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Comparison of Physical Fitness and Respiratory Parameters of Elite Wrestlers and Judokas

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Abstract

The aim of this study was to comparison of physical fitness and respiratory parameters of wrestlers and judokas. A total of 24 athletes in the 19-21 age range, 12 male wrestlers and 12 male judoists were volunteers. Physical fitness parameters for subjects; age, body weight, height, body mass index (BMI), body fat percentage (BF%), hand grip strength, 20 m sprint tests, maxVO2, vertical jump, anaerobic power, as respiratory parameters, forced expiratory volume (FEV1), forced vital capacity (FVC), forced expiration ratio (FEV1/FVC), maximum voluntary volume (MVV) and vital capacity (VC) test measurements were performed. Independent Samples T test was used to analyze the data. In the physical fitness parameters of the groups; Age, body weight, height, BMI, BF%, 20 m sprint test, maxVO2 and vertical jumping values were not significant. The right handgrip strength values were found to be significant in favor of wrestlers. FEV1, FVC, FEV1/FVC, MVV and VC values were not significantly different between the groups. As a result of our research, it can be said that wrestlers and judoists have similar characteristics in terms of physical fitness and respiratory parameters.

Keywords: Wrestler, Judokas, Physical fitness, Respiratory.

INTRODUCTION

Achieving success in sports and preserving the success achieved is one of the most important goals of sport. Under the successes of the countries in the sportive branches, there are mostly programs based on the infrastructure of sports and the results of the scientific tests used (3, 18, 30).

Success in sport is possible through scientific methods. With the long term training program to achieve success, the athlete is expected to achieve higher levels of physical and psychological performance (16).

Wrestling and judo branches are complex sports branches. Wrestle; the courage, which requires all body parts to work together, is an activity and sports branch that requires movement time, reflex, skill, endurance and strength (2). Judo; it is an excellent live combat sport that is required by the great mental and physical skill (35).

The intertwining of defense and offensive techniques in wrestling and judo sports, the fact that the games are played in a very short period of time and the competition time is short, has increased the interest in these sports. The training, nutrition, technical tactical, physical and physiological characteristics of these two branches, which have many similar features, are important in terms of performance and condition. Sports branches are highly determinants on physical fitness and respiratory characteristics of athletes (7, 27, 28).

The reason for this is that the training plans of the branches and the studies are different. Detection of these differences will reveal the differences in

physical fitness and respiratory characteristics of wrestling and judo branches, which are seen in two identical characteristics. Wrestling and judo sports are the sports branches that require individual combat where coordination, speed, quickness, strength and endurance are of great importance. Sports branches are high-level determinants on the physical fitness and respiratory functions of the athlete. Therefore, physical fitness values and respiratory values need to be improved and need to be at the highest level. In this study, it is aimed to examine the physical fitness and respiratory parameters of wrestling and judo training which require the same physical characteristics and skills. In the light of the information obtained, the development of biomotoric characteristics of wrestling and judo athletes and suggestions for annual training programming are important.

MATERIAL and METHOD

Subjects and Research Model

In our study, 12 male wrestlers and 12 male judoists who participated in the national and international competitions in Gaziantep province and who regularly train in the 19-21 age range were selected. One measurement was done on the subjects and the measurements were recorded. In the selection of individuals, attention was paid to be close to each other in terms of age, height and body weight.

To reveal the anthropometric measurements of individuals; age, body weight, height, body fat percentage, handgrip, 20m sprint test, shuttle run test measurements and vertical jump measurements were made. FEV1, FVC, FEV1/FVC %, MVV and VC measurements were performed in the Physiology Laboratory of Gaziantep University School of Physical Education and Sports. For this study, permission was obtained from Gaziantep University Clinical Research Ethics Committee.

Data Collection

Anthropometric Measurements

The body weights of the subjects were measured with a weighing of 0.1 kg, lengths were measured by digital height measuring device. Subjects' body mass indexes (BMI) were calculated. BMI measurements were calculated by dividing the body length of the body in meters of length.

Handgrip Strength Test

Handgrip strength measurements were measured with Takei brand dynamometer. Measurements were repeated 3 times for both hands and the highest value was recorded (29).

Vertical Jump and Anaerobic Power Tests

The distance between the subjects' standing distance and the distance they touched were found in meters. Meter unit formula and Lewis nomogram were used to convert the obtained data to anaerobic power (34).

Body Fat Percentage Measurement

Body fat percentage measurement Holtain skinfold clamp type calibrator was used. The values obtained were calculated according to the Yuhasz formula and the body fat percentage of the subjects was calculated (34).

20 m Shuttle Run Test

20 m shuttle run test was used to measure the aerobic capacity of the subjects (34). According to the results, maxVO2 value was found as ml/kg/min.

20 m Sprint Test

The subjects ran the 20 m sprint test with their maximal speed. Measurements were taken with the help of a photocell. The best running rating of the two values obtained was evaluated.

Respiratory Parameter Measurements

Respiratory parameter measurements were realized by using M.E.C. Pocket Spiro USB-100 device. Information about the measurement was given to the subjects. It was said that a maximal effort was required to make the measurement results accurate. Measurements were taken when the subject was sitting. A separate mouthpiece was used for each individual. During the measurements, the subject was motivated by voice.

FVC measurement: At the time of measurement, the subject was first and foremost able to perform normal inspiration and expiration twice, and then quickly and strongly maximal inspiration followed by expiration as fast as possible. FVC, FEV1, FEV1% values were obtained by this measurement method (24).

VC measurement: When the command was given, the subject who filled his lungs completely with air by making a maximum maximal inspiration 3 times after normal breathing, completed the

measurement by expiratory expiration so that all the air in the lung was emptied as much as possible (15).

MVV measurement: When the subject felt ready, he quickly expedited and deeply inspirited and expired for 12 seconds with his device (15). The MVV value was obtained by this measurement method.

Statistical Analysis

SPSS statistical program (SPSS for Windows, version 16.0, SPSS Inc. Chicago, Illinois, USA) was used in the analysis of the data. Data were presented with mean and standard deviation. The Shapiro-Wilk test was performed to check the normal distribution before proceeding with statistical procedures. Independent Samples T test was used for comparison of bilateral groups. Statistical results were evaluated at 95% confidence interval and $p<0.05$ significance levels.

RESULT

Table 1. Comparison of physical and physiological parameters of wrestlers and judoists

Variable	Wrestlers	Judoists	df	t	p
	Mean ± SD	Mean ± SD			
Age (year)	20±1.76	20±1.54	22	0.000	1.000
Height (cm)	172.92±5.88	174.08±6.35	22	-0.467	0.645
Weight (kg)	71.41±12.10	72.33 ±16.41	22	-0.156	0.878
BMI (kg/m²)	23.75±2.71	23.82±4.94	22	-0.042	0.967
Body fat percentage (%)	12.61±4.51	11.27±3.20	22	0.842	0.409
Right handgrip strength (kg)	50.04±5.78	43.07±8.08	22	2.433	**0.024***
Left handgrip strength (kg)	46.16±5.08	41.89±6.46	22	1.798	0.086
20 m sprint (sec)	3.26±0.18	3.28±0.19	22	-0.228	0.821
Vertical jump (cm)	43.25±0.06	42.5±0.06	22	0.320	0.752
Anaerobic power (kg.m/sec)	103.94±19.27	103.06±18.23	22	0.115	0.909
MaxVO2 (ml/kg/min)	46±6.61	45.59± 8.67	22	0.130	0.898

*p<0.05

When the physical and physiological parameters of the wrestlers and judoists were compared, the right handgrip strength was significant in favor of the wrestlers ($p<0.05$). There was no statistically significant difference in terms of other physical and physiological parameters ($p>0.05$).

Table 2. Comparison of respiratory parameters of wrestlers and judoists

Variable	Wrestlers	Judoists	df	t	p
	Mean ± SD	Mean ± SD			
VC (lt)	4.42±0.63	4.39±0.74	22	0.118	0.907
FVC (lt)	4.20 ±0.51	4.37 ±0.42	22	-0.904	0.376
FEV1 (lt)	3.89±0.45	3.92±0.37	22	-0.178	0.860
FEV1/FVC (%)	92.92 ±8.12	89.75 ±6.40	22	1.061	0.300
MVV (breaths/min)	159.6 ± 84.80	137.09 ± 12.77	22	0.909	0.373

Respiratory parameters of the wrestlers and judoists were compared and no statistically significant difference was found in terms of measured lung volume and capacity ($p>0.05$).

DISCUSSION

In this study, no significance was found between the average height of wrestlers and judoists ($p>0.05$). In a study conducted by Claessens et al., The average height of the elite judoists was 1.75 m and the mean weight was 79.45 kg (4). Studies on wrestling and judoists have similarities in height and weight averages in the same age group (9, 32).

In our study, the mean height and body weight of the subjects were similar with the similar studies in the literature. According to the results obtained in our study, it is possible to say that the group consisting of subjects who compete in close range together was the reason for the lack of significance between the two groups of athletes.

In this study, no significant difference was found between the two groups in terms of BMI (p>0.05). Uzun et al., in the study of the relationship between some anthropometric properties of respiratory parameters, have found that the average BMI of the young elite wrestlers is 25.29 (36). In another study, the average BMI of male basketball players was found to be 21.94 (8). In a study of different strength training, BMI values of volleyball players were found to be 21.93 (10).

The fact that the wrestling and judo athletes who participated in our study were parallel to each other and that they had similar working characteristics, and that the two groups of volunteers were similar to each other in terms of their BMI properties, can be said to have the same value.

In this study, there was no significant difference in body fat percentage values between the two groups (p>0.05). There are many studies that show that regular and scheduled exercises reduce body fat percentage (5, 14, 19, 21, 25).

Zorba et al., found the body fat percentage was 7.39±1.24 in the study of the young men in Turkey in judo and weight class judoka in the comparison of the work of some anthropometric parameters of the wrestler (40). The average percentage of body fat percentages of Helicksan American Olympic wrestlers was 7.6 % (17).

There was no significant difference between the two groups in our study. It can be said that both sports branches are on a weight basis and athletes taking part in our research group are close to each other in both branches and that they continue their regular training and there is no significant difference between the groups.

In our study, right handgrip strength values between both groups were found to be significant in favor of wrestlers (p<0.05).

Imamoglu et al., found in male national judoists in the right handgrip strength 47.31±6.26 kg left handgrip strength 46.20±7.30 kg as (20). Fleischlag found the average handgrip strength of 42 wrestlers to be 42.27 kg (11).

According to the results of our study, it has been revealed that wrestlers are more significant in terms of right handgrip strength than judoists. It can be said that strength training applied to wrestlers is more intense, uses their right hands more, and strength training from a young age leads to a better development of right handgrip strength in wrestlers.

In our study, there was no statistically significant difference between the two groups in the average vertical jump and anaerobic power data of the athletes (p>0.05).

Ziyagil et al., wrestlers in a study they made on the weight category of the first vertical jump test wrestlers found 51.78±7.38, the average of the second wrestlers found that the average of 50.11±4.29 (39). Fox et al. stated that the average anaerobic power of male athletes between the ages of 20 and 30 was 140-145 as “moderate” value and 176-210 kg.m/sec as “good” value (12).

The values we obtained in our study were close to the good class in the classification mentioned in the literature. The use of techniques that require continuous effort and explosive force, both during judo and wrestling, can be considered as the reason for the anaerobic performance of both sports.

In our study, there was no statistically significant difference between the two groups in the average maxVO2 data of the athletes (p>0.05).

Kutlu and Cicioglu, free style stars wrestlers of the national team maxVO2 values of 48.23±3.52 grekoromen star national team wrestlers found that the maxVO2 of 51.56±4.43 (23). In a study conducted on judoists, a significant increase in maxVO2 values after aerobic exercise was determined (38).

The data in our study are in parallel with some of the results in the literature and some of them are different. In judo and wrestling branches where endurance is as important as force, the competition times are similar. The effort shown during the competition requires a very high aerobic capacity. For this reason, it is important to develop the endurance as much as the force is included in the training planning. Therefore, it can be said that endurance is given importance in both sports. The duration of the competition and the effort shown during this period can be said to be the common characteristics of both branches, which is the reason for the similarity in both branches.

In our study, no statistical significance was found in the respiratory parameters (FEV1, FVC, FEV1/FVC, MVV and VC) values of the subjects between the two groups (p>0.05).

In a study, FVC measurement values of national team wrestlers were determined 4.55±5.97 lt, FVC

measurement values of university team wrestlers were 4.93±6.45 lt (1). Shoarrott et al., measured the average of vital capacities of Canadian national wrestlers as 4.9±1.0 lt (31). Sinning, measured American and college wrestlers' VC averages of 5.06 lt (33).

Together with training, a number of lung capacities and volumes may be affected. (26). Vital capacity and forced vital capacity are the parameters that demonstrate lung function and 80% or more of the expected value is considered normal for each person according to age, height, gender and body weight (37). FEV1% below 80% indicates a problem in expiration (34). Since wrestling and judo branches are sports branches that require endurance, it can be said that the trainings will affect the breathing capacities and volumes positively. In many studies, respiratory functions were compared between athletes and sedentarys, and a positive superiority was generally seen in favor of athletes (6, 13, 22, 38). The results of our study support the literature.

CONCLUSION

As a result, there were no significant differences between wrestlers and judoists, except for right hand grip strength, in physical fitness and respiratory parameters. The reason for the similarity in physical fitness and respiratory parameters; It is thought that the sports activities and training characteristics of the group are parallel to each other. It can be said that by comparing the wrestling and judo branch, which are parallel to each other, it will be a guide to trainers and athletes in training planning in order to help improve physical fitness and respiratory functions.

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Examining Trait Anger and Anger Expression Styles of Pro-Licensed Football Coaches

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Abstract

This study aims to determine the trait anger and anger style levels of football coaches with prolicense in Turkey.The sample group consists of 171 participants selected from within the determined universe by means of easy sampling method.Trait anger and anger expression style scale and personal information form ,developed by Spielberger and colleagues (1983) and Turkish validity and reliability study conducted by Özer(1994) was applied to the sample group.In the scope of the study ,descriptive statistics were used to summarize the demographic characteristics and personal information of the sample group.Data in this study show that there is a significant difference between the groups of the anger control and anger out subdimensions according to the age variable;trait anger and anger out subdimensions according to the educational level; anger control and anger out sub dimensions according to foreign language variable and anger outward subdimensions according to coaching experience.($p<0,5$). Coaches dealing with football sport encounter multidimensional stimulates in an intense competition environment that will cause anger both in and out of the field.These stimuli affect the emotional worlds and selfies of the coaches positively or negatively.Trait anger and unconrollable external and internal expression style ,as well as legal exposures ,harm the coach's personality, Professional career and corporate identity.It is thought that the data obtained by this study will shed light on the effects of trait anger ,anger control,anger inward and anger outward situations of football coaches who have the highest degree (pro licence)in our country ;help to develop strategies in anger control and contribute to more research in this field.

Key words: Football coachs, trait anger, anger expression styles

INTRODUCTION

The anger that many people experience universally in daily life manifests differently in each culture (1). Culture has an important place in expressing emotions and transforming these feelings into behaviors. In cultures where submission, obedience, non-speaking, and oppression are approved, verbal expression of anger is prevented (25). In this context, people show different attitudes in anger (19,23).

Anger, one of the human emotions, has been defined in different ways. Kennedy (1992) defines anger as an effective experience that an individual feels in danger and experiences by another individual, Kısaç (15) defines anger as one of the basic emotions that an individual experiences when he / she feels that he / she is exposed to a threat, injustice or inequality. On the other hand, Lerner (19) expresses anger as a message perceived as being hurt when things go wrong, preventing our desires and needs, and violating our rights.

Physical activities and competition sports that take place within this framework are an important tool for both satisfaction and control of emotions with their unique structures. However, today, the stage that competition sports has reached and the sports economy that has formed have brought competition to an uncontrollable stage. All

stakeholders, especially football coaches, who make up the world of football, experience many emotions such as anger at constantly changing and intensifying rates.

Uncontrollable anger manifests itself as an external and internal expression style. The style of external expression often manifests itself through physical, verbal and body language, depending on the identity of the Football Coach. This negative situation harms the personality, professional career and corporate identity of the trainer, as well as legal sanctions. The aim of this study is to determine the trait anger, anger-in and anger-out states of football coaches with the highest diploma (Pro-Bachelor) in our country, and to help them develop strategies for anger control.

Anger is a behavioral expression that is also expressed as "touching the Bam wire" in our cultural life and can cause extreme sensitivity in the person. Spielberger defines anger as a gradual emotional state ranging from a simple state of "irritability" or "anger" to a state of intense "anger" (30). Anger is defined as a strong emotion that is related to cognitions that occur in the face of a real or supposed obstacle, threat or injustice and that directs the person to remove disturbing stimuli (21,26). Novaco explains Anger within the framework of a cognitive-behavioral model. Anger is defined as “one of the basic emotions experienced when an individual's plans, wishes and needs are blocked and perceives injustice, injustice and a threat to his or her self” (8,12).

Anger is a highly social emotion. Most people know what it is like to play the role of the angry actor or to be a supporter or a taker of someone else's wrath. Anger provides drama and magnifies it. Anger can sharpen a person's critical perspective and creative side. While there is little doubt that anger can be personally and socially destructive - if it is too intense, persistent, and misguided - anger can motivate and mobilize efforts against injustices in daily life (26,27).

General causes of anger; intimidation, unfair treatment, incompetence, disrespect, poor communication, lack of support, neglect, mismanagement, not being recognized, repetitive problems, weakness, insecurity, lack of teamwork, unprofessional behavior, humiliation, uncertainty, power distance in hierarchy, merit, perfection deadlocks, qualified practice to specialize, social culture and the problem-solving practice of our cultural heritage of our world of football, ambiguities in the understanding of law and justice, steps that coaches navigate in the hierarchy of needs, ethical values of the profession and moral solutions (3,4).

There is a close relationship between emotional states such as stress and aggression and anger. Anger and aggression are examined in direct connection with each other. Aggression is action, anger is feeling. Although intense anger generally triggers aggressive behaviors, anger is not always the basis of aggression (30,14). Neuroticism, which is defined as an anxiety feature that has a tendency to react negatively to social and psychological stress factors, is reported to be associated with anger and similar sensory states (21)

When anger is not properly expressed, it can cause people to move away from the person who is angry. This situation may cause negative self-concept, low self-esteem, interpersonal and intra-family communication conflicts and guilt in the angered person (10,23). According to Kiper (17), "In many studies in the field of social psychology, aggressive behaviors are carried out in an experimental environment; Considering the nature of football that contains unique opportunities and threats, it has a natural environment in revealing these behaviors (1,17).

In their study on the dynamics of aggression, Kirker et al. Stated that aggression typically occurs in clusters and varies in frequency according to game conditions (16). It was determined that the moral dissociation created by the perceived trainer ego and associated anger attitudes positively correlated with the level of aggression tolerance within the team. It is emphasized that the most important factor that triggers the anger levels of all athletes and coaches, both in team and individual sports, is the environment and the competitive atmosphere (6, 11,22).

There are 3 sub-dimensions in Spielberger's Anger Style Scale. The scale includes anger, which is expressed as the situation of living inside by ignoring the feeling of anger; It aims to evaluate the dimensions of anger control, which is expressed as the direct reflection of anger to the outside, and controlling the emotion of anger with logical behaviors such as attributing anger to a rational reason, rejecting, and ignoring its presence (15).

When the literature on anger in football is examined, it is seen that the subjects such as audience violence, fanaticism, the expressions of anger and anger of the players, moral dissolution and aggression are studied, and the studies of the coaches holding the highest diploma in the football world, Pro-License, on anger and anger sub-dimensions are insufficient (1).

Considering that pro-license football coaches generally perform their profession professionally, it is important in terms of their professional careers, what kind of crisis management they display in the face of events and facts they are exposed to, and what kind of anger they have in the face of material and moral situations they think they are injured. . The aim of this study is to determine the trait anger, anger-in, anger-out and anger control of football coaches with the highest diploma (Pro-Bachelor) in our country and to help them develop strategies for anger control.

Material & Method

In this study, the "screening model", which is frequently used and evaluated as a qualitative study model, was used (29). The population of the study consisted of football coaches with a Pro-Bachelor's degree, and the sample of the study was composed of 171 male coaches selected by random sampling. Descriptive statistics were used to summarize the personal information of the sample group within the scope of the study.

The Trait Anger and Anger Expression Style Scale, developed by Spielberger et al. (1983) and adapted into Turkish by Özer (1994), was used to determine the level of the sample group in terms of anger-in, anger-out and anger control sub-dimensions, which show trait anger and anger expression styles.

The Trait Anger and Anger Expression Style scale consists of 34 items. The first 10 items of the 4-point Likert-type scale measure trait anger and the other 24 items measure anger expression styles. The lowest score that can be obtained from the Trait Anger scale is 10 and the highest score is 40. Anger Expression Style Scale, anger introversion (items 13, 15, 16, 20, 23, 26, 27 and 31), anger expression (items 12, 17, 19, 22, 24, 29, 32 and 33) and anger control (items 11, 14, 18, 21, 25, 28, 30 and 34).

As a result of the reliability analysis performed for the scale items, the Cronbach Alpha coefficient was determined as .687. Participants' scores on Trait Anger and Anger Expression Style scale were analyzed according to age, football background, league they work, coaching experience and foreign language variables. Kruskal-Wallis and Mann-Whitney U tests were used in the analysis of these variables. The findings obtained were evaluated at the significance level of $p < .05$.

RESULT

Table 1. Frequency and percentage distributions for the age variable

Age Groups	f	%
41-45	30	17.5
46-50	21	12.3
51-55	41	24.0
56-60	29	17.0
61 and above	50	29.2
Total	171	100.0

When Table 1 is examined, 30 (17.5 %) of the participants are between the ages of 41-45, 21 (12.3%) are between the ages of 46-50, and 41 (24.0%) are between the ages of 51-55, 29 of them (17.0%) are between the ages of 56-60, 50 of them (29.2%) are between the ages of 61 and over.

Table 2. Frequency and percentage distributions for education variable

Edu. Lev. (Group	f	%
Prim-Sec-High	86	50.3
Prim-Sec-High	85	49.7
Total	171	100.0

When Table 2 is examined, it is seen that 86 (50.3 %) of the participants in the study received primary-secondary and high school education, and 85 (49.7) received undergraduate and graduate education.

Table 3. Frequency and percentage distributions for the foreign language variable

Foreign Lang. (Groups)	f	%
Less	90	52.6
Mid	53	31.0
Good-High	28	16.4
Total	171	100.0

When Table 3 is examined, 90 of the participants (52.6%) have a low level of foreign language knowledge, 53 (31.0%) have medium level foreign language knowledge, 28 (16.4%) are good and It is seen in the group that they have high level knowledge.

Table 4. Frequency and percentage distributions for the experience variable

Experience(Groups)	f	%
0-5 year	40	23.4
6-10 year	41	24.0
11-15 year	20	11.7
16-20 year	33	19.3
21 year and above	37	21.6
Total	171	100.0

When Table 4 is examined, 40 of the participants (23.4%) have 0-5 years of professional experience, 41 (24.0%) have years and above 6-10 years of professional experience, 20 (11%) 7) It is seen that they have 11-15 years of professional experience, 33 of them (19.3%) have 16-20 years of professional experience, 37 of them (21.6%) have 21 years or more of professional experience.

Table 5. The results of the Kruskal Wallis-H Test conducted to determine whether trait anger and anger expression scale scores differentiate according to the age variable of pro-license trainers.

	Groups	N	A.Rank	χ^2	sd	p
Trait anger	41-45 age	30	85.97			
	46-50 age	21	91.10			
	51-55 age	41	101.24	7.221	4	.125
	56-60 age	29	73.10			
	61 age and above	50	78.86			
Anger inword	41-45 age	30	71.25			
	46-50 age	21	94.81			
	51-55 age	41	100.05	7.941	4	.094
	56-60 age	29	76.00			
	61 age and above	50	85.40			
Anger outward	41-45 age	30	77.43			
	46-50 age	21	113.27			.000*
	51-55 age	41	78.81	16.554	4	
	56-60 age	29	77.97			
	61 age and above	50	76.46			
Anger control	41-45 age	30	94.63			
	46-50 age	21	48.99			
	51-55 age	41	101.95	31.441	4	
	56-60 age	29	104.38			.000*
	61 age and above	50	93.81			

* P <.05

When Table 5 is examined, it is determined whether the mean trait anger and anger expression style scale show a significant difference according to the age variable of the Pro-Undergraduate Trainers; As a result of the Kruskal-Wallis-H analysis performed to determine which groups there are, if there is a difference, it is seen that there is a significant difference between the groups in the Anger Control sub-dimension and the Anger-out sub-dimension (p <. 05).

This significant difference in the anger control sub-dimension was found in the 46-50 age group and the 41-45 age group, the 46-50 age group and the 51-55 age group, the 46-50 age group and the 56-60 age group, and the 46-50 age group and the 61 and over age group. between. It was determined that the mean rank of the 46-50 age group was lower than the other groups, and the anger control scores of the 46-50 age group were lower than the other groups. A significant difference was found between age groups in the Outward Anger sub-dimension (p <.05). It was observed that this significant difference was between the 46-50 age group and the other age groups, and the mean rank of the 46-50 age group was significantly higher than the other age groups. According to age groups, no significant difference was found between the groups in the sub-dimensions of Trait Anger and Anger in (p> .05).

Table 6. The results of the Mann-Whitney U Test conducted to determine whether trait anger and anger expression scale scores differ according to the education variable of pro-license trainers.

	Groups	N	A.Rank	χ^2	sd	p
Trait anger	Prim-Sec-High	86	85.01	-.266	1	.790
	UndergradPostgrad	85	87.01			
Anger inward	Prim-Sec-High	86	92.52	-1.74	1	.081
	Undergrad Postgrad	85	79.42			
Anger outward	Prim-Sec-High	86	94.48	-2.26	1	.064
	Undergrad Postgrad	85	77.42			
Anger control	Prim-Sec-High	86	72.08		1	
	Undergrad Postgrad	85	100.09			.000*

* P <.05

When Table 6 is examined, a significant difference was found between the groups in the Anger Control sub-dimension according to the Mann-Whitney U test results for educational status (p <.05). It is observed that the primary-secondary-high school participant group has a lower average rank than the university and graduate participant group. Primary, secondary and high school graduates had lower anger control scores, and there was no significant difference between the two groups in terms of education status in the sub-dimensions of Trait Anger, Anger Inside, and Anger Out (p> 0.05).

Table 7. The results of the Kruskal Wallis H Test conducted to determine whether the trait anger and anger expression style scale differentiates according to the foreign language variable of pro-license trainers.

	Groups	N	A.Rank	χ^2	sd	p
Trait anger	Less	90	85.16			
	Mid	53	92.05	1.713	2	.425
	Good-advanced	28	77.27			
Anger inward	Less	90	99.72			.000*
	Mid	53	73.20	15.225	2	
	Good-advanced	28	66.13			
Anger outward	Less	90	96.43			.002*
	Mid	53	82.17	12.307	2	
	Good-advanced	28	59.73			
Anger control	Less	90	84.11			
	Mid	53	78.52	6.054	2	
	Good-advanced	28	106.23			.048*

* P <.05

When Table 7 is examined, it is seen whether the mean trait anger and anger expression style scale show a significant difference according to the foreign language variable of the Pro-Undergraduate Trainers; As a result of the Kruskal-Wallis-H analysis performed to determine which groups there were differences, if there was a difference, it was observed that there was a significant difference between the groups in the sub-dimensions of Anger In, Anger Control and Anger Out (p <.05). It has been determined that there is a significant difference between the Good-High level and Low Level and Medium and Low Level groups in the Anger-in subscale. It is seen that the average rank of the Low Level group is higher than the other groups. A significant difference was found between the Intermediate Level and the Good-High Level groups according to the anger control sub-dimension. It is seen that the average rank of the Good-High Level group is higher than the Intermediate Level group. According to the Outward Anger sub-dimension, a significant difference was found between the Good-High Level and Low Level groups. It is observed that the average rank of the Good-High Level group is lower than that of the Low Level group.

Table 8. The results of the Kruskal Wallis-H Test conducted to determine whether trait anger and anger expression scale scores differ according to the experience variable of pro-license trainers

	Groups	N	A.Rank	χ^2	sd	p
Trait anger	0-5 year	40	91.60			
	6-10 year	41	73.61			
	11-15 year	20	102.23	6.733	4	.151
	16-20 year	33	92.83			
	21 year and above	37	78.81			
Anger inward	0-5 year	40	85.10			
	6-10 year	41	94.82			
	11-15 year	20	74.50	5.779	4	.216
	16-20 year	33	73.36			
	21 year and above	37	94.69			
Anger outward	0-5 year	40	86.95			
	6-10 year	41	98.66			
	11-15 year	20	79.35	15.282	4	.004*
	16-20 year	33	88.75			
	21 year and above	37	61.38			
Anger control	0-5 year	40	90.84			
	6-10 year	41	70.66			
	11-15 year	20	80.75	6.620	4	.157
	16-20 year	33	90.11			
	21 year and above	37	96.95			

* P <.05

When Table 8 is analyzed, it is determined whether the mean trait anger and anger expression style scale show a significant difference according to the experience variable of the Pro-License trainers; As a result of the Kruskal-Wallis-H analysis performed to determine which groups there are, if there is a difference, a significant difference was found between the groups in the anger out sub-dimension (p <.05). In the anger out sub-dimension, there was no significant difference between the group with 21 years or more of experience and the groups with 0-5 years, 6-10 years, 11-15 years, 16-20 years (p> .05). It is seen that the average rank of the group with 21 years and more experience is lower than the other groups.

DISCUSSION

This study diploma with Pro-License Football Coach of the age of Trait Anger and Anger Expression in Turkey, education, foreign language and vocational conducted to determine the difference in terms of years of experience creating create.

Analysis results show that there is a significant difference between the groups in the sub-dimensions of anger control and anger out according to the age variable (p <.05), as seen in Table 6, this difference is between the 46-50 age group and the other groups.

Considering the frequency distributions and analysis results for the age variable, it is seen that 12.3% of the pro-license trainers constitute the 46-50 age group and the average rank of anger control is lower than the other groups, and the average rank outside anger is higher than the other groups (p <.05).

Studies show that there is a negative relationship between trait anger and anger expression styles and age, anger control increases due to aging, and anger expression strategies are strengthened positively (9,24, 21,31). Looking at Table 1, it is seen that the 46-50 age group is the second younger age group when compared with other age groups. The literature supports the anger control and anger outcomes of this age group.

According to the education variable, a significant difference was found between the University and graduate participant group and the primary school-secondary-high school participant group in the Anger Control sub-dimension (p <.05). There was no significant difference between the two groups in terms of education level in trait anger, in-anger and out-of-anger sub-dimensions (p> .05).

Considering the Frequency and Percentage Distribution for the Education Variable, it is seen that 49.7% of the pro-graduate trainers have received university and postgraduate education and the anger control averages of this group are high. Studies show that there is a linear relationship

between education level and anger control, and the higher the education level, the higher the anger control scores (2,7; 27,31). The results of the literature support the data showing the positive effects of the education variable obtained from this study on anger control.

When looking at the frequency and percentage distribution of the groups for the foreign language variable, it is seen that 16.4% of them have advanced foreign language levels; There were significant differences between the groups in terms of anger in, anger out and anger control sub-dimensions ($p < .05$); It was determined that this difference is between the Good-High level and Medium and Low Level groups in anger expression sub-dimensions.

In anger in, anger out and anger control sub-dimensions, it is observed that the average rank of the Good-High level group is higher than the other groups ($p < .05$). Although there are no studies investigating the relationship between foreign language and anger in the literature, the results of the studies on education and anger seem to support the data we have obtained.

A significant difference was found between the groups in the anger out sub-dimension according to the experience variable ($p < .05$). This difference in the anger out sub-dimension is between the group with 21 years and more experience and the groups with 0-5 years, 6-10 years, 11-15 years, 16-20 years, and the group with 21 years and more experience shows that the average anger out It seems to be lower than the groups.

In their study on drivers and nurses, Leonhardt and La stated that drivers with more driving experience had more control over their anger expression styles while driving, professional experience prevented them from being provoked easily, and nurses with higher anger control had more experience and more job satisfaction. (18,19).

Conclusion and recommendations

In human life practice, he encounters different events and facts depending on the hierarchy of needs. The attitudes and behaviors of the individual in such situations are affected by many factors, especially education and cultural heritage.

Pro-license trainers also encounter opportunities and threats in their football life and coaching life, and experience their weaknesses and strengths. Each experience brings new teachings and different perspectives.

It is thought that coaches managing football at a high level also experience these processes intensely and develop strategic mechanisms such as anger control in the face of threats. It can also be said that the reduction of time pressure and the concentration of religious feelings contribute to lower anger among older adults.

It was found that the activation of a dynamic education on anger control will have a positive effect on trait anger, anger-in and anger-out expression styles, it will play a regulatory role on individual and psychosocial conditions affecting processes related to anger, 50.3% of the participants Considering that they have high school education, it is thought that raising awareness about the education and intellectual development of the pro-graduate trainers will be beneficial for their professional careers and quality lives.

It is thought that foreign language knowledge is an important dynamic of education and vocational education, it can provide a flexible approach and a different perspective towards events and facts, and will play a facilitating role in accessing necessary and qualified information.

In this study, the age of the pro-licensed football coaches anger in Turkey, education, foreign language skills and professional experience is limited to determining terms. Stronger parameters and would be helpful universe as a whole to the achievement for analysis, with the pro-license in Turkey football stress affecting the anger of the coach, anxiety, professional satisfaction, ethical values and is thought to be needed in areas of research such as coaches styles.

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Relationship Between Adolescents' Leisure Boredom and Substance Use in Turkey

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Abstract

This study aimed to determine the relationship between adolescents' leisure boredom, substance use, and participation in recreational sports in a high-risk substance use region of Turkey. To determine high-school adolescents' socio-demographic characteristics, data collection relied on an adolescent self-report data form and 'substance' and 'boredom' subscales of the Adolescent Risk-Taking Scale and Leisure Boredom Scale, respectively (n = 235, all males, Mage = 15.75 years, SD = 1.19). While there was a positive correlation (r = 0.43) between leisure boredom and substance use, a small significant negative relationship was observed between leisure boredom and participation in recreational sports (r = - 0.27) and between substance use and participation in recreational sports (r = -0.16). However, as research has shown that recreational sport activities may play an effective role in preventing leisure boredom, the results of the present study suggest that sports may play role in preventing substance use as well.

Key words: Adolescents; Leisure Boredom; Substance Use; Turkey

INTRODUCTION

Developmental theories describe adolescence as a period when sharp changes occur and when there is a significant increase in risky behaviours, such as substance use, along with increased impulsiveness (65, 52). Researchers also have reported that leisure boredom experiences of substance-using adolescents were much higher than those who do not use substance (29, 65). Correspondingly, it can be inferred that leisure boredom is one of the factors contributing to substance use in this population (64, 51).

For adolescents, Leisure is defined as a 'fourth environment' beyond school, home and work. Adolescents spend 50% of their time in leisure (6). If the density of the participated activity and the meaning assigned this participation is low or below the expected level boredom may occur (31). For adolescent who is experiencing leisure boredom, this may display itself in a risky behaviour, such as substance use. Display quotations of over 40 words, or as needed.

It is highly complex to understand the manner in which leisure boredom affects substance use. There are many theories that explain reasons of boredom in people. According to psychodynamic theories, boredom is caused by not defining consciously what people want which may happen as result of suppressing desires since they are considered threatening (Greenson, 1953; cited 17).

Existentialists assert that boredom arises from lack of meaning in life and from an individual's failure to participate or ceasing to participate in activities that are compatible with personal values. Attention theorists posit that boredom results from a failure of the attention processes and a consequent inability to focus on events of interest (27, 19). Finally, arousal theorists suggest that boredom arises from the mismatch between individuals' need to be stimulated and the availability of environmental stimuli (Zuckerman, 1979; cited in 17). Studies have shown consistency in two dimensions: state and trait (60, 17, 39, 59).

In the case of 'trait', whatever the situation is, there is always a distress, and individuals may have personality especially prone to boredom, whereas, in the case of 'state', boredom is a distress attached to any type of situation, and it occurs when the presented situation is not interesting enough (17). Vadonovich and Watt (59) classified leisure boredom as a context-specific trait boredom within "trait." Based on the items of the scale used in this study, leisure boredom conceptually reflects context-specific trait boredom: inability of the adolescents to organize properly in their free time, dissatisfaction from the participated activity or the activity does not meet their expectations.

Substance Use in Turkey

Numerous studies have observed a significant increase in substance use among adolescents; these studies have indicated that the age of substance use continues to decrease (22, 20, 56). According to the TUBIM (55) the average age of initiation of substance use is 13.88, whereas 75% of substance users started using substances before the age of 20. The Parliamentary Inquiry Commission Report (54) indicates that factors such as the recent influx in migration from the countryside to the big cities and inability to provide youth with activities that can help them use their leisure time effectively contribute to increase in substance use. The findings of the studies on the role of leisure activities are crucial for Turkey as a developing country in terms of its development as well as its policies and public health. Despite its importance, the number of the studies that research the relation between substance use and leisure boredom in Turkey is quite limited. Ertuzun et al. (16) in their study on substance users have explained that users associated the addiction as an irreplaceable habit, derivational crisis and death, and the users stated that the reason of their addiction is peer groups, problems at family and leisure boredom resulted from lack of leisure time activities that would satisfy them. In Turkey, there is also not enough study to evaluate whether boredom is an actual problem among adolescents.

Relation between Leisure Boredom and Substance Use

As mentioned above, one of the reasons that appears often in adolescents' history of substance use is leisure boredom (29, 68, 64, 65). Some studies in literature have determined that risky behaviours such as media violence, internet addiction and alcohol or drug addiction are related to leisure boredom (68, 45, 18, 41). Studies have determined that boredom is higher among smoking and substance-user adolescents than that of their non-user peers (47, 29). In contrast to the literature, Wegner et al. (63) have observed no relation between leisure boredom and substance use despite the leisure boredom of adolescents. In Iceland, a quasi-experimental study with control group that observed a 12-year-change indicated that organized leisure activities had positive effect on adolescents and decreased the number of bad habits (OR = 0.89, 95% CI 0.82, 0.98, p = 0.012) (35). Intervention studies have an important role for the decrease of substance use and the retardation of the first-time use age because substance use often starts during adolescence (7, 23). In this case, adolescents' choice of leisure activities and after a negative feedback they got from their choice, an ability to reconstruct new activities may prevent their substance use. Intervention studies to prevent the use and spread of addictive substances in society are conducted to minimize the personal and social problems caused by these substances and develop healthy behaviours in society. The principal aim of the prevention studies is to strengthen adolescents and improve the ability to decline substance use.

A study conducted in South Africa indicated that activities with peers that are conducted in risky environments, activities that are non-controlled and non-constructed, in addition to the effect of the lack of leisure sources, might turn into a risky behaviour (64, 58, 37). Studies have indicated that substance use of individuals is affected by their leisure experiences as well as by people who they spend their leisure with (42, 36). The substance use of individuals that occurred with boredom during their leisure also decreased their interest towards the

activities of their choice that provide immense pleasure (40, 12 43, 62).

The Relationship of Recreational Sports Participation with Leisure Boredom and Substance Use

Leisure is defined as a time beyond the one required organically for existence; it consists of things that we have to do to maintain our lives beyond biological needs. Recreational activities, on the other hand, refer to activities that we have chosen based on our judgments and pleasures in our leisure (44, 8). Recreation and leisure activity are interwoven concepts. For recreation, the emphasis is on the 'content', while in the state of utilization of leisure, the emphasis is on the element of 'time' (10). Recreation includes various leisure activities such as games, sports, recreation, physical activity, relaxation and hobbies along with artistic and cultural occupation. Recreational sports, in one hand, contribute to personal goals and, on the other hand, contribute to the psychological and physical health. Participation in leisure activities, including exercise and socialization, is associated with components such as physical health and well-being (26, 53, 13, 14, 50, 48).

