 0,413 | 284 | 0,687 |
| | No | 179 | 2,162±0,703 | | | |
| **P<0.05** | | | | | | |

When Table 13 was examined, a statistically significant difference was found in favor of national athletes in the Sport Mental Toughness Questionnaire confidence sub-dimension in terms of the athletes' nationality status variable (F(286) =4,494; p<0,05), while there was no statistically significant difference between participants in the continuity and control sub-dimensions.

Table 14. Pearson Product-Moment Correlation Coefficient Results for Determining the Relationship between Athletes' Sport Character Scale and Sport Mental Thoughness Questionnaire Sub-dimensions Mean Scores

| | | | Honesty | Anti-Social | Compassion | Sportsmanship | Justice |
|---|---|---|---|---|---|---|---|
| **Sport Mental Toughness Questionnaire** | **Confidence** | **r** | **0,313**** | 0,045 | **0,188**** | **0,232**** | **0,228**** |
| | | **p** | 0,000 | 0,446 | 0,001 | 0,000 | 0,000 |
| | **Continuity** | **r** | **0,345**** | 0,257 | **0,240**** | **0,217**** | **0,173**** |
| | | **p** | 0,000 | 0,275 | 0,000 | 0,000 | 0,003 |
| | **Control** | **r** | 0,009 | 0,026 | -0,058 | 0,063 | 0,045 |
| | | **p** | 0,886 | 0,659 | 0,329 | 0,287 | 0,453 |
| | **Total** | **N** | **286** | **286** | **286** | **286** | **286** |

****P<0,01**

When Table 14 was examined, Pearson Product-Moment Correlation Coefficient results were performed to determine the relationship between the Sport Character Scale of athletes and the score averages of the Sport Mental Toughness Questionnaire sub-dimensions. A significant relationship was found between the honesty sub-dimension of the Sport Mental Toughness Questionnaire and the honesty sub-dimension of the Sports Character Scale in a decently positive direction, and between the honesty sub-dimension and the compassion, sportsmanship and justice sub-dimensions in a decently positive direction. A significant relationship was determined between the continuity sub-dimension of the Sport Mental Toughness Questionnaire and the honesty sub-dimension of the Sport Character Scale in a decently positive direction, and between the continuity sub-dimension and the compassion, sportsmanship and justice sub-dimensions in a decently positive direction. In the control sub-dimension of the Sport Mental Toughness Questionnaire, a statistically significant relationship was not found in any of the sub-dimensions of the Sport Character Scale.

## DISCUSSION AND CONCLUSION

According to the results in Table 2, it can be said that the reason why women's antisocial behavior is higher than men's is that women who have grown up in a patriarchal society have always had to prove themselves, they have a more ambitious structure, and therefore they are more antisocial than male athletes, because they try to prove themselves more. Özlü (19), Yıldız and Özmaden (33), İmamlı and Ünver (12) and Yazıcı (30) reached similar results in their research. Mouratidou, Goutza & Chatzopoulos (18) concluded that there was no significant difference between male and female in terms of character development.

Contrary to the research results, Kavussanu and Roberts (15) determined that men's self-centered approaches are higher than women in sports, Kavussanu, Stamp, Slade, and Ring (16) determined that men exhibit more anti-social behavior than women in football. Öztürk (20), Gürpınar and Kurşun (8), and Yıldız and Özmaden (33) found that women exhibit more positive behaviors than men in sports.

As regards the results in Table 3, it can be interpreted as that increasing the age, maturation and sports experience of fencing athletes has a positive effect on honesty, compassion and justice scores. İmamlı & Ünver (12), Kaplan and Akyüz (14) and Öztürk (20) reached similar results in their research.

Nevertheless Yıldız (32) and Yıldız and Özmaden (33) reached conclusions contrary to the research results in their studies.

In proportion to the results in Table 4, it can be said that the reason why athletes with a high school level education level have a lower justice sub-dimension compared to athletes with a bachelor's level education level is because high school level athletes are younger in age than undergraduate level athletes and do not fully understand the concept of justice. Yazıcı (30), Özlü (19), Yıldız (32) and Öztürk (20) reached similar results in their research.

In comparison with the results in Table 5, it shows that there are various differences in terms of sports character in epe, foil and sabre branches in fencing branch. However, it can be said that the sports character may not show great differences between sports branches. Sinulingga et al. (22) in their research, in which they examined the sports characters of athletics, taekwondo, wrestling, volleyball and football athletes, they concluded that there is no difference between the branches in terms of sports character.