Active leisure activities, such as exercising, are highly positively correlated with wellness (28, 12, 49, 46). Individuals who have a sense of wellbeing may organize their leisure times better or may not have difficulty in reconstructing their leisure. At the same time, the recreational sports include a social environment they provide opportunities for the individuals to be aware of different recreational activities which ultimately lead to reconstructing their leisure time. Therefore, participation in recreational sports may eliminate leisure boredom or facilitate reconstruction of the state of boredom. In turn, this can indirectly reflect the prevention of adolescents' substance use. Reconstruction of individuals' boredoms with activities such as exercise might play an active role to prevent the substance use (36). Barnett (3) in his study has stated that boredom in adolescents depend on factors such as internal (difficulty in defining leisure interest) and external (being obliged to do an activity). This exemplifies negative impact of characteristics and conditions on boredom. For example, when the adolescents realized that they got bored due to a leisure activity (context-specific trait boredom), as argued in self-as-entertainment theory (40) and in Flow theory, they are expected to reconstruct the activity to minimize any negative boredom experience (2). This may indirectly reflect in preventing substance use in adolescents.

It is thought that reconstructing the leisure activities with exercises would play an important role in reducing their substance use (36). Probably, substance use comes into individuals' minds when they are not occupied with an activity that could satisfy them. Exercise may provide an additional benefit in preventing substance use because it activates dopaminergic reward pathways (24). However, at this point, individuals' voluntary participation is important. In this light, this study determines the relation between leisure boredom and substance use of adolescents in an area that is considered to be high risk for substance use.

H1. The substance use of adolescents who are attending high school is positively correlated with boredom subscale of the leisure boredom scale.

H2. There is a negative correlation between high school adolescents' participation in recreational sports and boredom subscale of the leisure boredom scale.

H3. There is a negative correlation between high school adolescents' participation in recreational sports and substance use.

MATERIAL & METHODS

Participants

The research sample was consisted of high-school students studying in areas considered to be high risk for substance use in Konya city center. According to the Provincial Education Directorate, one of the schools within high risk of two schools in the area, was randomly selected. Although all students of the school participated in the research (N = 2000) during the study period, the questionnaire was completed only by 235 students. Since female students do not prefer both vocational high schools, which include technical disciplines such as motor vehicle technology and furniture decoration, the sampling of the study is only consisted of male students (n = 235).

Table 1. Frequencies and descriptive statistics of demographic variables

		n	%
Education Level	High school 1	153	65.1
	High school 2	29	12.3
	High school 3	33	14.0
	High school 4	20	8.5
Mother Education Level	Primary	124	52.8
	Secondary	56	23.8
	High	25	10.6
	University	3	1.3
	Missing	27	11.5
Father Education Level	Primary	93	39.6
	Secondary	58	24.7
	High	47	20.0
	University	12	5.1
	Missing	25	10.6
Perceived Income	High	17	7.2
	Good	83	35.3
	Average	125	53.2
	Low	10	4.3
Living Place	City	190	81.0
	Town	33	14.1
	Others	12	4.9
	Mean	Std. Dev.	
Age	15.75	1.19	

Procedures

Data for this study was collected by the researchers conducting this study talking to the students agreed to participate in the research (n = 235) face to face between 15 November 2015 and 15 December 2015. Before starting the research, verbal consent was obtained from the school director and students who participated in the study . Researchers took the permission of the school administration and counsellor and informed students about the survey by entering the lessons during which students were available. The necessary permission was obtained from the Ethics Committee of Selcuk University, Faculty of Sport Sciences. Students were informed that the participation is voluntary that their names would not be mentioned in surveys and that the results would not be shared with anyone. They were asked to fill the survey and put it in a box placed at the corner of the classroom to avoid the recognition. Implementation of the survey took about 20 minutes.

Measurements

To determine the socio-demographic characteristics of high-school adolescents and the frequency of their participation in recreational sports, data collection relied on adolescent data form, the 'substance' subscale of Adolescent Risk-Taking Scale (ARQ) and 'boredom' subscale of the Leisure Boredom Scale (LBS).

Adolescent Information Form

The participant students were asked to fill a personal data form comprising six questions on their age, parents' education level, family income, place of residence and educational status and a 4-point Likert Scale survey comprising 10 items developed by the researchers. The survey determined the frequencies of participation in recreational sports within 12 months from 1 (not at all) to 4 (almost every day). In the survey, frequency of adolescents' participations in activities such as walking, running, fitness, martial arts, weight lifting, racket sports, ball sports, climbing/trekking/mountaineering, fishing and horse riding are identified with the answer format 'never, rarely, sometimes, often' and evaluated on average scores (38). For this study, the 'participation in recreational sports' scale was calculated as $\alpha = 0.80$.

Adolescent's Risk Taking Questionnaire (ARQ)

ARQ is a five-point Likert-type scale that indicates various adolescent risk-taking behaviours. In this study, substance use subscale of adolescent risk taking questionnaire (26 items), developed by Kiran-Esen (33) which is based on the Adolescent Risk-Taking Questionnaire of Gullone et al., (25), was used. Reliability of ARQ has been evaluated by internal consistency, item-total correlation and test-retesting. In this study, the substance use subscale (5 items) which is one of the subscales in Risk-Taking scale was used. In the subscale of the substance use, there are five items: 'drug use' 'drinking alcohol', 'getting drunk', 'smoking', and 'inhaling addictive substances such as thinner, glue'. Adolescents are asked choose one of the following options: 'I always do it' (5 points), 'I often do it' (4 points), 'I sometimes do it' (3 points); 'I rarely do it' (2 points) and 'I never do it' (1 point). The Substance use subscale is evaluated on average scores. For the assessment of internal reliability of ARQ, internal reliability coefficients (Cronbach's alpha) have been calculated. The internal consistency coefficient for the entire 26-point scale is 0.88. For the Risk-Taking Subscale related with substance use, the score was .62. To determine the reliability of ARQ in terms of stability, reliability coefficients have been calculated by test-retesting method applied twice to a group of 208 sophomore students with three weeks intervals. A reliability coefficient of 0.85 was obtained for the

entire scale (33). The findings regarding ARQ scale validity and reliability demonstrate that the scale can be safely used. In this study, for the substance use subscale, it is calculated as α = 0.86.

Leisure Boredom Scale (LBS)

For this part, this study employed LBS that was developed by Iso-Ahola and Weissinger (31). This scale was adapted into Turkish and tested for the validity and reliability by Kara et al., (32). The scale determines the subjective perceptions of leisure boredom. The original scale that consists of a single subscale and 16 items is used on five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The total grade score ranges from 16 to 80. The increase of the points obtained from the scale means that the boredoms is increasing. The adaptation by Kara et al., (32) into Turkish found through its exploratory factor analysis that the scale yielded two subscales, which are 'boredom' (5 points) and 'satisfied' (5 points) and 10 items.

Boredom subscale reflects the negative perspective against leisure activities of individuals (I usually don't like what I do in my leisure, but I do not know what else to do). 'Satisfaction' subscale reflects the positive perspective of the individual for the leisure perception of the individual perspective (Leisure idea excites me). In the Turkish version of the scale, the interval between boredom and satisfaction subscale range from 5 to 25 for each. The Chronbach's alpha coefficients have been calculated for 'boredom' subscale as α = .72, for 'satisfaction' subscale as α = .72 and for the entire scale as α = .77. Confirmatory factor analysis revealed the compliance index values as χ^2/df = 1.83, RMSEA = .05, GFI = .96, CFI = .95, SRMR = .05, NFI = .90, which fall within the valid range. This study is planned on 'boredom' in leisure time. Since the positive result in perceiving leisure time is not questioned, only the boredom subscale part of the scale is used. For this study, the 'boredom' subscale was calculated as α = 0.73.

Statistical Analyses

This research, a descriptive and relational design, is conducted to determine whether there is a relation between leisure boredom and substance use and participation to recreational sports among high-school adolescents.

Statistical analysis of the study has been performed using on a statistical package program. Descriptive statistics on the adolescents' socio-economic characteristics are represented by percentage, average and standard deviation. Spearman's rho correlation was employed to determine the relation between leisure boredom, substance use and the participation in recreational sports . Because it did not follow a normal distribution according to Kolmogorov-Smirnov test and Kurtosis-Skewness' values.

Table 2. The reliability, normality and descriptive statistics of subscales

	Sub Scale	Item number	Chronbach's Alpha	Mean	Std. Dev.	Kolmogorov Smirnov Z	P	Kurtosis	Skewness
Recreational Sports Participation	-	10	0.80	2.29	0.61	0.11	0.00	- 0.29	0.46
Risk Behaviors	Subs. Use	5	0.86	1.63	1.00	0.30	0.00	1.99	2.00
Leisure Boredom	Boredom	5	0.73	12.40	4.71	0.08	0.00	0.06	0.53

The fact that the participation of adolescents in the sample in recreational sports is 2.29 out of 4 demonstrates that the participation is moderate. Nevertheless, the fact that substance use is 1.63 out of 5 demonstrates that substance-use ratio is low. Besides, the fact that adolescents' boredom was 12.40 out of 25 indicates that participants do not have a high level of boredom (Table 2). The boredom level 12.40 out of 25 indicates that it is not high among the participants.

Table 3. Substance use frequency distribution

		I never DO IT	I rarely DO IT	I sometimes DO IT	I often DO IT	I always DO IT
Smoking	n	137	12	9	16	61
	%	58.3	5.1	3.8	6.8	26.0
Drinking Alcohol	n	170	18	26	1	20
	%	72.4	7.7	11.1	0.4	8.5
Getting Drunk	n	187	13	13	5	17
	%	81.3	5.5	5.5	2.1	7.2
Smelling addictive substances such as thinner and adhesives	n	206	9	4	23	14
	%	87.7	3.8	1.7	0.9	6.0
Using Drugs	n	216	1	4	1	13
	%	91.9	0.4	1.7	0.4	5.5

The most common substance used, as Table 3 indicates, is cigarettes with a rate of 26%. The ratio of substance-user adolescents in the sample group has been determined as 6%, while the ratio of drug users has been determined as 5.5% (Table 3).

Table 4. Relationship between participation in recreational sports substance use and boredom

		Recreational Sports Participation	Substance use	Boredom
Recreational Sports Participation	Correlation Coefficient		- 0.16*	- 0.27**
	Sig. (2-tailed)		0.01	0.00
	N		235	235
Substance use	Correlation Coefficient	- 0.16*		0.43**
	Sig. (2-tailed)	0.01		0.00
	N	235		235
Boredom	Correlation Coefficient	- 0.27**	0.43**	
	Sig. (2-tailed)	0.00	0.00	
	N	235	235	

As shown in Table 4, there is a positive correlation between boredom and substance use ($r = 0.43$, $p<0.01$) (for H1). Negative relationship was observed between boredom and participation with recreational sports ($r = - 0.27$, $p<0.01$) (for H2) and between substance use and participation with recreational sports ($r = - 0.16$) (for H3).

DISCUSSION

This study aimed to determine the relation of adolescents' leisure boredoms with substance use and the relation between participation in recreational sports and substance use and leisure boredom in a risky environment in terms of substance use. Research findings support a positive correlation between adolescents' leisure boredom and substance use. A negative relation was found between participation in recreational sports and leisure boredom and substance use.

While the most commonly used substance item in the sampling group was found as cigarette, the study found out that substances such as 'thinner' or 'glue' were used at least once by 5.9% adolescents.

Furthermore, the rate of adolescents that used substance at least once was found as 4.9%. According to TUBIM (55), the ratio of the substance use among high-school graduates is 2.6%. Compared with these rates, it can be said that our research findings are considerably high. This difference can be explained by the fact that the study sample resides in a risky area. The Parliamentary Inquiry Commission Report (54) indicated that 75% of substance users started using substances before the age of 20. National and international studies indicate that there is a significant increase in substance use among adolescents and that the age of first substance use continues to decrease (22, 20, 56). The findings indicated a positive correlation between boredom subscale of adolescents' leisure boredom scale and substance use, so hypothesis H1 was accepted. It can be said that increase in adolescents' leisure boredom is accompanied by an increase in substance use. In this regard, findings of this study are consistent with those of the literature. Some studies indicated that almost 50% of male adolescents at risk who rely on substance use to reduce negative experiences of boredom spend time in drinking environments; these studies indicated a relation between substance use and leisure boredom (68, 41). An adolescent who feels bored can reduce the risk of substance use by reconstructing this state of mind by choosing a new activity. While some can cope with this feeling more easily, others may display risky behaviour, such as using substance as a way out from this situation. At this point, 'leisure education programmes' can positively influence adolescents in learning how to cope with boredom and substitute it with an activity so that adolescents can cope with this feeling without displaying any negative risky behaviour. An adolescent who did not find the right activity for his leisure time and did not enjoy its satisfaction can search for this pleasure in substance use. According to Iso-Ahola and Crowley (29), an individual's leisure boredom can be a motivating force for major social problems such as substance dependence. A study conducted in South Africa emphasised that leisure boredom plays an active role in substance use (65). Many studies have indicated that familial factors (66, 61, 1, 5) and factors related to the peer group (15) are prominent in the youth's tendency to substance use. This may be due to adolescent's inability of matching leisure activities with their parents or peers.

According to some studies, the ratio of substance use of adolescents who do not reside in a sport center or natural environments is higher compared with that of other adolescents who participate in healthy recreational activities such as being in a sport center or national environments (4, 57, 21).

H2 hypothesis has been accepted since there was a meaningful negative relation between participation in recreational sports and leisure boredom. It can be said that leisure boredom is lower in adolescents that participate actively recreational sports in their leisure time. Participating in leisure activities may contribute to the health and wellbeing of the individuals (64). For adolescents, leisure means freedom experience, internal motivation and positive effect (34). Active recreational sports such as doing exercise are highly positively related to wellbeing (28, 11, 49, 46). Adolescents feeling good may easily cope with boredom. Not to choose a related activity in leisure time may contribute to boredom experience (64).

H3 hypothesis has been accepted since there was a meaningful negative relationship between participation in recreational sports and substance use. Substance use was found lower in adolescents who participate in recreational sports. Since exercise activate dopaminergic reward pathways, it can be beneficial in preventing substance use as well (24). In Iceland, a quasi-experimental study with control group that observed a 12-year-change indicated that participation in organized leisure activities four or more times a week had positive effect on adolescents and decreased the number of bad habits (OR = 0.89, 95% CI 0.82, 0.98, p = 0.012) (35). In their study Liebregts et al. (36) indicated that participation in recreational sports play an important role in preventing their substance use. When the substance user individuals are not busy with activities that would satisfy them in their leisure time, it is highly possible that they want to use substance.

RECOMMENDATIONS

It is the limitation of the study that the sampling group was consisted only male students and conducted only in one city. The mechanisms to cope with leisure boredom lack in this study. This study may be a reference for future studies. For this field which is rarely researched in national literature, it would clearly define the problem and increase suggestions for solution of this problem if the studies determine leisure boredom sampling different substance user groups experimentally in

qualitative or quantitative designs with structural equation modelling. The mechanisms on which substance-user individuals' boredoms depend may be a new topic for new researchers. The opinions of individuals whether they see the substance use as a leisure activity or not may be a new research topic for the national literature. In addition, a follow-up study may be conducted about leisure habits of individuals who have been treated for substance abuse. Simultaneously, an experimental study can be planned with a control group in which a recreational program is implemented during admission in the centers of treatment for preventing addiction in risky regions.

Also, a study can be implemented to mixed gender high schools in large cities such as Istanbul, Ankara, and Izmir to compare the substance use and participation in recreational activities.

CONCLUSION

In conclusion, it can be claimed that adolescents who experience leisure boredom are more prone to substance use. Participation of recreational sports influences positively leisure boredom and is decreased substance use.

Therefore, for adolescents, who are in a critical transition period of their lives, it is crucial to plan satisfactory, motivating, entertaining and restful activities of their own choice to keep them away from risky behaviors such as substance use.

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Effects of Curcumin on The Changes in Some Acute Phase Proteins in Aflatoxin B1 Applied Rats

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Abstract

This research was carried out to evaluate the possible effects of curcumin on acute phase proteins in aflatoxin applied rats. In the study, 38 healthy male Wistar Albino rats were used. Group I animals was no applied. Animals in Group II were orally given 1 ml 10% DMSO daily for 60 days. Animals in Group III were orally given 300 mg/kg curcumin dissolved in 10% DMSO daily for 60 days. Animals in Group IV were orally given 250 µg/kg aflatoxin B1 dissolved in 10% DMSO daily for 60 days. Animals in Group V was orally given 250 µg/kg aflatoxin B1 dissolved in 10% DMSO and 300 mg/kg curcumin dissolved in 10% DMSO daily for 60 days. At the end of the study, nitric oxide, amyloid-A, haptoglobin and ceruloplasmin were determined in blood samples taken from all animals. In this study, nitric oxide, amyloid-A, haptoglobin and ceruloplasmin levels with aflatoxin B1 administration were found to be significantly higher than the control group ($p<0.05$). In the group in which aflatoxin and curcumin were administered together, nitric oxide, amyloid-A, haptoglobin and ceruloplasmin levels were lower than in the aflatoxin group ($p<0.05$). In conclusion, the obtained data indicated that administration of curcumin may be useful to alleviate the abnormalities in acute phase proteins resulting from aflatoxicosis.

Key words: Aflatoxin, Curcumin, Amyloid-A, Haptoglobin, Rats

INTRODUCTION

Food and feed products can be contaminated with aflatoxins, which are secondary metabolites produced by Aspergillus widely occurring genus of mold fungi. Aflatoxin B1 is the most hazardous mycotoxin in this group. The main target of aflatoxin B1 is liver and it undergoes transformations in hepatocytes: biotransformation to active aflatoxin B1-8,9-epoxide (8, 9, 18, 38, 40, 46). While infections, traumas and toxic events cause the onset of inflammatory reactions in the organism, aflatoxins also cause inflammation related to tissue damage and chemical reactions occurred in various organs, especially the liver. Inflammation is a protective tissue response against injury or various factors. This event includes different cellular populations, extracellular matrix components and a series of complex cellular and plasma events performed by mediators. The inflammatory response occurs in three different phases, each developed by different mechanisms. These are an acute transient phase characterized by local vasodilation and increased capillary permeability, a subacute phase characterized by infiltration of leukocyte and phagocytic cells from the blood into tissues, and finally a chronic proliferative phase in which tissue degeneration and fibrosis develop (30). It is stated that macrophages and proinflammatory

cytokines play an important role in the onset and continuation of chronic inflammation (13, 49). In particular, TNF-α and IL-1β are active in this process (41). With haptoglobin and CRP, which are acute phase markers, prostaglandins, leukotrienes, nitric oxide are other factors known to assist this process (4, 6, 7, 21, 22, 31).

Curcumin obtained from the rhizome of Curcuma longa L. (Zingiberaceae) is one hydrophobic polyphenol. There is a great interest to anti-inflammatory and antioxidant properties of curcumin in the last two decades. Some studies established its effectiveness in wide variety of diseases including inflammatory disorders (1, 5). It is important that curcumin retains and effectively scavenger free radicals formed during inflammation and released from macrophages and other tissue cells (25, 26, 44). There are also studies related to antimicrobial, insecticidal and anti-inflammatory properties (3, 16, 27).

The aim of this study was to determine the possible effects of curcumin on some acute phase proteins in aflatoxin applied rats.

MATERIALS AND METHODS

In the study, 38 healthy male Wistar Albino rats (2 weeks old) were used. The animals were divided into five groups. These animals fed for 60 days with standard rat food as ad libitum. Group I (K) (n=6) animals was no applied. Animals in group II (DMSO) (n=6) were orally given 1 ml 10% DMSO daily for 60 days. Animals in group III (Cur) (n=6) were orally given 300 mg/kg curcumin (Sigma Aldrich, St. Louis, MO, USA) dissolved in 10% DMSO daily for 60 days. Animals in group IV (AFB1) (n=10) were orally given 250 µg/kg aflatoxin (Acros Organics, Geel, Belgium) B1 dissolved in 10% DMSO daily for 60 days. Animals in group V (AFB1+Cur) (n=10) was orally given 250 µg/kg aflatoxin B1 dissolved in 10% DMSO and 300 mg/kg curcumin dissolved in 10% DMSO daily for 60 days (24, 45). This study protocol was approved by Selçuk University Experimental Medicine Research and Application Center Ethics Committee (Report no. 2018-26).

At the end of 60 days, blood was taken from animals in all groups. Nitric oxide, amyloid-A, haptoglobin and ceruloplasmin were determined in these blood samples taken from all animals. While nitric oxide and amyloid-A levels were determined with ELISA (Biotek ELx800, Biotek Instrumentations, Inc, Winooski, VT, USA) in accordance with the prospectuses via sandwich enzyme-linked immunosorbent measurement method using commercial kits (Bioassay T. Lab. ELISA kit), haptoglobin and ceruloplasmin levels were determined with Siemens BN2 nephelometer using nephelometric method via Siemens kits.

The data obtained from the study were analyzed by one-way ANOVA (SPSS 19). Differences among the groups were determined by Duncan's multiple range test. Differences were considered significant at $p<0.05$.

RESULTS

In the study, the effects of curcumin application in rats treated with aflatoxins on nitric oxide, amyloid-A, haptoglobin and ceruloplasmin levels are given in Table 1.

Table 1. The effects of curcumin on nitric oxide, amyloid-A, haptoglobin and ceruloplasmin levels in aflatoxin-applied rats (Mean±SE).

	Nitric Oxide (µmol/l)	Amyloid-A (µg/ml)	Haptoglobin (mg/dL)	Ceruloplasmin (mg/l)
Group I	21.75±2.35^{c}	36.56±2.02^{c}	29.43±1.02^{c}	146.77±5.93^{bc}
Group II	20.19±1.26^{c}	35.39±1.49^{c}	29.60±1.44^{c}	148.39±3.35^{bc}
Group III	19.93±1.51^{c}	36.12±1.39^{c}	28.04±1.25^{c}	139.05±2.74^{c}
Group IV	34.78±0.90^{a}	47.72±0.95^{a}	43.52±1.13^{a}	194.68±6.47^{a}
Group V	28.34±1.03^{b}	41.25±1.39^{b}	35.34±1.70^{b}	162.26±6.59^{b}

$^{a-c}$ The difference between mean values with different superscripts in the same column is significant at the $p<0.05$ level.

DISCUSSION

Acute phase response; it is an early and non-specific systemic reaction of the immune system to restore and improve homeostasis against local or systemic disorders caused by trauma, infection, stress, operation, neoplasia or inflammation (11, 14, 19, 42). Cytokines and chemokines are released at the location where any infection or tissue damage occurs (19). Cytokines and chemokines are protein and peptide mediators and these mediators are released from cells that play a key role in the immune and inflammatory response (51). These inflammatory mediators initiate and modulate an acute phase reaction by diffused into extracellular fluid and circulation. Cytokines and chemokines along with nitric oxide and also glucocorticoids activate hepatocytic receptors and alter protein synthesis and secretion. As a result, significant changes in concentrations of some plasma proteins known as acute phase proteins occur within a few hours. Although changes in plasma concentrations of acute phase proteins depend on the severity of the stimulus, these changes can also be determined at longer periods (19, 42). Acute phase response may become chronic after receptor stimulation begins and with repeated stimuli (19). Measurements of acute phase proteins are widely used in humans and animals for prognosis or as a disease biomarker. In the acute phase reaction, these proteins may decrease or increase. Increased ones are called positive acute phase protein and decreased ones are called negative acute phase proteins. For example, albumin, the most abundant plasma protein, represents the major negative acute phase protein (42). Amyloid-A and haptoglobin are positive acute phase proteins. These proteins are associated with chronic inflammatory conditions and are synthesized in mainly the liver and in other tissues such as adipose tissue (34, 47, 52).

Under some conditions, inflammatory processes persist for a long time and can cause further damage. Refer to observation of chronic elevations of acute phase proteins, have been used the terms metainflammatory and parainflammatory. Atherosclerosis, cardiovascular diseases, obesity, asthma and diabetes are examples of these elevations (12, 37, 50).

Nitric oxide is a regulatory agent in almost every stage of the development of inflammation. The regulation of the proinflammatory properties of the endothelium and regulation function in the early stages of inflammatory cell migration to the inflammatory area are important (20). In addition, it is a powerful immunoregulatory factor. It has antiapoptotic effects with inhibition of mainly the expression of developmental genes and cellular proliferation (29). The antioxidant properties of nitric oxide also mediate its anti-inflammatory properties (10, 32, 33). Modulatory effects of nitric oxide on inflammation and immunoregulation occurs as a result of its interaction with many signal transduction pathways and transcription factors (20). In our study, while the amount of nitric oxide, which has very important roles in inflammation, significantly increased in the group with aflatoxicosis compared to the control group ($p<0.05$, Table 1), it was determined that in the group in which aflatoxin and curcumin were administered together, the amount of nitric oxide significantly decreased compared to the aflatoxin group ($p<0.05$, Table 1).

Amyloid-A, the most important function of which is to modulate lipoprotein transport and metabolism during the acute phase response, also allows the immune cells to be localized in the inflammation area, while showed preventive effect against oxidative tissue damage (42, 48). In this study, amyloid-A level with application of aflatoxin B1 was found to be significantly higher compared to the control group ($p<0.05$, Table 1), while it was found to be significantly lower in the group in which aflatoxin and curcumin were administered together when compared to aflatoxin group ($p<0.05$, Table 1).

Haptoglobin, another positive acute phase protein, acts as a hemoglobin cleanser. Haptoglobin binds to free hemoglobin and this complex is phagocytosed by macrophages (12, 35). Haptoglobin also prevents the oxidative activity of hemoglobin and helps the recycled iron in heme (28). In the study, it was determined that the amount of haptoglobin in the aflatoxin B1 group was higher than the control group ($p<0.05$, Table 1). It was determined that the amount of haptoglobin in the group in which aflatoxin and curcumin were administered together was lower than the aflatoxin group ($p<0.05$, Table 1).

Ceruloplasmin is a multifunctional protein that provides both transport and storage of copper within the body. Ceruloplasmin is also an antioxidant protein and functions to scavenge reactive oxygen species, while preventing their

formation. It is among the notifications that it protects from iron-induced oxidative stress regarding iron homeostasis (17, 42). In this study, ceruloplasmin, which is a positive acute phase reactant, depend on aflatoxin application significantly increased compared to the control group ($p<0.05$, Table 1), while it was found to be significantly lower than aflatoxin group in group with the curcumin application together with aflatoxin for the same duration ($p<0.05$, Table 1).

In this study, significant changes in acute phase proteins were determined with oral administration of curcumin, which is mentioned it's positively effects in various diseases and inflammations, at dose of 300 mg/kg together with aflatoxin for 60 days. These findings determined in acute phase proteins support the reports that curcumin administration has corrective effects on hepatic functions and related acute phase proteins in inflammatory conditions and inflammations related to aflatoxicosis (2, 15, 34, 36). Studies in recent years offer various propositions about the preventive effects of curcumin against aflatoxicosis. It was shown that the first is the antioxidative effects of curcumin against DNA lesions, lipid peroxidation, reactive oxygen species and glutathione reduction, that the second is the inhibitory effect of the aflatoxins and their active epoxide derivatives against the cytochrome p450 isoenzyme-mediated biotransformation effects and that the third is its immunomodulator effects on IL-1β and TGF-β (39). In this regard, curcumin has been shown to inhibit proinflammatory prostaglandins and leukotrienes, prevent the uptake of arachidonic acid by macrophages, thereby limiting the availability of these substrates in terms of eicosanoid production. It is also reported that curcumin is a potential lipid peroxidation inhibitor and free radical scavenger (23, 43, 44).

CONCLUSION

Consequently, it has been thought that the data obtained in the study were beneficial and important for further studies considering the positive effects of curcumin at dose of 300 mg/kg for 60 days on acute phase proteins in aflatoxicosis.

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A Scrutiny on the Burnout Levels of Fencing Referees

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Abstract

The objective of this study is to measure and interpret the burnout levels of the fencing referees who act in the fencing contests in our country as referees actively. The study group is constituted by the 60 referees with varying refereeing levels taking place on the Certified Referees List 2018 of the Turkish fencing Federation. The Maslach Burnout Inventory developed by Maslach and Jackson (10) and adapted into Turkish conducting a study on its reliability and validity by Ergin (6) was used in this study conducted on the basis of the survey model. In the evaluation of the data and determination of the calculated values, SPSS 16.0 statistics package program was used. The data was summarized by providing the percentages, averages, and standard deviations. As the data distributed normally, an independent group t test was used for the pairwise cluster comparisons and One way Variance Analysis (ANOVA) was used for the multiple cluster comparisons. Tukey HSD multiple comparison test was conducted to determine the significant differences as a result of the ANOVA. The scale reliability coefficient was calculated as .82 and significance level was taken into account as 0.05 in this study. In conclusion, it was observed that the variables of ages, income and education statuses, sportsperson ship background, and material revenues obtained from acting as referees did not differentiate statistically and statistically significant differences were determined in terms of the variables of refereeing experience period, refereeing level, and the number of the annually received assignments, in the personal success subcategory.

Keywords: Sport, Fencing, Referee, Burnout

INTRODUCTION

Particularly in recent years, there are many psychological factors that negatively affect human life. Burnout, which has been frequently observed in many different occupational groups recently, is one of these psychological factors and its first appearance as a concept refers the 1970s. The concept of burnout was first introduced by Freudenberger to describe a situation characterized by fatigue; disappointment and quitting work seen among volunteer healthcare workers and was later developed by Maslach and Jackson (8). Maslach and Leiter; In their book titled "The Truth About Burnout", while questioning what really causes burnout, they suggested that the issue appears to be a problem arising from individual characters and behaviors at first glance in the shadow of the traditional mind and emphasized that their study suggested the opposite. Although eliminating individual problems in the traditional pattern or getting rid of the element that creates these problems is seen as the only method to eliminate burnout, it has revealed that the issue is entirely related to the social environment worked within. Therefore, believing that in order to prevent burnout, it is necessary to examine the structure and operation of the workplace, and the dimensions of people's interaction with each other, they expressed the view that the further away from the humanitarian factors in the workplace, the more burnout will be caused (11).

The Burnout; When the literature is examined, is frequently encountered circumstance as a very common situation in stressful work environments. Sports matches, in which the winner and the loser are in the same environment, can be seen as an environment where intense stress and emotions are experienced, not only athletes but also many people such as coaches, managers and referees are affected by this stress and emotions. Referees and other officials involved in sports matches are a particularly important part of competitive sports not only because of the effects on the behavior of the players and the results of the game, but also because they ensure that the competitions are conducted safely according to certain rules (5). However, referees must deal with conflicts arising from criticism from players, coaches and even team managers. They are almost always physically and verbally attacked by players, coaches and impatient supporters, who create an environment of fear of making mistakes during the game. Too many referees must deal with a stressful professional and social life. Moreover, they live under high levels of stress due to poor social appreciation of their profession (2). Especially in branches that require quick interpretation and decision-making of actions like fencing, this stress, together with external factors, can affect the referees significantly.

Although there are very few scientific studies on fencing, it is sufficient to understand the features of the branch. Fencing is a versatile combat sport that requires quite a high level of specific abilities, where physical as well as psychological competence is particularly important, and has a dynamic structure depending on the actions of competing athletes (13). Due to the fact that the fencing branch has a versatile structure, many elements that fencing referees will consider within the scope of their responsibilities come across during the competition. When the literature is examined, it is possible to find many studies on burnout, while the number of peer-focused studies seems to be quite insufficient. In this study, the level of burnout of fencing referees who actively work as referees in fencing competitions and its relationship with some variables are tried to be interpreted.

METHOD

The relevant scale consists of 22 items and is 5-point Likert type. It consists of three sub-dimensions: Emotional Exhaustion, Depersonalization and Personal Success. Moreover, while the data were collected with the Maslach Burnout Scale, some personal information of the referees who participated in the study were also collected. These are age, education level, income status, duration, and level of arbitration experience.

Research group is consisting of 60 candidate, Provincial, National and International referees actively involved in competitions and Turkey Fencing Federation as of the date 2018 05/31, listed in the 2018 referees list for visas. The scale forms were distributed by giving the necessary explanations by the researcher to the volunteer participants. In the evaluation of the data and determination of the calculated values, SPSS 16.0 statistics package program was used. The data was summarized by providing the percentages, averages, and standard deviations. Whether the data showed normal distribution or not was checked with Kurtosis - Skewness Coefficient range, and it was determined that the data were normally distributed, since the range did not exceed the values of +2.0 and -2.0. As the data distributed normally, an independent group t test was used for the pairwise cluster comparisons and One way Variance Analysis (ANOVA) was used for the multiple cluster comparisons. Tukey HSD multiple comparison test was conducted to determine the significant differences as a result of the ANOVA. The scale reliability coefficient was calculated as .82 and significance level was taken into account as 0.05 in this study. For this study, approval was obtained from the non-invasive ethics committee of the Selçuk University Faculty of Sport Sciences, under number 123 and resolution number 61.

FINDINGS

Table 1. Distribution of Personal Information of the Referees Participating in the Research			
Variables		**f**	**%**
Age	22 Years and Below	30	50,0
	23 Years and Over	30	50,0
	Total	**60**	**100,0**
Education Status	High School and Below	21	35,0
	Undergraduate and Higher	39	65,0
	Total	**60**	**100,0**
Income Level	1500 TL and Below	29	48,3
	1501 TL and Over	31	51,7
	Total	**60**	**100,0**
Referee Year	1-3 Years	27	45,0
	4 Years and Over	33	55,0
	Total	**60**	**100,0**
Refereeing Level	Candidate Referee	16	26,7
	Provincial Referee	18	30,0
	National and International Referee	26	43,3
	Total	**60**	**100,0**
The Average Referee Duty In One Year	1-3	25	41,7
	4 and Over	35	58,3
	Total	**60**	**100,0**
Athlete History	6 Years and Below	23	38,3
	7 Years and Over	37	61,7
	Total	**60**	**100,0**

When Table 1. is examined, 65% (n = 39) the referees participating in the research have a bachelor's degree and above, and 55% (n = 33) of them have 4 years or more of a referee history. When the athlete history of the participants before or during the refereeing was examined, it was observed that 61.7% (n = 37) had a athlete history of 7 years or more.

Table 2. Maslach Burnout Scale Mean Scores t Test Results of Referees Participating in the Study According to the Age Variable

	Age	**N**	**X**	**Ss**	**Sd**	**t**	**P**
Emotional Exhaustion	22 Years and Below	30	1,914	0,587	58	0,770	0,444
	23 Years and Over	30	2,040	0,675			
Desensitization	22 Years and Below	30	2,026	0,663	58	0,713	0,479
	23 Years and Over	30	2,166	0,845			
Personal Success	22 Years and Below	30	3,554	0,737	58	0,970	0,336
	23 Years and Over	30	3,729	0,658			

When Table 2 is examined, a statistically significant difference was not found in all sub-dimensions as a result of examining the Maslach Burnout Scale Mean Scores of the fencing referees participating in the study according to the age variable

Table 3. Maslach Burnout Scale Mean Scores t Test Results of Referees Participating in the Study According to the Education Status Variable

	Education Status	**N**	**X**	**Ss**	**Sd**	**t**	**P**
Emotional Exhaustion	High School and Below	30	1,867	0,449	58	1,129	0,326
	Undergraduate and Higher	30	2,037	0,707			
Desensitization	High School and Below	30	2,171	0,636	58	0,602	0,579
	Undergraduate and Higher	30	2,056	0,819			
Personal Success	High School and Below	30	3,476	0,685	58	1,363	0,180
	Undergraduate and Higher	30	3,730	0,698			

When Table 3 is examined, a statistically significant difference was not found in all sub-dimensions as a result of examining the Maslach Burnout Scale Mean Scores of the fencing referees participating in the study according to the education status variable.

Table 4. Maslach Burnout Scale Mean Scores t Test Results of Referees Participating in the Study According to the Income Level Variable

	Income Level	N	X	Ss	Sd	t	P
Emotional Exhaustion	1500 TL and Below	30	1,996	0,667	58	0,217	0,830
	1501 TL and Over	30	1,960	0,604			
Desensitization	1500 TL and Below	30	2,124	0,727	58	0,271	0,788
	1501 TL and Over	30	2,071	0,794			
Personal Success	1500 TL and Below	30	3,560	0,743	58	0,870	0,390
	1501 TL and Over	30	3,717	0,656			

When Table 4 is examined, a statistically significant difference was not found in all sub-dimensions as a result of examining the Maslach Burnout Scale Mean Scores of the fencing referees participating in the study according to the income level variable.

Table 5. Maslach Burnout Scale Mean Scores t Test Results of Referees Participating in the Study According to the Referee Year Variable

	Referee Year	N	X	Ss	Sd	t	P
Emotional Exhaustion	1-3 Years	30	1,843	0,509	58	1,555	0,137
	4 Years and Over	30	2,087	0,703			
Desensitization	1-3 Years	30	2,044	0,779	58	0,480	0,634
	4 Years and Over	30	2,139	0,747			
Personal Success	1-3 Years	30	3,310	0,706	58	3,656	**0,001***
	4 Years and Over	30	3,912	0,570			

*p < 0,05

When Table 5 is examined, Maslach Burnout Inventory Score Average of fencing referee participating in the survey, examination by the years of being referee variable results, emotional exhaustion and depersonalization dimensions in a statistically meaningful differences were not detected in Personal Success sub-scale 4 years and more in favor of referees with experience statistically significant difference has been detected.

Table 6. Maslach Burnout Scale Mean Scores t Test Results of Referees Participating in the Study According to the Average Referee Duty in One Year Variable

	The average referee duty in one year	N	X	Ss	Sd	t	P
Emotional Exhaustion	1-3	30	1,840	0,579	58	1,473	0,154
	4 and Over	30	2,076	0,655			
Desensitization	1-3	30	2,024	0,757	58	0,626	0,534
	4 and Over	30	2,148	0,762			
Personal Success	1-3	30	3,255	0,603	58	4,108	**0,000***
	4 and Over	30	3,917	0,633			

*p < 0,05

When Table 6 is examined, Maslach Burnout Inventory Score Average of fencing referee participating in the survey, examination by average assignment in 1-year variable results, emotional exhaustion and depersonalization dimensions in a statistically meaningful differences were not detected in Personal Success sub-scale 4 years and over in favor of referees with experience statistically significant difference has been detected.

Table 7. Maslach Burnout Scale Mean Scores t Test Results of Referees Participating in the Study According to the Athlete History Variable

	Athlete History	N	X	Ss	Sd	t	P
Emotional Exhaustion	6 Year and Below	30	1,917	0,641	58	0,577	0,569
	7 Year and Over	30	2,015	0,630			
Desensitization	6 Year and Below	30	2,034	0,847	58	0,496	0,637
	7 Year and Over	30	2,135	0,704			
Personal Success	6 Year and Below	30	3,429	0,661	58	1,920	0,063
	7 Year and Over	30	3,773	0,697			

When Table 7 is examined, a statistically significant difference was not found in all sub-dimensions as a result of examining the Maslach Burnout Scale Mean Scores of the fencing referees participating in the study according to the athlete history variable.