In reference to the results in Table 6, it has been observed that the honesty and compassion dimensions of the lower dimensions of the scale are positively affected and increase as the experience time of athletes increases. It is thought that this situation may be related to the athletes' experiences gained in training and competitions. İlhan et al. (11), Kaplan and Akyüz (14), Yıldız (32) and Yazıcı (30) reached similar results in their research.

In compliance with the results in Table 7, it can be said that national athletes who get the chance to compete in many domestic and international competitions have more competition experience than non-national athletes, and the sub-dimensions of honesty, compassion, sportsmanship, anti-social and justice are positively affected depending on their long-term spending in national team camps and the mental and physical training they have received during this time. Yazıcı (30) and Özlü (19) reached similar results in their research.

In accordance with the results in Table 8, it can be said that the responsibility given to boys from a young age in patriarchal societies is greater than that of girls, and the fact that men's feelings of confidence and control are more developed due to the freer upbringing of boys' children causes the confidence and control sub-dimensions of the Sport Mental Toughness Questionnaire to be higher than women's. Farrokhi et al. (5) they determined that the mental endurance of men is higher than that of women.

Contrary to the research results, Bülbül (3) found that the psychological endurance of female athletes is better compared to male.

In regard to the results in Table 9, athletes aged 14-15 compete in the U17 class, while athletes aged 18 and over compete in the seniors class. The fact that the athletes competing in the senior class have more competition experience and the more extensive training they receive has enabled them to dominate the fencing branch more. It is believed that this condition causes the confidence sub-dimension of the mental endurance sub-

dimensions to be higher in athletes aged 18 and older than in athletes aged 14-15. Yıldız (31) and İlhan (10) reached similar results in their research. Uçar and Kaplan (28) Bülbül (3) and Tekkurşun Demir and Türkeli (25) reached results contrary to their research results.

According to the results in Table 10, depending on the increase in education level and age, it is expected that the confidence of individuals will also increase. However, as a result of the research, it can be interpreted that the high school level athletes' sense of confidence is higher than undergraduate level athletes, high school athletes have developed a much higher sense of self-confidence than expected through sports, despite being in adolescence. While there is no study in the literature that supports the research results, Yıldız (31) and Uçar and Kaplan (28) reached results contrary to the research results.

Considering the results in Table 11, it can be interpreted as the fact that there are more achievements in the sabre branch compared to other branches, which causes the athletes of the sabre branch to have higher average scores in the sub-dimension of confidence, continuity and control. There have not been any studies that have similarities with the study or that have obtained opposite results.

As regards the results in Table 12, it can be interpreted that athletes with a lot of experience master the subtleties of sports and their confidence levels are higher because they know how to cope with the challenges they face. The reason why control levels are high in athletes with fencing experience between 1-5 years can be said to be due to the fact that their knowledge and skills are not developed much compared to athletes with fencing experience of 6 years and over, and they behave more controllably during the competition due to their low competition experience. Yıldız (31) and İlhan (10) reached results contrary to their research results.

In proportion to the results in Table 13, since the achievements of national athletes, the time they spend on sports, the training they have received in national team camps and as a result of these trainings, they consider themselves to have sufficient knowledge and skills in sports, it can be interpreted that their confidence levels are higher than non-national athletes. Contrary to the research results, Yıldız (31) found that there is no significant difference in the mental endurance levels of professional and non-professional athletes.

In comparison with the results in Table 14, it is believed that the reason why there is a positive relationship between confidence, which is the sub-dimension of the Sport Mental Toughness Questionnaire, and honesty, compassion, sportsmanship and justice from the sub-dimensions of the Sport Character Scale, is directly proportional to the increase in the athlete's self-confidence. Continuity, which is the sub-dimension of the Sport Mental Toughness Questionnaire, can be interpreted as positively affecting the honesty, compassion, sportsmanship and justice behaviors of an athlete who fights without giving up under all conditions and difficulties, from the sub-dimensions of the Sport Character Scale.

## SUGGESTIONS

In the research, it has been seen that there is a linear relationship between the duration of athletes' experience in sports and their character traits in sports. For this reason, orientation, promotion and incentive studies can be carried out for the development of character traits in the sport of fencing.