Table 8. Maslach Burnout Scale Mean Scores Anova and Tukey Test Results of Referees Participating in the Study According to the Referee Levels Variable

		Referee Levels	N	X	Ss	Sd	F	P	Tukey
Emotional Exhaustion	A	Candidate Referee	16	1,694	0,400	2 5759	2,677	0,077	
	B	Provincial Referee	18	1,987	0,667				
	C	National and International Referee	26	2,145	0,677				
Desensitization	A	Candidate Referee	16	1,925	0,656	2 57 59	0,562	0,573	
	B	Provincial Referee	18	2,177	0,811				
	C	National and International Referee	26	2,146	0,787				
Personal Success	A	Candidate Referee	16	3,140	0,482	2 5759	7,112	**0,002***	A<B A<C
	B	Provincial Referee	18	3,729	0,699				
	C	National and International Referee	26	3,889	0,670				

*p < 0,05

When Table 8. is examined, the result of examining the referees participating in the study according to the variable of refereeing level; While it was determined that the Personal Success perceptions of National and International Referees were higher than the Candidates and Provincial Referees in the Personal Success sub-dimension, no statistically significant difference was found between the referee levels in the Emotional Exhaustion and Depersonalization sub-dimensions.

CONCLUSION

As a result of the study, in respect of the Maslach Burnout Scale Mean Scores of the fencing referees actively involved in the competitions; It was determined that there was no statistically significant difference according to age, educational status, income level, sportive background variables, while statistical differences were found in the variables of the duration of experience in the refereeing profession and the refereeing rank. In general, it has been observed that the average scores of the personal achievement sub-dimension of the referees who have more experience in both sub-dimensions and if a generalization is made again, the referee levels of national and international levels are higher than the other referees. The Experience seems to be a significant factor in dealing with other negative aspects when refereeing. In the study, where Kargün et al. (9) examined the level of professional burnout of soccer referees, while no difference was found in the variables of income, age, education level, and referees with more experience in the emotionality sub-dimension, depending on the duration of the referee, had the highest score average. The findings of the aforementioned study and our study are quite similar. Again, in the study of Ilkım and Güllü (7) on the wrestling referees; No statistically significant difference was found in sub-dimensions of age, education level, sports history, and this result is similar to our study. However, different from our study, different results were found in income and experience variables. In the study, where statistically significant difference according to the duration of experience and the level of refereeing was not found, it is thought that this difference may have occurred due to the difference in the number of national and international referee participants between the two studies. In the study carried out by Yıldırım et al. (14) on the professional burnout levels of hockey referees, similar to our study, there was no difference in variables such as gender, marital status, income and education, while a statistically significant difference was found in the duration of refereeing experience variable. In the sub-dimension of insensitivity of the referees, whose years of experience ranged from 7-9 years, it was observed that the average scores were higher than the other referees, and this may be due to the fact that the new referees do not have the enthusiasm for development and professional success, depending on the experience of the hockey referees participating in the study. In the study carried out by Al-Halıq et al. (1) on Jordanian sports referees, it was found that the referees with high referee experience had lower levels of burnout than those with less experience. This result is similar to our study. Da Gama et al. (3) observed that the burnout levels of professional league referees were higher in their study, which examined the burnout levels of football referees who worked as referees in professional and amateur leagues. Again, Dağlı Ekmekçi et al. (4), in their study examining the relationship between organizational commitment and burnout on swimming referees, have observed that those who have been in refereeing for a long

time have higher burnout than those who have been referee for a shorter time. The higher level of burnout of professional league referees, who have a relatively high period of experience in refereeing, coincides with results of our study. In the study conducted by Rainey and Hardly (12) on rugby referees, it was observed that burnout levels were high due to performance anxiety focused on personal success, and this situation supports our study.

While it is possible to find a wide range of studies on athletes related to burnout in the literature, an extremely limited number of studies have been conducted on referees. For this reason, it is thought that our study will contribute to the scientific literature. However, the fact that the study was conducted only on fencing referees can be interpreted as a limitation. Despite this, the limited number of studies for fencing referees in the national and international arena increases the importance of our work.

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Examining Transfer Directions in 2019-2020 Season in Turkey by Means of Social Network Analysis

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Abstract

The structural change in world football has also reflected on Turkey transfer market. In these concepts, clubs, considering their available economic possibilities, aim to realize the best transfer. In this study, the aim is to examine football player transfers conducted in 2019-2020 Super League Cemil Usta Season by measures regarding social network analysis. The studies were realized through 941 transfer data actualizing, 2019-2020 Season. During analyzing data, NodeXL Software was used. As a result of the study, 941 transfers actualized between 345 clubs in 2019-2020 Super League Cemil Usta Season.
It was identified that the clubs that purchased the most football players were Kayserispor" "Çaykurrizespor", and "Kasımpaşa" and the ones that sold the most football players were "Çaykur Rizespor" "Alanyaspor" "Fenerbahçe". It revealed that "Kayserispor" was the most important club serving as a bridge to be able to interact with the other clubs in realizing transfers in 2019 – 2020 Season.

Keywords: Football Player Transfer; Network science; transfer network

INTRODUCTION

Football, in respect of meaning it holds in 21st Century, has turned into a sector not only concerning millions of proponents but also hundreds of clubs. In local and international platform, the growth in football has also reflected on transfers. At the present time, European Football taking place in the center of global football industry comes into our face as one of the biggest economies of the world together with the change and transformation that have continued for the last ten years (11).

Clubs, for being able to become better, have become developing new procedures, forcing their economic limits (12). Good transfer shows itself not only in obtaining sportive achievement but also in alternating balances of the live transmission, match day, and commercial incomes.

In the last 20 years, in football transfers, economic dynamics were completely modified, and the amount of money spent for transfers increased incrementally (18). In 2019, world clubs realized 18.042 international transfers. This showed an increase of 9.1% compared to the previous year. This increase is also the highest rate of transfer that has been made for ten years (12).

The number of active clubs rose from 3,880 in 2018 to 4,062 in 2019. The growths are not only in the number of clubs. The number and fees of transfer reached an unprecedented level. 179 out of 211 FIFA member countries participated in the transfers of the year 2019, realizing at least one transfer. In 2019, the sum of international transfers reached US $ 7.35 billion (12).

Certainly, this growth is also seen in Turkey transfer market. While the number of in- degree

football players in 2018- 2019 transfer period actualized as 427, the number of out-degree football players, as 424, in 2019-2020 transfer period, the number of in-degree football players was 483 and the out-degree football players was 520. In 2019-2020 periods, while transfer incomes actualized as € 87,707,000, transfer expenses were €75,010,500 (21).

Literature review

In 1954, social network used by J.A. Barnes in 1954, is a structure, in which the nodes are generally considered as individuals, institutes, and organizations, and connections between them are socialized(13). When the literature of international area is examined, in many disciplines such as biology and sociology, social network analysis was used. Social network analysis based on graph theory (14) has been begun to be used in general sports research and, specifically, in transfer research (1; 17).

The studies related to social network in sports generally concentrates on team performance and match or pas analyses. In other words, this study is on examination of the relationship between pas performances of teams and their sportive achievements (10). Many studies (3; 4; 5; 6; 7; 8; 9) were carried out related to pas analysis

When the domain literature is examined, it can be said that the studies dealing with direction of transfer are limited in either international domain literature or [national] domain literature. Raffaele et al. (2018), in the study they carried out, studied the major transfer points of athletes transferred. Portugal was identified as the most transfer place for Brazil by far the most important. It was revealed that 219 football players that came from Portugal formed 19% of football players that went from Brazil to the different countries. In addition, it was identified that Chili and Mexico were the transfer points of Argentinian immigrants (19).

Liu et al. (2016), in the study they carried out, assessed the transfers of 410 professional clubs taking place in 24 Premier Legue from 2011 to 2015. According to the results of this study, it was identified that professional football was a monetary game, which a larger investment generally is needed for acquiring capable football players (16). Li et al. (2019) examined 470792 transfers between 23765 footbal clubs in 206 countries and regions from 1990 to 2016 by means of the measures regarding social network analysis (15). In addition, the different researchers assessesed the transfers by the different methods (21).

In addition, which countries are the source of transfer (22; 23), how the biggest European leagues direct the migration flows of footballers (24), comparison of country-based high and low market value transfer networks Gürsakal et al., (2020) (25).

At the same time Sevilmiş and Devecioğlu (2020) Turkey has identified 20 transfers seasonal aspects of the Professional Football League (26).

Despite the proliferation of theoretical ideas, which is one of Europe's largest league Turkey has not seen the studies that examine how to carry out the transfer of the super league. Turkey super league of this research to understand the direction of transfers in 2019-2020 season and makes his own tranfer is important to uncover the club played an intermediary in transfers. When the literature is examined, no research has been found that examines this subject within the scope of social network analysis. which is one of the two league revenues continued to grow in Europe as location, type of transfer area to investigate, Turkey has carried out research Based on the opinion will contribute to making the right transferred.

METHOD

Social network analysis is a type of analysis that examines social structures through network and graph theories. Accordingly, actors (node - node) within social structures are positioned within the structure through the relationships (edge - edge) they establish with each other.

Nodexl is a program with many functions such as extracting data from social networks such as twitter, calculating network statistics, providing network visualization. Manual data entry can be done with the Nodexl program (27)

In social network analysis, the results are presented with the measurements of the networks. Networks consist of nodes and the connections between them. In this research, nodes represent clubs and links represent transfers (13).

A transfer of football players keeps an important place in the achievements of teams. The studies on transfers of football players are highly limited. In this study, which is examined by the measures regarding social network analysis of the transfers of football players, made 2019-2020 Super League Cemil Usta Season, the study data were

drawn from www.transfermarkt.com website. The summer and winter transfers of 2019-2020 Season and those going were included in the study. 841 transfers made by 18 teams in 2019-2020 Season were also included in analyses. If the transfers were made in the same club (For example, Galatasaray makes a transfer from U19), the datum was entered as Garatasaray – Galatasaray. Analyses were made by nodeXL software.

RESULT

Assessment of the transfers made in the summer and winter months of 2019-2020 Cemil Usta Season and athletes left their clubs in terms of social network analysis was presented as follows:

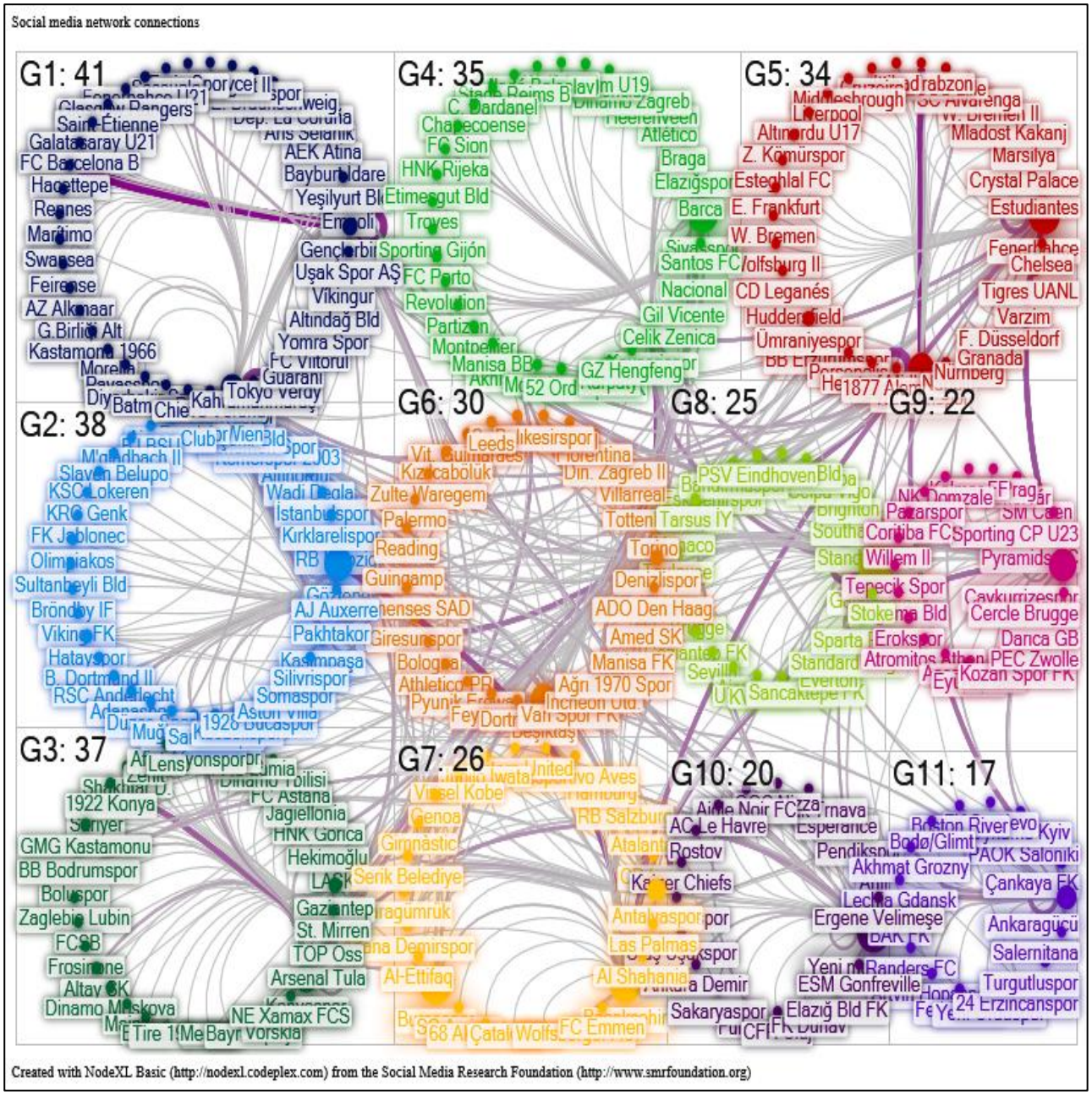

Figure 1. Turkey transfer network

When the groups formed according to clustering algorithm is examined, the transfers in the summer and winter seasons of 2019-2020 Cemil Usta Season consist of 10 different clusters. There are 325 clubs in 11 different clusters. The numbers of club in clustering are different from each other. Average Clustering Coefficient was found 0.061.

Table 1. Graph Metric	
Graph Type	Directed
Vertices	325
Unique Edges	520
Edges With Duplicates	421
Total Edges	941
Self-Loops	93
Reciprocated Vertex Pair Ratio	0,134408602
Reciprocated Edge Ratio	0,236966825
Connected Components	1
Single-Vertex Connected Components	0
Maximum Vertices in a Connected Comp.	325
Maximum Edges in a Connected Comp.	941
Maximum Geodesic Distance (Diameter)	5
Average Geodesic Distance	3,18968
Graph Density	0,006011396

Graph Metric Vertices represent clubs. In 2019-2020 Season, 325 clubs purchased and sold player. The number of unique edges was, identified as 520 and that of edges with duplicates, as 421. A total number of unique edges and edges with duplicate 941. There are 93 Self-Loops. In other words; in-club transfer was realized. Modularity value was calculated as 0.32.

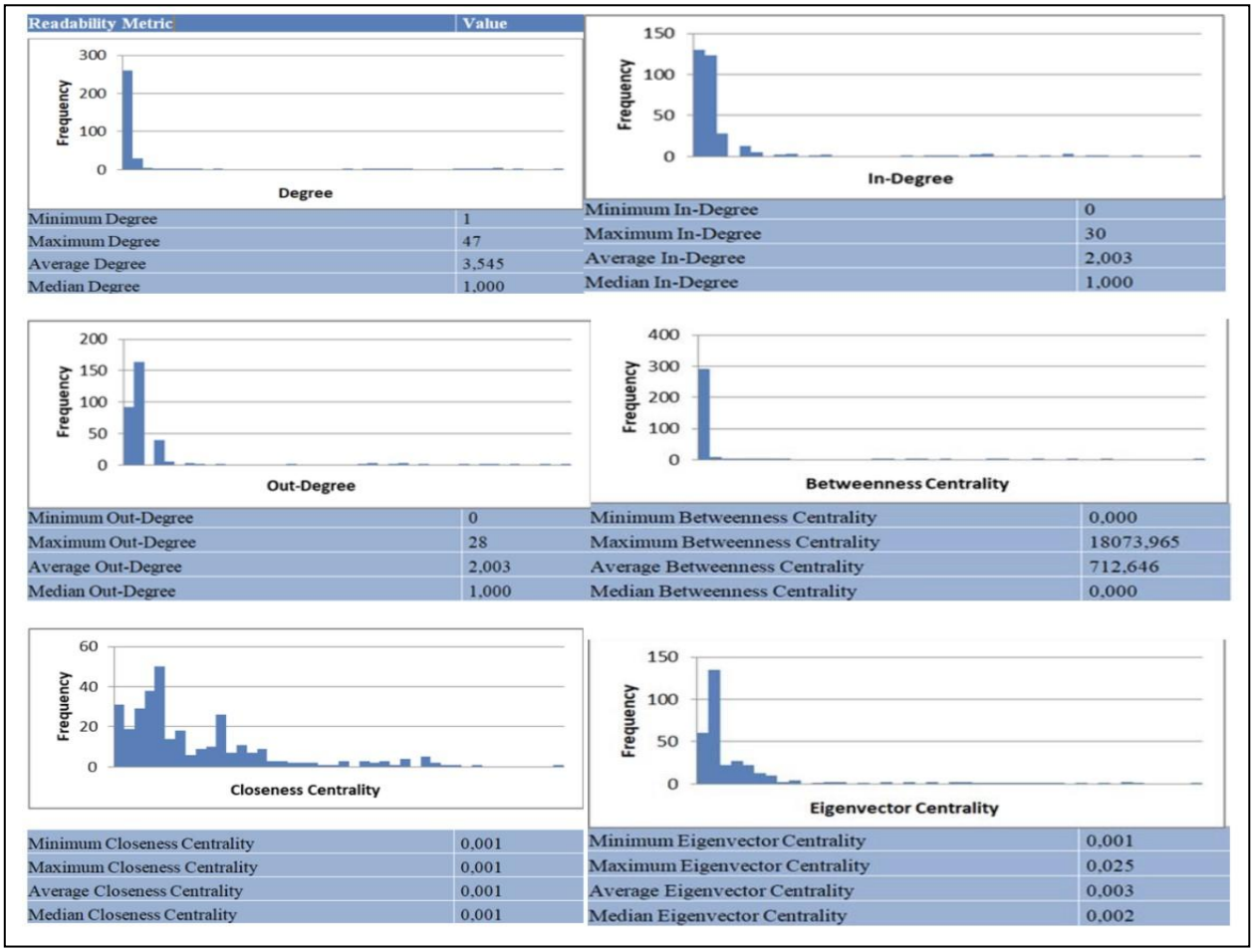

Figure 2. Centrality measures

Clustering coefficient determines how good a peak point in a graph is connected with its neighbors. Here, it can be said that clustering coefficient is a result of degree-correlation biasness (Soffer & Vazquez, 2005). While the summer and winter transfers in Cemil Usta Season form eleven different clusters, average clustering coefficient was identified as 0.061.

Table 3. In degree/out degree

In-degree		Out-Degree	
Kayserispor	30	Çaykurrizespor	28
Çaykurrizespor	27	Alanyaspor	28
Kasımpaşa	25	Fenerbahçe	27
Yeni Malatyaspor	24	Başakşehir	25
Alanyaspor	23	Trabzonspor	24
Trabzonspor	23	Gençlerbirliği	23
Gaziantep	23	Yeni Malatyaspor	22
Gençlerbirliği	21	Galatasaray	22
Fenerbahçe	20	Antalyaspor	19
Galatasaray	18	Kayserispor	18

When in-degree values are examined, in 2019-2020 season, it was identified that the clubs purchasing the most football players were "Kayserispor" "Çaykur Rizespor", and "Kasımpaşa". When the out-degree values are examined, the clubs selling the most football players are Çaykur Rizespor" "Alanyaspor", and "Fenerbahçe". When the in-degree and out-degree values are examined, it was identified that "Çaykur Rizespor" took place in two values as well.

Table 4. Betwennness centrality

1. Kayserispor	18073,965
2. Çaykur Rizespor	14926,691
3. Yeni Malatyaspor	14851,431
4. Gençlerbirliği	14751,536
5. Fenerbahçe	13688,519
6. Alanyaspor	13670,360
7. Galatasaray	12460,151
8. Kasımpaşa	11318,006
9. Trabzonspor	11302,150
10. Gaziantep	11005,125

In 2019 -2020 season, the top 10 clubs whose Betweenness centrality was the highest were shown. These clubs are the ones whose mediation role is the highest in realizing transfers. "Kayserispor" comes to our face as the most important club serving bridge to be able to interact with the other clubs in realizing transfers.

Table 5. Self loops

Self Loops	N
Trabzonspor	13
Gençlerbirliği	11
Alanyaspor	9
Galatasaray	8
Başakşehir	8
Fenerbahçe	8
Antalyaspor	8
Kasımpaşa	4
Denizlispor	4
Göztepe	3

When Self- loops values are examined, the top 10 clubs whose in-club transfer rates are the highest were shown. It was seen that the clubs, who's the number of transfer within itself were the highest, were "Trabzonspor" "Gençlerbirliği" "Alanyaspor".

DISCUSSION

In this study, Transfers of football players made in 2019-2020 Super League Cemil Usta Season were examined by the measures regarding social network analysis. In the study, the groups formed according to clustering algorithms were examined, and it emerged that the summer and winter transfers in 2019-2020 Cemil Usta Season formed eleven different clusters and that the numbers of clubs in clustering are different from each other.

It is seen that a total number of connections between clubs is 941. In the findings of the study, network density was identified as 0.0060. According to this finding, it came up that the transfers of football players made in 2019-2020 Super League Cemil Usta had a low connection and that a large part of potential network was not used.

In 2019-2020 seasons, it was identified that 325 clubs purchased and sold players and that the number of Unique Edges was 520 and the number of Edges with Duplicates 421. A total of unique and edges with duplicates is 941. It was revealed that there were 93 self-loops. In other words, in 2019-2020 seasons, 325 clubs purchased and sold athletes and it was revealed that 520 transfers were made unique and 421 transfers, edges with duplicates. In 2019 – 2020 seasons, it was revealed that a total of 941 transfers were made and that 93 of these transfers were in –club transfers.

It was also identified that Average Geodesic Distance was 3.18968. It was seen that radius of networks was far away from the point 0. It can be said that in 2019-2020 season, the passing rate of clubs to interaction to each other is slow. Modularity is a quality measure for graphical clustering (2). In our study, modularity number was identified as 0.329.

In 2019-2020 seasons, it was revealed that the clubs purchasing the most football players were Kayserispor" "Çaykurrizespor" "Kasımpaşa", while the ones selling the most football players were

"Çaykurrizespor" "Alanyaspor", and "Fenerbahçe. It was also identified that the club "Çaykurrizespor" was at the top level in purchasing and selling football player. It was identified that the most important serving bridge to be able to interact with the other clubs was "Kayserispor". In 2019-2020 seasons, athe club who's the number of transfer within itself were seen to be "Gençlerbirliği" and "Alanyaspor". In other words, these clubs are the ones the football players they need raise themselves.

CONCLUSION

The study was realized, considering the transfers in 2019-2020. The transfers in the other seasons can be included in the study. A comparison can be made between the other seasons. A comparison can be made by dividing transfer period as summer and winter. From which countries and between which countries the most transfers are made can be introduced by measures regarding networks in detail.

Given Turkey bewweenness transfer coefficients of the 2019-2020 network "Kayserispor" "Rizespor" as it has been concluded that the Anatolian teams. Turkey intermediary role in the realization of the transfer Anatolian clubs in the professional league clubs said to be the highest.

Anatolia sports clubs turkey 'is carried out in view of bridging the transfer of a professional league. At the same time, Anatolian clubs (such as Kayserispor, Çaykur Rizespor) have emerged as important actors in interacting with other clubs.

Clubs like "Trabzonspor" "Gençlerbirliği" have the highest number of transfers among themselves.

These clubs are also the clubs that use their own resources the most.

The development of football in Turkey in breeding of lower structure is possible by the use of their own players or skiing. For this reason, it is recommended to take measures against this situation and increase the incentives of local football players.

In line with this research, the following suggestions can be listed:

-Clubs can train football players from their own infrastructure.

-The rates of the teams to train and transfer players by taking advantage of their own resources are very low. Clubs should be supported in training players.

-Youth football organizations should be reconsidered.

-The direction of transfers in different countries should be explored; equity transfer of data should be compared with Turkey.

-Research results received from Turkey was more than the rate of foreign players in the Professional Football League clubs it proves that. The results of the Professional Football League players in the labor Turkey to become an international market 'is an indicator that reflects net. For this reason, foreign constraints can be reviewed in terms of the future of football in the country.

In this study, the realization of the transfer of turkey, revealing the club undertakes the role of intermediary in the realization of the transfer, in terms of Turkey's discovery that the transfer of established communication with clubs in the world which will contribute to the literature.

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The Effect of Financial and Sports Achievements of Football Clubs on Stock Values: A Study on European and Super League Clubs

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Abstract

In the literature, although there are studies examining the stock values by applying the ratio analysis method with the data obtained from the financial tables of football clubs, there are limited number of studies examining the factors affecting the stock values of football clubs with econometric methods. The main aim of the study is to investigate the effects of financial and sports achievements criteria of 14 football clubs on stock values competing in European League and Turkish Super League and traded on the stock market. The study includes a four-year period between 2016-2019. In this period, 6-month financial data of the clubs were tested by using panel data analysis method. Empirical results reveal that the market value and league scores of football clubs affect the stock value positively, but club revenues affect the stock value negatively.

Key Words: football clubs, stock, panel data.

INTRODUCTION

The place and importance of football, which is a sports competition with an audience of about 4 billion, is indisputable. Football, which was just an entertainment in the past, has become an industry today thanks to the globalization in the world and the technological developments it brings. In the first periods, when football was for entertainment purposes, only low match revenues such as ticket sales were obtained in stadiums; but today sports clubs have become institutionalized and gained association and company status. As well as match revenues, they earn millions of dollars from advertising revenues, revenues from broadcasting rights, sponsorship revenues, licensed product sales revenues, revenues from national and international competitions, betting revenues and stock market revenues, so each of them is mentioned as an important brand in national and international markets and they have an important share in the world economy.

The desire to manage football clubs for profit, that is the industrialization of football, has caused important changes in club administrations. Financial management areas, which have not been emphasized much so far, have started to be an issue to focus on and budgeting, financial management, professional observation, and legal consultancy have become important (11).

As the football clubs started to be traded in stock markets in the world and in our country, the sportive and financial success of these companies started to attract interest by investors and researchers, and the issues related to the financial status of football clubs offered a new field of study to the researchers.

This study is intended to deal with football market in Europe and Turkey along with its economic dimensions and to determine the effect on the stocks of sporting and financial success of the football clubs in the study.

Economic dimensions of Football Industry in Europe and Turkey

Football is the most popular and followed sport in our country as it is in Europe. The popularity of football is increasing day by day, and not only its sports activities but the social, emotional, economic and even political effects of football can be shown as the reason for the increase of interest in football.

In today's Turkish football, the number of fans of Galatasaray, Beşiktaş and Fenerbahçe Sports Clubs, which are named as the Big Three in the Super League, have more than 80% of the number of fans of all football clubs in our league, and this has led the Turkish football and football market to continue its existence in the axis of these clubs (29). Being established as associations in the past, Galatasaray and Beşiktaş were incorporated and offered to public in 2002 and Fenerbahçe and Trabzonspor in 2004. With the offering of sports clubs to the public, the clubs produced high income and advertisement, broadcasting, jersey sales and stadium revenues increased, and parallel to this, transfer fees and other payments to football players increased as well. Although the number of clubs with incorporation in Turkey is high, the fact that only four biggest clubs with the most fan bases are traded on Istanbul Stock Exchange prevents other football clubs from getting the expected share from the capital markets (19). Today, Turkish football shows positive momentum especially in terms of financial success and increases its brand value with each passing season. Revenue items such as match day revenues, broadcast revenues, product sales and sponsorship revenues, which are obtained in national and international competitions, constitute the commercial revenues of the clubs. The total of commercial income of the last four seasons of 18 football clubs competing in the super league is shown in figure 1.

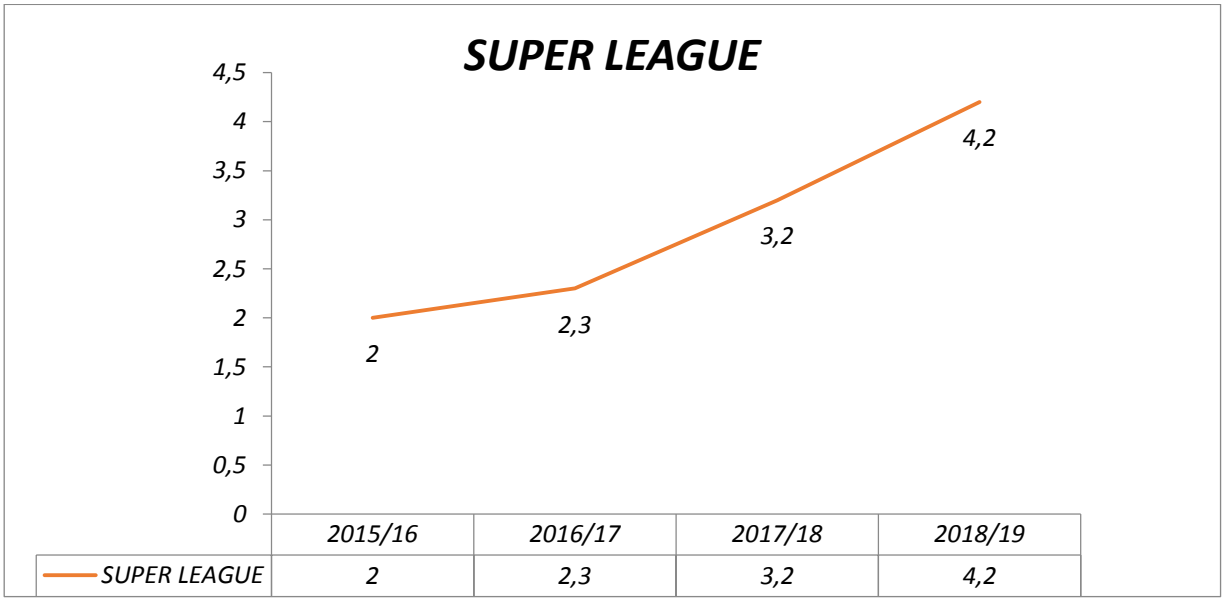
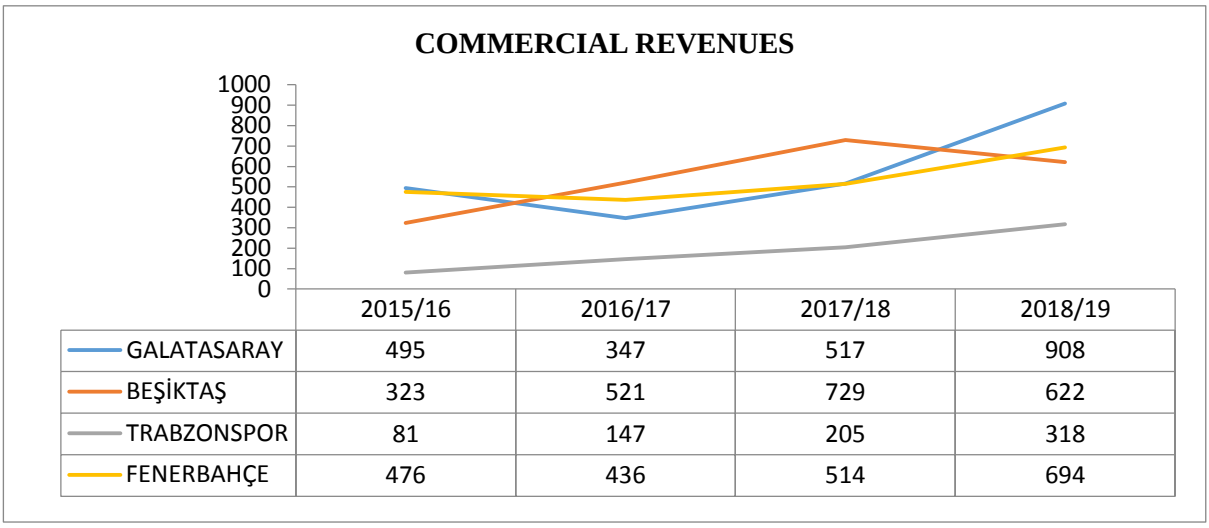


Figure 1. Total Commercial Revenues of Super League Clubs (Billion TL) 2015/16 -2018/19 (32)

In Super League, Galatasaray, Beşiktaş, Trabzonspor and Fenerbahçe Sports Clubs constitute the majority of the total commercial income and the commercial revenues of these four clubs in the last four seasons are shown in Figure 2.

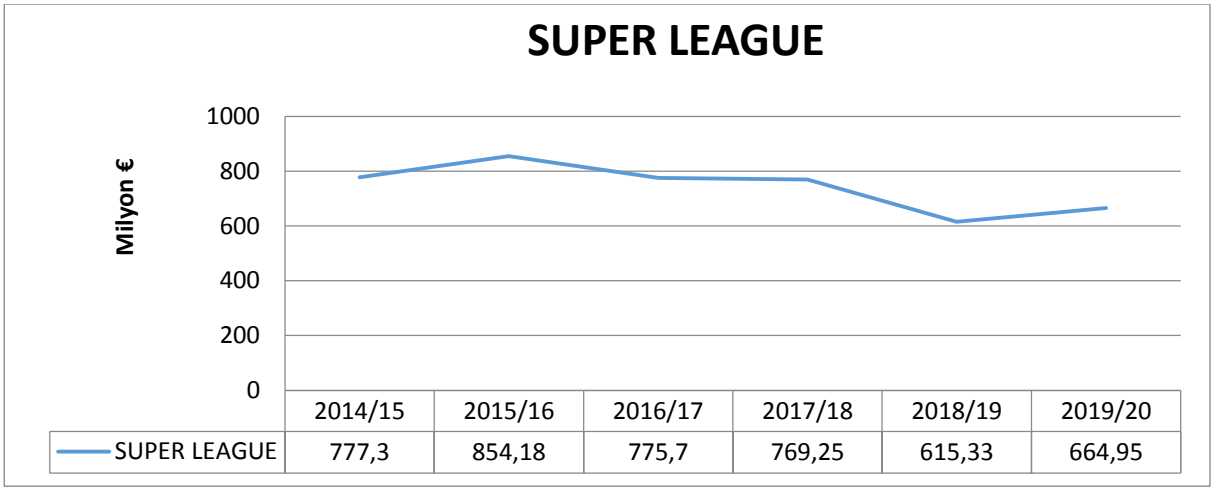


	2015/16	2016/17	2017/18	2018/19
GALATASARAY	495	347	517	908
BEŞİKTAŞ	323	521	729	622
TRABZONSPOR	81	147	205	318
FENERBAHÇE	476	436	514	694

Figure 2. Commercial Revenues of 4 Major Super League Clubs (Million TL) 2015/16- 2018/19 (32)

As presented in Figure 1 and Figure 2, the commercial revenues of all clubs in Super League have increased steadily in the last four seasons and the revenues of the four big sports clubs that have a large share in these revenues have increased from time to time in parallel with their financial and sportive success in these four seasons.

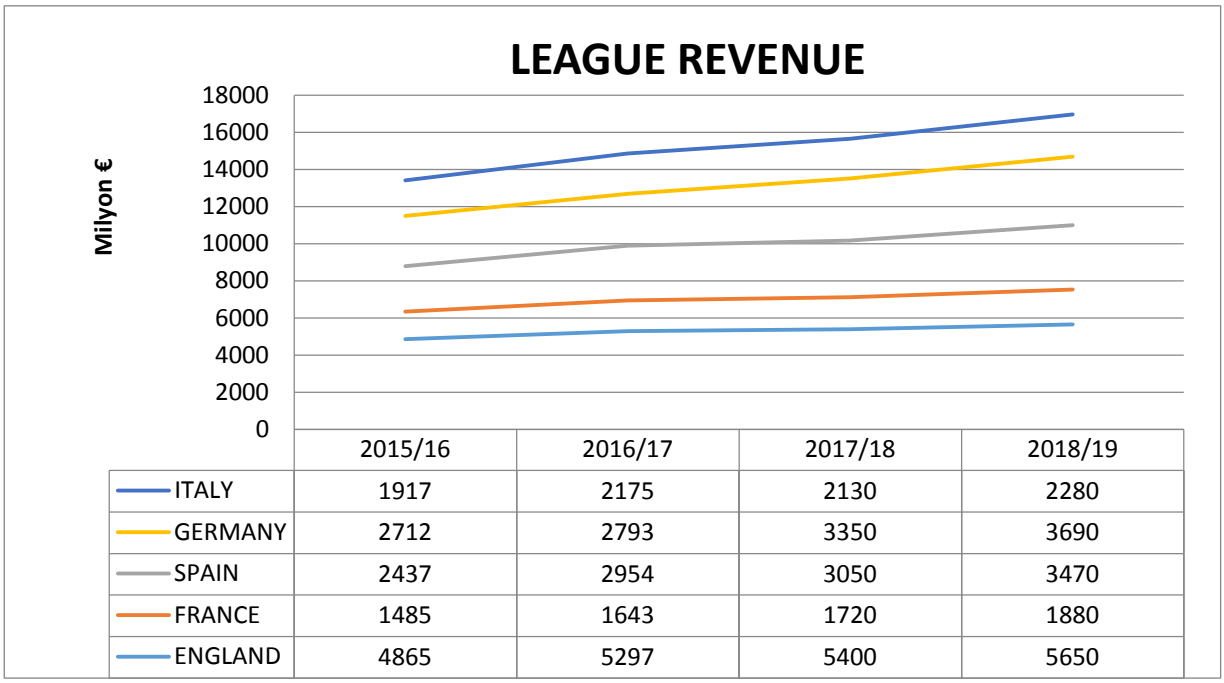
Moreover, the total brand values of 18 football clubs in Turkish Super League based on the market values of the players decrease periodically within the framework of the financial situation of the clubs in the last four seasons and UEFA's Financial Fair Play sanctions.



	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
SUPER LEAGUE	777,3	854,18	775,7	769,25	615,33	664,95

Figure 3. Total Brand Value Based on Super League Player Values (Million TL) 2015/16-2018/19 (38)

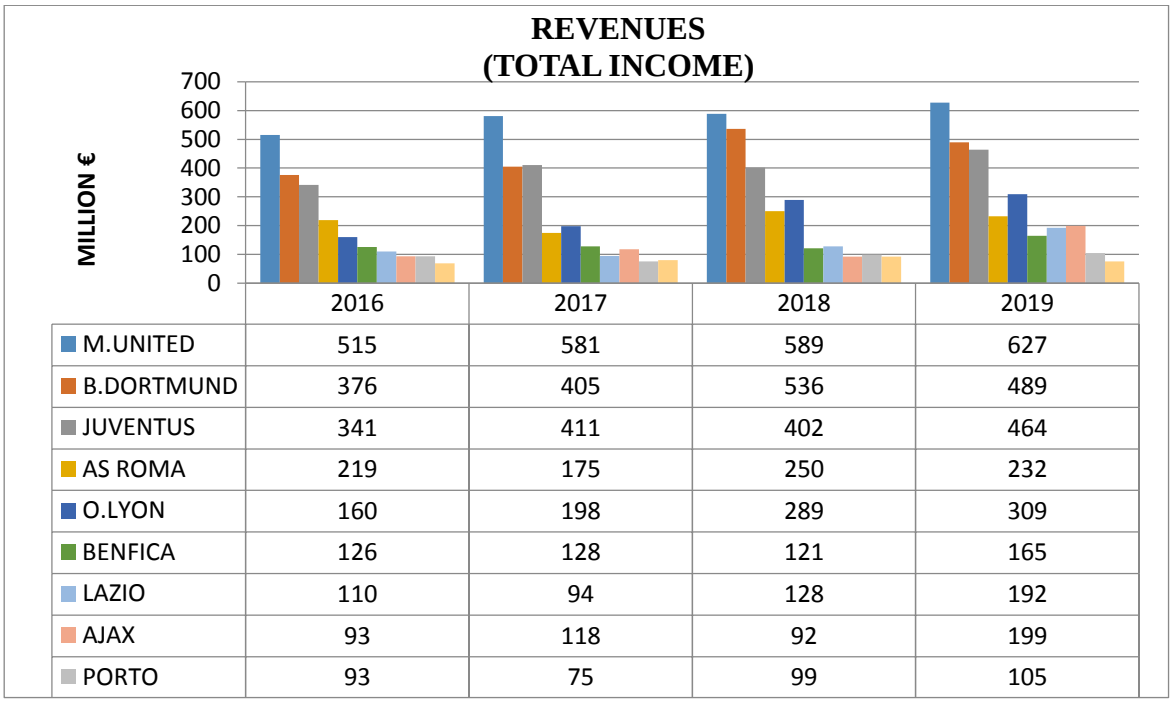
It is seen that England (Premier League), Germany (Bundesliga), Spain (La Liga), Italy (Serie A) and France (Ligue 1) leagues, the world's 5 major leagues forming the basis of European football market, are also structured as an association and incorporated company. Football clubs are incorporated companies and some of the countries whose shares are traded in the capital markets through the public offering method are England, Germany, Italy, France, Holland, Portugal, Sweden, Scotland and Denmark (25). European football has shown positive momentum regarding both sporting and financial success from past to present, and it is leading the world football market and becoming a role model by increasing its brand value constantly.