It has been observed that the mental endurance characteristics of athletes in the sabre branch are higher compared to other branches. According to the investigation of the reason for this and the results obtained, the training programs necessary for the mental endurance of athletes in the epe and foil branches can be applied.

It has been observed that the sports character traits and mental endurance characteristics of national athletes are in a positive direction. According to the results obtained by investigating the differences between the mental endurance of elite fencing athletes with international achievements and national athletes in Turkey, it can be ensured that positive characteristics are applied decently to fencing athletes in Turkey and that the achievements of Turkish fencing in international competitions are increased.

It should be investigated whether the positive effect of the sports character traits and mental endurance characteristics of national athletes is due to the training they received at the national team camps, and if it is due to the national team camps, fencing coaches can be provided with training to increase these characteristics of athletes.

It can be investigated whether the character traits and the mental endurance characteristics of athletes have an effect on success.

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# The Relationship Between Musculoskeletal Disorders, Anxiety and Body Awareness in Elite Athletes

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**Abstract**

The aim of this study was to determine the most common musculoskeletal disorders in athletes and to investigate the relationship between musculoskeletal complaints and sport-related anxiety and body awareness. This study, which was designed using the relational screening method as a quantitative research, was conducted using the online survey method (via Google Forms). The study included 80 athletes aged 18-35 years, who were actively involved in elite level sport. The Nordic Musculoskeletal Questionnaire was used to assess musculoskeletal disorders, the Sports Anxiety Scale-2 (SAS-2) to assess anxiety, and the Body Awareness Questionnaire (BAQ) to assess body awareness. There was a significant difference in somatic anxiety levels between the athletes who experienced musculoskeletal pain and those who did not ($p<0.05$). The somatic anxiety levels of athletes with musculoskeletal disorders were found to be higher than those without musculoskeletal disorders. A weak correlation at significant level was found between the somatic anxiety levels of the athletes and the number of complaint areas reported in the last 12 months ($p<0.01$). With the body awareness status of the athletes; while a positive significant weak level relationship was found with somatic anxiety level ($p<0.05$), a negative relationship was found with concentration disorganisation at a high level of significance ($p<0.05$). It was observed that athletes with musculoskeletal disorders had higher levels of somatic anxiety and that the number of regions in which the athlete experienced complaints was related to the level of somatic anxiety; there was no relationship between body awareness levels and musculoskeletal complaints. A multidisciplinary study with a psychological perspective is important for the clinical care and support of elite athletes in different sports.

**Keywords:** Anxiety, Athlete, Body Awareness, Musculoskeletal System.

**Özet**

**Elit Sporcularda Kas İskelet Sistemi Bozuklukları, Anksiyete ve Vücut Farkındalığı Arasındaki İlişki**

Bu çalışmanın amacı, sporcularda en sık görülen kas-iskelet sistemi rahatsızlıklarını belirlemek ve kas-iskelet sistemi şikayetleri ile sporla ilgili kaygı ve beden farkındalığı arasındaki ilişkiyi araştırmaktır**.** Nicel bir araştırma olarak ilişkisel tarama yöntemi kullanılarak tasarlanan bu çalışma, çevrimiçi anket yöntemi (Google Forms aracılığıyla) ile gerçekleştirilmiştir. Çalışmaya aktif olarak elit düzeyde spor yapan 18-35 yaş arası 80 sporcu dahil edilmiştir. Kas-iskelet sistemi rahatsızlıklarını değerlendirmek için İskandinav Kas İskelet Sistemi Anketi, anksiyete değerlendirmesi için Spor Kaygı Ölçeği-2 ve vücut farkındalığını değerlendirmek için Vücut Farkındalığı Anketi kullanılmıştır. Kas-iskelet sistemi ağrısı yaşayan ve yaşamayan sporcular karşılaştırıldığında somatik kaygı düzeyleri arasında anlamlı fark bulunmuştur ($p<0.05$). Kas-iskelet sistemi rahatsızlığı olan sporcuların somatik kaygı düzeyleri, kas-iskelet sistemi rahatsızlığı olmayanlara göre daha yüksek bulunmuştur. Sporcuların somatik anksiyete düzeyleri ile son 12 ay içinde rapor edilen şikayet alanlarının sayısı arasında anlamlı düzeyde zayıf bir ilişki bulunmuştur ($p<0.05$). Sporcuların beden farkındalığı durumu ile; somatik kaygı düzeyi arasında pozitif yönde anlamlı zayıf düzeyde bir ilişki bulunurken ($p<0.05$), konsantrasyon dağınıklığı ile negatif yönde yüksek anlamlılık düzeyinde bir ilişki bulunmuştur($p<0.05$). Kas-iskelet sistemi rahatsızlıkları olan sporcuların somatik kaygı düzeylerinin daha yüksek olduğu ve sporcunun şikayet yaşadığı bölge sayısının somatik kaygı düzeyi ile ilişkili olduğu; beden farkındalığı düzeyleri ile kas-iskelet sistemi şikayetleri arasında bir ilişki olmadığı görülmüştür. Psikolojik bakış açısına sahip multidisipliner bir çalışma, farklı spor dallarındaki elit sporcuların klinik bakımı ve desteği için önemlidir.