	2015/16	2016/17	2017/18	2018/19
ITALY	1917	2175	2130	2280
GERMANY	2712	2793	3350	3690
SPAIN	2437	2954	3050	3470
FRANCE	1485	1643	1720	1880
ENGLAND	4865	5297	5400	5650

Figure 4. Revenue of the 'Five Major European League Clubs' (Million €) 2015/16- 2018/19 (1)

The total income of 10 football clubs in the last four seasons in our study competing in European leagues is presented in figure 5.



	2016	2017	2018	2019
M.UNITED	515	581	589	627
B.DORTMUND	376	405	536	489
JUVENTUS	341	411	402	464
AS ROMA	219	175	250	232
O.LYON	160	198	289	309
BENFICA	126	128	121	165
LAZIO	110	94	128	192
AJAX	93	118	92	199
PORTO	93	75	99	105

Figure 5. Revenues of 10 Clubs Competing in the European Leagues (Million €) 2016-2019 (37)

As of 2019, 9 clubs in the Premier League, three clubs in the Bundesliga, six clubs in La Liga, six clubs in the Serie A and six clubs in the League 1 are incorporated companies, and the total company values in the last four seasons on the basis of their leagues are shown in Figure 6.

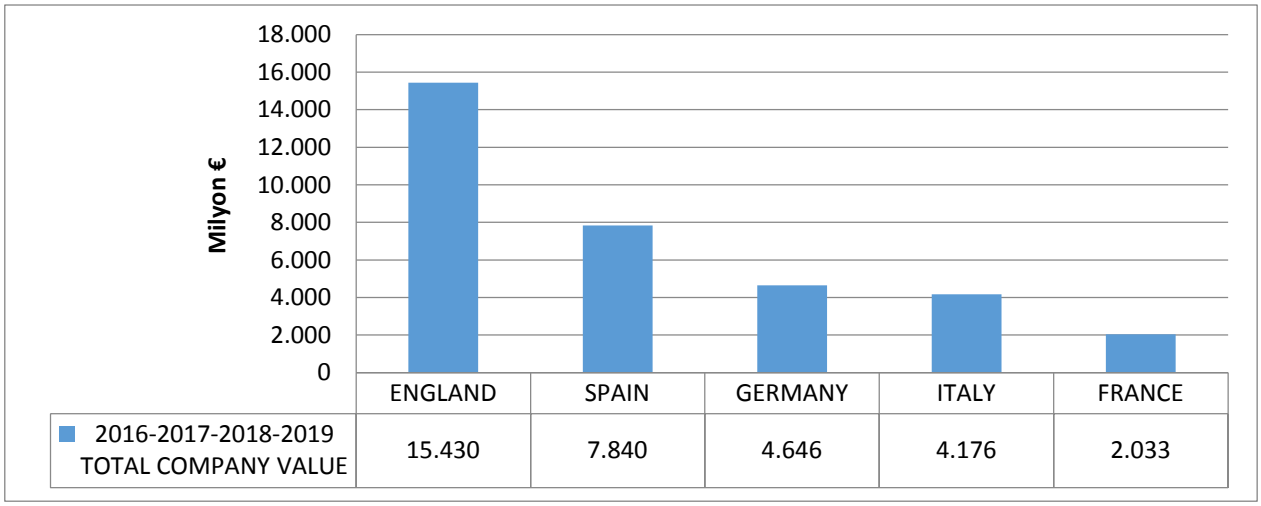


Figure 6. Total Company Revenue of '5 Big' European League Clubs (Million €) 2015/16- 2018/19 (34)

If we take a look at the shares of the five big leagues that are leading the world football market and including top brand football clubs; in the world football market which has a brand value of $13.4 billion, England has 46% share, Germany has 16% share, Spain has 15% share, Italy has 9% share and France has 7% share. Five countries including Turkey share the remaining 7% (33).

Table 1. Total brand values and percentiles of the Countries (33)

COUNTRY	TOTAL BRAND VALUE	Percentile
ENGLAND	6.109.000.000 $	46%
GERMANY	2.208.000.000 $	16%
SPAIN	1.984.000.000 $	15%
ITALY	1.172.000.000 $	9%
FRANCE	983.000.000 $	7%
TURKEY	297.000.000 $	2%
HOLLAND	230.000.000 $	2%
BRAZIL	173.000.000 $	1%
SCOTLAND	120.000.000 $	1%
PORTUGAL	103.000.000 $	1%
Total	**13.400.000.000 $**	**100%**

While the annual turnover of football clubs, which have become a global show industry, is around 14.6 billion Euros, the annual turnover of big football clubs around the world is 200 million Euros. The annual turnover of the European Champions League, which is held annually, is 1 billion Euros. While the global scale of the football industry, together with external economies, is at 200 Billion USD level, the volume of Turkish football sector is about 800 million euros. While the budget of Turkish Football Federation was about 6 million USD over the past ten years, it has now reached 150 million USD (34).

MATERIAL & METHOD

Data Set

In similar studies on football clubs in the literature, it was seen that generally the local clubs in a single country traded on the same stock market were used. In the selection of football clubs that constitute the dataset of this study, the fact that the clubs were traded in different stock markets and in different countries were taken into account, and it was thought that the sportive and financial structures of different criteria and scales will enrich the sample of the research. The common features of the 14 football clubs used in the study are that they compete in European leagues and they are incorporated companies traded on stock markets.

The research includes a four-year period between 2016-2019. The companies included in the study are Turkish Super League clubs Galatasaray A.S., Beşiktaş A.S., Trabzonspor A.S. and Fenerbahçe A.S. traded on Istanbul Stock Exchange, Borussia Dortmund in the German Bundesliga and traded on the German stock exchange Xetra, Lazıo, Juventus and A.S. Roma in Italy Serie A and traded on Milan stock exchange, Manchester United competing in the English Premier League and traded on the New York stock exchange, Olympic Lyon in Ligue 1 France and traded on the Paris stock exchange, Benfica, Sporting Lisbon and Porto F.C. in Portugal Liga NOS and traded on Euronext Lisbon Stock Exchange and Ajax competing in the Dutch Eredivisie League and traded on the Amsterdam stock exchange. The data of these clubs are published for four-year as six-month-half periods in total of eight periods.

The data used in the study are in two groups as dependent and independent. The dependent variable is the stock values of the 14 football clubs in the study. The independent variables consist of the league score and the number of trophies gained throughout the season to measure the financial activities of 14 football clubs, club income, club market value, transfer fees spent, return on assets, return on equity, leverage ratio variables and sporting events.

Method

Econometric studies are generally analysed using time series analysis and cross section data analysis methods. In the studies in which time series are used, the time dimension of the data is taken into consideration, that is, the values of variables in the analysis over a period of time are emphasized. In the studies in which cross sections are used, different variables at a single time point are compared. Analyses, where time series data and cross section data are used together, are called "Panel Data Analysis". In other words, panel data analysis consists of time series and cross section data, and data sets of different time intervals belonging to the same units (30). In econometric studies conducted recently, the panel data method has been used quite frequently. One of the important reasons for the increase in the interest in panel data method in studies is the use of cross and time series data in panel data sets together, benefiting from more information in the research and increasing the level of freedom. Therefore, the number of observations in the research increases and the problem of multiple linear connection is eliminated by adding more variability to the researched relationship (4). Another reason is to control the individual effects that can be related to other variables and cannot be observed within the framework of the model in determining the economic relations between the variables in the established model (17). For these reasons and since the data set to be used in the research includes the time series data and the data of the cross-section series, panel data analysis method was used as an econometric analysis.

The basic panel regression model used to analyse the relationships between dependent and independent variables using the data of cross and time series together is shown as follows (16).

$$y_{it} = \alpha_i + \beta_1 X_{1it} + \varepsilon_{it} \qquad i = 1,2,\ldots,N \qquad t = 1,2,\ldots,T$$

In the formula above, the subscript i indicates cross section series such as household, company, country, while the subscript t indicates the time series dimension. In the equation, yit shows the dependent variables, X1it shows the independent variables in the model, εit indicates error term and αi indicates s constant coefficient intersection.

There are two basic methods for estimating the panel data model. One of these models is named as "fixed effects model" and it allows to obtain different constant coefficients for each cross-section units. In the fixed effects model (FEM), a different fixed value is created for each cross-section unit. Fixed effects model (FEM) assume that slope coefficients indicated by model β do not change but constant coefficients vary only between cross section data or only between time series data or between both cross and time data. In other words, when there is a difference between the sections in the panel data set, if there is no time-dependent variation, this regression model is named as one-way and cross-sectional fixed effects model (FEM). Another method used to estimate panel data analysis is "random effects model" (REM). This model is used in cases where changes due to cross section and time series are included in the panel data model as a component of the error term. The

fact that the random effect model is superior to the fixed effects model can be explained by the removal of loss of degrees of freedom in the random effects model. In addition, the random effects model allows the effects outside the sample to be included in the created model (18).

One of the important issues when using panel data analysis method is to decide which model should be used; that is, whether to use fixed effects model (FEM) or random effects model (REM). Of the two models, which one to use in the analysis is usually determined by Hausman test statistics, and the hypotheses for Hausman test statistics are as follows:

H0: $E(\varepsilon it \mid Xit) = 0$ cross-section data and time series effects are random, no correlation

H1: $E(\varepsilon it \mid Xit) = 0$ cross-section data and time series effects are steady, there is correlation.

Acceptance of the null hypothesis (H0) in the Hausman test means that the random effects model will be used in the analysis (22). Likelihood ratio (LR) test can also be used to test the random effects model against the classical model. H0 hypothesis is established that there is no difference between the sum of squares of the residuals of the two models (26). H1 hypothesis states that there is a difference between the sum of squares of the residuals of the two models. LR test statistic is the following model:

$$LR=-2\log(H_0 / H_1)=-2[\log(H_0)-\log(H_1)]=2[L(H_1)-L(H_0)]$$

Model of the Study

Literature is used to determine the model used in panel data analysis and the variables used in the model. In the light of the studies in the literature, the model created to determine the econometric relationship between stock returns and variables that indicate the sports and financial and sportive success of football clubs are as follows.

$$HSD_{it} = \alpha_{it} + \beta_1 PİYDEĞ + \beta_2 LİGP + \beta_3 KUPS + \beta_4 KULGELİRİ + \beta_5 HARCBONBD + \beta_6 ROA + \beta_7 KALDO + \beta_8 ROE + \mu_{it} + \varepsilon_{it}$$

In the study model, Stock Value (HSD) was used as the dependent variable. The data needed to calculate the HSDs of 14 football clubs used as dependent variables were obtained from Club websites, investing.com and BIST website.

The independent variables used in the study are explained below.

One of the independent variables used in the model is the Market Value of the Clubs (PİYDEĞ). Market value data was obtained from Transfermarkt.com. One of the independent variables used in the model is the League Score (LİGP) of the Clubs. League score data was obtained from Transfermarkt.com and the clubs' websites.

One of the independent variables used in the model is the Number of Cups (KUPS) obtained during the season of the clubs. The Number of Cup data was obtained from Transfermarkt.com and the clubs' websites.

One of the independent variables used in the model is Club Revenues (KULGELIRI) obtained throughout the season. Club Revenue data was obtained from investing.com.

One of the independent variables used in the model is the Transfer Fee (HARCBONBD) spent by the clubs throughout the season. Transfer fee data was obtained from Transfermarkt.com.

One of the independent variables used in the model is return on assets (ROA). To calculate ROA, the data were obtained from investing.com and ROA was calculated as follows.

ROA = Net Profit / Total Assets

One of the independent variables used in the model is the Leverage Ratio (KALDO). The necessary data for calculating KALDO was obtained from investing.com and KALDO was calculated as follows.

KALDO = Total Debt / Total Assets

One of the independent variables used in the model is Return on Equity (ROE). The data required for calculating ROE was obtained from investing.com and ROE was calculated as follows.

ROE = Net Profit / Equity

RESULT

Before the regression model was run, firstly, panel unit root tests were performed to evaluate whether the panel data series were stationary to

prevent spurious regression. After the series were found to be stationary at the expected level, the model was run, and an autocorrelation test was performed to determine whether there is cointegration for panel data. Finally, the application part was completed with the estimation of the panel data model and the regression results were interpreted.

Panel Unit Root Test Results

One of the most important points to be considered to reach the correct result in econometric analysis is that the series are stationary. If the mean and variance of the time series is stable over time and the covariance between the two periods does not depend on the time of the observed variables but on the distance between the two periods, the time series is stationary. If the series is not stationary, it will not be able to maintain its average in the long run and the variance value will go to infinity as time approaches to infinity. Autocorrelation values move away from zero as the number of delays increase and R2 values are high and t statistical values are significant. In this case, the regression model estimates obtained in the long term are not able to give correct results and the spurious regression model problem is faced. Series should be made stationary not to fall into the spurious regression model trap (23). Whether the series are stationary or not will be measured by unit root tests. The fact that the test results are not stationary will directly affect the significance of the econometric model to be established. Unit root tests used to measure the stationarity of series in panel data studies can be examined in two groups. The tests in the first group are Im, Peseran, Shin and Fisher focused tests (such as ADF and Philips & Perron, PP tests) and are called individual unit root tests. Levin, Lin, Chu; Breitung and Hadri unit root tests in the second group are called common unit root tests. The unit root tests of Im, Peseran, Shin, Fisher ADF-PP and Levin, Lin, Chu were used to measure the stationary of the series in this study, and the test results are presented in Table2.

Table 2. Panel Unit Root Test Results

Variables	Im, Peseran, Shin		Fisher chi square				Levin, Lin & Chu	
	W stat.	**P-Value.**	**ADF**		**Philips & Perron**		**T**	**P-Value**
			Stat.	**P-Value**	**Stat.**	**P-Value**	**Test**	
HSD	1.7079	0.8792	25.4	0.4953	31.8	0.1983	2.512	0.0060***
PİYDEĞ	-0.0430	0,4828	42.5	0.0385**	10.18	0.9992	-1.190	0.1169
LİGP	-0.2395	0.4053	30.6	0.2414	12.8	0.9852	-2.078	0.0188**
KULGELİRİ	-0.1208	0.4519	32.3	0.2588	13.18	0.9920	-8.422	0.0000***
ROA	-0.3957	0.3462	31.98	0.2750	47.94	0.0109**	-4.021	0.0000***
KALDO	-3.7542	0.0001***	70.84	0.0000***	45.57	0.0193**	-13.88	0.0000***
ROE	-2.1668	0.0151	54.58	0.0019**	56.34	0.0012***	-12.80	0.0000***
HARCBONB	-22.527	0.0000***	56.26	0.0012***	19.98	0.8650	-172.1	0.0000***

** and *** represent statistical significance at the 5% and 1% level, respectively. So there is no unit root and the variables are stationary.

As a result of examining the stationarity of each series by performing unit root tests, the series were found to be stationary at the level of 5% and 1%. The next step of the study is to decide the model to be used in panel data analysis. F test, Likelihood Ratio LR test and Hausman tests were used to determine the model to be used. According to the results of F and LR tests, it was concluded that the Random Effects Modal (REM) is the appropriate model since the p (probability) values of the model are less than 0.05. In addition, the null hypothesis of the Hausman test for model selection is established as no correlation between explanatory variables and unit effect. In this case, since both estimators are consistent, the difference between stable and random effects estimators is expected to be very small. In this case, the random effects estimator will be more suitable to use because it is more effective (27).

Autocorrelation Test

The classical Durbin-Watson or Breusch-Godfrey test cannot be applied to measure whether there is a problem of autocorrelation in panel data analysis (6). In the literature, Durbin-Watson test

recommended by Bhargava et al. (1982) and arranged for panel data sets and LBI statistics developed by Baltagi and Wu (1999) are used instead of these tests.

The results of autocorrelation tests between the variables that explain the dependent variable in the model are shown in Table 3.

Table 3. The results of autocorrelation tests

Baltagi -Wu LBI	1.293
Durbin – Watson	0.948
Group number	14
Number of Observations	108
Wald χ^2 (Prob)	0.245

In the autocorrelation test, Durbin-Watson test recommended by Bhargava, Franzini and Narendranathan and LBI test statistics recommended by Baltagi-Wu were applied. As seen in the table, in the random effects model, the values in both tests were less than 2, which is the critical value. Therefore, it was observed that there is a 1st degree autocorrelation problem in the random effects model. To obtain more consistent results in the presence of autocorrelation, this problem is solved by estimating the model with corrected autocorrelation. For this reason, the model with corrected autocorrelation was estimated with resistant standard errors and the regression model was obtained.

Main Regression Results of Model Application

Table 4 displays the results obtained by panel data analysis regarding the effect of sporting and financial success of the football clubs in Europe and Turkey between the years of 2016-2019 on stock values.

Table 4. Panel Data Results

HSD was used as the dependent variable in the model.	MODEL Random Effects Model (REM)
HSD	-0.546
	(0,678)
PİYDEĞ	0.00958**
	(0.017)
LİGP	0,0445***
	(0.007)
KUPS	0.692
	(0.288)
KULGELİRİ	-0.0018***
	(0.003)
HARCBONBD	0.0027
	(0.190)
ROA	-0.761
	(0,649)
KALDO	-0.340
	(0.236)
ROE	0.1408
	(0.260)
Group number	14
Number of Observations	108
Wald χ^2 (Prob)	0.0000
F Test	56.002
F Test Probability (Prob)	0.0000
LR Test Probability (Prob)	0.0000
Hausman Test	14.06
Hausman Probability (Prob)	0.080

*, ** and *** represent statistical significance at the level of 10%, 5% and 1%, respectively. Values in parentheses are p-significance values.

In the analysis of the model used in the study; together with the REM method, the Wald test, which shows whether the variables used in the model is significant as a whole, was used. According to the result of the Wald test, it was seen that the explanatory variables were significant in explaining the dependent variable. With the study of the econometric model, the following equation was obtained for the model that describes the dependent variable.

$$HSD_{it} = -0.546 + 0.0958PİYDEĞ + 0.0445LİGP + 0.692KUPS – 0.0018KULGELİRİ + 0.027HARCBONBD – 0.761ROA – 0.340KALDO + 0.1408ROE$$

In the analysis of the panel data model, a statistically significant positive relationship (at the 5% level) was found between Market Values (PİYDEĞ) and Stock Values (HSD), which are the financial success criteria of 14 football clubs that constitute the data set of the study; similarly, a statistically significant and positive relationship (at the 1% level) was found between League Scores at the end-of-season and Stock Values (HSD) which are the sporting success criteria of the clubs. Between Club Revenues (KULGELİRİ) and Stock Values (HSD), which are the financial success criteria of 14 football teams; a statistically significant negative relationship was found at the 1% level.

No significant relation was found between the number of Cups (KUPS), Return on Assets (ROA), Return on equity (ROE), Leverage Ratios (KALDO) and Stock Values (HSD) among the independent variables used in the study.

According to the results of the panel data analysis, the results regarding the financial and sportive success variables, one-unit increase in the market values of the clubs increase the stock value by 0.0096 units, and one-unit increase in the league score variable of the clubs increases the stock value by 0.04459 units. The results are in line with the expectations, and the high market values and league scores of the clubs encourage the future positive expectations for investors and further investment in clubs' stocks.

However, in the results of the analysis, it is seen that one unit increase in the club income variable caused a decrease of 0.0018 units in stock values.

This situation can be explained by the short-term (non-permanent) resources such as match day revenues, broadcasting and sponsorship revenues, revenues from transfer fees (sales), international competition revenues that make up the income items of the clubs in the football industry. In addition, since the administrations are short-term, they apply to a high amount of financing to achieve sportive success, so the level of indebtedness of many clubs are much higher than the income.

DISCUSSION & CONCLUSION

Today, football is the most popular sport in the world. As the ratio of watching football activities increases with the developing technologies since the late 20th century, football has become a sector with increasing economic added values as well as being a sports branch. To have a competitive advantage and to achieve sustainable sporting success in the increasing competition conditions, the clubs in the football industry are required to have a management of a strong financial structure. The efforts of the clubs to get the maximum share from national and international football revenues pushed the clubs to create new sources of income. For this purpose, the clubs were opened to capital markets and offered to the public to provide longer term and lower cost funds.

There are many sports and financial factors that affect the stock values of football clubs going public. In the literature, many studies have been conducted on the relationship between sports clubs in various sports branches and stock market values; some of the studies are summarized below.

In an analysis by Scholtens and Peenstra (25) on 1274 competition results of 8 football clubs competing in European leagues, the effects of the results of the matches on the stock values were measured and, as a result, it was concluded that the stock values had a significant and positive effect on the winning result and a significant negative effect on the losses. In a study on baseball, Coates and Humphreys (8) investigated the relationship between stock prices and baseball club performances. As a result of the research, a significant relationship was found between national team performances and stock indexes in the World Cup. In their study examining the positive effects of Summer Olympics held at five different times between 1988 and 2004 on the economies of host countries, Nishio et al. (24) concluded that large organizations such as the Olympic Games had positive effects on the stock markets of small countries such as South Korea and Greece; however, the markets of France, America and Japan were not affected. However, contrary to this study, Floros (14) found that the Athens Summer Olympics did not affect the ASE (The Athens Stock Exchange) index, but only had a positive effect on the OTE (Hellenic Telecommunications Organization) index. Duque and Ferreira (13) revealed in their study that there is a positive correlation between the results of the football clubs traded on the Lisbon stock exchange and stock prices. In their studies on the effects of national teams' sporting achievements on stock prices, Ashton et al (2) concluded that the achievements of national teams in international competitions had a positive effect on stock prices. In the study, two possible reasons were envisaged for the effects of the sports achievements of the national teams on the stock prices. These are the sportive successes that will create a positive atmosphere for the investors in the future and common stock markets that will want to benefit from the economic expectations resulting from the successes of the national teams. Gannon et al. (15) investigated the short-term effect of the sale of the broadcasting rights of football matches in England between 1996-2000 on the stock prices of the football clubs quoted and traded on the stock exchange. As a result of the research, it was found that the sale of broadcast rights had a positive effect on the stocks. In their study, Boyle and Walter (7) examined the relationship between sports performances and stock market performances of New Zealand Rugby sports clubs using monthly data between 1950-1999 and Panel Data Analysis which is the econometric method. According to the results of the panel data, a

significant relationship was not found between the stock market performances of the teams and the international competition results of the teams.

In a study for Turkey by Kırlı and Gümüş (21), the relationship between the accounting data disclosed to the Public Disclosure Platform of Fenerbahçe A.S., whose shares are traded on Istanbul Stock Exchange, and the annual stock returns was investigated, and no statistically significant relationship was found between the financial rates used in the study of the Fenerbahçe club and the annual stock returns. In a study, Doğru (12) investigated the relationship between the shares of Galatasaray Football Club traded on stock market and the results from Turkish and European league matches, stock price changes before and after the matches, stock market index changes after the matches of Galatasaray Sportif Sinai ve Ticari Yatirimlar AS (Galatasaray Sportif). As a result of the study, it was found that the defeat in a match affected the stock prices, however; it was concluded that this effect was not significant with the statistical model. Berument et al. (5) investigated the relationship between the match results of Galatasaray, Besiktaş and Fenerbahçe competing in Turkish league and stock returns. According to the results of the research, it was concluded that the matches won by Beşiktaş club provided an increase on the stock returns. However, the same effect could not be found for Galatasaray and Fenerbahçe clubs. In another study by Berument et al., the relationship between fanaticism and stock returns was investigated and, compared to the other clubs' fans in the study, it was found out that the wins of Beşiktaş in European matches has a positive effect on stock returns. In their study, Temizel et al. (28) investigated the effect of the match results of Big Four Galatasaray, Besiktaş, Trabzonspor and Fenerbahçe clubs on stock prices competing in Super League and traded on the stock market. As a result of the study, it was seen that there was a significant relationship between the wins and stock values of the clubs. In their study, Zeren and Gümüş (31) examined the relationship between the results of 8 domestic and foreign football clubs traded on the stock exchange and the stock shares. In the study, it was concluded that there is a significant relationship between the match results of the clubs and stock prices. In his study, Devecioğlu (10) investigated the relationship between sports achievements of Galatasaray and Beşiktaş and club market values. As a result of the research, it was found out that the stock prices of the clubs are affected by the results of the matches. In their study, Aygören et al. (3) investigated the issue of whether investors are affected by the results of football matches through an application in the Istanbul Stock Exchange. According to the results of the study, it was seen that the investors care the matches in Europe more than the derbies in Turkey. Furthermore, it was observed that they took into account the defeat more than the wins and draws. Çam (9) investigated the relationship between the match results of Besiktaş, Fenerbahçe, Galatasaray and Trabzonspor clubs in Turkish Super League and stock returns. While there was a significant relationship only between match losses and stock returns of Fenerbahçe and Trabzonspor, there was a significant relationship between the stock returns and not only the match losses but also the wins of Beşiktaş club. In addition, while the matches won by Galatasaray club increase their stock returns, it is concluded that the losses have a negative effect on stock returns. Kaya and Gülhan (20) examined the relationship between abnormal returns of stocks and the results of Super League, Turkey Cup and European Cup matches by Galatasaray, Fenerbahçe, Beşiktaş and Trabzonspor clubs traded on Istanbul stock Exchange. As a result, they concluded that the 4 clubs' wins and away draws caused positive abnormal returns on the stocks, while the losses and home draws caused negative abnormal returns.

In the literature, the rate analysis methods applied by using the financial tables of football clubs are frequently used in measuring stock performance. However, in our study, in the light of the literature of the clubs subject to the research, the factors of sports and financial success affecting the stock values were analysed using the econometric method. In this context, this study is intended to examine the effects of financial and sports achievements criteria of 14 football clubs on stock values competing in European League and Turkish Super League and traded on the stock market. The study includes a 4-year period between 2016-2019. In the relevant periods, 6-month financial data belonging to the clubs obtained from club websites, Public Disclosure Platform, investing.com and borsaistanbul.com were tested by applying panel data analysis method. With the panel data analysis, a significant and positive relationship was determined between the market values of the football clubs, the league score variables they obtained during the season and the stock values; and a statistically significant negative relationship was obtained between the club income variable and the stock values.

In recent years, the fact that football clubs are managed with an understanding that is far from financial rationalism to achieve sporting success in national and international platforms causes clubs to face serious financial problems even if they achieve relative sporting success. A management far from financial mentality results in high cost of borrowing of clubs, payment of astronomical transfer fees, and high financial sanctions and compensation as a result of exceeding financial fair play criteria. The fact that debt items are much higher than income items make clubs farther away from sustainable successes. For this reason, it is necessary to include not only sportive success-oriented management approaches, but also financial-oriented new management approaches in clubs in the football industry.

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Examination of Physical Education Teachers' Feelings, Attitudes and Perceptions Towards Integration/Inclusion of Autistic Students*

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Abstract

Aim: The aim of this study was to examine the feelings, attitudes and perceptions of physical education teachers towards inclusion and integration of autistic students. Material and Methods: The research sample was composed of physical education teachers who taught at private and state schools affiliated to Edirne Provincial National Education Directorate. To obtain the research data, a "Personal Information Form" developed by the researcher, and the fourth part of the "Placement and Services Survey" (PASS) developed by Segall (2011) for inclusion and integration of students with Autistic Spectrum Disorder (ASD) and adapted to Turkish by Ahmetoğlu et al. (2017), namely, the "Scale of Attitudes, Feelings and Perceptions towards Inclusion/Integration of Students with Autism Spectrum Disorder", were used. In the study, the data obtained by means of the questionnaire were analyzed and evaluated using SPSS 17 software. The Kolmogorov-Smirnov and Shapiro-Wilk tests were used to investigate the normal distribution of variables. 0.05 was used as the level of significance when interpreting the results. For examining differences between the participant groups in the study, the independent samples t-test was utilized when variables were normally distributed. In the test results, when p values obtained for the related variables were greater than 0.05, data were assumed to be normally distributed, whereas when p values were less than 0.05, data were assumed not to be normally distributed. Findings: A statistically significant difference was found in mean scale scores depending on whether or not the physical education teachers had worked with children requiring special education during their years of service ($p<0.05$). It was determined that the mean scale score (96.11) for physical education teachers who stated that they had worked with children requiring special education during their teaching careers was significantly lower than the mean scale score (103.52) for physical education teachers who stated that they had not worked with children requiring special education during their teaching careers. Conclusion: It can be said that physical education teachers' experience or lack of experience of working with children who require special education had a significant effect on their feelings, attitudes and opinions.

Keywords: Physical education teacher, autism, inclusion, integration, feelings, attitudes and perceptions.

INTRODUCTION

In Turkey, integration began to be applied in 1983 with the "Children With Special Education Needs Act" no. 2916, and continued with the "Legislative Decree Regarding Special Education" no. 573 of 1997, and the "Special Education Services Regulation" (SESR), which came into force in 2000. Inclusion/integration practices involve the implementation of the principle of normalization in education that began in Scandinavian countries in the 1970s and spread to the rest of Europe and to the USA, in the name of "providing equality of opportunity in education for everyone". These include the whole school population (14). Planning and evaluating academic and social education (Lewis and Doorlag 1999) (20), and establishing schools and social institutions where all students

learn to respect the differences between each other and which are based on meeting their needs (Salend 1998) (20), involve addressing the needs of all students (14,28). The concept of integration is much debated by experts (25). Guldberg (2010) (17) expresses inclusion for students with autism as "the process of identifying, understanding and breaking down barriers to participation and belonging, and therefore goes beyond education to cover the total experience of a child or young person on the autism spectrum, as well as his or her family" (19). According to İnce (2017) (7) , in the context of "Physical Education and Sport for the Disabled", the importance of physical education within the scope of special education cannot be ignored. Physical education can be defined as all the physical activities organized for contributing to an individual's physical, psychomotor, sensory, mental and social development. According to Akdenk et al. (1997) (2), physical education and sport are the easiest way for the disabled to communicate physiologically, sociologically and psychologically with society (6). Physical education for disabled individuals involves the implementation of education programmes organized according to their abilities, limitations and interests in order to accelerate and support their development, and to meet their mobility needs. In the USA, with the signing of the Education for all Handicapped Children Act (Public Law 94-142), a special education resolution passed by President Ford's government in 1975, physical education for all disabled children became compulsory (26). When special education programmes in Turkey are examined, with the inclusion of the statement in the SESR (2018) that "…religious culture and moral knowledge and other…lessons related to physical education and vocational lessons are to be taught by their branch teachers. A special education teacher is to provide support for the teaching of lessons given by branch teachers by participating in the lessons…", the fact that physical education lessons for all disabled children are among the lessons that have an active role in inclusion/integration programmes, which are an implementation of special education, can be understood. The statement that "every child has the right to mobility, games and sport" is a legal guarantee on an international level that asserts the right of students with special needs to participate at least as much as their peers with typical development in games, physical education and sports activities. The 31st Clause of the Convention on Children's Rights, adopted by the United Nations General Assembly in 1989 and approved in later years by Turkey, determines that mobility, games and sport are the basic right of every child. In inclusion classes, all students should have the opportunity to take part in learning, play, and educational and social activities together. According to Morris and Schulz (1989) (13), activities that are organized for disabled individuals are intended to improve a number of developmental areas such as constructive self-concept, social competence, motor skills development, physical and motor fitness, free time skills, and stress relief (11).

MATERIALS AND METHODS

The study group consisted of a total of 86 (49 male and 37 female) physical education teachers employed in state and private schools affiliated to the Provincial National Education Directorate of Edirne in the 2018-2019 academic year. Data collection tools were a Personal Information Form used to gather demographic data about the physical education teachers, and a measurement tool, namely, the "Scale of Attitudes, Feelings and Perceptions towards Inclusion/Integration of Students with Autism Spectrum Disorder", which was developed by Segall (2011) (23) and adapted to Turkish by Ahmetoğlu et al (2016) (1) , and which can be evaluated with six different and original scenarios. However, since groups diagnosed with autism are represented in this study, a single scenario (Scenario E) was selected. The scale is made up of a total of 32 Likert-type items, each scored from 1 ("I completely disagree") to 6 ("I completely agree"). Analysis and evaluation were made with SPSS software. To determine whether or not variables showed normal distribution, the Kolmogorov-Smirnov and Shapiro-Wilk tests were utilized. Results were interpreted by accepting a significance level of 0.05; it was determined that for $p<0.05$, variables were assumed not to be normally distributed, whereas for $p>0.05$, variables were assumed to be normally distributed. For examining differences between groups, the independent samples t-test was utilized when variables were normally distributed. When interpreting the results, a significance level of 0.05 was used; it was determined that for $p<0.05$, there was a significant difference, whereas for $p>0.05$, there was no significant difference. A statistically significant difference was found ($p<0.05$) between mean scale scores for participants answering "Yes" to the question in the Personal Information Form which asked them whether or not they had worked with

children requiring special education during their teaching careers. It was determined that the mean scale score (96.11) for participants who stated that they had worked with children requiring special education during their teaching careers was significantly lower than the mean scale score (103.52) for participants who stated that they had not worked with children requiring special education during their teaching careers. This study was conducted in accordance with the Principles of the Declaration of Helsinki. Moreover, approval for the study was obtained from the Ethics Committee: "Social and Human Science Research Ethics Committee no. E.27371531/10/2018".

FINDINGS

Table 1. Data related to participants' demographic characteristics

Teacher Variables		n	%
Gender	Male	49	57.0
	Female	37	43.0
Age group	Aged 18-25	6	7.0
	Aged 26-33	18	20.9
	Aged 34-41	34	39.5
	Aged 42 and over	28	32.6
Marital status	Married	75	87.2
	Single	11	12.8
Education level	Bachelor's	76	88.4
	Postgraduate	10	11.6
Years spent teaching	Less than 1 year	3	3.5
	1-5 years	13	15.1
	6-10 years	21	24.4
	11-20 years	30	34.9
	21 years or more	19	22.1

As can be seen in Table 1, 49 (57%) of the physical education teachers included in the study were male, while 37 (43%) of them were female. It was determined that the majority of the physical education teachers belonged to the 34-41 (39.5%, n=34) and 42 years-and-over (32.6%, n=28) age groups. Regarding marital status, 75 (87.2%) of the teachers were married, while 11 (12.8%) were single. In terms of the teachers' educational level, 76 (88.4%) had bachelor's degrees, while 10 (11.6%) had received postgraduate education. Finally, it was determined that the majority of the physical education teachers (59.5%, n=51) had between 6-20 years of experience in their current positions.

Table 2. Frequency and distribution of personal data of participants answering "Yes" to the question "Have you worked with children requiring special education during your teaching career?"

YES		n	%
Gender	Male	30	52.6
	Female		47.4
Age group	Aged 18-25	6	10.5
	Aged 26-33	9	15.8
	Aged 34-41	26	45.6
	Aged 42 and over	16	28.1
Marital status	Married	47	82.5
	Single	10	17.5
Education level	Bachelor's	49	86.0
	Postgraduate	8	14.0
Years spent teaching	Less than 1 year	0	.0
	1-5 years	10	17.5
	6-10 years	13	22.8
	11-20 years	22	38.6
	21 years or more	12	21.1

When examining Table 2, which shows data related to participants who answered "Yes" to the question "Have you worked with children requiring special education during your teaching career?" it can be seen that 52.6% of physical education teachers stating that they had worked with children requiring special education were male, while 47.4% of them were female. 10.% of participants belonged to the 18-25 age group, 15.8% to the 26-33 age group, 45.6% to the 34-41 age group, and 28.1% to the 42-and-over age group. 82.5% of the teachers were married, while 17.5% of them were single. 86% of teachers had bachelor's degrees, while 14% of them had postgraduate degrees. In terms of length of career, it was determined that 17.5% of teachers had worked for 1-5 years, 22.8% of them for 6-10 years, 38.6% of them for 11-20 years, and 21.1% of them for 21 years or more.

Table 3. Frequency and distribution data related to responses given to questions 10-22 by participants answering "Yes" to the question "Have you worked with children requiring special education during your teaching career?"

Teacher Variables		n	%
How long did you work with them?	4 months or less	11	19.3
	5-8 months	8	14.0
	9-12 months	9	15.8
	13-24 months	7	12.3
	Over 24 months	22	38.6
(Which special education/disabled groups have you worked with?) Those with attention deficit/hyperactivity disorder	No	28	49.1
	Yes	29	50.9
(Which special education/disabled groups have you worked with?) Those with physical disabilities	No	35	61.4
	Yes	22	38.6
(Which special education/disabled groups have you worked with?) Those with hearing impairment	No	45	78.9
	Yes	12	21.1
(Which special education/disabled groups have you worked with?) Those with visual impairment	No	53	93.0
	Yes	4	7.0
(Which special education/disabled groups have you worked with?) Those with mental handicaps	No	35	61.4
	Yes	22	38.6
(Which special education/disabled groups have you worked with?) Other	No	48	84.2
	Yes	9	15.8
Do you have knowledge about physical education and sports activities for the disabled?	Yes	50	87.7
	No	7	12.3
(How did you acquire knowledge about physical education and sports activities for the disabled?) Undergraduate study	No	18	31.6
	Yes	39	68.4
(How did you acquire knowledge about physical education and sports activities for the disabled?) In-service training	No	43	75.4
	Yes	14	24.6
(How did you acquire knowledge about physical education and sports activities for the disabled?) Course	No	50	87.7
	Yes	7	12.3
(How did you acquire knowledge about physical education and sports activities for the disabled?) Seminar	No	50	87.7
	Yes	7	12.3
(How did you acquire knowledge about physical education and sports activities for the disabled?) Postgraduate study	No	56	98.2
	Yes	1	1.8
(How did you acquire knowledge about physical education and sports activities for the disabled?) Other	No	53	93.0
	Yes	4	7.0
Do you have inclusion experience?	Yes	43	75.4
	No	14	24.6
Have you received training related to inclusion?	Yes	30	52.6
	No	27	47.4
(What kind of training related to inclusion have you received?) Undergraduate study	No	40	70.2
	Yes	17	29.8
(What kind of training related to inclusion have you received?) In-service training	No	36	63.2
	Yes	21	36.8
(What kind of training related to inclusion have you received?) Course	No	51	89.5
	Yes	6	10.5
(What kind of training related to inclusion have you received?) Seminar	No	48	84.2
	Yes	9	15.8
(What kind of training related to inclusion have you received?) Other	No	55	96.5
	Yes	2	3.5
Is there a child in need of special education in your class this term?	Yes	32	56.1
	No	25	43.9
Is your school's physical education and sports hall suitable for the use and inclusion of special needs children?	Yes	18	31.6
	No	39	68.4
Would you like to receive information about physical education and sport for the disabled?	Yes	41	71.9
	No	16	28.1
Would you like to receive information about inclusion?	Yes	43	75.4
	No	14	24.6
Do you wish for a child requiring special education to be included in your class?	Yes	39	68.4
	No	18	31.6
Do you wish for your school's physical education and sports hall to be reorganized to facilitate inclusion of special needs children?	Yes	49	86.0
	No	8	14.0

When examining Table 3, which shows data related to responses of participants who answered "Yes" to the question "Have you worked with children requiring special education during your

teaching career?" it is seen that in terms of the length of time that participants had spent working with children needing special education, 19.3% had worked with them for 4 months or less, 14% had worked for 5-8 months, 15.8% had worked for 9-12 months, 12.3% had worked for 13-24 months, and 38.6% had worked for over 24 months. Regarding the responses to the question "Which special education/disabled groups have you worked with?" 50.9% of participants had worked with groups who had attention deficit/hyperactivity disorder, 38.6% had worked with groups who had physical disabilities, 21.1% had worked with the hearing impaired, 7% had worked with the visually impaired, 38.6% had worked with the mentally handicapped, and 15.8% had worked with other groups. In response to the question asking participants whether or not they had knowledge about physical education and sports activities for the disabled, 87.7% said that they did, whereas 12.3% stated that they did not. Examining responses to the question that asked participants how they had acquired knowledge about physical education and sports activities for the disabled, 68.4% of participants stated that they had acquired knowledge via undergraduate study, 24.6% had acquired it with in-service training, 12.3% had obtained it on a course, 12.3% had acquired it at a seminar, and 1.8% had obtained it through postgraduate study. 7% of participants stated that they had acquired this knowledge by other means. In response to the question asking participants whether or not they had experience of inclusion, 75.4% said that they did, while 24.6% stated that they did not. Regarding the question asking them whether or not they had received training related to inclusion, 52.6% said that they had, while 47.4% stated that they had not. Of those who had received training related to inclusion, 29.8% had received training through undergraduate study, 36.8% had received it via in-service training, 10.5% had been given training on a course, and 15.8% had received it at a seminar. 3.5% of participants stated that they had received this training by other means. When asked if there was a child requiring special education in their class during the current term, 56.1% of participants said that there was, while 43.9% stated that there was not. When participants were asked if the physical education and sports hall at their school was suitable for the use and inclusion of special needs children, 31.6% answered that it was, whereas 68.4% reported that it was not. In response to the question asking them if they would like to receive information about physical education and sport for the disabled, 71.9% said that they would, while 28.1% stated that they would not. When asked if they would like to receive information about inclusion, 75.4% of participants said that they would, while 24.6% stated that they would not. When participants were asked whether they wished for a child requiring special education to be included in their class, 68.4% stated that they did, whereas 31.6% declared that they did not. In response to the question asking participants whether they wished for their school's physical education and sports hall to be reorganized to facilitate inclusion of children with special needs, 86% of them answered that they did, while 14% of them replied that they did not.

Table 4. Normality test

		Kolmogorov-Smirnov			Shapiro-Wilk		
		statistic	sd.	p	statistic	sd.	p
Have you worked with children requiring special education during your teaching career?	Yes	.083	57	**.200***	.989	57	.866
	No	.150	29	**.095**	.829	29	.000

Prior to analysis of the data set, the related variables were tested for normal distribution in order to determine the statistical method that would be used. At this stage, the Kolmogorov-Smirnov and Shapiro-Wilk tests were used. p=0.05 was taken as the critical value. As a result of the tests, it was determined that when the p values obtained for the related variables were greater than 0.05, the data were assumed to conform to normal distribution, whereas values less than 0.05 were considered not to conform to normal distribution. Since the data set showed normal distribution, the independent samples t-test parametric method was used to compare differences between the groups.

Table 5. Independent t-test results for comparison of participants' total scale scores related to experience/lack of experience of working with children requiring special education

Have you worked with children requiring special education during your teaching career?		n	Mean	sd.	Min	Max	t	p
Total Scale	Yes	57	96.11	13.26	61	124	-2.516	0.014*
	No	29	103.52	12.20	85	151		

A statistically significant difference was found in mean scale scores according to whether or not participants had worked with children requiring special education during their teaching careers ($p<0.05$). The mean scale score (96.11) for participants who stated that they had worked with children requiring special education during their teaching careers was significantly lower than the mean scale score (103.52) for participants who stated that they had not worked with children requiring special education during their teaching careers. Finally, in the study, following the test results shown in Table 5, when the p values obtained for the related variables were greater than 0.05, the data were assumed to conform to normal distribution, whereas values less than 0.05 were considered not to conform to normal distribution. When Table 4 is examined, it is seen that there was a statistically significant difference in mean scale scores depending on whether or not the physical education teachers had worked with children requiring special education during their teaching careers ($p<0.05$). The mean scale score (96.11) for participants who stated that they had worked with children requiring special education during their teaching careers, was found to be significantly lower than the mean scale score (103.52) for participants who stated that they had not worked with children requiring special education during their teaching career.

DISCUSSION

With regard to the gender variable related to the physical education teachers who made up the study group of this research into their feelings, attitudes and perceptions towards integration/inclusion of children with autism, it was determined that in general, 57% of them were male and 43% were female, and that in line with this, of those who answered "Yes" to the question asking them whether or not they had worked with children requiring special education during their teaching careers, 52.6% of them were male and 47.4% of them were female, whereas the majority of those replying "No" to the same question consisted of female teachers. In studies conducted on the subject of inclusion education, with regard to teachers' gender, it was determined from the obtained data that teachers' gender had no effect on their attitudes towards inclusion (5,3). On the other hand, it was also determined in other studies that attitudes towards inclusion education differed according to gender, that female teachers were in the majority and that gender groups participating in the studies and attitudes towards inclusion varied (29, 30). With regard to the participants' age group, it was seen that 34-41 was the largest age group with 39.5%, while 18-25 was the smallest with 7%. Among those who stated that they had worked with children requiring special education during their teaching careers, 34-41 was the largest age group with 45.6%, while 18-25 was the smallest with 10.5%. On the other hand, among those who stated that they had not worked with children requiring special education during their teaching careers, 42 and over was the largest age group with 41.4%, while 18-25 was the smallest with 0%. Of the physical education teachers participating in the study, it was determined that teachers in the 34-41 age group had a more positive attitude towards inclusion than teachers in the 42 and over age group. Çolak and Çetin (2014) (3) , in a study entitled "A research on teachers' attitudes towards disability", concluded that the largest age range belonged to the 26-42 age group, while the age range of physical education teachers found by Özer et al. (2006) (16) in a preliminary study aimed at examining physical education teachers' attitudes towards mentally handicapped children also supports our study (29, 31). In Ertunç (2008) (6) study, it was determined that teachers' marital status had an effect on their viewpoints towards students and that generally, married physical education teachers had more positive attitudes towards inclusion implementations than unmarried physical education teachers did (15,10,5). In terms of the physical education teachers' professional experience, it was found out that for participants as a whole, the largest age group was 11-20 years with 34.9%, while the smallest age group was less than one year with 3.5%; that for those stating that they had worked with children requiring special education, the largest age group was 11-20 years with 38.6%, while the smallest age group was 11-20 years with 0%; and that for those stating that they had not worked with children requiring special education, the largest age

groups were 6-10 years and 11-20 years with 27.6%, while the smallest age group was less than one year with 10.3%. Sources which support our study (Özer et al., 2006; Özdemir, 2010) (16, 15) report that the highest percentage of teachers had 11 years' experience or more, while there are studies in which it is stated that professional seniority had no effect on attitudes towards inclusion (5,21,19,29,27,28). Regarding responses given to the question asking participants whether or not they knew anyone or had a relative requiring special education, 31.4% of all participants replied that they did, while 68.6% of them stated that they did not; of those stating that they had worked with children in need of special education, 64.9% answered "No" to this question, while 75.9% of those stating that they had not worked with children in need of special education answered "No" to this question. In sources in the literature that support our study, no significant difference was found among groups consisting of individuals who had a disabled relative or acquaintance (9), while it was determined that for preservice physical education teachers who had a disabled acquaintance, there was no significant difference in relationships among competencies for inclusion training (20,24). With regard to receiving training in the field of special education, 58.1% of all participants stated that they had received training in special education, while 41.9% of them said that they had not; of those stating that they had worked with children in need of special education, 66.7% said that they had received training, while 41.4% of those stating that they had not worked with children in need of special education reported that they had received training. In the related literature, the rates of participants receiving training in the field of special education show a parallel with our study (24,23,31,4). Regarding types of training received by the physical education teachers, among participants in general, 54.7% had received training during undergraduate study, 29.1% had been given in-service training, while the rate for training received on courses and at seminars was the same, with 9.3% for each. Regarding rates for participants stating that they had worked with children in need of special education, these rates were 66.7% for undergraduate study, 35.1% for in-service training, 12.3% for courses and 12.3% for seminars, respectively; while for participants stating that they had not worked with children in need of special education, the rates were 31% for undergraduate study, 17.2% for in-service training, 3.4% for courses and 3.4% for seminars, respectively. In terms of length of time spent by the physical education teachers in working with individuals needing special education, most participants (38.6%) had worked for more than 24 months, while the fewest (19.3%) had worked for less than 4 months. The disabled group that the PE teachers most often worked with was the attention deficit/hyperactivity disorder group (50.9%), followed by the physically disabled (38.6%), the mentally disabled (38.6%), the hearing impaired (21.1%), and other groups (autistic, Downs syndrome and cerebral palsy) (15.8%), respectively. The group least often worked with was the visually impaired (7%). In a study conducted by Kırımlıoğlu et al. (2016) (10) on teachers in special education and rehabilitation centres together with preservice physical education and sports teachers, their levels of awareness of the effects of participation by mentally handicapped individuals in physical exercise were examined. In the study, with regard to participants who answered "Yes" or "No" to the question asking them whether or not they had received training related to the disabled, it was stated that levels of awareness were higher in favour of the group answering "Yes" according to different statistical results obtained from the research scale (12,27). 87.7% of the participants stated that they possessed knowledge about physical education and sport practices for the disabled. It was determined that this knowledge had been acquired by 68% of the teachers during undergraduate study, by 24.6% during in-service training, by 12.3% on courses, by 12.3% at seminars, by 1.8% during postgraduate study and by 7% by other means (journals, the internet or professional experience). Of the 11.6% of participants who had received postgraduate education, 86% of teachers who had worked with children requiring special education and 93.1% of teachers who had not worked with children requiring special education stated that they had acquired their knowledge during undergraduate study. Özkuloğlu (2015) (18) considered that the source of knowledge of teachers who had received training during undergraduate study originated from taking the Physical Education and Sport for the Disabled course as a compulsory lesson in physical education and sports colleges from the year 2006 onwards (8,11).

CONCLUSION

As a result, it is observed that physical education teachers do not have a negative attitude

towards inclusion, lack of school gymnasiums or not suitable for the use of individuals with special needs, and it is stated that there is a need to make arrangements for education. In addition, it was observed that there was a statistically significant difference ($p < 0.05$) in terms of average scale scores according to the working status of physical education teachers with children who require special education during the service year. It was found that the mean scale score (96.11) of the participants who stated that they worked with children requiring special education during their teaching was significantly lower than the average scale score (103.52) of the physical education teachers who stated that they did not work with children requiring special education. According to these results, within the framework of the positive attitudes of the teachers, it is envisaged that the necessary arrangements will be made periodically by applying to the teachers' experiences for the education of children with special needs.

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'Why I Became a Camp Leader?': Insider Views of Camp Leader Candidates

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Abstract

The aim of this study was to describe individuals' motivation of being camp leader in youth camps of Ministry of Youth and Sport (MYS). Thirteen camp leader candidates who had previously been admitted in the Ministry of Youth and Sports were interviewed using open-ended questions. The data were analyzed using thematic analysis. Analysis resulted in a synthesis of the various ways camp leader candidates were motivated: (a) Self-Actualization and being Beamy, (b) Creating More Leisure and Adventure, (c) Social Integration and, (d) Role Modeling. It is through being volunteer as a camp leader, as we stress, 'that anyone can realize their best selves and find deeper purpose and help others find theirs'. Motivation to be a camp leader is experienced from a perspective of both individualism and social constructivism that shows an interrelated view of freedom, autonomy and also organizational commitment.

Key words: Youth camps, leader, leisure context, adventure experience.

INTRODUCTION

The term 'leisure' evokes various thoughts, images and concepts (1). Normative expressions of the word have traditionally been expressed as freely evaluated time or activity, and some researchers have added the state of mind to the alternative definition of the term (2). Other leisure researchers have criticized this popular understanding (3–5) and from a critical perspective of leisure; they have associated with liberating action (Hemingway, 1999), participatory democracy (6), and community development (6). On the other hand, Mannell, Kleiber and Walker have suggested that leisure should be defined and functionalized objectively or subjectively in an alternative way (2). Objectively leisure is understood to be an activity or set of activities, a specific environment, such as camping, or a specific time period, and is typically measured by time budgets or activity inventories. Subjectively leisure is understood to be the mental experience of the individual when dealing with leisure activities and the satisfaction or meanings that obtained from these participations (2).

In many contemporary lives, the importance of leisure is gradually increasing (7,8). Traditionally, work and leisure time have been understood as completely separate, inevitable and opposing areas (9–11). However, in the current job and employment literature, the boundary between work and leisure is much more permeable and interconnected (12–14). For example, leisure activities such as art, music and recreation (or sport recreation included in the new language) require hours of routine practice to develop skills, and productive aspects of the work can be comforting, binding and pleasure-oriented for employees (11). Based on this, the research aims to discover, synthesize and conceptualize the

reasons why volunteers who are entitled to attend training as candidate camp leaders in the Youth Camps of MYS become youth camp leaders.

Youth camps as a leisure adventure

Youth camps organized by the MYS today stand out as facilities established to enable young people to evaluate their leisure with various social, cultural and recreational activities. Activities in Youth Camps run under the leadership of MYS aim to contribute to the holistic development of individuals participating in camps (15). Young people's education and their time outside work areas in Turkey (leisure) to evaluate, provide relaxation, creative, productive, responsible, adopting the owner and Ataturk's principles and reforms of the citizenship and contribute to internalize that grow as individuals are among the objectives of the Youth Camp. For this purpose, in line with various camp activities for young people in various lacations are carried out in the summer and winter months (16).

By performing activities such as horse riding, paintball, mountain biking, sea and pool activities, handicrafts, trips, folk dances of young people; body-mind-spirit development, talent development, awareness of nature and environment, common sharing habits, leadership, tolerance, and a planned and planned work and rest habits are provided with positive desired gains (16,17). A total of 36 Youth Camps, 18 of which are summer and 18 of which are winter camps, serve each year. In these camps, the average number of camps each year, the number of young people participating in the camp and the number of leaders taken to education increase. Looking at the statistical data; While an average of 360 camps were held in 2015, the average number of camps was 540 in 2017. While the number of young people attending youth camps was 30,250 in 2014, this number increased to 120,000 in 2017. When we look at the education statistics of the camp leaders, which are important for the realization of these activities and which are the basis of our study; The number of camp leaders trained increases regularly every year (18).

Self determination theory and being a camp leader in youth camps

Self-Determination Theory represents a broad framework for the study of human motivation and personality. This theory consists of six mini-theories, each developed to explain a number of motive-based phenomena and personality functioning arising from laboratory and field research (19–21).

Cognitive evaluation theory is concerned with the intrinsic motive based on the satisfaction of acting "for its own sake". This theory specifically addresses the effects of social contexts on internal motive, or how factors such as rewards, interpersonal controls, and ego participations affect internal motive and interest, and emphasizes the critical roles that competence and autonomy supports play in the development of intrinsic motive. Organismic integration theory treats the determinants and consequences of the extrinsic motive in various ways, and in particular emphasizes the supports of autonomy and relatedness, which are critical to internalization. In general, the extrinsic motive is an instrumental behavior that targets the extrinsic consequences of the behavior itself, and the more internalized the extrinsic motive, the more autonomous the person becomes when animating the behavior. Causality orientations theory explains individual differences in people's tendency to move toward the environment and regulate their behavior in a variety of ways. This theory defines and evaluates three types of causality orientations: the autonomy orientation in which people are not interested in what is occurring and value what is happening; the orientation of focus on rewards, gains, and control over approval; the impersonal or motivated orientation characterized by anxiety about competence. Basic psychological needs theory examines evolved psychological needs and their relationship to psychological health and well-being. It argues that psychological well-being and optimal functioning are based on autonomy, competence and relationship. Therefore, contexts that support these needs should invariably affect health. Goal contents theory arises from the differences between internal and external goals and their effect on motive and wellness. Goals meet basic needs satisfaction in a different way, and therefore relate

differently to well-being. External goals such as financial success, appearance, and popularity / fame are particularly contrasted with internal goals such as community, close relationships, and personal development. In addition to belonging to groups, relationship through relationships motivation theory is one of the three basic psychological needs related to the development and maintenance of close personal relationships, such as best friends and emotional partners, and suggests that healthy relationships are essential for harmony and well-being.

The research covers the study of the reasons underlying the behavior of individuals to become volunteer camp leaders in MYS's Youth Camps. 'What are the reasons for the voluntary behaviour of being a camp leader?' the fact that the overarching qualitative research question has not previously examined a similar problem situation with quantitative, qualitative or mixed method approaches indicates the originality of the issue. Thus, it is aimed to better understand the systemic mechanism of Youth Camps connected to the MYS in the wider context of leisure, adventure and Recreation.

In the focus of this research, the leader is the person who devotes herself/himself to her/his work with a great passion, has the ability to simplify high-level communication, human relations and complex issues, and by spreading positive energy around him persuades people to strive towards determined goals (22). On the other hand, the youth camp leader; physical education teachers with educational Formation, music teachers, teachers and instructors in the field of crafts, experienced people in the field of theatre, drama, folk dances and Performing Arts, and youth with the ability, knowledge and skills to work in the field of group by participating in the course and seminar opened by the MYS (16). Camp leaders at the same time; provide guidance and counseling to young campers with their knowledge and experience, exhibit role model behaviors, keep them away from bad habits, and provide them with education while entertaining them through social-cultural activities. However, the youth camp leader is key in cultivating a youth committed to her/his values (15).

MATERIAL AND METHOD

Methodological approach

An interpretive qualitative method was considered appropriate in order to question the problem status of the research in depth, rich and transparent. Changes and trends that have diverged from the positivist approaches in research traditions have led to the relative acceptance of the necessity of qualitative research (23,24). Leisure researchers agree that qualitative approaches are constructive and innovative efforts to reveal meaning using alternative methods and a number of different research questions (25,26). The use of a qualitative series of research values supports different assumptions, as multiple meanings can explain human actions and ensure that the language used to define and interpret social behavior is often loaded with value (27,28).

Participants

In the inclusion of prospective participants in the research group, the research was introduced by holding meetings at the facility where candidates who wish to become camp leaders voluntarily in the Youth Camps of the MYS received training. Participants were selected based on previously determined criteria to ensure diversity and richness in the data (29). According to this, 56 out of 650 candidate camp leaders who wish to become youth camp leaders in different regions of Turkey and who have a bachelor's degree in educator formation were included in the research by declaring their voluntary participation. The use of different criteria helped create analysis by adapting to a wide range of and alternative views, rather than findings that reflected the main thinking without considering variation (Miles et al., 2014). As data saturation began to emerge, no further efforts were made to collect data from participants (30) and the research was terminated by including data collected from 13 people. In ensuring personal information confidentiality, pseudonyms were assigned to each participant.

Data collection

Before beginning the research, an application was submitted to the Ethics Review Board of Inönü University, which concluded that there were no

ethical obstacles to the conduct of the research (2017/8-1). The board's application process for ethics review required the institution's consent letter, which had been previously obtained from the MYS. Participants were informed about the Declaration of Helsinki and the voluntary aspects of the study in both written and oral formats, as well as the right to withdraw at any time without any consequences or impact on their future life. Audio recording interviews conducted using open-ended questions created by the consensus of three field experts were considered the best method of allowing the vocalization of participant experiences (31,32). There is no relationship between the interviewer and the interviewee. To create a relaxed atmosphere, the meeting began with small talk. Although It is not standard (in-sutu) (33) the interview began with a trigger question, 'What is your inspiration in wanting to be a leader in youth camps, can you tell me?' Then, to encourage the participant to focus more on specific topics or ideas, follow-up questions were asked, depending on their answers (30). For example, 'can you tell me more about this?' or 'how was that?' The recorder was turned off after the official interview was over. The participants were then asked how they felt, and it became clear that they were not psychologically affected by the issue. None of the participants expressed the need for 'disclosure' or further details.

Data analysis

A six-step method of thematic analysis proposed by Braun and Clarke was used to identify patterns in the data and to minimally organize, describe and report the data set in depth and richly (34):

Phase one (becoming familiar with the data): the data that was deciphered was read over and over again and the initial ideas were noted. Phase two (generating initial codes): throughout the entire data set, the interesting properties of the data were systematically encoded and gathered under each code to which the data were related. Phase three (theme search): all data and codes were collected under potential themes to which they were associated. Phase four (reviewing themes): themes with encoded data content (1. Level) and with the entire data set (2. Checking the alignment (level) (35,36) and the preparation of a Thematic 'Map' of the analyses. Phase five (defining and naming themes): the analysis was continued to refine the details of each theme, and the whole of the story and themes told by the analysis were clearly defined and named. Phase six (report preparation): this section, which is the last opportunity for analysis, selected direct citations with concrete, striking and convincing examples. The encoded data particles were analyzed for the last time. The results of the analysis were re-associated with the research question and field writing, and the results were reported in an academic language.

In thematic analysis, the themes or patterns in the data can be determined in one of two main ways (34): inductive or 'bottom-up' (37) or theoretical or deductive (38,39). An inductive approach was adopted in the analyzes to demonstrate that the themes identified were strongly related to the data. Cohen's kappa coefficient (κ), which is used to measure inter-rater reliability for themes, was calculated as .84.

WHY I BECAME A CAMP LEADER?

The findings of this study explain the reasons why volunteers who are eligible to attend training as candidate camp leaders in the Youth Camps of MYS become youth camp leaders. The findings show a diverse synthesis of the desire to become a youth camp leader: (a) Self-Actualization and being Beamy, (b) Creating More Leisure and Adventure, (c) Social Integration and (d) Role Modeling.

Self-actualization and being beamy

In the individual-oriented interpretations of the participants, the tendency to discover the best self, find a better purpose from life and connect with the world around them is consistent with the desire to realize itself. This also emphasizes volunteering awareness, ''I am already volunteering here. I take on responsibility so that I can help the young people who came.'' (Halil)

> First of all, I'm a person who likes to learn as my personal property. Maybe if I said I was in love with learning. I wanted to realize myself by pursuing things I was curious about. That's why I'm here. (Yusuf).

> The expectation is that I volunteer first, and the next expectation is that I will be able to develop myself better and be able to benefit young people more effectively in the future. (Deniz)

> An environment where I can increase my knowledge and experience. By likening a person to myself, I mean by likening myself to myself, I want to add my knowledge and experience to it, to show it the right way, to be tasked with contributing to it. (Polat)

Participants who believe that self-realization can be achieved through personal development believe that their own development is linked to the development of young people. Based on this relationship, participants' willingness to provide their own personal development in the camps and then transfer their experiences to young people and to provide information and cultural photosynthesis is seen to be at the forefront of the discourse. This refers to Maslow (1943)'s theory of the hierarchy of needs.

Maslow refers to the need for self- realization as the realization of a person's potential, self-completion, search for personal development and the highest experiences, and describes this level as the desire to achieve everything possible, to be as much as possible (40). Empowerment of self-realization refers to the need for personal growth and discovery that is present throughout a person's life (41). According to Maslow, a person never stays static and always 'happens' by trying to find significant meaning for life (41). Where each individual is unique, the self-realization motive drives people in different directions (42). It should be known that self-realization is a process of being a continuous motion rather than being a perfect situation that is 'happily ever after' (43).

Creating more leisure and adventure

As a result of the transcripts of the audio recordings, it is understood that the participants wanted to evaluate their leisure during their stay in the camps through social, cultural, artistic and adventure-based activities. During this evaluation process, candidates tend to share their positive feelings, such as personal development and well being, with the youth participating in the camps and inoculate. The tendency to create leisure is perceived as the basis of professional awareness.

> My life changed with the youth camps. Because before I was limited to school, home and computers. Now I'm filling my leisure thanks to these camps. And I want to share that with children and young people. (Saban)

> I want to spend my leisure with camping activities. I love canoeing, swimming, climbing... I've learned that these activities are also available in youth camps and I want to benefit from these activities while helping young people. (Cemil)

By framing the career concept from the point of view of the individual rather than the organization of work, it is now possible to accept the peculiar and diversity of today's working life. Conditional commitment to work due to leisure creation has received little interest in career field writing to date. The four skiers in the study of Adler and Adler provide evidence of the existence of a leisure-oriented career identity. The strongest evidence for this is the 29-year-old research participant 'I'. 'I''s commitment to any business relationship depends on the presence of snow, with no immediate thought for changing the lifestyle dominated by ski adventure. This ski quest propels the "I"to ski and work in ski resorts around the world (10).

This acceptance of leisure-oriented career identity carries significant implications for Career Research. While the commitment to working in leisure goals is taking shape, the leisure-driven career identity works in contrast to established career theory. This theoretical opposition reveals a certain level of opposite opinion in the field Summer. Because established career theory does not

find and critiques free-time-oriented career identity 'serious' (44,45). However, business-business whether you are focused or unfocused, I will not participate in the adventure jun of your leisure in individuals (46) and long-term well-being (47,48) such as by creating positive emotions (49), it is possible to mention that pushed people to create more leisure. The results of the research show consistency with this situation.

Social integration

In interviews, it is seen that the desire to be a camp leader affects the candidates' willingness to be in social environments and to gain social status, to establish a social network and to fight the fear of being alone in the future for this purpose, ''I am here for more of a social environment. I want to have many brothers. That's why I want to do these activities in the future so that I won't be alone.'' (Ziya). Candidates' willingness to ensure social interaction and social integration with young people participating in the camp are related to their desired behavior. In participant interpretations, the belief that higher social integration will contribute to a closer social distance, more consistent values and practices among candidate camp leaders themselves and other youth participating in the camp is at the forefront.

> The indispensable part of our youth camps is that they are from different cultures. (Timur)

> I want to take part in order to gain a social environment and to gain status. I want to be in this community when I give education to our youth in the best way. (Levent)

> I want to take part in the youth camps to gain social environment and to improve my status for this purpose. (Osman)

Society exerts effective power over individuals, and people's norms, beliefs and values form a collective consciousness or a shared way of understanding and behavior in the world. Collective consciousness connects individuals and creates social integration (50). Humans are social beings, and the interaction between them is essential to their mental health (51). The importance of interpersonal relationships between well-being between humans (52) and livelihoods has been extensively debated by various scholars (53–55). The need for membership, and especially the desire for intimate and close interpersonal relationships, often reflect part of the theory of need (56). Kaplan and Tausky emphasize the importance of satisfying interpersonal experiences and point out that satisfaction stems from the allegiances established in the workplace (57).

Role modeling

In the discourses of the participants pointing out the reasons for becoming camp leaders, it is evident that the youth who will participate in the camp will be able to be a role model. This willingness is associated with themes such as passion and inspiration, setting values, commitment to society, self-sacrifice and achieving success, and being able to overcome obstacles.

> The reason I want to be a leader in youth camps is to be a role model in their eyes, or rather to be able to get to the background of them, to help our adolescent youth in their troubles. (Ismail)

> First of all, I think I can be useful in educating young people who are more social, more active, more able to see the good and bad aspects of society. (Hamza)

> Also, the idea of a candidate being a role model is about a desire to be unifying and integrative, 'let's think of a chain split in two, I want to be one of the rings that brings those two chains together. I mean, all of the leaders I've seen to this day have done so, and they've all left a mark on us. So I want to be a force that

unites the right and the left, the up and the down.'' (Kaan)

Role models are often suggested as a way of motivating individuals to set and achieve ambitious goals, especially for members of stigmatized groups in achievement environments (58). Role models show individuals how to live with honesty, optimism, hope, determination and compassion (59,60). They play an important role in the positive development of an individual and enter the lives of individuals in various ways: educators, civic leaders, mothers, fathers, clergy, peers, and or ordinary people encountered in everyday life (61,62). In this study, it is seen that participants want to enter the life of young people as camp leaders and are thinking of becoming role models. While the research focuses on the positive impact of camp leaders as a role model on the lives of young people, role models can also have negative effects. For example, the negative and inappropriate behavior of acclaimed public figures or peers involving racism, sexual harassment, and dishonesty can sometimes be perceived as acceptable (63,64). In such a case, values should come to the fore and discourse should be made about why behaviour is unacceptable.

CONCLUSION THOUGHTS

We, here stress that MYS being a camp leader in Youth Camps is extensively related to self-realization and usefulness, creating more leisure and participating in adventure activities, building social relationships and role models. Paradoxically, the results also emphasize that the motivation of the participants to become camp leader is intertwined with 'individualism' and 'social constructionism'. It is possible to observe freedom, autonomy as well as organizational commitment together, as there is self-management and participation in a group.

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Body Composition and Somatotype Profiles of Rowers*

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Abstract

Purpose: The aim of this study was to examine the body composition and somatotype profiles of rowers. Method: 15 male rowers having at least 4 years rowing training from two different rowing clubs in Sinop participated voluntarily in this study. In athletes, conditions such as being healthy, not having chronic or acute disease and having no limitation of mobility were sought. In body 120 Body Composition Analyzer was used to assess the body composition components and Skinfold caliper-tape measurement was used to determine somatotype profiles. Mean and standard deviations of the participants were calculated by using SPSS 22.0 V. package program. Results: Mean values of body composition of the rowers were respectively; body fat ratio %15.94±6.84, body fat mass 11.73±5.76 kg, skeletal body mass 34.207±5.98 kg, basal metabolic rate 1674±211.65 kcal and total body water 44.36±7.10 l. Somatotype profiles values of athletes were found endomorph 2.01±0.71, mesomorph 4.75±0.82 and ectomorph 2.70±0.71 body type. Conclusion: This study supports that rowers have the body composition proportional to the normal fat percentage and the mesomorph body type associated with high muscle strength as somatotype.

Key words: Rowing, body composition, somatotype.

INTRODUCTION

Rowing is a sports branch bases on humankind's struggle against seas and streams by using simple tools. Defined as 'the most perfect sport in existence' by Pierre de Courbertin (3), organizer of the Modern Olympic Games, rowing is the fastest branch among the water sports which bases upon the principle of moving the boat with the help of shovel. In rowing, to enable an athlete reach the highest performance level, structural and physiological factors of the body must be considered at first, technical and tactical understanding should be developed later (2).

Metric measurements of the human body and proportions among them have engaged the attention of many artists and scientists from ancient times up to now, so numerous studies have been conducted. In the course of time, these studies performed through society in general were specified and metric measurement of human body parts, especially in athletes, commenced to be made (10). Body composition is highly appealing and intensely-assessed physical characteristic in exercise and sport physiology. It has been broadly known that body type and composition have substantial effect on athletic performance and exercise also has potential to change the body composition alike (13).

When structure of the body composition examined, it seems to be consisting of the balanced combination of the fat, bone, muscle cells, other organic substances and extracellular fluids. Personal differences can be identified precisely by the assessment of all these structures. The key factors leading to these differences' occurrence are; physical activity, gender, age, nutrition and health problems (25,11). Just as in the various sport branches, physical characteristics such as body weight, shape and composition are important for performance also in rowing. Proper technique, however, is crucial for high-level performance. In addition, body size and proportions are complementary factors for success (4).

Somatotype (body type), a classification defined as based on physique components, assessments are obtained by anthropometric measurements. Somatotype is used in definition of the individual's present morphological condition through three numbers. Each of these three numbers represents one of the three basic components of body composition (23). Determining muscularity, fatness and slenderness relationships via scientific methods Sheldon, built up an atlas in 1954 and classified people in regard to fatness, muscularity and slenderness traits. These classifications are endomorph, mesomorph and ectomorph (22). Endomorphy indicates the relative adiposity of the individual. Increase in value of this component describes that adiposity level also increases which signifies the nutrition status and energy stores of the organism. Mesomorph describes the development in musculo-skeletal system. This component can be regarded as relative lean body mass (LBM) is dominant. Ectomorph describes the relative slenderness of the body (24,20).

With the occurrence of scientific background - especially depending on the development in sports sciences - which is required for preparing proper training programs, the era that competitions were won by the brute force became outdated, in rowing and also in other sports branches with strength-oriented. Therefore, becoming successful for the athletes can only be possible if they have high level of strength and endurance, besides outstanding technique and body type. The development process of rowing in our country is not at the level of desired, however it is accepted as an interesting sport branch by dint of its distinctive elements (15). On the other hand, the requirement of high level of training and body type in addition to its distinctive difficulties and interesting features are considered as disadvantages that make people not tend towards to rowing.

By force of the requirements relating to rowing, body composition and body type are obvious to be important for rowing together with many factors determining the performance. Based on above mentioned information, the aim of this study was to investigate the body composition and somatotype profiles of rowers.

MATERIAL AND METHOD

For the project work entitled The Investigation of Body Composition and Somatotype Profiles of Rowers, an application was made to Sinop University Human Research Ethics Board. In accordance with the Human Research Ethics Board decision dated 12/04/2017 and numbered 2017/14, it was decided that this research was compliance with the Human Research Ethics Board Guideline and there was no inconvenience ethically.

Research Group

This study was carried out with trained rowers, aged between 18-24. 15 male rowers having at least 4 years rowing training from two different rowing clubs in Sinop participated voluntarily in this study. In athletes, conditions such as being healthy, not having chronic or acute disease and having no limitation of mobility were sought. The subjects were contacted via their coaches the day before measurements, and they were asked- at least four hours prior to measurements- not to eat anything, drink anything including caffeinated drinks, consume alcohol the day before and exercise on measurement day.

Measurements

Body height and weight: Subjects weights were measured via scales with 0.01 kg of sensitivity (InBody 120). They were weighed wearing only their shorts with bare feet, and values were recorded in 'kg'. Statures were measured through subject was

standing straight on scale and the measurer lowered the ruler until it touches top of the head. It was important that subjects stood completely upright and their chins were parallel with the ground. Values were recorded in 'cm'.

Body Composition: Body compositions of the subjects were measured by using Inbody 120 Bioimpedance Body Composition Analyzer. Body composition analysis; is a process of adipose tissue, muscle tissue, body water and soft tissue measurements through sending mild electric current to the body with electrodes contacting hands and bare feet, by using body analysis device. Using 'Tetrapolar 8-Point Tactile Electrodes', the analysis device can measure bone mineral density, body water and skeletal muscle mass besides separate adipose measurement for each part of the body (16). Subjects complied with device operation instructions. Subjects were asked to stand on metal surface of the device in bare feet while holding the hand electrodes with two hands both. Measurements for each athlete lasted 1-2 minutes and detected values were printed out as result sheet from bioelectric impedance analysis device. Athletes' body weight, body mass index, basal metabolic rate, body fat percentage, body fat weight, skeletal muscle mass and total body water measurement values were recorded.

Somatotyping: Somatotype values of the subjects were determined with the Heath-Carter method of somatotyping (6). Subjects' skinfold was measured with skinfold caliper whereas measuring tape was used for girth and breadth measurements.

Endomorphy: - 0.7182+0.1451 (X) – 0.00068 (X2) + 0.0000014 (X3)

X= Triceps + Subskapular + Suprailiac Skinfold

Mesomorphy: 0.858x (humerus breadth) + 0.601x (femur breadth) + 0.188x (biceps girth-triceps skinfold thickness) + 0.161x (calf girth-calf skinfold thickness) – 0.131x (height) + 4.5

Ectomorphy: (Height-Weight ratio) x 0.732 – 28.58

Height Weight Ratio = Height (cm) / 3 √ weight (kg)

Statistical Analysis

To discover general characteristics of the subjects in statistical analysis of the obtained data, descriptive statistics were used and represented as n, %, mean, standard deviation, minimum and maximum. All calculations were analyzed by using SPSS 22.0 V. statistical package program.

Table 1. Age, height, mean body weight and standard deviation values of subjects

Physical Characteristics of Subjects					
	n	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Age (year)	15	18.00	24.00	20.80	2.37
Rowing Experience	15	4.00	8.00	5.28	2.21
Height (cm)	15	170.00	194.00	175.12	7.72
Body Weight (kg)	15	67.74	81.14	72.18	5.80
BMI (kg/m²)	15	18.50	27.00	21.26	1.17

15 male rowers who had been exercising regularly in rowing sport at least four years participated in this study voluntarily. Athletes' some values were found as; mean age was 20.80±2.37 year, mean of rowing experience was 5.28±2.21 year, mean height was 175.12±7.72 cm, mean body weight was 72.18±5.80 kg and mean BMI was 21.26±1.17 kg/ m^2 (Table 1).

Table 2. Mean values of rowers related to body composition

	Body Composition				
	n	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Body Fat Ratio (%)	15	7.10	29.80	15.94	6.84
Body Fat Weight (kg)	15	4.20	22.50	11.73	5.76
Skeletal Muscle Mass (kg)	15	24.40	44.90	34.207	5.98
Basal Metabolic Rate (kcal)	15	1327	2058	1674	211.65
Total Body Water (l)	15	32.50	57.20	44.36	7.10

When examined the body composition values of rowers in table 2, it was found that body fat ratio was %15.94±6.84, body fat weight was 11.73±5.76 kg, skeletal muscle mass was 34.207±5.98 kg, mean basal metabolic rate was 1674±211.65 kcal and total body water was 44.36±7.10 l.

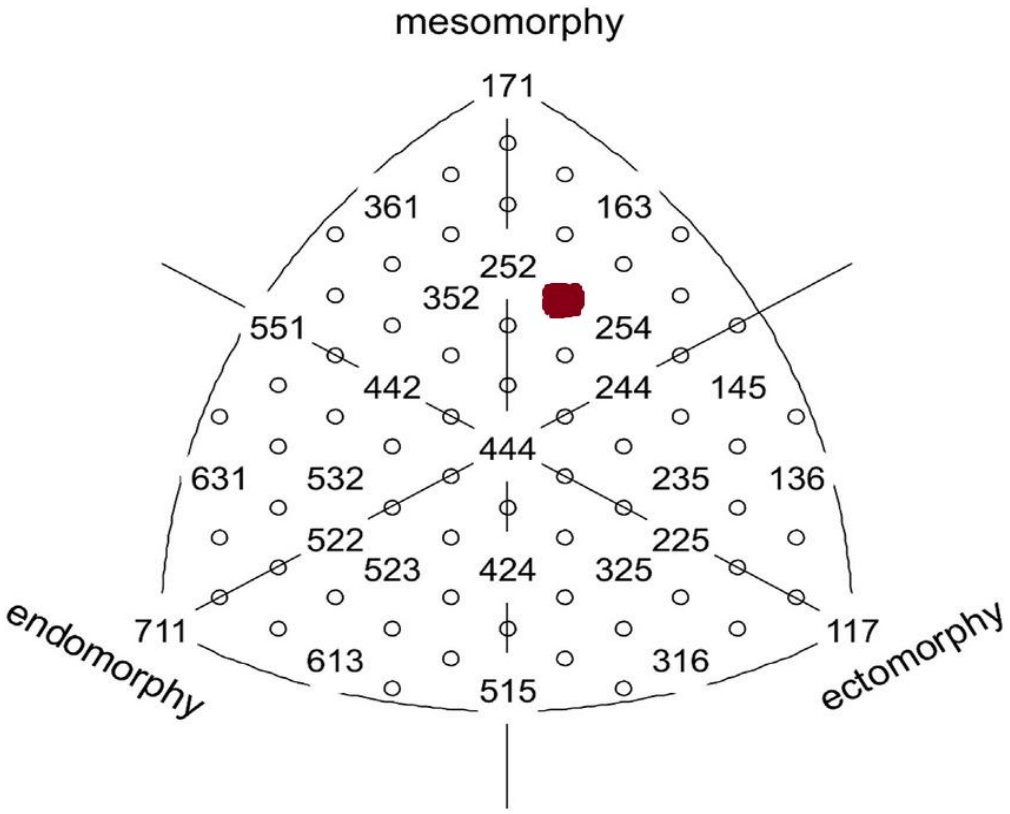

Figure 1. Somatochart

Participating subjects' endomorph, mesomorph and ectomorph values were detected as 2.01±0.71, 4.75±0.82 and 2.70±0.71, respectively. In our study, it seemed that rowers had mesomorph body type at most with the numeric values of 4.75±0.82.