**Anahtar Kelimeler:** Anksiyete, Elit Sporcu, Vücut Farkındalığı, Kas-İskelet Sistemi.

## INTRODUCTION

The International Olympic Committee defines musculoskeletal disorders in its Handbook on Sports Injuries as "new or recurrent musculoskeletal complaints occurring during competition or training that require medical attention, regardless of the possibility of absence from competition or training (1). According to the literature, elite athletes can range from Olympic gold medallists and world record holders to regional and university level athletes (2). Muscle injuries, sprains, tendonitis and strains are among the most common health problems in athletes. Elite athletes can suffer from various musculoskeletal disorders due to high levels of physical activity. These disorders can occur in athletes due to overuse, particularly repetitive movements. Examples of these disorders include pain, fatigue, cramps and injuries (3).

Pain in the musculoskeletal system is often associated with sports injuries and is frequently observed in elite athletes (4). Although pain is often associated with sports injuries, which are common among elite athletes, pain can also be present in the absence of an injury, or can be present even after the healing of an injury (5) . Pain is a personal experience influenced to varying degrees by biological, psychological and social factors (6). The longer the duration of pain, the greater the potential for psychological, social and environmental/contextual factors to influence pain-related problems. These factors can cause problems such as functional limitations as well as pain. (7).

Psychological factors play an important role in athletes' responses to musculoskeletal disorders. Psychological assessment is necessary to understand the athlete's process of understanding their pain, when pain exceeds the expected recovery time or when psychosocial symptoms occur. Such an assessment includes questioning the athlete's cognitive and behavioural responses to pain, assessments of pain and its consequences, psychosocial stress levels and psychological symptoms (anxiety, depression, anxiety, etc.). There are bidirectional relationships between pain and anxiety, anxiety, depression, stress and anger. The

assessment of social and environmental factors related to the pain problem also constitutes an essential component of psychosocial factors (5, 8).

Among the various factors that researchers have addressed in the search for higher levels of performance in sport, athletes' body awareness has been a topic of particular interest in recent years (9). Body awareness represents an athlete's interpretation, evaluation, beliefs and memories within a natural, phenomenological attitude of proprioception and interoception that involves conscious awareness of the body. Body awareness includes attentive focus on the body and awareness of internal body sensations (10). Increased awareness of the interconnection between body, mind, emotions and context can lead to a better understanding of the messages emanating from painful muscles. This awareness, combined with a focus on personal experiences, has a significant impact on outcomes for individuals with chronic musculoskeletal pain. With increased body awareness, people learn to recognise and use body signals other than pain and to identify their physical and mental state (11). Awareness of the relationship between physical and mental states in different contexts can lead to a better understanding of this bodily information and thus to increased confidence in one's body and self (12, 13).

There is a paucity of studies in the literature examining the relationship between musculoskeletal complaints in athletes and psychosocial factors. There are no studies analysing the relationship between musculoskeletal disorders and anxiety and body awareness in elite athletes. The aim of our study was to determine the most common musculoskeletal disorders in athletes and to investigate the relationship between musculoskeletal complaints and sport-related anxiety and body awareness. We hypothesise that there is a significant relationship between musculoskeletal complaints, anxiety and body awareness in elite athletes.

## METHOD

This study, which was planned as a quantitative research using the relational screening method, was carried out using the online survey method (via Google Forms) between 11.07.2022-10.10.2022 dates. 80 licensed active athletes aged between 18 and 35, volunteered to take part in the study were included. Who had known diagnosed systemic disease, had suffered an injury that would prevent them from participating in sport in the previous 6 months, and were excluded.