DISCUSSION AND CONCLUSION

In this study, body composition and somatotype profiles of the rowers were analyzed and obtained data were evaluated within the scope of literature.

15 male rowers who had been exercising regularly in rowing sport at least four years participated in this study voluntarily. Correspondingly, rowers who had been training regularly in Sinop province and improving their performances by taking part in competition comprised study group of our research. Athletes' some values were found as; mean age was 20.80±2.37 year, mean of rowing experience was 5.28±2.21 year, mean height was 175.12±7.72 cm, mean body weight was 72.18±5.80 kg and mean BMI was 21.26±1.17 kg/ m^2 (Table 1).

Limited availability of studies about rowing is encountered when literature is reviewed. In a study conducted by Bourgois et al. (5), junior rowers participating World Junior Rowing Championships were assessed and it was found as mean age 17.8 year, mean height 187 cm and mean weight 82.2 kg. Cosgrove et al. (8) discovered mean height of 180.5±4.6 cm in their study with 13 male rowers while Hanel et al. (12), determined mean age was 19, mean body weight was 81 kg and mean height was 186 cm. In study performed by Parkin et al. (17), over 19 rowers with ages varied 19 to 26, mean height was found 1.88±0.04 similar to literature. Mean age of 17.05, mean height of 183.94 cm and mean body weight of 75.86 kg were found in study carried out with Turkish Junior Rowing National Team consisted of 18 athletes (9). Shephard, in similar research, showed that rowers were 10% taller and 27% heavier than general population. 180.8 cm of mean height and 71.88 kg of mean weight in elite rowers at national level were identified by Akça et al. (2). It has been suggested that long arms and legs in addition to becoming tall-bodied provide some advantages in rowing sport. Our research results can be said to show similarity with rowers competing at national level, but become under the level of national teams.

When examined the body composition values of rowers in our study, it was found that body fat ratio was %15.94±6.84, body fat weight was 11.73±5.76 kg, skeletal muscle mass was 34.207±5.98 kg, mean basal metabolic rate was 1674±211.65 kcal and total body water was 44.36±7.10 l. Furthermore, athletes' somatotype components were assessed and it was found that athletes were in mesomorph body type (2.01±0.71 – 4.75±0.82 – 2.70±0.71) which is one of the essential physique traits for rowing sport.

Claessens reported that test battery was used for determining the anthropometric profile of junior rowers, therefore, body mass, body type, extremity length-girth and subcutaneous fat assessments were performed. In another study, male rowers competing at the Australian Rowing Championships were recorded as mean height was 180.7 and mean weight was 71.2. Besides, athletes who had lower body fat and higher levels of muscle mass achieved better rowing performance outcomes (19). In thesis study made by Çetinkaya (9), significant relationship was found between fat ratio of elite rowers and sedentary, but there was found no significant difference in pectoral, triceps, femur and fat measurement segments of the body as a result of comparison between elite athletes and sedentary. In another study in which body type of children were evaluated, effects of extremity length and girth measurements on rowing performance were observed. Hereby, the group with better rowing performance were found 5.9 cm taller and 2.7 kg heavier compared to the other group, besides extremity length and girth measurements of the group with better rowing performance were detected as longer and broader (15). Open age and U23 rowers' somatotype values were assessed in a study carried out in 2005. Somatotype profiles were defined respectively as endomorph, mesomorph and ectomorph; U23 rowers were 1.4, 4.4, 3.6 and open age rowers were 1.4, 4.8, 3.4 (19). In another study researchers examined somatotypes, it was reported that 296 male and female rowers, assessed during 2000 Olympic Games, displayed high level of mesomorph characteristics (1). Data of 509 club level rowers aged 11-16 and 29 elite male rowers were compared in a study with high population. Researchers reported that subcutaneous fat and body fat percentage values decreased with aging, endomorph rating went down until 14 years, mesomorph rating was higher in all age categories, and in comparison of 15-16 aged rowers' body types

with elite rowers; their body types were similar to each other while body compositions were different. Moreover, researchers highlighted these characteristics could be used as criterion for selection of rowers by the coaches from the early ages (14).

Knowing physical characteristics of successful athletes is a crucial data in sports orientation period. Especially physique which contains body type and body composition has an important role in rowers' performance. Specific to rowing, athletes with very good and mean performance are known to have better physical and physiological properties compared to general athlete population. Besides, defining those who are inclined to rowing sport among the new starters can only be possible by knowing their body composition and body type.

The findings obtained support the fact that body composition values of rowers are in normal level and athletes represent mesomorph body type as somatotype profile. In conclusion; it was explored that athletes in this branch of sports show body composition in proportion to normal fat percentage and mesomorph body type traits associated with high muscle power.

In sports, especially, such as rowing that requiring continuous muscle power and endurance, it has been observed lower and upper extremity muscles of the athletes grow in volume through muscle hypertrophy. Thanks to this strength gain, no physiological determinants depending on overstrain reactions in rowers were reported despite high training load (21). In this context, normal or low body fat ratio and showing mesomorph traits in terms of somatotype profiles in rowers are anticipated result. Abiding by this result, whether an athlete has mesomorph body type traits must be taken into consideration in the process of athlete selection for rowing branch.

Considering the fact that rowing is a developing branch of sports, these above mentioned results may contribute to the literature not only through promotion or development of the branch but also through sports orientation. Further studies, by means of data from our research, conducted with elite athlete group are to contribute to the literature by finding out the national level norm values related to athletes' body composition and somatotype profiles.

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Traditional Wrestling of Gagauz Turks And its Role in Strengthening of Nation's Cultural Traditions

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Abstract

This article is about one of the unique and rarest fragments of the cultural heritage of the Gagauz Turks people - national "Güreş" wrestling, information about which is partially preserved and has survived till nowadays. Published materials give information about national "Güreş" wrestling and its role in historical, cultural and socially significant processes of modern society development. Method: in the study conducted with observation and literature review, descriptive research method was used. While writing the article, authors came to the conclusion that the preservation, popularization and further development of traditional sports in Gagauzia contribute to the development of both national and modern sports in Gagauzia and out. It also will contribute to the unity of people based on the interest to know their national and ethnic roots, national and unique traditions and customs of other peoples, increase a sense of national dignity, social justice, patriotism and responsibility for the future of the country. Presented material is the result of expeditions and long-time scientific research in archives, first published outside of the Republic of Moldova. Such researches are relevant in the context of preserving the cultural heritage and supporting unique national development of not only Gagauz people, but also all small nations of the world.

Keywords: National Guresh (wrestling), Gagauz people and culture, pelivan (hero, athlete).

INTRODUCTION

Every nation has many games, Gagauz people also have many of them. They say us about traditions and customs of the people. Since antiquity, people's games have clearly reflected the way of people's life, their mode of life, their work, national principles, ideas about honor, courage, bravery, desire to have strength, skills, endurance, speed and beauty of movements, to show ingenuity, endurance, creative invention abilities, resourcefulness, the will and desire for victory. Every nation has an understanding of sports culture that comes from the past, originates from social structure and life, and includes partially geographical features. Wrestling has been practiced throughout history as a sport that requires the coexistence of various physiological and motoric features (19,20).

Gagauz enlighteners and scientists M. Cheakir (1), D. Kara Choban (3), M. Marunevich (12), S. Kuroglo (10) were caring about preservation of national culture, they demanded to collect and describe folk games for transmitting to the descendant's national customs, original style of self-expression of Gagauz people. Since the XIXth century, ethnographic studies have been carried out with the purpose of preserving and systematizing folklore material. Russian ethnographer and scientist V.A. Moshkov have preserved original samples of Gagauz folk art for the world culture (13).

Folklore and literary sources say about the many Gagauz national outdoor games: about wrestlers, strong men, participating in various fights

and performing heroic acts. There is a mythological hero «Gözäl Yuvan» in Gagauz folklore, who fought with the snake. This is how the fight is described: «They started to fight, the snake hit «Gözäl Yuvan» on the ground and drove him down till the throat into the ground». Another «Çocuk» tale tells about a guy with a bear power who could lift huge stones and perform heroic acts (13). «Üç pelivan / Three wrestlers» tale tells about three mythological heroes «Aaç kıran», «Ayı kulak», «Gürgen kıvradan», who compete in various strength exercises (1).

Nowadays, in Gagauz Autonomy of the Republic of Moldova are being revived and practiced many national outdoor games, as well as games based on dexterity and ingenuity, among which there are: national wrestling «Güreş»; ancient dice game «Aşık», which has variants like - «Beşka», «Kaytuş», «Ataklan»; the ancient game «Kuran», which is close to chess by form; horse racing «Koşu»; donkey races «Eşeklerlen yarışma»; weightlifting competitions «Pelivan»; «Pırıldak» dexterity game as well as the old-time entertainment «Dönecek» - riding on a special device made of the cartwheel and drawbar, and a number of others.

By content, Gagauz folk games are brief and expressive. They express the active work of thought, help broadening the horizons, clarifying ideas about the world, improving all psychological processes in the minds of young people. Having cheated on children, participants in folk games reflect their life impressions and experiences in a conditionally game form. Already in the child ages, folk games participants reflect their life impressions and experiences in the fictional game form.

Game situation captivates young people's attention and educates them, actions and dialogues directly characterize characters and their actions, which must be skillfully emphasized in the image, which requires folk games participants to have active mental activity and team unity. Games which have no plot and are built only on certain game tasks, also have much cognitive material that helps to broaden thinking and independence of actions. Game rules have educational value - they determine the entire course of the game, regulate the actions and behavior of game participants.

There is much competitive enthusiasm in folk games, movements are precise and figurative, very often they are accompanied by unexpectedly funny moments that keep their artistic charm, make up unique game folklore. For participants of popular outdoor games, physical victory is combined with spiritual fulfillment. Young people are forming a stable, interested, respectful attitude to the culture of their people, creating an emotionally positive basis for patriotic feelings, love and loyalty to their Homeland.

Unfortunately, nowadays, many Gagauz folk games are not held and are undeservedly forgotten. However, thanks to such an outstanding researcher of the Gagauz folk culture as V.A. Moshkov, who recorded Gagauz folk games at the end of the XIXth century, we have the opportunity to restore this imperishable national heritage. In his «Bendery County Gagauzes» book V.A. Moshkov listed and described in details 50 folk games of Bessarabia Gagauz people.

We list some of them: «Kör Çepiş / The Blind Chepish», «Piliç-piliç / Chick», «Sopa kavramaycä / Gripped stick», «Çelik / Chock », «Kaymak çelik / Sour Cream Chock», «Tava tencera / Frying pan», «Topu kapmayıncä / Without grabbing the ball», «Kuü pıtalamayıncä», «Buza alamayıncä / Take calves », «Harman topu / Threshing ball », «Aşık / Dice / Talus », «Cengä», «Kuü geçmeyıncä», «Kuran / A kind of mind game» etc (13).

Bulgarian scientist Atanas Manov lists favorite games of Gagauz people of Bulgaria: «Aşek», «Omada», «Esir almaca / Capture the slave», «Uzun eşek / Long donkey» (11). There is also mentioned «Tavşam oyunu / Rabbit game» (6,7).

Traditionally, Gagauz wrestling «Güreş» is one of the most entertaining and that's why most beloved sports among the people. «Güreş» is national kind of wrestling, which is not only an element of national culture, but also has an important meaning for developing and enriching national system of physical education. During the wrestling, «Güreş havası» melody (wrestling melody) is being performed on the ancient musical instrument «Gayda». Gagauz strongmen were called with word «Pelivan». Such a «Pelivan» man of heroic power was Uzunov Semyon Panteleimonovich. A strong man, a wrestler, a man of tremendous physical strength, and at the same time kind and cultured man. During his short life, he managed to become famous for his heroic abilities. He could lift up 18 pounds (288 kg) with one hand. Once he lifted up a 600 liters barrel with wine (8).

There is a story how S.P. Uzunov won the dispute against the wealthy fellow villager, who suggested that he test his strength and lift a cart loaded with bags of grain. Uzunov crawled under the cart, and lifted it with his back, twisting with it around him clockwise, lowered into place and

received this cart with grain as a prize. Fame about Uzunov strongman reached St. Petersburg and he was soon invited to participate in international wrestling competitions, where he many times became the champion. The great Gagauz strongman Uzunov Semyon Panteleimonovich (1883-1908) was born in Kotlovina village, Reni district of Ukraine Odessa region (former Bessarabia).

In Gagauzia, many villages had their own strong men. In Chishmikoy village lived the strongman Ilya Khristev, with whom G.I. Kotovsky (a famous strongman and hero) himself wrestled. There was a strongman «Pelivan» Demirchu Kel in Cazaclia village (9), who could fight with several opponents at the same time. Among the Greek Gagauzes there is a famous «Yaalı güreş» wrestler in the Balkans - Georgios Christu, who had about 300 fights, most of them he won (4). For many centuries, the Gagauz people have kept the techniques used by wrestlers during the fight, like: «yan serpisi» (thigh throw), «kırnik» (hook), «çengel» (throw with a leg entwined from the inside with arm and belt grip) and others. Russian ethnographer V.A. Moshkov described in detail one wrestlers fight in Kongaz village, which took place on Easter in 1895 (13). Thus, the descriptions of the main folk games for science and modern culture both have been preserved.

«Pelivan / Weight lifting»: Gagauz people had a tradition of identifying the most powerful men of the region. By agreement, initiated by wealthy philanthropists, strongmen gathered in one of the villages where «Pelivan» strongmen competed in weightlifting. For example, they were lifting a cart loaded with bags of grain. Another way was to place three bags of grain on the back of the strongman, which the strongman would have to carry around. There was also lifting up big stones by a strongman. The winner received cash money prize (21).

«National wrestling / Güreş»: Güreş, wrestling appearance time is not exactly known. This is an independent sport and a way of physical education of the young generation. Guresh («wrestling», «fight») – traditional wrestling of Gagauz people – this nation lives now, mostly in the south of modern Moldova and Ukraine, as well as in Russia, Turkey, Kazakhstan, Bulgaria, Greece and other countries of the world. According to the tradition that existed among the Gagauz people of Bessarabia, in each village there were competitions in national wrestling «Güreş», during which the winner of «Güreş» wrestling was being determined in each village. Competitions began on the second day of Easter, and the next ones were held every Sunday, and so on until Hıdır-ellez (St. George's Day), when there is the last «Güreş» competition of the year.

Competitions were held on the square in the presence of the entire male population of the village, presence of village women and girls was prohibited. Specially appointed old men with the stick in their hands made a circle called «Genish alan».

A respected person was the judge at the competition, «he observed the wrestling to be conducted according to all the rules of art». Wrestlers «they took off their shoes and top dress, remaining in shirts and trousers tied with red cummerbund. During the wrestling, they were pulling their cummerbunds several times and each their move moved the crowd». During the fight, the wrestlers used various techniques, but, as a rule, one of them had to throw the opponent on the ground. Here is how the Russian ethnographer V. Moshkov describes the end of the fight: «Finally, the wrestling ended when one of the wrestlers lifted another up to the air and threw him on the ground, then the crowd was furious, and sticks of home-grown police could not control it. For a long time after that, the crowd was still worried talking and arguing about today's fight»" (13).

Today «Güreş» exists in two main kinds: kaishtan (from kaish – «belt», «cummerbund») – wrestling «on belts" and actually «guresh» – free style wrestling. In the first kind of wrestling, wrestlers (Gureschi or Gureshiji) went to the alai - the place where the fights took place - and gripped each other's belts with both hands. They were holding this wrestling grip until the end of the fight, until the winner was determined. The fight was carried out only in the wrestling stance - without using techniques to impact to opponent's legs. But they widely used such techniques as throwing through the thigh (almajaa almaa), deflection throwing (kabak atmaa), back pressure, etc. For winning, it was necessary to turn (throw) the opponent on the ground.

The famous Turkologist, ethnographer and historian V.A. Moshkov, who observed kaishtan at the end of the XIXth century. in Congaz village of Izmail district, were Gagauz people live, writes the following about it: «…the organizer of the competition, was always near by the wrestlers, encouraging either one of them or another, he watched the wrestling to be held according to all the rules of art, without steps and without any tricks

which are not allowed by the rules of the fight. The wrestlers took off their hats, shoes and top dress, remaining in shirts and harem pants girded with the red cummerbund. During the fight, they were pulling out cummerbunds from each other several times... the fight finally ended when one of the fighters lifted up another one to the air and threw him on the ground» (14).

In the second kind of wrestling, opponents were coming to wrestle naked to the waist and always without shoes. The wrestling was carried out with any possible grip of opponent's clothing and body both above and below the belt, using various throws with legs and foot sweeps. Actually, its technique and rules are not much different from Yaali Gyuresh - "oil wrestling", which is popular in Turkey today. In fact, this is not surprising, because nomadic Turks were the ethnic base for both Turks and Gagauzes in ancient times, and at the certain historical stage both nations had very close mutual contacts.

Wrestling competitions usually were taking place being accompanied by musicians who performed special wrestling melodies - Guresh Avasi. Competitions were usually held during various traditional holidays; wrestlers were preparing to this competition long before. Ethnographer E. Kvilinkova, who studies the traditional Gagauz culture, in one of her publications notes: «Another kind of national sport was wrestling competitions, which were held mainly in the spring season, starting from the second day of Easter, and every Sunday. The main winner was determined at the Hederlez holiday. Here is manifested the connection of this sport with cattle breeding ritual, because Hederlez holiday (Hederlez or «Ay Yorgi», «Ay Yorgi» - is a holiday in honor of St. George – Authors note) was the beginning of a new cattle breeding season and was dedicated to sending sheep to summer pastures. It is interesting to note that among the Mongols, such competitions were held after driving flocks to summer pastures.

It is also important to note that for many centuries, Gagauz people have preserved the techniques used by wrestlers during the fight, like: «yan serpisi» (thigh throw), «kırnik» (hook), «çengel» (throw with a leg entwined from the inside with arm and belt grip) and others. During the wrestling, certain rules were strictly observed. However, it was conducted without certain weight categories. The prize for the winners (usually a ram or money) was awarded by the rural rich man, and sometimes by the priest (15).

The most famous were wrestling competitions in Congaz village, there were gathering people from many villages. A specific feature of wrestling fights, unlike other traditional types of competitions, such as horse racing «kushiyya», «koshu» or «at yaryshlary» was the absence of women and girls among the viewers. As noted by V. Moshkov, already mentioned, «Not a single fellow will decides to fight in their presence, being afraid to be defeated and to be disgraced in front of them» (15).

Based on the foregoing, we can say that traditional Gagauz wrestling «Güreş» is one of the most entertaining and that's why most beloved sports in the nation. «Güreş» is national kind of wrestling, which is not only an element of national culture, but also has an important meaning for developing and enriching national system of physical education (16). Eventually, it got the character of a multifunctional action, as competitive martial arts, game entertainment, a traditional-ritual act, and it is also an effective way to do physical and military training of the younger generation among the male population of Gagauz villages (21).

In fact, new things often are well-forgotten old things. And the tasks of national and cultural education, which were at a time when guresh was so relevant that ancestors of modern Gagauz people could not imagine their very existence without it, and it is relevant for the Gagauz national community today as well. Here we have great opportunity to adapt our ancestors' positive experience and traditions to modern civilization realities and challenges of the time, exploring, reviving and multiplying them for the benefit of society, for the sake of future generations (19).

During the last years, many events have been held in Gagauzia Aautonomy to promote the preservation of traditional culture and national sports. Every year, General Department of Youth and Sports of Gagauzia organizes events such as: opened championship of Gagauzia in freestyle wrestling among school age children, opened championship of Gagauzia in weightlifting, freestyle wrestling tournament in memory of N. Orlioglo, national freestyle wrestling tournament in memory of coach V. Taucci, freestyle wrestling tournament in memory of international warrior H. Bezhenar, international freestyle wrestling tournament in memory of coach P. Tulu, freestyle wrestling tournament in memory of Kioroglo (18).

RESULT AND SUGGESTIONS

In this context, the following conclusions can be drawn: Wrestling with Gagauz Turks of Central Asia and even the perception of Turkey was found to be the same with Turkey. In this context, it is stated that there is a symbiosis relationship between language and culture; however, it is understood that there is no same relation between religion and minority. Because they'd of orthodox Christian religious Gagauz Turks, the Turks in Turkey are Muslims. However, sports cultures overlap with each other. Thus, it is understood that religions are privileged over cultures.

These athletes are the pride of the Republic of Moldova and of Gagauzia Autonomy: Nikolai Grahmez – won silver medal of the European Championship and bronze medal of the World Championship in freestyle wrestling among youth; Karaseni Petr - won bronze medal of the European Championship in freestyle wrestling among youth; Nedialko Eugenii – is the participant of the Olympic Games in Rio de Janeiro in freestyle wrestling; Romanov Alexander - won bronze medal of the World Championship among students and bronze medal of the World Championship in freestyle wrestling among adults; Zamfirov Ivan - won the medal of the European Championship in freestyle wrestling; Petr Yanulov - won silver medal of the European Championship in freestyle wrestling, won the medal of the 1st European Olympic Games, multiple champion of the Republic of Moldova in freestyle wrestling; Duvenji Gennady - won bronze medal of the European Championship in freestyle wrestling among cadets; Kylchik Elena - won bronze medal of the European Championship in weightlifting among youth.

Development of national sports in Gagauzia performs these tasks:

- Popularization and further development of folk and national sports; education of younger generation based on old traditions of folk culture and national sports; physical education and sports promotion; attracting the population to a healthy lifestyle, increasing the role of physical education and sport in every person's life; improving skills in national sports and folk art; experience exchange in national sports development; consolidation of citizens based on the national and ethnic roots interest unique national traditions and customs of other nations; educating the sense of national dignity, social justice, patriotism and responsibility for the future of the country; cultural heritage preservation of Gagauz people, demonstration of unity and spiritual culture richness of Gagauz people.

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Kyrgyzstan-Turkey Manas University of Social Sciences and Humanities Council of Ethics and Decision number 2020/410 Date 24/07/2020: Decision No. 2020/318: Our University Research and Application Center of Traditional Games and Sports Prof. Dr. Mehmet TÜRKMEN's qualitative-descriptive research on the field and computer environment of the Faculty Member Research titled "Traditional Wrestling of Gagauz Turks and its Role in Strengthening of Cultural Traditions) was unanimously accepted.

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Evaluation of The Factors Affecting Voluntary Participation in Sports Events in Turkey: Case of Vodafone 39th Istanbul Marathon

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Abstract

The purpose of this article is to determine the factors that influence the motivations of the 39th Istanbul Marathon volunteers towards this event. This study was conducted on a total of 196 volunteers, 95 male and 101 female. Information about the participants was provided by Sport Events Volunteer Motivation Scale (SEVMS). For the statistical evaluation of the study, first factor analysis was conducted in order to determine whether the SEVMS provided a basic pattern of the scale and reliability analysis was conducted to determine whether it was measuring a holistic structure. Since Bartlett's test for sphericity Chi-square value was 2582.64 ($p < 0.05$) and Kaiser-Meyer-Olkin value was 0.849 as a result of the reliability and factor analyses, it was concluded with factor analysis that the items could create patterns at high levels. According to the results of the study, it was found that in terms of the students' departments, there were statistically significant differences in purposive, solidary and external traditions sub-dimensions and volunteer motivation total scores in favour of sport students and graduates. Therefore, it should be ensured that the success of the organization is increased by providing the individuals who have received or who are receiving education in the field of sports to participate in sports events. In addition to this, efforts should be made so that the students who are studying in the field of sport can experience the subjects they study in school. Another important result of the study is that external traditions sub-dimension scores of volunteers who have low English level are higher when compared with volunteers who have moderate and high levels of English. This is because international sport events provide volunteers a chance to improve foreign language skills. In this regard, volunteers who have low foreign language levels should be appointed with foreign language-knowing volunteers and their expectations should be met and they should be given opportunities to become global citizens in the globalizing world.

Keywords: Volunteer, sports event, motivation

INTRODUCTION

Today, it can be said that one of the most effective ways of physical, emotional and social development of people, facilitating group work, providing mutual solidarity and gaining membership of the society is the phenomenon of sports (9). Due to this feature, sport's reaching masses necessitates an accord between the existing structure in the sport and social environment and this accord seems to be a natural way for the ability and preparation needed so that every person can adopt sports-related structures (22).

As it is understood, new and chancing values or today's lifestyle and practices affect sports-related

phenomena closely. Particularly, some elements such as personal development and independence have increased the orientation to individualization in sports. The change in the family structure, the increasing participation of women in the labor force, and the increase in urbanization and industrialization are significant factors that motivate participation in sports-related activities. Besides, other factors affecting participation in sports-related activities may be cultural values and results of political decisions (21).

Fundamentally, all factors affecting orientation to sports bring along an impact which serves sports' being understood and perceived as a social responsibility. Sport is a factor for a person to reach other people in a society. Also, people begin to aim at same goals and experience feeling of acting together through sport. Sport is also beneficial for physical, mental and social development (20). Accordingly, within the concept of volunteerism, most people show efforts to support an attempt by using their knowledge, time, abilities, experiences and all sources they have without having financial expectations in order to increase the life quality of their immediate surroundings or people other than their family or to be of use to society in general (10, 26). Thus, a big part of human resources in big sport events consist of volunteers who receive short-term training (16). As can be seen in Table 1, the employment of volunteers are of great important in the sense of Olympic Games and the numbers of volunteers who work in Summer Olympic Games approximate hundreds of thousand people in particular.

Table 1: The number of Volunteers in Olympic Games by years (1,11,12,13,14,15,17,19,24).

Summer Olympic Games	Number of Volunteers	Winter Olympic Games	Number of Volunteers
Los Angeles 1984	28,742	Lake Placid 1980	6,703
Seoul 1988	27,221	Sarajevo 1984	10,450
Barcelona 1992	34,548	Calgary 1988	9,498
Atlanta 1996	47,466	Albertville 1992	8,647
Sydney 2000	46,967	Lillehammer 1994	9,054
Athens 2004	45,000	Nagano 1998	32,000
Beijing 2008	100,000 (30.000 Paralympics)	Salt Lake City 2002	22,000
London 2012	70,000	Turin 2006	18,000
Rio 2016	50.000	Vancouver 2010	22,773 (6,500 Paralympics)
		Sochi 2014	25,000
		Pyeongchang 2018	22,400

Today, sports events are one of important events which are growing up day by day with the impact they create on societies, markets and economics. Recent developments on communication and technology due to the impact sports events create on these fields enlarge sport events and provide creating new departments in itself. Because of these, volunteers are now accepted as an important part of sports services and sports management and they also support sport managers in many areas of events such as transportation, communication, promotion and food services etc. and they can take important tasks like professional personnel in big events. Fulfilling these responsibilities no doubt requires volunteers to get regular and systematic training. Volunteers try to show their capacities and abilities by spending their time and energy for sports events to be free of problems. Therefore, organization committees want to benefit from volunteers in maximum levels by determining their motivations, features, needs and expectations carefully (3) because satisfactions of those who participate in events (athletes, coaches, managers and spectators) are directly proportional to volunteers' needs and expectations being met (16). Likewise, the success of an event depends on those who have different features working with each other with team spirit. At this point, not ignoring volunteers who don't expect anything financial in return and who work in team spirit and knowing the factors which motivate volunteers to volunteer are very important in the success of big events (16).

Finding out social and psychological conditions which encourage volunteers to participate in events through determining potential volunteers' needs and expectations by analyzing volunteering

phenomenon in sports sociologically is the aim of the present study.

MATERIAL AND METHOD

This study was conducted on a total of 196 marathon volunteers, 95 males and 101 females, who participated in the 39th Vodafone İstanbul Marathon volunteer training in 2017.

In the study, "Special Event Volunteer Motivation Scale" (SEVMS), which was developed by Farrell et al. (7) and adapted into Turkish by Yıldız et al. (27) was used in addition to demographic questions. "Special Event Volunteer Motivation Scale" (SEVMS) is a 5-Likert type scale and the items in the scale are expressed as (1) not important at all, (2) somewhat important, (3) important, (4) very important and (5) extremely important. First of all, reliability analysis was conducted to find out whether SEVMS measured an integrative structure for the existing data and factor analysis was conducted to find out whether the data met the basic pattern of the scale. Since Bartlet Sphericity test Chi-square value which showed that the correlation matrix of the items was not unit matrix as a result of reliability and factor analysis was 2582.64 ($p<0.05$) and Kaiser-Meyer-Olkin value was 0.849, it was concluded with factor analysis that the items could form a high degree of pattern. When a four factor structure was formed, it was seen that 64.29% of the total information within the data, which statistically forms a significant part of the information, could be kept. Following all these results, items 16 and 18 were excluded from the analysis both due to their low factor loads and their tendency to pull down the reliability coefficient that showed the integrative structure obtained.

Table 2: Factor loads and Cronbach alpha coefficients of SEVMS total and sub-dimensions

Cronbach α Values	Items	Factor Loads
	M19. I wanted to help make the event as success	0,771
Purposive sub-dimension	M20. I wanted to help out in any capacity	0,763
M9-M13-M14-M19-M20-M21	M14. I wanted to put something back in the community	0,736
$\alpha = 0.879$	M13. I wanted to do something worthwhile	0,729
	M21. I wanted to feel part of this community	0,717
	M9. Volunteering creates a better society	0,596
	M7. Volunteering at this tournament makes me feel better about myself	0,793
External traditions sub-dimension	M1. It was a chance of a lifetime	0,758
M1-M2-M5-M6-M7	M5. I wanted to broaden my horizons	0,752
$\alpha = 0.872$	M6. Being a volunteer with this tournament is considered prestigious	0,750
	M2. My skills were needed	0,683
Solidary sub-dimension	M3. I wanted to interact with others	0,787
M3-M4-M11-M12	M11. I wanted to develop relationship with others	0,785
$\alpha = 0.869$	M4. I wanted to gain some practical experience	0,704
	M12. I wanted to work with different people	0,674
Commitments sub-dimension	M15. A relative/friend is involved in this event	0,727
M8-M10-M15-M17-M22	M8. Most people in my community volunteer	0,726
$\alpha = 0.772$	M17. I wanted to continue a family tradition of volunteering	0,719
	M10. I am expected to volunteer	0,542
General $\alpha = 0.892$		

Since total score and sub-dimension scores of SEMVS were not distributed normally according to Kolmogorov-Smirnov test ($p<0.05$), all analyses were conducted by using non-parametrical methods. In the assessment of demographic variables, whether the groups were statistically different from each other was shown with one way univariate non-parametric variance analysis Kruskal-Wallis Test for the comparison of more than two independent groups and Mann-Whitney U Test in the comparison of two independent groups. SPSS 22.0 (Statistical Packages of Social Sciences) software was preferred for statistical analyses.

RESULT

Table 3: Sub-dimension scores of the volunteers in the study in terms of the variable of gender

GENDER		N	Average	Standard deviation	Standard error	Median	*P-value*
Purposive Total Score	male	95	27,2316	3,26312	0,33479	28	
	female	101	26,6040	4,21445	0,41935	28	0,572
Solidary Total Score	male	95	17,4526	2,62057	0,26887	18	
	female	101	16,1782	3,30876	0,32923	16	0,005*
Commitment Total Score	male	95	15,0000	5,13644	0,52699	18	
	female	101	14,7327	5,36077	0,53342	18	0,746
External traditions Total Score	male	95	18,2526	4,24507	0,43553	24	
	female	101	17,8020	4,07926	0,40590	22	0,497
Volunteer Motivation Total Score	male	95	77,9368	11,31823	1,16123	87	
	female	101	75,3168	12,97300	1,29086	85	0,182

In terms of solidary sub-dimension, there is a statistically significant difference between male and female volunteers ($p<0.05$). Male volunteers have higher scores than female volunteers. No difference was found in other dimensions.

Table 4. Sub-dimension scores of the volunteers in the study in terms of their departments

DEPARTMENT		N	Average	Standard deviation	Standard error	Median	*P-value*
Purposive Total Score	Physical education and sport	95	27,4526	3,40765	0,34962	29	
	Other	101	26,3960	4,06221	0,40421	28	0,024*
Solidary Total Score	Physical education and sport	95	17,4316	2,79305	0,28656	18	
	Other	101	16,1980	3,18126	0,31655	17	0,004*
Commitment Total Score	Physical education and sport	95	15,3895	5,30214	0,54399	18	
	Other	101	14,3663	5,16086	0,51352	18	0,193
External traditions Total Score	Physical education and sport	95	18,9579	3,82020	0,39194	24	
	Other	101	17,1386	4,28259	0,42613	22	0,003*
Volunteer Motivation Total Score	Physical education and sport	95	79,2316	11,12162	1,14105	86	
	Other	101	74,0990	12,76362	1,27003	85	0,011*

In terms of the department participants graduated from/will graduate from, statistically significant difference was found in terms of purposive, solidary, external traditions scores and volunteer motivation total score ($p^*<0.05$). The scores of physical education and sports department students/graduates were found to be higher than those of students/graduates of other departments.

Table 5: Sub-dimension scores of the volunteers in the study in terms of age variable

AGE		N	Average	Standard deviation	Standard error	Median	*P-value*
Purposive Total Score	15-24 years	168	26,8631	3,80973	,29393	28	
	25-34 years	21	26,8095	4,02019	,87728	28	0,765
	35-45 years	7	28,2857	2,42997	,91844	29	
	Total	196	26,9082	3,78685	,27049		
Solidary Total Score	15-24 years	168	16,8869	2,96370	,22865	17	
	25-34 years	21	15,3810	3,57038	,77912	16	0,021
	35-45 years	7	18,8571	2,03540	,76931	20	
	Total	196	16,7959	3,05491	,21821		
Commitment Total Score	15-24 years	168	14,9762	5,16895	,39879	18	
	25-34 years	21	13,1905	5,70630	1,24522	17	0,192
	35-45 years	7	17,1429	4,94734	1,86992	20	
	Total	196	14,8622	5,24149	,37439		
External traditions Total Score	15-24 years	168	18,0536	4,08775	,31538	23	
	25-34 years	21	17,0476	4,73789	1,03389	21	0,238
	35-45 years	7	20,1429	3,57904	1,35275	25	
	Total	196	18,0204	4,15588	,29685		
Volunteer Motivation Total Score	15-24 years	168	76,7798	12,09267	,93297	85.5	
	25-34 years	21	72,4286	12,83188	2,80015	82	0,048
	35-45 years	7	84,4286	10,75263	4,06411	94	
	Total	196	76,5867	12,23855	,87418		

Statistically significant difference was found between age groups in terms of solidary sub-dimension and volunteer motivation total score ($p<0.05$). The scores of 34-45 age group were found to be higher than the scores of other groups. No difference was found in other dimensions.

Table 6: Sub-dimension scores of the volunteers in the study in terms of monthly income variable

MONTHLY INCOME		N	Average	Standard deviation	Standard error	Median	*P-value*
Purposive total score	Less than 1000 TL	154	27,1039	3,54093	,28534	28	0,669
	1001-2000 TL	24	25,5833	5,38853	1,09993	28.50	
	2001-4000 TL	11	27,6364	2,57964	,77779	28	
	More than 4001 TL	7	26,0000	3,74166	1,41421	27	
	Total	196	26,9082	3,78685	,27049		
Solidary total score	Less than 1000 TL	154	16,9481	2,99628	,24145	17.50	0,108
	1001-2000 TL	24	16,0833	3,33514	,68078	17	
	2001-4000 TL	11	17,5455	3,01210	,90818	19	
	More than 4001 TL	7	14,7143	2,81154	1,06266	14	
	Total	196	16,7959	3,05491	,21821		
Commitment total score	Less than 1000 TL	154	14,8052	5,10552	,41141	18	0,490
	1001-2000 TL	24	14,0417	6,33472	1,29307	18.50	
	2001-4000 TL	11	16,5455	3,98406	1,20124	21	
	More than 4001 TL	7	16,2857	6,12955	2,31675	23	
	Total	196	14,8622	5,24149	,37439		
External traditions total score	Less than 1000 TL	154	18,2532	3,91338	,31535	23	0,023
	1001-2000 TL	24	16,7500	5,49506	1,12167	22.50	
	2001-4000 TL	11	19,7273	2,83164	,85377	25	
	More than 4001 TL	7	14,5714	3,82349	1,44514	21	
	Total	196	18,0204	4,15588	,29685		
Volunteer motivation total score	Less than 1000 TL	154	77,1104	11,45469	,92305	85	0,246
	1001-2000 TL	24	72,4583	16,82643	3,43468	87	
	2001-4000 TL	11	81,4545	7,47481	2,25374	88	
	More than 4001 TL	7	71,5714	13,98639	5,28636	80	
	Total	196	76,5867	12,23855	,87418		

While there were no statistically significant differences in purposive and solidary sub-dimension scores and volunteer motivation total scores in terms of monthly income variable ($p>0.05$), a significant difference was found in favour of individuals with a monthly income of 2001-4000 TL in terms of personal interest dimension ($p<0.05$).

Table 7: Sub-dimension scores of the volunteers in the study in terms of foreign language level

Level of English		N	Average	Standard deviation	Standard error	Median	*P-value*
Purposive total score	High	20	24,3500	5,41222	1,21021	25.50	0,078
	Moderate	77	27,0390	3,38122	,38533	28	
	Low	99	27,3232	3,53071	,35485	29	
	Total	196	26,9082	3,78685	,27049		
Solidary total score	High	20	15,6000	3,23468	,72330	16	0,099
	Moderate	77	16,7403	2,76445	,31504	17	
	Low	99	17,0808	3,19973	,32159	18	
	Total	196	16,7959	3,05491	,21821		
Commitment total score	High	20	14,5000	6,05675	1,35433	18.50	0,851
	Moderate	77	14,6623	4,42068	,50378	18	
	Low	99	15,0909	5,68222	,57108	18	
	Total	196	14,8622	5,24149	,37439		
External traditions total score	High	20	15,1500	4,88041	1,09129	19.50	0,009*
	Moderate	77	18,1299	3,93818	,44880	23	
	Low	99	18,5152	3,97277	,39928	23	
	Total	196	18,0204	4,15588	,29685		
Volunteer motivation total score	High	20	69,6000	16,46815	3,68239	78.5	0,072
	Moderate	77	76,5714	10,42824	1,18841	85	
	Low	99	78,0101	12,21115	1,22727	86	
	Total	196	76,5867	12,23855	,87418		

In terms of level of English, statistically significant difference was found in external traditions sub-dimension scores ($p<0.05$). Participants with low level of English were found to have higher external traditions scores. Since no statistically significant differences were found in purposive, solidary, external traditions sub-dimensions and volunteer motivation total scores in terms of the state of being a member of a Civil Society Organization (CSO), the state of the city of

residence and the state of occupation ($p>0.05$), it can be said that these variables do not affect volunteer participation in sport activities ($p>0.05$).

DISCUSSION

As a result of the statistical analyses in the study, it was found that women volunteered in sports organizations more than men. Although it was found that more man volunteers participated in sports events than women in studies of Koşan and Güneş (7), Downward et al.(6) and Yıldız (28); it was found that more women volunteers participated in sports events in the studies of Berber (4), Atçı et al.(2), Fişne (8). Since the interest and popularity of sports branches can differ according to gender in the country and the city in which an event is organized, the state of gender can also differ in volunteer participation in an event.