### Data Collection Tools

At the beginning of the study, demographic information of all participating athletes was recorded in the socio-demographic information form. The Nordic Musculoskeletal Questionnaire was used to determine musculoskeletal disorders, Sports Anxiety Scale-2 (SAS-2) was used to evaluate anxiety levels, and Body Awareness Questionnaire (BAQ) was used to determine body awareness levels.

**Socio- Demographic Information Form:** Information such as the age, gender, age of starting sports and the number of hours of training per day of elite athletes can be obtained.

**The Nordic Musculoskeletal Questionnaire:** It is a self-administered or interviewer-administered questionnaire that provides reliable information in the first two parts by asking yes/no about the presence of pain, soreness, discomfort in nine parts of the body (neck, shoulders, back, elbows, wrists, hips, ankles, feet and ankles) in the last 12 months and 7 days, (neck, shoulders, back, elbows, wrists, hips, knees, ankles, feet and ankles) in the last 12 months and 7 days and in the last part by asking yes/no if the pain or discomfort experienced in the last 12 months has prevented him/her from doing his/her job in which of the nine different areas mentioned. Kahraman et al. reported that the Turkish version of the questionnaire has favourable psychometric properties, including good test-retest reliability, internal consistency and construct validity. (14).

**Sports Anxiety Scale-2 (SAS-2):** It is a 15-item scale with 3 sub-dimensions: somatic anxiety, anxiety and concentration distraction. Items 2, 6, 10, 12 and 14 of the scale measure somatic anxiety level, items 3, 5, 8, 9 and 11 measure anxiety level and items 1, 4, 7, 13 and 15 measure concentration distraction. The scale is scored on a 4-point Likert scale and consists of "Not at all (1), a little (2), a lot (3) and very much (4)" (15). Karadağ and Aşçı adapted the scale into Turkish and conducted validity and reliability studies.(16).

**Body Awareness Questionnaire (BAQ):** It is an 18-item questionnaire that asks about bodily reactions, the individual's assessment of bodily processes, the disease process and the sleep-wake cycle. A high score on the questionnaire indicates a high level of body awareness. The Body Awareness Questionnaire is frequently used by health researchers because it comprehensively assesses emotional, physical and social aspects, does not require training for its use, is easy to understand, can be applied quickly and has a holistic approach. Karaca and Bayar conducted a validity and reliability study of the questionnaire, and found the Turkish version to be reliable and valid (17).

**Ethical approval and institutional permission**

The approval of this study, which was conducted in accordance with the ethical rules of the Declaration of Helsinki, was approved by the Üsküdar University Non-Interventional Research Ethics Committee with the decision dated 27.05.2022 and numbered 613513342/May 2022-39 Athletes who volunteered for the study were given detailed information about the study before completing the questionnaires and their consent was obtaine.

**Statistical Analysis**

The IBM SPSS 24.0 package was used for statistical analyses. The normality of the data was analysed using Kolmogorov Smirnov tests. It was found that the data were no distributed. Descriptive data were expressed as percentages, frequencies, means, standard deviations, medians and lower and upper quartile. The Mann-Whitney U test was used for two group comparisons that did not show a parametric distribution. Spearman correlation analysis was used for analysis of relationships. Statistical significance was taken as $p<0.05$.

## FINDINGS

**Table 1.** Socio-Demographic Information

| | | Mean±SD | N (%) |
|---|---|---|---|
| **Age** | | 24.89±4.16 | |
| **Height** | | 177.73±8.88 | |
| **Weight** | | 69.48±11.36 | |
| **Gender** | Woman | | 19 (23.8%) |
| | Man | | 61 (76.3%) |
| **Educational Status** | Primary School | | 0 (0.0%) |
| | Middle School | | 7 (8.8%) |
| | High School | | 32 (40.0%) |
| | University | | 38 (47.5%) |
| | Postgraduate | | 3 (3.8%) |
| **Sports Branch** | Football | | 46 (57.5%) |
| | Volleyball | | 6 (7.5%) |
| | Basketball | | 4 (5.0%) |
| | Swiming | | 9 (11.3%) |
| | Other (Boxing. Taekwondo. Rowing) | | 15 (18.8%) |
| **How many hours a day do you train?** | 2 | | 41 (51.3%) |
| | 3 | | 33 (41.3%) |
| | 4 | | 4 (5.0%) |
| | 5 | | 2 (2.5%) |
| **How many days a week do you train?** | 1 | | 2 (2.5%) |
| | 2 | | 2 (2.5%) |
| | 3 | | 5 (6.3%) |
| | 4 | | 4 (5.0%) |
| | 5 | | 29 (36.3%) |
| | 6 | | 33 (41.3%) |
| | 7 | | 5 (6.3%) |

A total of 80 athletes, 19 females (mean age=23.95±4.30) and 61 males (mean age=25.18±4.10) participated in the study. The athletes' age, height, weight, educational status, sports, daily and weekly training times are shown in **Table 1.**

**Table 2.** Frequency of musculoskeletal disorders according to body parts of athletes

| Body Area | The presence of pain, sorenes, discomfort and numbness in the last 7 days | The presence of pain, soreness, discomfort and numbness in the last 12 months | Impact on functionality |
|---|---|---|---|
| | n (%) | n (%) | n (%) |
| **Neck** | 11 (13.8) | 29 (36.3) | 10 (12.5) |
| **Shoulder** | 13 (16.3) | 27 (33.8) | 10 (12.5) |
| **Elbow** | 5 (6.3) | 10 (12.5) | 4 (5) |
| **Hand and Wrist** | 9 (11.3) | 27 (33.8) | 8 (10) |
| **Back** | 12 (15) | 29 (36.3) | 6 (7.5) |
| **Waist** | 12 (15) | 29 (36.3) | 12 (15) |
| **Hip** | 10 (12.5) | 23 (28.8) | 12 (15) |
| **Knee** | 12 (15) | 32 (40) | 22 (27.5) |
| **Foot/Ankle** | 19 (23.8) | 43 (53.8) | 27 (33.8) |

The frequency of musculoskeletal complaints observed in the 'last 7 days' and in the 'last 12 months' in the parts of the body of the athletes and the frequency of these complaints affecting their functionality are shown in **Table 2.**

**Table 3.** The relationship between the number of regions where the athletes reported that they experienced discomfort and the BAQ and SAS-2 parameters

| | | Body Awareness Questionnaire | SAS-2 Somatic Anxiety | SAS-2 Anxiety | SAS-2 Concentration Distraction | SAS-2 Total |
|---|---|---|---|---|---|---|
| **Number of areas where discomfort was reported in** | r | 0.049 | **0.250*** | -0.010 | 0.054 | 0.114 |
| | p | 0.668 | **0.025** | 0.927 | 0.635 | 0.315 |

r: Spearmann correlation coefficient *: Significance

When analysing musculoskeletal disorders in the last 12 months by sport, footballers were most likely to have musculoskeletal disorders in the foot/ankle region (65.21% of footballers), volleyballers were most likely to have musculoskeletal disorders in the shoulder region (83.33% of volleyballers), basketballers were most likely to have musculoskeletal disorders in the shoulder region (100% of basketballers) and swimmers were most likely to have musculoskeletal disorders in the back region (66.6% of swimmers).

In the past 12 months, 82.6% of football players reported complaints in at least one body region, all volleyball players reported complaints in at least two body regions, all basketball players reported complaints in at least three body regions and 88% of swimmers reported complaints in at least one body region.

A significant weak correlation was found between the somatic anxiety levels of athletes and the number of complaint areas reported in the last 12 months and the somatic anxiety levels of athletes ($p<0.05$). **(Table 3).**

**Table 4.** Total BAQ and SAS-2 Scores

| | Mean | ±SD | Median | Minimum | Maximum |
|---|---|---|---|---|---|
| **BAQ** | 85.95 | 16.13 | 85,5 | 57.00 | 126.00 |
| **SAS-2 Somatic Anxiety** | 8.41 | 2.07 | 8.00 | 5.00 | 13.00 |
| **SAS-2 Anxiety** | 10.24 | 2.98 | 10.00 | 5.00 | 17.00 |
| **SAS-2 Concentration Distraction** | 8.18 | 1.81 | 8.00 | 5.00 | 12.00 |
| **SAS-2 Total** | 26.83 | 5.23 | 27.00 | 16.00 | 37.00 |

Body Awareness Questionnaire and Sports Anxiety Scale-2 scores of the athletes are shown in **Table 4.**