According to solidary sub-dimension, there is a statistically significant difference between women and men and the scores of men are higher than the scores of women. According to the results of the study, aim of social interaction and having group identity in men provided more motivation to volunteer. This result is different from data in the study of Yıldız (28). Atçı et al. (2) showed that there was no significant result in terms of female volunteers in the results of the interpersonal relations sub-dimension which we can evaluate with the solidarity sub-dimension. In societies that male hegemony is dominant, boys are brought up more freely than girls. This situation causes men to adapt to social life quicker, to be more active in getting in social interaction and to get a group identity easier. When it is considered that men who are brought up freely are appreciated since childhood even when they misbehave causes them to believe that they can succeed in every situation by being appreciated and that they consider this appreciation as success, it can be said that the wish to be appreciated motivates men to volunteer in a sport event with the aim of interacting socially and gaining a group identity. Thus, we can say that as a result of the wish to be appreciated, men have more motivation to volunteer in sport events than women with the aim of social interaction and gaining a group identity.

35-45 age group, which is the oldest age group of volunteers in 39th Vodafone İstanbul marathon, has more motivation to volunteer with the aim of social interaction and gaining a group identity when compared with other groups. Considering that this age group is more used to group work due to both their life experiences and professional experiences with the need to be with others to get away from loneliness, the result that they fulfil team solidarity more than other age groups is an acceptable result. This result is similar to Fişne (8)'s result that with increasing age extroversion, accommodativeness and openness to experience also increase.

In terms of monthly income, external traditions total scores of volunteers who have a monthly income of 2001-4000 TL are higher. There are also students in this income group. The reason for such a result is thought to be the fact that volunteering is seen as a recreation activity. Through volunteering, individuals can break away from their routine, refresh themselves and get away from stress.

In terms of the students' departments, there were statistically significant differences in purposive, solidary and external traditions sub-dimensions and volunteer motivation total scores in favour of physical education and sport students and graduates. The fact that the event is a sports event undoubtedly attracts the attention of physical education and sports students / graduates. For physical education and sports students / graduates, sports events mean as a practical training. Thanks to the sport event, they have the opportunity to follow an event organization closely in terms of management functions. Also physical education and sports students / graduates have an opportunity to demonstrate their skills and gain new experiences for having different occupational ability and implement them since there are many different units (media, communication, accreditation, tasks in sports areas, information technologies etc.) in sports events.

External traditions scores of volunteers who had low level on foreign language were higher. Especially in international sports organizations, there are many units where volunteers can work according to their abilities and interests. Due to the possibility of working in many different units and the fact that the event is international, English is used as the communication language. This situation causes volunteers who have low foreign language level to have more interest to volunteer because volunteers both work in different departments according to their abilities and interests and they have an opportunity to improve their English skills. This situation transforms individuals into a global citizen who knows the language in a globalized world where borders have disappeared and the interaction with technological developments is spreading and increasing, making them strong actors that influence the other side in cultural,

political and sporting ways through international communication and interaction. As a result, it is concluded that volunteers see sports events as a career personal development opportunity based on some authors emphasizing that volunteering is related to career and personal development opportunities (23) and that this is perceived as an investment for volunteers (25).

Volunteerism, which is closely related to civil society, is therefore mostly addressed by NGOs today (5); however, the state of being a member of an NGO does not affect volunteering in this study. In Palaz and Boz's (18) study, no difference was found between subjects who were members of voluntary organizations and those who were not in terms of motivations for volunteering. According to the results of the study, the city volunteers live in, employment status and education level do not affect participating voluntarily in sports activities.

Based on the results of this study, which was conducted on Turkish sport volunteers, the following can be recommended for sport managers, researchers and educators:

As studies on volunteerism may differ according to the interest in the branch of sport and the characteristics of the sport branch, it is thought that there may be significant differences in voluntary participation in some sport branches according to gender. It is estimated that there may be more male or more female volunteer participation in some branches of sports. Therefore, studies on volunteering in sports should be diversified and increased according to the branches of sport.

Feminist approaches should be used to ensure that both male and female volunteers work together and as equally as possible and have equal rights.

A more social environment should be created by including different occupational groups without preventing students studying in the field of sports from participation. Thus, interaction between occupations and individuals should be increased and personal development should be supported by creating working environments which allow volunteers from different groups to share their skills and volunteers to develop their communication skills. Trainings, seminars and conferences should be given at the educational levels on the subject of volunteering and the benefits of volunteering to the individual and society should be explained and the culture of volunteering should be instilled. In this way, it is thought that a great contribution will be made to the formation of sports culture. It is estimated that these trainings will be the most important step of raising a generation with sports culture. In addition to this, it should be ensured that the participation of other occupational groups in volunteer activities in sports besides the students should be increased and the sports culture should be transferred to the whole nation. The spread of sports culture to the nation will increase the interest in sports. In this way, the participation of individuals in sporting activities and sports organizations will increase and the sport sector will be revitalized due to people who show a tendency to sporting goods, services and products.

For successful volunteer management, sports volunteers should be given pre-event trainings and mutual expectations should be conveyed and communication problems that may occur should be prevented. In addition, information about the event should be provided for the success of the event.

The impact of NGO membership on volunteering and volunteer motivation should be supported by qualitative research.

Sports organizations should ensure that university students and sports high school students are involved in sports events and efforts should be made to enable them to experience the subjects they are studying at school on site.

Expectations should be met by assigning individuals who want to improve their foreign language in international sports organizations with volunteers who know a foreign language.

Special activities for sport volunteers according to their age and occupation groups and also student groups should be organized and volunteers should be both merged and motivated to events.

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Investigation of The Body Composition And Maximal Oxygen Consumption Capacity Of Elite Boxing And Wrestling Athletes

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Abstract

The aim of the study is to compare body composition and maximal oxygen consumption of elite boxing and wrestling athletes and to investigate the relationship between body composition and maximal oxygen consumption. A total of 26 elite athletes (13 boxing and 13 wrestling) were included in the study. On the same day, the and body composition assessment and maximal oxygen consumption measurement of the athletes were performed. Body composition evaluation of athletes was made with MF-BIA (Tanita MC-980, 1000 kHz, Tokyo, Japan) device. Maximal oxygen consumption measurement was made using a direct method breath-by-breath automatic portable gas analysis system (Cosmed K5, Italy). Mann Whitney U Test and Spearman Correlation Test were used for statistical analysis. The statistical significance level was determined as $p < 0.05$. There was not any difference in body weight, body fat percentage, and relative oxygen consumption values of boxing and wrestling athletes ($p > 0.05$); however, there were statistically significant differences in the Body Mass Index, muscle mass, absolute oxygen consumption, carbon dioxide production, respiratory coefficient, and heart rate values ($p < 0.05$). In boxing and wrestling athletes, there was a strong negative correlation between BMI and body fat percentage and relative oxygen consumption values ($p < 0.05$); Muscle mass and relative oxygen consumption values were found to be strong in boxing athletes and moderate in wrestling athletes ($p < 0.05$). As a result of our study, it has been observed that there is a relationship between body composition and maximal oxygen consumption of both boxing and wrestling athletes. In addition, with the knowledge that body composition is important in strength and anaerobic power-based sports branches, it raises the idea that athletes in these branches should do aerobic exercises to keep their body composition at the targeted levels.

Key words: boxing, wrestling, body fat, aerobic capacity

INTRODUCTION

Body composition is one of the important factors affecting sports performance, and It consists of components such as lean body mass, body fat mass, body muscle mass, body fat ratio. While optimal lean body mass and muscle mass affect sports performance positively, excess body fat mass negatively affects performance (29, 30). Body composition is affected by factors such as age, height, and gender; It has also been reported that body composition is affected by normal growth and development processes (4, 14, 28). It is known that the relationship between body composition and sports performance may vary according to the energy requirements of the sports branch (8, 12, 24, 28).

Another important factor affecting sports performance is aerobic capacity. Aerobic capacity is an indicator of a person's endurance in all physical activities, from daily activities to high-intensity exercise. Maximal oxygen consumption (Max VO2)

indicates the person's oxygen-carrying and using capacity, in other words, their aerobic capacity (26). Maximal oxygen consumption can be measured directly on the basis of the amount of oxygen and carbon dioxide in the expiratory air during maximal exercise or calculated indirectly during submaximal exercise using heart rate, exercise intensity, total work, etc. (19). Cinsiyet, yaş, vücut kompozisyonu ve spor branşı maksimal oksijen tüketimini etkileyen faktörlerdendir (19). In previous studies, the relationship between body composition and maximal oxygen consumption was investigated (3). On the other hand, the present study, to the authors' knowledge, is the first study that compares the body composition and maximal oxygen consumption of elite boxing and wrestling athletes in our country and investigates the relationship between body composition and maximal oxygen consumption of these athletes.

In the light of this information, with the hypothesis that boxing and wrestling have different body composition and maximal oxygen consumption, the aim of the study is to compare the body composition and maximal oxygen consumption of elite boxing and wrestling athletes in our country and to investigate the relationship between body composition and maximal oxygen consumption of each branch.

MATERIAL AND METHOD

Participants: A total of 26 national team athletes (13 boxing and 13 wrestling) were included in the study. The athletes were given detailed information about the study. The verbal and written consent of the athletes was obtained. The presence of chronic disease, past or ongoing sports injury history was questioned. Physical examinations were carried out by a sports medicine specialist.

The inclusion criteria in the study were at least 3 years of sports experience and to be at the national team level. The exclusion criteria from the study were to have an ongoing musculoskeletal injury or disease. All procedures of the study were in accordance with Helsinki Criteria and ethics committee approval was obtained from the University Ethics Committee (2020-41 / 04.03.2020).

Study Procedure: Body composition analysis was performed on the first day with the Bioelectrical Impedance Analysis (BIA) method. On the second day, the maximum oxygen consumption was measured with the breath-by-breath automatic portable gas analysis system.

Body Composition Evaluation: Body composition evaluation of the athletes was made with the MF-BIA (Tanita MC-980, 1000 kHz, Tokyo, Japan) device. Athletes were asked not to perform high-intensity exercise for at least 24 hours and not to drink diuretic beverages such as tea, coffee, etc.. At least 8 hours of fasting was achieved before the test. All metal items on the athletes were removed during testing. The test was conducted with athletes standing on the device with bare feet and holding the handpieces of the device with their hands. Bodyweight, body fat ratio, body fat mass, body muscle mass parameters were measured and recorded for statistical analysis.

Measurement of Maximal Oxygen Consumption: Measurement of the maximal oxygen consumption was made by running on the treadmill (H / p / cosmos para control, Germany). After 2 minutes of warm-up at a constant speed of 5 km/h, the speed of the treadmill was increased 0.016km/h per second, and the slope of the treadmill was increased 0.25% per minute. Measurements were made directly via breath-by-breath automatic portable gas analysis system (Cosmed K5, Italy). The basic unit of maximal oxygen consumption measurement is its absolute value expressed in liters per minute or milliliters. However, the absolute value is affected by body weight, therefore results are also expressed as a relative value (milliliter/kg/minute). The observation of three of the criteria listed below at the same time was accepted as an indication reaching the maximal oxygen use capacity, and the test was terminated:

- Despite the increase in workload, the increase in VO2 value between the two applied workloads is 150 ml.min-1. kg-1 or lower,
- Marking perceived fatigue level 17 and above in Borg's original scale
- Respiratory change rate (VCO2 / VO2) (RQ value) is 1.15 or above,
- The heartbeat rate is 85% or more of the maximal heartbeat,
- No increase in heart rate despite the increasing workload.

Statistical Analaysis: After the descriptive statistics of the data obtained, the data that do not show normal distribution according to the branch were compared with the Mann Whitney U Test. The relationship between body composition and maximum oxygen consumption was determined by Spearman Correlation Test. The statistical

significance level was determined as p <0.05. Statistical Analysis was performed using the SPSS 23.0 for Windows (Statistical Package for Social Sciences, Chicago, IL, USA) package program.

RESULTS

The results of body composition assessment of athletes in boxing and wrestling branches are given in Table 1. While there was no statistically significant difference in body weight and body fat percentage values of boxing and wrestling athletes (p> 0.05); however, when the Body Mass Index (BMI) and muscle mass values are examined, there were statistically significant differences (p <0.05). It was determined that BMI and muscle mass values were higher in wrestling athletes than in boxing athletes.

Table 1. Comparison of body composition of boxing and wrestling athletes

Body Composition		n	Mean	SD	Z	U	p
Age	Boxing	13	20,39	0,67	-4,334	0,000	0,198
	Wrestling	13	21,25	0,89			
Body Weight (kg)	Boxing	13	70,02	17,10	-1,257	60,000	0,209
	Wrestling	13	76,72	17,35			
BMI (kg/m²)	Boxing	13	22,47	3,90	-2,360	38,500	0,018*
	Wrestling	13	25,85	3,91			
Height (cm)	Boxing	13	174,58	7,67	-1,335	58,500	0,182
	Wrestling	13	170,81	7,17			
% Fat	Boxing	13	14,15	12,94	-1,744	50,500	0,081
	Wrestling	13	9,05	7,95			
Muscle Mass (kg)	Boxing	13	53,78	13,82	-2,026	45,000	0,043*
	Wrestling	13	64,33	9,72			

BMI: Body Mass Index, *: Mann Whitney U Test

The results of maximal oxygen consumption measurement of boxing and wrestling athletes are given in Table 2. While there was no statistically significant difference between the relative oxygen consumption (VO2 = ml / (kg * min)) values of boxing and wrestling athletes (p> 0.05); there were statistically significant differences in absolute oxygen consumption (VO2 = (ml / min)), carbon dioxide production (VCO2 = (ml / min)), respiratory coefficient (RQ) and heart rate (p <0.05). It is seen that wrestling athletes have lower heart rate and higher respiratory efficiency and oxygen consumption values compared to boxing athletes in the maxVO2 test.

Table 2. Comparison of the maximal oxygen consumption measurement of boxing and wrestling athletes

Oxygen Consumption		n	Mean	SD	Z	U	P
Absolute VO2 (ml/min)	Boxing	13	3522,80	363,62	-3,154	23,000	0,002*
	Wrestling	13	4258,13	609,01			
VCO_2 (ml/min)	Boxing	13	3569,71	471,25	-3,974	7,000	0,000*
	Wrestling	13	4994,33	618,09			
RQ	Boxing	13	1,01	0,11	-3,030	25,500	0,002*
	Wrestling	13	1,18	0,07			
Relative VO_2 ml/(kg*min)	Boxing	13	53,93	8,69	-0,462	75,500	0,644
	Wrestling	13	56,59	6,63			
Heart Rate (beat/min)	Boxing	13	193,92	8,83	-2,547	35,000	0,011*
	Wrestling	13	183,92	8,83			

VO_2: oxygen consumption, VCO_2: carbon dioxide production, RQ: Respiratory Quotient (VCO_2/VO_2), *: Mann Whitney U Test

The relationship between the body composition values of boxing and wrestling athletes and their maximal oxygen consumption capacity is given in Table 3. In boxing and wrestling branches, there was a high and statistically significant negative correlation between BMI and body fat percentage and relative oxygen consumption values (p <0.05). Muscle mass and relative oxygen consumption values were positively high in boxing athletes and a moderately significant correlation was found in wrestling athletes (p <0.05).

Table 3. The relationship between the maximal oxygen consumption measurements and body composition values of wrestling and boxing athletes

Body Composition	Relative Oxygen Consumption	
	Boxing	Wrestling
BMI	-,738**	-,632*
% Fat	-,849**	-,713**
Body Mass	,658*	,571*

BMI: Body Mass Index, *: Spearman Correlation Test

DISCUSSION

In the study conducted to compare the body composition and maximal oxygen consumption of boxing and wrestling athletes and to investigate the relationship between body composition and maximal oxygen consumption of each branch, the relative oxygen consumption values of the branches were found to be similar in terms of body weight, percentage of body fat and body weight; however, body mass index, muscle mass, absolute oxygen consumption, carbon dioxide production, respiratory coefficient, and heart rate values were found to be different. In addition, a relationship between body composition parameters and maximal oxygen consumption was found in both branches.

Body composition is one of the important indicators of physical fitness. It has an important role in following the nutrition program and training (1, 25). As there are technical and tactical differences between sports branches, it is thought that the body composition must be specific to the sports branch in order to adapt to these differences (11). The importance of muscle mass in sports branches that require strength and power is known (17, 27). In some branches, body mass determines the category that athlete competes. Athletes in these branches aim to keep their body mass under control in order to compete in the category they target. The weight control can be done with long-term regular diet programs, as well as quickly, close to the competition. Rapid weight loss often causes dehydration, and this can adversely affect the health and performance of the athlete (23). Boxing and wrestling are among these branches, and body composition has great importance in these branches (10). It is claimed that as the body mass and muscle mass increase within the weight category, the success increases (23). In a study examining the body composition of the Olympic-level boxing and wrestling athletes, it was found that the average body fat percentage of the athletes were statistically similar. Wrestling athletes have been shown to have higher average body mass and muscle mass than boxing athletes (22). These results are consistent with the results of the present study.

Another indicator of physical fitness is aerobic capacity. Aerobic capacity shows the endurance of the person (26). Maximal oxygen consumption is essential in combat sports as well as in other sport branches (31). In a study examining the aerobic capacity of wrestling athletes, the relative maximal oxygen consumption of the athletes was found to be 45.9 ± 6.6 mL/kg/min (21). In another study, the aerobic capacity of wrestling athletes was investigated, and the relative oxygen consumption capacity was found to be 45.1 ± 3.4 mL/kg/min (31). In the study performed by Rahmani-Nia et al., the maximal oxygen consumption level in young wrestlers was determined as 50 ± 4.75 mL/kg/min (20). In the study of Kravitz et al., The maximal oxygen consumption level of boxing athletes was found to be 41.0 ± 6.5 mL/kg/min (9). In another study conducted on boxing athletes, it was observed that the maximal oxygen consumption was 52.2 ± 7.2 mL/kg/min (6). It is thought that the reason for the different results in the literature may be related to factors such as training level, age, gender, etc.

Body composition can be at targeted levels with appropriate diet and training. Various studies have been conducted on the relationship between aerobic endurance and body composition (2, 5, 13, 15, 16). In the study of Minasian et al., it was shown that there is a strong negative correlation between body fat percentage and maximal oxygen consumption capacity in both boys and girls (15). In the study of Laxmi et al., it was shown that there is a moderate negative correlation between BMI and maximal oxygen consumption (5). In the study of Mondal et al., a weak-moderate negative correlation was found between BMI and maximal oxygen consumption, while a strong negative correlation was found between body fat percentage and maximal oxygen consumption (16). In our study, a strong negative correlation was found between body fat percentage

and maximal oxygen consumption, and the results are consistent with previous studies. The fact that the relationship between body fat percentage and aerobic endurance is stronger than the relationship between BMI indicates the importance of body fat percentage in body composition monitoring. There are also studies on the relationship between body fat percentage and lean body mass with anaerobic capacity and muscle strength (7, 18). These studies show the importance of body composition in boxing and wrestling sports where muscle strength and anaerobic power are essential for performance.

Due to the limited number of participants, it was not possible to evaluate the relationship between body composition parameters and maximal oxygen consumption via regression analysis. Besides, the fact that the study is a cross-sectional study does not show a cause-effect relationship. These situations can be considered as the limitations of the study. However, the present study, to the authors' knowledge, is the first study that compares the body composition and maximal oxygen consumption of elite boxing and wrestling athletes in our country and investigates the relationship between body composition and maximal oxygen consumption of these athletes.

CONCLUSION

Considering the results of the current study, the body composition values of wrestling and boxing athletes were similar. In addition, it has been observed that there is a relationship between body composition and maximal oxygen consumption of both boxing and wrestling athletes.

The fact that the level of this relationship with body fat percentage is higher than other parameters indicates that the fat percentage is an influential parameter in body composition monitoring.

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Acute Effects of High-Intensity Competition on Macroelements and Relationship with Corrected QT Interval

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Abstract

The purpose of this study is the find the changes of calcium, sodium, and potassium ions and relationship with Corrected QT (QTc) interval in professional athletes during a short duration of intense exercise. Thirty-two male athletes (age, 26.9±4.7 yrs) competed in 8 minutes high-intensity competition. The competition items included: Running on Skillmill for 400 meters; Three-stage deadlifting, bar pulling up, 30-kilogram kettle bell swinging, and throwing 20 sand-filled balls. The resting electrocardiogram was recorded in a sitting position for one minute. Venous blood samples were obtained before and immediately after the competition and analyzed for Sodium (NA+), Potassium (K), and Calcium (Ca). Plasma volume changes were estimated from hemoglobin and hematocrit readings before and after the competition. The results showed that the serum calcium ($p<0.001$) and sodium ($p<0.001$) levels significantly increased as a result of intense exercise activities while the serum potassium ($p<0.001$) significantly decreased. After adjusting raw data for plasma volume changes serum calcium, sodium, and potassium significantly decreased ($p<0.001$). No significant relationship between QTc and Ca, Na, and K at rest. These results implicated that high-intensity exercise would provoke the change of macroelements and the current data suggest that the Ca, Na, and K don't have a relationship with QTc at rest.

Keywords: Calcium, Potassium, Sodium, Athletes, Sudden cardiac death

INTRODUCTION

The role of ions, especially calcium, sodium, and potassium, for body health has been well established. These electrolytes are of vital importance for athletes due to their metabolic and physiological roles such as muscular contraction, the transmission of nerve impulse, and heartbeat (12). On the other, Sudden Cardiac Death (SCD) in athletes is an infrequent accident, but each time this happens, it is considered a tragedy or dramatic event that attracts the public's attention. It is difficult to find the underlying reason for the death of healthy active young athletes, and this problem is increasing for them (16, 21). Several studies have shown that the main symptoms associated with sudden cardiac death are structural or electrical. One of these signs is long QTc interval in the athlete's electrocardiogram (ECG), which remains unknown for the athletes who have no history of a familial disease (2). The results of studies in healthy volunteers have shown that changes in these three serum ions can cause abnormalities in the ECG, especially in QTc. In this group, it was shown that the serum calcium and potassium have negative significant relationships with QT interval while there is a positive relationship between the serum calcium and the QT interval (8, 10, 22). Malfunction of myocardial channels can lead to an increased sodium penetration or decreased potassium outflow, which subsequently increases the duration of repolarization and prolongs QTc interval (15). Moreover, the role of calcium ions in the cardiac

pacemaking and its destructive effects has attracted more attention (7). Equilibrium between calcium, sodium, and potassium contents is required to lead to a normal contraction and relaxation in the heart muscle. Furthermore, it must be noted that low levels of calcium in the bloodstream can cause tetany and muscle disorders (12).

However, no accurate information is available on the relationship between changes of serum ions and QTc interval for professional athletes in the resting and those in the immediately after exercise. Given its crucial role for controlling sudden cardiac deaths during exercise, it is worth being investigated. To this end, this work investigates changes of calcium, sodium, and potassium ions and the relationship with QTc interval in professional athletes during an intense exercise.

Methodology

Participants

Among 540 male athletes who competed in the qualification stage of a high-intensity interval competition (started about two months before the semi-final stage), 32 male athletes reached the semi-final stage and participated in this research. The demographic characteristics and body composition of participants were shown in Table 1. Body height was measured by an ultrasound stadiometer (InBody, South Korea). Body composition was identified through Bio Impedance Analysis (InBody 270, InBody, South Korea). All participants provided written informed consent. The study followed the ethical guidelines of the Declaration of Helsinki and was approved by the Research Ethics Committee of the faculty of sport science Shahid Rajaee Teacher Training University (IR.SRTTU.SSF.2018.103).

Table1. Participants characteristics. Data are presented as mean ±SE (n=32)

Age (years)	26.9±4.7
Height (cm)	177±5
Weight (kg)	80.7±6.4
Body mass index (kg/m^2)	25.6±1.6
Body fat percent (%)	9.9±2.7
Skeletal muscles mass (kg)	42±4

Procedure and competition stages

The participants (n=32) were divided into 16 groups. Each group included two athletes who competed in two separate lanes in the form of a duel. The total duration of the competition was 8 minutes and the winner of each group was determined in two methods; Method I) The first athlete finishing the competition stages in under 8 minutes would be the winner and the opponent was eliminated, Method II) If none of the athletes completed the competition stages in 8 minutes, the athlete who was ahead in the competition stages would be selected as the winner.

The competition was held indoor, and the competition stages included: 1) 400 m running on the skill mill, 2) triple deadlift including the lifting of 110 kg (5 repetitions), 130 kg (3 repetitions), and 150 kg (1 repetition) weights, 3) pull up (30 repetitions), 4) kettlebell swing (30 kg), and 5) throwing 20 sand balls of different weights at a distance of 5 meters behind a 75 cm box; the stages were run by athletes in succession.

ECG Analysis

Prior to the competition, the electrocardiogram belt (custoguard, customed, Germany), which records the Lead II, was placed on the subjects' chest. In addition, the resting electrocardiogram was recorded in a sitting position by custo diagnostic software at a speed of 25 mm/s and amplitude of 0.1 mv/mm for one minute. The QT interval was calculated from the beginning of the QRS complex to the end of wave T. All of the QT intervals were measured from the mean value of 3 consecutive beats. QTc was calculated by Bazett's Formula (QTc = QT interval/$\sqrt{RR}$ interval) (3).

Blood Sampling and Laboratory Methods

Before and immediately after the competition, fourteen ml venous blood samples were obtained from antecubital veins in a sitting position and poured into three separate tubes. Two ml of the first tube anticoagulated with 3 ml of ethylenediaminetetraacetic acid (EDTA) was used to measure CBC by Cell Counter. Before and after the competition, hematocrit and hemoglobin were used to estimate the percentage change in plasma volume by the Dill and Costill equation (5). Eight ml of the second tube blood was used to measure calcium, sodium, and potassium. Sodium and potassium were measured by the Electrolyte Analyzer Cb4, while calcium content was measured by Hitachi 911. Two ml of the third tube anticoagulated with 3 ml heparin was used to measure lactate by Hitachi 911. All blood samples were stored at a temperature between 3°C and 4°C in the competition location

and centrifuged (Behdad, Iran) for 10 minutes at a speed of 3000 rpm.

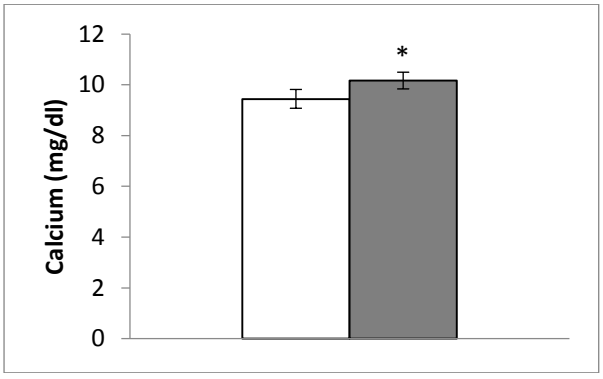
Statistical Analysis

All statistical analyses were performed using IBM Statistical Package for the Social Science software (IBM SPSS statistical. v. 25 for windows). A paired samples t-test was used to examine the difference variables in resting and those in the immediately after competition mean values of all the variables measured. Pearson test was used to examine the relationship of each variable with QTc. The significance level of each statistical analysis was $P < 0.05$.

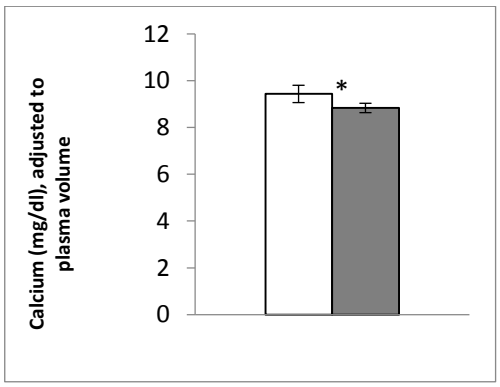
Results

All participants performed the competition and all blood samples were collected. Of the 32 participants, 16 were the winner and qualified for the next stage. Of these 16 winners, three athletes won the competition through the first method in 8 minutes, and the rest through the second method (four in stage 5 and the rest in stage 4).

The competition significantly increased blood lactate levels (Pre exercise it was 3.2 ± 0.7 mmol and immediately after exercise was 21.2 ± 1.6 mmol, $P < 0.001$). The changes in the plasma volume were calculated to be 12.9%. In comparison with the resting, the serum calcium ($t_{31} = -10.7. P < 0.001$) and sodium levels ($t_{31} = -20.1. P < 0.001$) showed a significant increase (Figs. 1A and 2A) while the serum potassium level significantly decreased after the competition (Fig.3A). By correcting the raw data for the lost volume of plasma, the serum calcium, sodium, and potassium levels ($t_{31} = 5.1.$ p 0.001 for calcium. $t_{31} = 9.3. p <$ 0.001 $for\ sodium\ and$ $t_{31} = 15.7. p <$ 0.001 $for\ potassium$) decreased significantly (Figs. 1B, 2B and 3B).



(A)

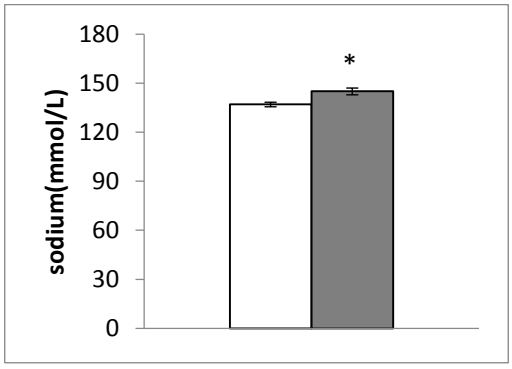


(B)

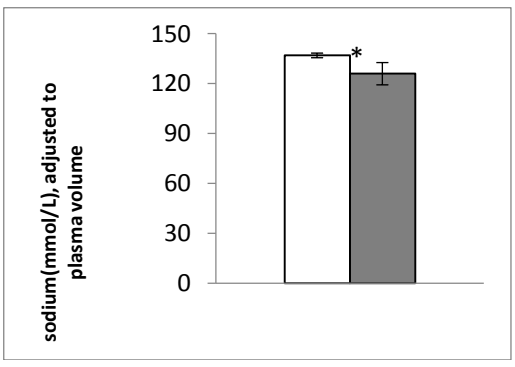
Figure 1. Mean (±SE) values of serum Calcium pre- (open bar) and the immediately after exercise (solid bar).

Upper and lower graphs represent values before (A) and after (B) adjusting raw data for plasma volume changes, respectively. Significant ($P < 0.05$) difference between pre- and the immediately after exercise mean values is denoted by *.

The results showed that there was no significant relationship between QTc interval and Ca, Na, and K in rest before and after adjusting raw data for plasma volume changes (Table2). The risk of type 2 error was calculated for pre-exercise Na, K, and Ca relationships with QTc (Table4).



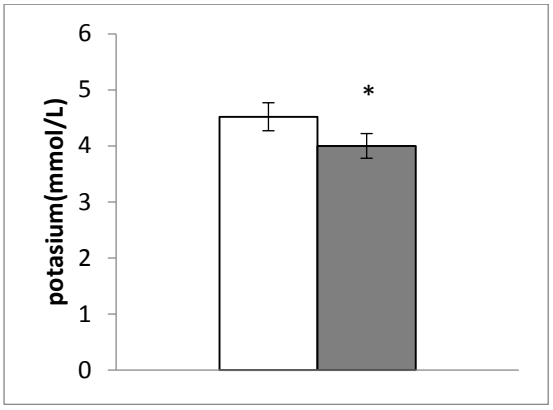
(A)



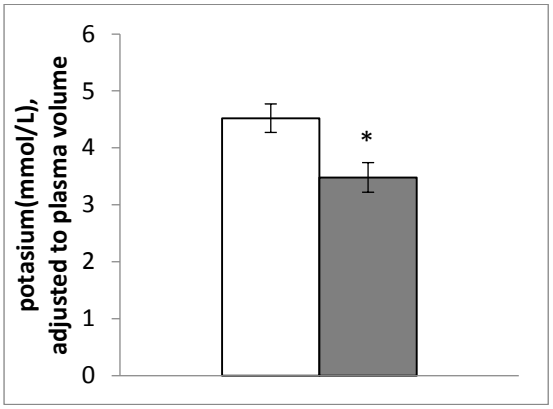
(B)

Figure 2. Mean (±SE) values of serum Sodium pre- (open bar) and the immediately after exercise (solid bar).

Upper and lower graphs represent values before (A) and after (B) adjusting raw data for plasma volume changes, respectively. Significant (P< 0.05) difference between pre- and the immediately after exercise mean values was denoted by *.



(A)



(B)

Figure 3. Mean (±SE) values of serum Potassium pre- (open bar) and the immediately after exercise (solid bar).

Upper and lower graphs represent values before (A) and after (B) adjusting raw data for plasma volume changes, respectively. Significant (P< 0.05) difference between pre- and the immediately after exercise mean values was denoted by *.

Table 2. Correlations between QTc and K, Ca, and Na in rest

QTc	Kpre	Capre	*Napre*
r	-0.31	-0.24	-0.21
P	0.77	0.18	0.23

Table 3. The mean (±SE) values of the ECG parameters (ms)

ECG parameters(ms)	Mean ± SE
QT interval	342 ± 27
R-R interval	727 ± 116
QTc interval	403 ± 30

Table 4. The risk of type 2 error for the Pearson Correlation test.

Ions	K	Na	Ca
Risk of type error 2 (β)	0.09073	0.29599	0.21916

DISCUSSION

In the present study, the results showed that the serum calcium and sodium levels significantly increased as a result of intense exercise activities while the serum potassium significantly decreased. Meanwhile, after adjusting raw data for plasma volume changes serum calcium, sodium, and potassium significantly decreased. No significant relationship between QTc interval and Ca, Na, and K in rest. To our knowledge, this first study determinates the relationship between Na, K, and Ca with QTc in professional athletes.

Reports have shown that the effect of exercise on serum calcium levels is contradictory. Some results showed that the serum calcium level decreases, while others did not show any change or even some showed an increase in the serum calcium level (11). The increase in serum calcium level found in this study may be due to the parathyroid hormone (PTH), which increases the serum calcium level through secretion by bone and the absorption in the intestine and kidney tubules (12). However, the increase in the calcium level might be correlated with the changes in plasma volume (1). As it was seen in the results, the serum calcium level decreased after the correction of raw data for the plasma volume change was made. Additionally, it has been shown in some papers that increased levels of PTH do not play a role in increasing calcium levels during exercise. Moreover, two other physiological events can occur in high-intensity exercises to reduce serum calcium level: increased sweating and hematocrit. Given that it is not possible to quantify the sweat loss, it can be suggested that calcium loss is somewhat related to the decrease in plasma volume, and it can be shown that changes in plasma volume are associated with the loss of calcium in sweat. As shown by the measurement of hematocrit, a possible explanation might be that the plasma volume has returned to the baseline value at this time, while the calcium loss in sweat has not yet been compensated (11). Another possibility is that the calcium loss from sweating was greater than its release from bone cells (23). However, it must be noted that the hypothesis of sweat calcium reduction should be empirically verified (1). In addition, it is possible that in response to high-intensity exercises, more calcium

ion enters the muscles and the neural tissue in order to help neural signals (23). On the whole, considering the results shown in this study, it can be concluded that one cannot accurately estimate the serum calcium level since the difference of the estimated calcium concentration with the plasma volume changes obtained by the Dill and Costill equation can be due to the measurement error of Hematocrit, hemoglobin and calcium level. In any case, in short-term exercises, the correlation between calcium and plasma volume reduction is closer (1).

It has been shown that in high-intensity exercises, sodium levels have increased significantly, and it is possible to increase the activity of $Na^+ - K^+ - ATPase$. This enzyme additionally catalyzes the intercellular ATP hydrolysis to release more energy and, hence, maintains the extracellular sodium concentration (23). However, having corrected the data for the plasma volume changes, the serum sodium decreased significantly. The competition may lead to dehydration due to severe loss of water and sodium (12). The loss of sodium can result in a loss of plasma volume, releasing antidiuretic hormone (ADH). This causes kidneys to re-absorb water, to dilute the blood sodium, and to increases the chance of hyponatremia (4). Moreover, the cause of sodium changes has not been well-established in the literature (6, 12, 23). There is a non-significant negative relationship between QTc interval and serum sodium, which is similar to the research results that showed a non-significant negative relationship between the serum sodium and QRS duration in athletes (4).

The serum potassium showed a significant decrease immediately after the exercise, and this behavior was also seen before and after the raw data correction for the plasma volume changes. Some studies have demonstrated that this decrease can be attributed to an enhancement in the sodium uptake by skeletal muscle cells for using in Na+-K+ pump (6). Nonetheless, it must be noted the results of the present study is in contrary to many other studies that have shown serum potassium level increases in the post-exercise state (4, 12). In a research, it was shown that the serum potassium level is linearly correlated to the exercise intensity (17). Since humans' skeletal muscles contain the largest single pool of potassium, the increase in the potassium level can be ascribed to the secretions by the muscle cells (6, 12). The reason why the potassium level decreases immediately after the exercise is not completely clear; however, it seems that it is partly due to the uptake of the secreted potassium ion and partly due to the response induced against the parasympathetic system to optimize the cardiovascular system during the relaxation (12). In the present research, it was shown that the QTc interval has a positive non-significant relationship with the potassium level in the pre-competition while having a negative non-significant relationship with the potassium level in the immediately after competition. Begum and Rahman have reported that the QRS duration has a positive non-significant relationship with the serum potassium level (4).

Body mass, body fat and muscle mass are associated with sodium, potassium and calcium levels. Oh et.al reported that higher sodium excretion is associated with higher risk for obesity and it is related to abdominal obesity (20). Yi and Kansagra reported that higher sodium intake is related to higher body mass index (24). Murakami et.al indicated that higher potassium intake is associated with lower risk of obesity (19). Kamycheva et.al showed that calcium intake has opposing effect on body weight (14). A previous study reported that higher sodium excretion, reflecting higher sodium intake, is associated with decreased muscle mass. High sodium intake may result in potassium excretion, which is related to lower muscle mass (9, 13). Due to the high muscle mass of the participants and their low body fat, this can affect changes in sodium, potassium and calcium levels.

CONCLUSION

The results of the present study suggest that the changes in the calcium and sodium levels showed a significant increase immediately after the competition; however, after the correction for the plasma volume changes, a significant decrease was seen. The serum potassium showed a significant decrease immediately after the competition, and this behavior was also seen before and after the correction for the plasma volume changes. The response to the high-intensity sports and the mechanism governing these changes can be multicausal. It is recognized that there are limitations to the results of the present study. For example, the subjects' nutrition programs, dietary supplements, exercise supplements, and drugs had not been controlled. The intake of sodium, potassium, and calcium can affect their serum changes (11, 18). Since the subjects of this study had participated in a single competition, the researcher was not able to control this restriction. Accordingly,

more studies under controlled conditions are needed to investigate the precise relationship between QTc interval and serum ions.

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CONFLICT OF INTEREST

The authors and funding agents declare that they have no conflict of interest. The results of the study are presented clearly, honestly, and without fabrication, falsification, or inappropriate data manipulation.

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The Relatıonship Between Functional Movement And Body Stability With Service Speed On Veteran Tennis Players

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Abstract

The purpose of this study is to investigate the effect of functional mobility analyse and body stability on service performance among veteran tennis players. 25 veteran (senior) players (X̄age: 40.79±4.2) who are active licenced, have participated in the study voluntarily. The analyse of body stability of participant group has been done by using 4 core endurance tests; plank test (PT), lateral bridge test (LBTdom./non-dom.), flexor endurance test (FET) and extensor endurance test (EET). The evaluation of the participant's mobility ability has been done with Functional Movement Screening test (FMS). Service performance scale has been conducted with Sports Radar Speed Gun SR3600. Participants have been asked for serving 8 times at maximal speed, the shots would be aimed at the cross service box with the dominant hand, accordingly with the tennis rules, balls which are hung to the net and out of service court (out) have been invalidated. Spearman Rank Order correlation analyse has been done on the gathered data by considering normality distribution at SPSS for windows 20.0 programme. In conclusion; a relationship couldn't be found between the FMS and service performance speed rates of veteran (senior) tennis players. While it has been seen that there is a relationship between service performance speed and from the body stability core endurance tests; LBT (dominant), ($p<0,05$; $r=0,550$) FET ($p<0,05$; $r=0,426$) and EET ($p<0,05$; $r=0,460$), a relationship between PT and LBT(non-dom.) and service performance and between FMS and body stability core endurance tests hasn't been encountered. A healthy psychical structure with a wide range of mobility can contribute to the performance of a variety of sport branches including tennis. When the role of service performance in a tennis match has been taken into account, it has been considered as one of the most important part of a play. For the studies that can be done in the future, with increasing the number of subjects, also using video analyse system can be recommended.