**Table 5.** Comparison of the anxiety and body awareness levels of the athletes according to their complaints in the last 12 months

| Body Area | | SAS-2 Somatic Anxiety | SAS-2 Anxiety | SAS-2 Concentration Distraction | SAS-2 Total | BAQ |
|---|---|---|---|---|---|---|
| **Neck** | Yes | 9 (7-11) | 10 (9-12) | 8 (7-9) | 27 (25-31) | 86 (79-94) |
| | No | 8 (7-10) | 10 (9-12) | 8 (7-10) | 27 (25-30) | 80 (72-101) |
| | **P** | 0.061 | 0.781 | 0.359 | 0.557 | 0.462 |
| **Shoulder** | Yes | 9 (7-11) | 11 (8-12) | 8 (7-9) | 28 (25-32) | 86 (77-93) |
| | No | 8 (6-10) | 10 (9-12) | 8 (7-10) | 27 (23-30) | 80 (72-98) |
| | **P** | **0.038*** | 0.408 | 0.717 | 0.129 | 0.640 |
| **Elbow** | Yes | 9.5(8-11) | 10 (7-12) | 8.5 (8-9) | 27 (25-35) | 88 (85-103) |
| | No | 8 (7-10) | 10 (9-12) | 8 (7-10) | 27 (24-30) | 80 (72-95) |
| | **P** | 0.117 | 0.587 | 0.362 | 0.531 | 0.162 |
| **Hand and Wrist** | Yes | 9.5 (8-11) | 10 (9-12) | 8 (8-9) | 28 (25-32) | 89 (77-98) |
| | No | 8 (7-10) | 10 (9-12) | 8 (7-10) | 26 (23-30) | 80 (72-94) |
| | **P** | **0.002*** | 0.685 | 0.462 | 0.076 | 0.248 |
| **Back** | Yes | 9 (7-11) | 10 (9-12) | 8 (7-10) | 27 (25-31) | 88 (77-96) |
| | No | 7.5 (6-10) | 10 (8-12) | 8.5 (7-10) | 27 (22-30) | 80 (72-95) |
| | **P** | **0.012*** | 0.815 | 0.627 | 0.268 | 0.173 |
| **Waist** | Yes | 9 (7-11) | 10 (9-12) | 8 (7-9) | 27 (25-29) | 80 (75-103) |
| | No | 8 (7-10) | 10 (9-12) | 8 (7-10) | 27 (23-31) | 85 (72-94) |
| | **P** | 0.146 | 0.554 | 0.815 | 0.685 | 0.243 |
| **Hip** | Yes | 9 (6-10) | 10 (9-11) | 9 (8-10) | 27 (25-30) | 77 (72-93) |
| | No | 8 (7-10) | 10 (9-12) | 8 (7-9) | 27 (23-21) | 87 (75-97) |
| | **P** | 0.953 | 0.566 | 0.319 | 0.970 | 0.156 |
| **Knee** | Yes | 9 (7-10.5) | 10 (8.5-12) | 8 (7-9.5) | 27.5 (24-31.5) | 83 (72-95.5) |
| | No | 8 (7-10) | 10 (9-12) | 8 (7-9.5) | 27 (23.5-30) | 85.5 (75-95) |
| | **P** | 0.277 | 0.827 | 0.972 | 0.598 | 0.458 |
| **Foot-Ankle** | Yes | 9 (7-10) | 10 (9-12) | 9 (7-10) | 27 (24-30) | 79 (73-93) |
| | No | 8 (7-10) | 10 (8-12) | 8 (6-9) | 27 (24-30) | 88 (75-98) |
| | **P** | 0.914 | 0.969 | 0.051 | 0.526 | 0.213 |

Data expressed as median (percntil 25- percentil 75), **P<0.05**

The relationship between athletes' musculoskeletal complaints in the last 12 months and their levels of anxiety and body awareness is shown in **Table 5.** There was a significant difference in somatic anxiety levels

between athletes who had experienced neck, hand-wrist and back pain in the past 12 months and those who had not ($p<0.05$). The somatic anxiety levels of athletes with musculoskeletal disorders were found to be higher than those without musculoskeletal disorders. There was no significant difference between athletes with and without musculoskeletal complaints in terms of anxiety, concentration problems, general anxiety and body awareness ($p>0.05$).

**Table 6.** Examination of the relationship between body awareness and anxiety

| | | SAS-2 Somatic Anxiety | SAS-2 Anxiety | SAS-2 Concentration Distraction | SAS-2 Total |
|---|---|---|---|---|---|
| **Body Awareness Status** | r | **0.266*** | -0.203 | **-0.399**** | -0.134 |
| | p | **0.017** | 0.072 | **0.001** | 0.237 |

r: Spearmann correlation coefficient *: Significance, **P<0.05**

With the body awareness status of the athletes; while a positive significant weak level relationship was found with somatic anxiety level ($p<0.05$), a negative relationship was found with concentration disorganisation at a high level of significance ( $p<0.05$). (Table 6).

## DISCUSSION AND CONCLUSION

As a consequence of this study, which was conducted to determine the musculoskeletal disorders in elite athletes in different sports and to examine the relationship between these disorders and the anxiety and body awareness levels of the athletes, it was found that the somatic anxiety levels of athletes with musculoskeletal disorders were higher and that the number of regions in which the athlete experienced discomfort was related to the level of somatic anxiety. It was found that the elite athletes who participated in the study experienced discomfort most frequently in the foot-ankle area in the football branch, most frequently in the shoulder area in the volleyball and basketball branches, and most frequently in the back area in the swimming branch.

Medical, psychological, and social factors have been shown to influence pain. When an athlete is injured, the sports medical team primarily focuses on treating the physical effects of the injury (18). However, it is important to address the negative psychological reactions that many injured athletes experience throughout the rehabilitation process. Therefore, it is crucial to consider psychosocial conditions in athlete health (19).

A study of male professional football players reported that the number of serious musculoskeletal injuries during their football careers was positively associated with symptoms of stress, anxiety, depression and sleep disturbance. In this study, professional male football players who have experienced one or more serious musculoskeletal injuries (joint or muscle) in their careers are more likely to be affected than professional male football players who have not experienced serious musculoskeletal injuries during their careers; They were found to be nearly two to four times more likely to report symptoms such as depression, stress, and anxiety (20). A pilot study among professional footballers showed that a higher number of serious musculoskeletal injuries and surgeries were significantly associated with stress, anxiety and depression (21). Another study found that injured Australian athletes had significantly higher symptoms of depression and generalised anxiety than uninjured athletes (22). These results are consistent with the anxiety-related results found in our study.

The findings of our study show that elite athletes in different sports branches with musculoskeletal disorders have higher somatic anxiety levels. The results of our study may contribute to the development of preventive measures. Investigating the relationships between the disorders experienced by athletes can guide the planning of possible treatment approaches, training programmes and taking the right precautions. Recently, it has been reported that while athletes and health professionals recognise that medical care and support as well as medical examinations throughout the sporting career are only directed towards physical health (mostly injuries), adequate support for psychosocial well-being is lacking and necessary (23, 24). In terms of support related to psychosocial factors, a study reported that increasing self-awareness about the

occurrence of symptoms such as depression, stress, and anxiety among athletes, access to internet-based interventions, and positive perspectives of all stakeholders (especially coaches) on this issue can be supportive (25).

It has been reported that depressive symptoms and pain symptoms are less common in people with high body awareness, and it has been highlighted that body awareness is an important parameter to consider in this sense (26). In a study that investigated body awareness levels in different sports, no significant difference was found between body awareness levels in different sports, and it was found that there was a moderate correlation with athletes' performance emotional state (27). The authors stated that body awareness levels were above average in all sports branches, and the body awareness levels of the athletes in our current study are in parallel with the literature. In the present study, it can be considered that the negative moderate relationship between body awareness levels and lack of concentration supports the findings in previous studies.

The clinical relevance of our study is that it highlights the importance of a multidisciplinary approach to the clinical care and support of elite athletes in different sports, particularly when an athlete is unable to train or compete for long periods as a result of recurrent serious joint or muscle injuries, which should also be monitored in the long term because of the potential impact on symptoms such as anxiety (28, 29). Given the recommendations for the use of supportive and preventive evidence-based interventions that address psychosocial factors, and the design and implementation of interventions to protect and improve the sustainable health of athletes (25, 28), our study may guide researchers in the design of these interventions.

To the best of our knowledge, scientific data on the effect of physical stressors such as musculoskeletal injuries on psychological symptoms such as anxiety in elite athletes is limited. Our study is an original study that will contribute to the literature in this regard. In addition, our study highlights the importance and need for a multidisciplinary study with a psychological perspective.

The study has some limitations. One of them is that the sample is limited in order to generalise the results. Another limitation is that the study population is mainly composed of football players. Another limitation is that the data obtained with the questionnaire method, which is a self-report method, may be subjective. There is a need for studies using more objective measures and larger sample sizes.

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