Keywords: Tennis, Tennis Service Performance, Functional Movement Screen, Body Stability

INTRODUCTION

Today, tennis, which attracts the attention of many people, is preferred as a sports branch that appeals to a remarkable audience by increasing the number of spectators and actors (31). Tennis, which is a sports branch that can appeal to all age groups, continues its development and population, as well as creating positive health effects for individuals of all ages and has become a sports branch that contributes to mental and physical development by showing its positive physiological and psychological advantages (31, 35).

Tennis is also considered as a racket sport that requires good physical strength. One of the key points in increasing the success level of athletes is due to their physical fitness being at the highest point possible. An athlete with maximum physical fitness reflects the technical and tactical skill components on the field in the best way (33). At the same time, the desired level of physical strength is

one of the most important factors affecting the result of the competition. For this reason, it is an important guiding factor to evaluate the physical properties and act according to this situation for the athlete. The high level of physical fitness in this sport has a positive effect on the athlete in the nature of tennis, such as rapid changes of direction, fast and strong arm movements and jumps, and reflects on the field as a performance enhancer (1, 8, 10). Considering such situations, the importance of evaluating sportive performance increases for researchers (47). A healthy physical structure is extremely important for the athlete to increase performance. Having an injury-free season will provide a great advantage in terms of athlete performance.

Experts have recently developed some methods to minimize the risk of disability (38). One of them is functional movement analysis developed by Cook et al. (2006). Although it has more than one evaluation area, it is used to determine whether there is a risk of disability in individuals. At the same time, although it meets an important expectation in determining the general functional performance of the athlete, it is considered as a comprehensive test that examines the basic movement patterns (19, 28). Another issue that the researchers who work on the subject aim to solve while applying the functional movement analysis on the athletes is to examine the individual asymmetric structures of the athletes and to evaluate the stabilization and mobilization situations that create the movement (44). The importance of the core zone also becomes evident in stabilization and mobilization situations.

Core muscles are seriously important as they act as a protective mechanism in protecting the spinal cord from unhelpful and unexpected forces in the prevention of a disability-like adverse situation and in basic movement patterns. The core is defined in most literature as the lumbo-pelvic-hip complex, as well as the midpoint of our center of gravity and the place where movements begin. Another explanation of the definition of core is defined as the spinal part being supported by the abdominal and spinal muscles at the time of movement and moving to its active position and maintaining this condition (14, 15).

The central core has a serious functional importance in providing stabilization in the athlete's body (41). All movements start from the core region before transferring to the extremity that will apply the movement. Evaluation of the strength and stability of the core region, which is the power transfer process between the upper part of the body and the lower part shows parallelism how strong your athlete will be (32). While evaluating the performance of the athlete, core stabilization, which is at the maximum level possible, supports the upper and lower extremities to reach such high strength values (42).

The muscles in the core are a factor that will reflect on the athlete's mobility in the court (15). Considering the importance of the core region in branches such as tennis where there is a sudden change of direction, swings, rotations and jumps are quite high during the game, however, in branches such as tennis where overhead throws are important, core stabilization and strength become undeniably important (42).

The service shot, which we consider as the beginning of the game when it comes to overhead shooting in tennis and which can also affect the outcome of the match in tennis, is an extremely important component for tennis players. A very good service shot is associated with a strong shooting action. The most important goal in the service shot is to send the ball to the opposite court at maximum speed. In this case, the player can move directly to get the point. It is important not to disrupt the coordination of the leg and arm muscles as well as the abdominal, chest and back muscles in order to throw the service shot as quickly as possible. (4, 18, 20, 45).

Today, tennis is not only a sport branch performed by elite players, but it is a game played with interest from young age groups to veteran players who have reached a certain status. Considering the literature in our country, there are studies on elite and young age groups dealing with tennis. (13, 42). However, in the accessible literature, there has been no previous study on veterans (seigneur) tennis players. Evaluating the requirements of tennis in terms of a healthy body

and performance in tennis may also be important for veteran tennis players.

The service shot, which is one of the important parts of the game during tennis competition, can earn the player points directly with a powerful shooting action. The good mobility of a healthy body and the level of functional performance can be considered as important parts in the service shot. At the same time, the core region, which is known as the starting point of movements in many sports branches such as service shooting, and is in good condition, can also perform the task of stabilizing the body and successfully reveal the movements and performances depending on the movements. Based on these considerations, this study aimed to investigate the relationship between functional movement and body stability with service speed.

MATERIAL AND METHOD

Study Group

25 active male veterans (seigneur), (Xage: 40.79 ± 4.18 years; XSport age: 15.75 ± 5.47 years; X Height: 178.79 ± 6.00 cm; XWeight: 81.00 ± 5.6 kg; XBMI (kg / m^2) 25.33 ± 1.93), who are licensed by the Turkish Tennis Federation, who have at least 7 tournament experience, who play tennis for at least 6 hours a week and who have been approved that they do not have any health and disability problems, and who are willing to participate in the study, participated in the study.

Collection of Data

After the participants were informed about the purpose of the study, the method of application of the tests was shown and explained.

FMS measurements of the individuals participating in the study were carried out without any warming and adhering to the order in the test procedure. After each test of functional movement screen tests was explained to the participant verbally and visually, 2 trials were given for each test.

Before the body stability tests, the individuals were given a 10-minute warm-up period, and then the test phase was started. After the core durability tests were explained to the participant verbally and visually, the shape of the body position during the tests was shown.

Before evaluating the service speed, the participant was given a 10-minute warm-up period specific to tennis and service shots. After the player completed the warm-up time, he was asked to serve 8 services to the cross service box by the dominant hand. At the end of 8 services, the service shot with the maximum value in terms of speed from the successful services (not getting the ball caught in the net and throwing it into the desired service box) was taken into consideration.

Taking into account the effects of weather conditions, service speed measurements were made on the closed court. All measurements were made by the same person in the indoor courts of Sakarya Tennis Club.

Data Collection Tools

Height, body weight and body mass index measurement

Height measurements were taken using the Seca brand portable height meter. Body weight and body mass index measurements were measured using the Tanita BC 545 N InnerScan easily portable body composition measuring device (28).

Functional movement analysis test (FMS)

This test consisting of 7 test protocols; 1-deep squat, 2-hurdle Step (bilateral), 3-inline lunge (bilateral), 4-shoulder mobility (bilateral), 5-active straight-leg raise (bilateral), 6-trunk stability push up, 7-rotary stability (bilateral), performed using a special test kit, developed by Gray Cook, evaluated over 21 points is applied according to the sequential procedure specified. At the same time, after tests of shoulder mobility (bilateral), trunk stability push up, rotary stability (bilateral) the clearing test was applied. Cleaning and control tests are tests that are evaluated with control movements specific to the test for the presence of pain and any problems after the movements of the test are completed (39). Test participant did 2 trials before each test, and then did 3 repetitions in each test evaluated for scoring (30). The score given to the participants is between 0-3 in each test. 3 points are given when the movement is done exactly as desired, 2 points when there are

some disruptions in the movement, 1 point when there are disruptions in most of the movement, 0 point is given if pain is felt during the movement.(25, 40). The lowest score was evaluated in the tests performed bilaterally (36, 43).

Body stability core endurance tests

These tests, developed by McGill et al., are used to evaluate the strength of core muscles and their ability to maintain their position during these test movements. (2, 9). At the same time, these tests are also used when evaluating the possibility of injury in the core region, evaluating the specific performance of any branch and examining the relationship between performance and core strength (23, 24).

Plank test (PT): The person participating in the test was positioned on his toes and elbows, the feet took the shape of plantar flexion and the whole body was made straight. The person participating in the test was positioned on his toes and elbows, the feet took the shape of plantor flexion and the whole body was made straight. It was recorded taking into account the time that the person held the position (2, 17).

Lateral bridge test(LBT): The person participating in the test was placed on his side, standing on his elbow, allowing the hip and body to take a stable position with one foot on the other. It was recorded taking into account the time to keep the current position. This test was done on both parts of the body, right and left (17, 27).

Flexor endurance test (FET): The person included in the test was asked to touch his shoulders by positioning his hands in a cross. The body was lifted close to the sitting position at an angle of 90 degrees parallel to the floor and the hip was brought to the flexion position. At this stage, both knees were brought to 90 degrees of flexion. The period that the person could stand while maintaining this position was taken into account (3, 21).

Extensor endurance test (EET): The person participating in the test was laid face down on the table with the support of the foot and calf section and taken into the space, including the body from the iliac part to the head level. Hands were placed crosswise to touch the shoulder. The foot section is fixed. The time that the person could stand in this position was taken into account by evaluating the stopwatch (6, 37).

Service Speed Measurement

Service speed was measured with Speed Gun Radar 3600 device. While the person applying the test was performing the service shot, service speed was measured at an angle of 10 degrees from 2 meters behind the participant towards the section where the service would be shot, taking into account the height (48).

RESULTS

Body stability of the study group, descriptive statistics on FHA and service speed, the correlation results between service speed and body stability tests and FHA are shown in Table 1 and Table 2, respectively.

Table 1. Descriptive Statistics of the Participants

	n	Mean	SD	Min	Max
Body stability (sn)					
PT	25	72,46	31,51	49,68	220,82
LBTdom	25	60,35	13,89	40,17	90,1
LBTnondom	25	53,65	11,22	33,9	72,74
FET	25	35,65	7,87	18,75	49,64
EET	25	77,18	27,81	38,47	172,58
FMS (point)	25	15,96	2,51	10	20
Serve speed (km/h)	25	140,16	12,50	121	170

Table 2. The Correlation Table Of Serve Speed and Body Stability and FMS			
	Serve Speed		
	r	R^2	p
Body stability			
PT	0,11	1,32	0,58
LBTdom	,550**	30,2	0,00443*
LBTnondom	0,39	15,18	0,054
FET	,426*	18,19	0,033*
EET	,460*	21,18	0,020*
FMS	0,16	2,43	0,46

When looking at the results, the service speed and the lateral bridge dominant, ($p < 0.05$; $r = 0.550$) Flexor endurance ($p < 0.05$; $r = 0.426$) and Extensor endurance ($p < 0.05$; $r = 0.460$) are seen that there is a positive significant relationship at the level. There is no relationship between service speed and Plank test and lateral bridge non-dominant tests (p>0,05).

As a result of the obtained results, it is seen that there is no relationship between service speed and functional movement analysis. (p>0,05).

Since the functional movement analysis test scoring is stated in the literature that the FMS score should be above 14 in order to reduce the risk of injury (46), it is divided into two as tennis players with 14 points or less and those above 14 points and the difference expressing the relationship between these ratings and service speed is shown in Table 3.

Table 3. Correlation Table Between Serve Speed and FMS 14 Point or Less and Above 14						
	FMS (score)	n	Serve Speed (km/s) X	SD	Z	p
Serve Speed and FMS	***14 point or less***	9	137.8	11.02	-652	0.514
	above 14	16	141.5	13.80		

Considering the results, a significant difference was not observed between the tennis players with a score of 14 points or less on the Functional Movement Screen test and the service speed of the tennis players with a score above 14 points (p>0,05)

The correlation analysis between the service speed and the functional movement analysis and core endurance tests whose effect is to be investigated is shown in Table 4.

Table 4. Correlation Table Between FMS and Body Stability Tests						
		PT	LBT*dom*	LBT*nondom*	FET	EET
FMS	**r**	0,045	0,35	0,10	0,12	0,28
	R^2	0,20	12,17	0,97	1,49	8,17
	p	0,83	0,087	0,64	0,56	0,17

It was found that there was no relationship between any of the functional movement analysis and body stability tests.

DISCUSSION

Serving in tennis is one of the most important parts of the game. The player with a strong serve has a significant advantage in the game (5). A maximum level of service shot is about a powerful shot and the quality of the movement dynamics that make that shot (45). Considering the service shooting kinematics, body stabilization, lumbo pelvic and core region is an important area for service throw, but also has an important place in the movements inherent in the service by affecting the development of strength, distal mobilization and proximal stabilization (22). In addition, having a good level of body stabilization minimizes possible injury risks (16). While serving in tennis is the most important part of the game, it is also considered as the heaviest shot. Coaches strive to avoid the risk of injury in development work to take the service to a better level (29). Functional movement screen, which is frequently used today in order to predict these injuries and then take the necessary measures, is also a test tool for evaluating many movement components. Functional movement screen is a test protocol to be used in many sports branches, including tennis (12). Elements such as lower extremity, upper extremity, body and rotation of the

body are very important in the service shot (11). Functional movement analysis stands out as an important tool in evaluating the effectiveness of working limbs and regions while performing these movements. Having the service performance at the maximum level after being able to estimate the risk of injury and taking the necessary precautions and bringing the mobility to a good point is one of the important components (29). The aim of this study is to investigate the effect of body stabilization and functional movement analysis on service speed on veteran tennis players. In conclusion, when the results were evaluated, while there is a moderate relationship between the LBTdom., FET, EET and service speed ($p < 0.05$), there is no relationship between PT, LBTnon-dom. and service speed.($p>0,05$). There is no relationship between functional movement analysis and service speed. ($p>0,05$). No relationship has been found between FMS and body stability tests performed to evaluate the relationship between service speed and them. ($p>0,05$).

While studies that directly examine the relationship between body stabilization and service speed are not found in the accessible literature, after measuring service speed, certain core training programs were applied and it was examined whether there was a change in service speed at the end of the training program. In one of these studies, 24 tennis players in the 11-13 age range with an average age of 11.9 were divided into two, as 12 training group and 12 control group. After the service speed measurements were made, an 8-week periodized core training protocol was applied, and then service speed was measured again. In this study; conducted on two groups divided into training group and experiment group, the service speed of the experimental group did not change, while the average service speed of the group included in the 8-week core training program varied by approximately 8 km/h. (42). However, when this study is compared with the mentioned study, the importance of age groups is also revealed. If the skill learned at a young age is gotten stronger than the skill to be learned at an advancing age, the improvement in performance can be noticed by applying the correct training methods (such as core training) with the right technique.When we think that the active functioning of the muscles is negatively affected as the age progresses (Ackland et al., 2009), better information can be obtained from the results of the measurements made after the studies are started as early as possible and continued at an advanced age as much as possible. In another study similar to this subject, 30 tennis players at the age of 13 who participated in national level competitions were applied core training 3 times a week for 6 weeks, as well as different training methods (such as pliometric). The service speed of the players was checked before and after training. As a result, in the mentioned study, it is interpreted that core training and other training methods (such as pliometric) caused an increase in the service speed of the players (12). The results of these studies are that the core training program will affect the service speed. Looking at this study, a moderate relationship was found between the LBTdom., FET and EET and service speed. There was no relationship between PT and LBTnon-dom tests and service speed.

The core training program to be made for veteran tennis players and its relationship with service speed at the end of this program can make the findings of this study more understandable.

In another study, hobby tennis players with a mean sport age of 3,4 years were divided into two as the control group and the study group after measuring their service speed, and core training methods were applied to the study group for 8 weeks. Although the core strength measurements made in the pre-test increased in the study group after the post-training tests, no significant relationship was found with the service speed after the training procedures. At the end of this study, it was concluded that core training could not only positively affect the service speed, but could be improved with the coordinated work of the lower and upper body strength and the involvement of other fitness elements (Smart et al., 2011). In order to make a better interpretation of the relationship between some tests performed in our study and service speed (LBTdom., FET and EET), and some lack of relationship (LBTnon-dom), during the service, correcting technical errors, if any, and increasing the number of participants participating in the study and making the measurements later can give more supportive information about the result.

In a study, anterior abdominal strength test and side abdominal strength test, lower and upper body angular velocities were applied to 24 tennis players between the ages of 12 and 19, and the racket speed values in contact with the ball were taken. Later, the athletes were included in the 5-week lumbo-pelvic

stabilization training program consisting of 5 levels. The tests, which were first performed again after the training program, were applied to the athletes. As a result of the study, it was concluded that at the end of the Lumbo pelvic stabilization training, an increase was observed in the tests applied on the athletes and that the service speed was also positively affected by affecting the contact speed of the racket with the ball (7). In addition to overhead shots and core training such as service shots, the relationship between throwing and throwing sports and shooting and core training methods was examined. 3. league baseball team players were divided into two groups, one group applied closed and open chain exercises training procedure, and one group applied an extra core stabilization training program. At the end of the study, the throwing rate of baseball was found to be higher in the group that did extra core training (26). During the service shot in tennis, considering that power generation in body rotation and energy transferred to the extremities in the kinetic chain (11), when evaluating the body's position of entry into rotation in the move made after throwing the ball into the air during the service in tennis, it can be thought that the applied core training procedure may cause more acceleration by affecting the rotation speed of the body and then an increase in the service speed with the greater force transferred to the ball.

In the available literature, there is no study investigating the relationship between FMS and tennis service, overhead shooting or throwing sports branches. Regarding this situation, FMS athletes may not give healthy results in terms of evaluating strength and performance, it is commented that explaining the relationship between FMS and performance is a complex situation (30,34). When we look at the results of our study, although the mean service speed of the participants whose average score of the FMS test was considered as 14 points, was higher than the participants with 14 points or less, no significant difference was observed between the two groups considering that the FMS subtests are performed slowly and in a controlled manner, and considering that the service shot technique in tennis is performed at maximum speed, it can be said that there are different movement speeds between the two situations.

One of the studies investigating the relationship between core stabilization and functional movement analysis included male and female groups consisting of 28 people with an average age of 24, who did various sports as a hobby and did not have a disability problem. At the end of the study, there was no relationship between core stabilization and functional movement analysis test. One of the comments made about the results of the study is that people with a strong core muscle structure may get low scores on the FMS and at the same time, the opposite opinion is that people with a weak core stabilization structure may have high success in FMS. Another comment is that explaining the relationship between performance and FMS and core stabilization is considered a complex situation (30). When we look at our study, no relationship was found between functional movement analysis and body stability core endurance measurements. The findings obtained are in parallel with the study.

Service shot is one of the most important elements in the game of tennis. The maximum level of service performance can be considered a great advantage for the players during the game.

During the service shot, which is considered one of the heaviest and most valuable shots of the tennis game the application of incorrect technique can be misleading for many studies (29). For this reason, the application of video analysis method together with the core measurements to be made in the future studies, and if there is a mistake made by the player based on the technique, the measurement results to be made after improving this error in the right direction and the effect of these measurements on the performance can be understood better.

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The Effect Of Servıce Qualıty On The Satısfactıon Level: A Case Study In Mersın Provınce

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Abstract

This study seeks to investigate to determine the differentiation situations according to some demographic variables of the individuals who are engaged in recreational activities in Mersin for a healthy life in an attempt to reveal the effect of the service quality on the satisfaction level. The sample group of the study was determined via convenience sampling method, and individuals preferring recreational activities in Mersin were chosen on a voluntary basis. A total of 424 participants, 158 female (37.3%) and 266 male (62.7%), participated in the study. The questionnaire form was used to collect research data and the scale of "Service Quality and Customer Satisfaction" consisting of 38 questions developed by Süllüoğlu was used to measure the service and satisfaction levels of the participants when being engaged in recreational activities (18). In the analysis of the data obtained in the study, the percentage and frequency were used to determine the distribution of the personal information of the participants, while the skewness and kurtosis values of the data were checked to determine whether the data showed a normal distribution. The analysis revealed that the data has a normal distribution. In addition to descriptive statistical models, t-test and Anova analysis methods were used in the statistical analysis of data (α = 0.05). As a result, significant differences were found in sub-dimensions regarding the service quality and satisfaction levels of the participants according to variables including gender, level of welfare, and the frequency of use at the facility.

Keywords: Service quality, customer satisfaction, recreational activities

INTRODUCTION

The customer is defined as the end-user of the goods or services. Today, the concept of customer has ceased to be the person who pays money, and everyone who benefits from the goods or services produced has started to be seen as customers (3). Satisfaction can be evaluated as the response of the customer to the desired and expected service (11). Customer satisfaction is a psychological concept that involves the feeling of well-being and pleasure that results from obtaining what one hopes for and expects from an appealing product and/or service (14). Achieving customer satisfaction stands out as an important responsibility for managers in the developing sports services industry. Customer satisfaction plays a key role in the success of for-profit organizations. One of the important criteria for the success of a sports facility is to avoid losing its customers. Acquiring new customers is five times more expensive than maintaining an existing customer. Customer loyalty is a product of increasing customer satisfaction and service quality (13).

Recreational activities attract more and more people day by day as such activities have positive effects on people's physical and mental health (16). Increasing technology and mechanization have a decreasing effect on people's movement, and lack of movement can be the source of various health problems, particularly in the future (15).

Recreational activities have become more important for people in that they allow them to lead a healthy life, and thus, the interest in fitness and

recreational activities in their free time has increased. As a natural consequence of this, there has been an increase in the number of facilities such as fitness and sports centers and health clubs where these activities can be conducted (20). Today, facilities preferred for recreational activities, as well as being user-centered, are expected to achieve user satisfaction as institutions that provide services. Therefore, the provision of services, activities, and products is important for facilities (6).

As in all businesses, management concepts that can provide quality service that fits in with customers' wishes and needs and keep the satisfaction level high should be adopted for recreational activities. Today, developments in different fields and rapidly changing conditions can lead to changes in the needs and expectations of people. Therefore, sports businesses should also create new trends, renew their equipment, update themselves on the training, and expand the physical and social facilities offered by the facilities under current conditions. In this process, companies that keep up with current conditions and respond to the demands, needs, and expectations of customers in a short time through adaptation will be preferred more. For, it is believed that facilities offering recreational activities may be preferred providing that customer satisfaction is achieved and high-quality service is provided (20).

METHOD

This section includes the research model, the population and sample, the measurement tools used in data collection, and the data collection and analysis.

Research Model

A descriptive survey was used in this research. Survey models attempt to describe a situation that existed in the past or exists for the time being as it is (8). In this study, the opinions of the individuals receiving service in private sports centers in Mersin province regarding their service quality and satisfaction levels are examined and the differentiation situations of the participants' opinions according to some demographic variables are presented.

Population and Sample

The population of the research consists of a total of 424 participants, 158 of whom are women and 266 men, who are engaged in recreational activities in Mersin for a healthy life. While determining the sample group, the convenience sampling method was preferred. Büyüköztürk et al. (1) defined convenience sampling as the selection of the population that is close to hand and applicable due to existing limitations such as time and labor.

Data Collection Tools

A questionnaire form was used to collect the research data. The relevant questionnaire consists of two sections. The personal information section of the form includes the variables of the participants' gender, age, education level, the use of time at the facility, frequency of use of the facility and level of welfare. In the research, a scale developed by Süllüoğlu (18) consisting of 38 questions in total was used to test the relationship between service quality and customer satisfaction. The 22-item SERVQUAL scale developed by Parasuraman et al. (12) was taken as a basis for the measurement of service quality. Since the service quality is the measurement of sports centers, questions about service quality and customer satisfaction were added to the scale after the literature review, by receiving opinions from academicians, practitioners, and members working in this field. Factors obtained as a result of factor analysis are given the names of "Competence", "Customer Satisfaction", "Empathy", "Physical Elements", "Reliability" and "Enthusiasm", taking into consideration the Servqual Model. The scale is a 5-point Likert type and graded as Strongly Disagree (1) and Strongly Agree (5). The scale of “Service Quality and Customer Satisfaction”, whose validity and reliability was conducted by Süllüoğlu (18), was used to measure the service and satisfaction levels of the participants from private sports centers.

Data Collection

To use the data collection tool in the research, the study of Süllüoğlu (18) was used in the current study by giving reference to the source in the text and on the scale. The individuals who participated in the study were selected on a voluntary basis. Besides, the participants were informed that the data

obtained would not be shared with secondary and tertiary individuals and would be kept confidential.

Data Analysis

The data of the research were analyzed using the SPSS for Windows 22.0 package program. In the analysis of the data obtained in the study, the percentage and frequency were checked to determine the distribution of the personal information of the participants, while the skewness and kurtosis values of the data were checked to determine whether the data showed a normal distribution. As a result of the analyses, it was determined that the data has a normal distribution. According to Jondeau and Rockinger (7), when the coefficients of skewness and kurtosis of the sub-dimensions range between +3 and -3, these sub-dimensions are suitable for normal distribution parameters. In addition to descriptive statistical models, t-test and Anova analysis methods were used in the statistical analysis of data ($\alpha = 0.05$).

FINDINGS

Table 1. Distribution of Scale Scores

Sub-dimensions	Number of Items	N	Mean	Ss	Skewness	Kurtosis
Competence	18	424	4.29	.726	-1.00	.528
Customer Satisfaction	6	424	4.26	.850	-1.30	1.39
Empathy	3	424	4.29	.783	-1.06	.843
Physical Elements	2	424	4.28	.824	-1.06	.833
Reliability	3	424	4.38	.782	-1.31	1.43
Enthusiasm	3	424	4.45	.716	-1.69	3.54

Table 2. Demographic Information of Participants

Variables		f	%
Gender	Female	158	37.3
	Male	266	62.7
	Total	**424**	**100**
Age	17-25	163	38.4
	26-33	194	45.8
	34 and41	47	11.1
	42 and over	20	4.7
	Total	**424**	**100**
Educational Level	Secondary Education	17	4.0
	High School	174	41.0
	Undergraduate	79	18.6
	Bachelor's Degree	130	30.7
	Graduate	24	5.7
	Total	**424**	**100**
The use of time at the facility	1 month and under	42	9.9
	2-5 months	130	30.7
	6-9 months	92	21.7
	10-12 months	57	13.4
	1-3 years	68	16.0
	3-5 years	20	4.7
	5 years and over	15	3.5
	Total	**424**	**100**
Frequency of use of the facility	Every Week Day	78	18.4
	1-2 days a week	125	29.5
	3-4 days a week	211	49.8
	1 day in 2 weeks	5	1.2
	1 day a month	5	1.2
	Total	**424**	**100**
Level of welfare	Very bad	3	.7
	Bad	16	3.8
	Normal	173	40.8
	Good	151	35.6
	Very good	81	19.1
	Total	**424**	**100**

The averages of the scores of the participants in the study within the scope of service quality and customer satisfaction scale are given in Table 1. Accordingly, it was determined that the highest average was 4.45 in the sub-dimension of enthusiasm. Besides, considering skewness and kurtosis values , it was determined that the data were suitable for normal distribution

As can be seen in Table 2, 62.7% of the participants in the study are male, 45.8% are in the age range of 26-33, the educational level of 41% is high school, 30.7% of them use the facility for 2-5 months, the use of the time of 49.8% is 3-4 days a week, and the welfare level of 40.8% is normal.

Table 3. Distribution of Scale Scores According to the gender variable

Sub-dimensions	Variable	Mean	Ss	T	p
Competence	Female	4,3383	,59738	.955	.000
	Male	4,2686	,79288		
Customer Satisfaction	Female	4,3291	,67719	1.22	.000
	Male	4,2249	,93771		
Empathy	Female	4,3017	,71560	.171	.056
	Male	4,2882	,82241		
Physical Elements	Female	4,2373	,80543	-.856	.278
	Male	4,3083	,83603		
Reliability	Female	4,4008	,68112	.396	.001
	Male	4,3697	,83775		
Enthusiasm	Female	4,4367	,66550	-.304	.806
	Male	4,4586	,74631		

It is clear from the results of the t-test between the service quality and customer satisfaction sub-dimensions according to the gender variable, there was a significant difference in the sub-dimensions of "Competence", "Customer Satisfaction" and "Reliability" ($p < 0.05$).

Table 4. ANOVA Test Results According to the Age of Participants

Sub-dimensions	Variable	Mean	Ss	F	p
Competence	17-25	4,2458	,80896	1,366	,253
	26-33	4,3663	,67153		
	34-41	4,2447	,65669		
	42 and over	4,1139	,65125		
Customer Satisfaction	17-25	4,1800	,99570	1,319	,268
	26-33	4,3522	,75452		
	34-41	4,2199	,72491		
	42 and over	4,1917	,67164		
Empathy	17-25	4,2188	,86732	,968	,408
	26-33	4,3591	,73008		
	34-41	4,2979	,74934		
	42 and over	4,2500	,62008		
Physical Elements	17-25	4,2638	,85583	2,399	,067
	26-33	4,3634	,76052		
	34-41	4,1702	,89246		
	42 and over	3,9000	,91191		
Reliability	17-25	4,3395	,85464	,906	,438
	26-33	4,4450	,72904		
	34-41	4,2695	,74093		
	42 and over	4,3667	,76395		
Enthusiasm	17-25	4,4172	,79552	1,571	,196
	26-33	4,5241	,64983		
	34-41	4,3262	,65382		
	42 and over	4,3000	,76395		

According to the results of the ANOVA test conducted between service quality and customer satisfaction sub-dimensions according to the age variable, there was no significant difference between sub-dimensions and age ($p > 0.05$).

Table 5. ANOVA Test Results According to the Level of Welfare Variable

Sub-dimensions	Variable	Mean	Ss	F	p
Competence	Very bad	3,7037	1,42761	23,380	,000
	Bad	3,5174	,82495		
	Normal	4,0334	,74330		
	Good	4,4673	,59905		
	Very good	4,7058	,49053		
Customer Satisfaction	Very bad	3,4444	2,11695	28,483	,000
	Bad	3,1667	1,10219		
	Normal	3,9557	,87712		
	Good	4,4768	,65122		
	Very good	4,7716	,46804		
Empathy	Very bad	3,7778	1,34715	23,044	,000
	Bad	3,3542	,89002		
	Normal	4,0193	,76225		
	Good	4,5143	,66748		
	Very good	4,6708	,61800		
Physical Elements	Very bad	3,3333	1,15470	24,091	,000
	Bad	3,4688	,84595		
	Normal	3,9711	,83997		
	Good	4,5000	,65574		
	Very good	4,7346	,65711		
Reliability	Very bad	4,2222	,83887	17,453	,000
	Bad	3,3542	1,12526		
	Normal	4,1753	,78385		
	Good	4,5651	,61221		
	Very good	4,6872	,70385		
Enthusiasm	Very bad	4,4444	,50918	4,833	,001
	Bad	4,1042	,86683		
	Normal	4,3237	,78291		
	Good	4,5077	,62519		
	Very good	4,6831	,63004		

It is observed from the results of the ANOVA test conducted between service quality and customer satisfaction sub-dimensions according to the welfare level variable, there was a significant difference between all sub-dimensions and the welfare level ($p < 0.05$).

Table 6. ANOVA Test Results According to the Frequency of Use of the Facility Variable

Sub-dimensions	Variable	Mean	Ss	F	p
Competence	1 month and under	3,9802	,98611	4,355	,000
	2-5 months	4,2517	,70974		
	6-9 months	4,5266	,61244		
	10-12 months	4,4825	,64320		
	1-3 years	4,1863	,68948		
	3-5 years	4,1194	,60919		
	5 years and over	4,1333	,79704		
Customer Satisfaction	1 month and under	3,8373	1,13963	4,620	,000
	2-5 months	4,1615	,83937		
	6-9 months	4,5127	,72889		
	10-12 months	4,5205	,66597		
	1-3 years	4,1740	,86695		
	3-5 years	4,2167	,72568		
	5 years and over	4,3111	,81617		
Empathy	1 month and under	3,9365	1,01543	4,243	,000
	2-5 months	4,2179	,78279		
	6-9 months	4,5109	,66382		
	10-12 months	4,5439	,65354		
	1-3 years	4,2108	,79364		
	3-5 years	4,2000	,66138		
	5 years and over	4,1556	,79549		
Physical Elements	1 month and under	3,9643	,94606	2,841	,010
	2-5 months	4,2231	,82373		
	6-9 months	4,4728	,72386		
	10-12 months	4,4912	,69752		
	1-3 years	4,1838	,90975		
	3-5 years	4,2250	,65845		
	5 years and over	4,2333	,97955		
Reliability	1 month and under	3,9286	1,04255	5,015	,000
	2-5 months	4,3487	,76516		
	6-9 months	4,6377	,57555		
	10-12 months	4,5205	,69299		
	1-3 years	4,3529	,78308		
	3-5 years	4,2833	,67776		
	5 years and over	4,0889	1,01939		
Enthusiasm	1 month and under	4,3968	,84018	2,324	,032
	2-5 months	4,3692	,69481		
	6-9 months	4,6087	,64167		
	10-12 months	4,6316	,49875		
	1-3 years	4,3578	,77549		
	3-5 years	4,2000	,94529		
	5 years and over	4,4000	,85635		

It is observed from the ANOVA test results between service quality and customer satisfaction sub-dimensions according to the Frequency of Use of the Facility variable, there was a significant difference between all sub-dimensions and the Frequency of Use of the Facility ($p < 0.05$).

Results and Discussion

The quality perception of the customer regarding the service offered in all service businesses, including those that offer individuals recreational activities for a healthy life, is one of the most essential conditions for businesses to establish superiority in conditions of market competition. The perceived service quality is likely to bring customer satisfaction and customers with a high level of satisfaction are likely to become loyal customers for the business. However, customers' satisfaction with the services they receive will create a reference for other customers. Considering all these factors, it is necessary to provide high-quality service in order to ensure customer satisfaction. In the study designed for this purpose, the main goal was to determine the perceived service quality offered in the sports centers and customer satisfaction regarding the services and to reveal the relationship between perceived service quality and customer satisfaction. Data were collected from a total of 424 participants,

158 women and 266 men, who work in private sports centers in Mersin.

According to the results of the t-test conducted between the service quality and customer satisfaction sub-dimensions according to the gender variable, there was a significant difference in the sub-dimensions of "Competence", "Customer Satisfaction" and "Reliability". This result may be due to the lack of a homogeneous distribution among the participants of the research. Ferrand et al. (5) stated that the services, safety, and image of the fitness center positively affect customer satisfaction. In a similar study conducted by Süllüoğlu (18) to examine the effect of service quality on customer satisfaction in fitness centers, it was determined that not only customer satisfaction but also the service quality elements such as competence, reliability, and enthusiasm differ according to the gender. In the studies of Theodorakis et al (19), it was determined that female satisfaction was lower compared to men in terms of the facility and the service provided. Contrary to the results revealed in the studies, Baş et al. (10) stated that there was no significant difference in the expected and perceived quality dimensions according to the gender variable.

According to the ANOVA Test conducted between service quality and customer satisfaction sub-dimensions according to the age variable, there was no significant difference between the sub-dimensions and age. These results are believed to stem from the fact that ın the wake of technological developments, the facilities are in competition with other private sports centers for service quality and customer satisfaction and thus the services are provided to each age group. Contrary to the findings obtained in the study, Süllüoğlu (18) reported in his study that the competence, reliability, enthusiasm, and customer satisfaction differed by age according to the age variable.

According to the results of the ANOVA test conducted between service quality and customer satisfaction sub-dimensions according to the level of welfare variable, there was a significant difference between all sub-dimensions and the level of welfare. It was determined that this result showed a significant difference in the sub-dimensions of “Competence, Customer Satisfaction, Empathy, Physical Elements, Reliability, and Enthusiasm”. As a result, with the increase in the level of welfare, the expectations and satisfaction levels of the individuals regarding the sports centers differ depending on the increase in the living standards of the individuals.

According to ANOVA Test results between service quality and customer satisfaction sub-dimensions according to the frequency of use of the facility variable, there was a significant difference between all sub-dimensions and the frequency of use of the facility. In his study, Süllüoğlu (18) found that the difference between the perceived service quality and the level of customer satisfaction according to the frequency of use of the facility differs according to the membership duration.

A strong relationship between service quality and customer satisfaction has been proven by studies (2; 17). When service quality assessments are low, the customer's behavioural intentions are unfavourable and the relationship is more likely to be weakened, and behavioural intentions can be viewed as indicators that signal whether customers will remain with or defect from the company (21). Factors such as cleanliness, a good quality, uncongested, and peaceful atmosphere, good ventilation, positive attitudes of the staff, the diversity of sports activities, good quality sports trainers, regularly-running tools and service, a high-quality and reliable service, cheap prices and considering complaints are among the expectations from a good sports center (9). Considering the difference between the average between the expected and perceived quality, one may notice that important information may be obtained from measuring whether individuals can benefit from the fitness center as they wish and whether they are satisfied with the service provided to take measures that will make customers more satisfied when using the fitness center and to improve the service quality offered in the fitness center in line with the customer satisfaction (4).

As a result, operations such as retaining the existing customers of sports centers, developing strategies to acquire new customers, diversifying the services and programs provided, renovating and organizing in-service training and development seminars for the personnel working in the facility should also be carried out in facilities where recreational activities are available. It is believed that applying these questionnaires that determine customer satisfaction and service quality to more participants in different city centers will contribute to the relevant field.

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Investigation of Selected Biomotor Ability And Technical Skills in 10-11 Years Old Badminton Athletes

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Abstract

This study was conducted to investigate the selected biomotor ability and technical skills of 10-11 year old badminton athletes and to determine the relationship between biomotor characteristics and technical skills. The sample of the study consists of athletes who are actively playing badminton in the 10-11 age groups in Kayseri and Batman provinces and have a badminton history of at least 1 year. For this study, French & Stalter badminton test, Lockhart & McPherson badminton test, agility t test, reaction test, vertical jump test and hand grip strength measurement were applied. Pearson correlation, independent-samples t test ve one-way anova test were used for statistical analysis. Significance level was accepted as $\alpha = 0.05$. While there was a negative correlation between technical tests and agility t test results; there was a positive relationship between anaerobic power. No significant correlation was found between vertical jump, hand grip left hand and hand grip right hand and technical tests. While there was a negative correlation between French & Stalter technical test and reaction visual right hand; There was no significant relationship between McPherson & Lockhart technical test. French & Stalter and McPherson & Lockhart technical tests showed no significant relationship between reaction visual left hand, reaction auditory right hand and left hand. As a result of 10-11-year-old badminton athletes selected biomotor ability and the technical skills investigated in this study, while a significant relationship was found between technical tests and agility and anaerobic power, and French & Stalter technique test and reaction visual right hand; vertical jump, hand grip left hand, hand grip right hand visual reaction left hand, auditory reaction right hand and auditory reaction left hand, no significant correlation was found between technical tests.

Key Words: Badminton, technical skills, biomotor ability, agility, reaction.

INTRODUCTION

Today, a lot of training methods are applied to improve the athletes' sports performance and increase the level of success of the athletes. These practices aim to achieve an increase in athlete's performance by considering and developing more than one variable rather than being uniform. Badminton training should also be in this direction and should be capable of providing multi-faceted development of athletes. Because badminton is a sporty game based on being quick, fast and resourceful, coordinating and making decisions quickly (7). In such sports, speed, coordination, strength, reaction, instinct, playing abilities and techniques are expressed as prerequisites for success (4). In the badminton match, which is an individual sports branch that does not host the opponent's contact area, there is a need for jumps, moves, serial changes and serial arm movements (3). The fact that the flight distance of the badminton ball is different and surprising suggests that the reaction time can be important in badminton sport. For this reason, badminton athletes must have a short reaction rate (1, 17). During the Badminton game, the jumps

made by the athletes, the 2-3 meter straight runs and the reactions in the strokes require the explosive power of the badminton athletes to be high (29, 22).

As it is seen, like in many other sports branches, biomotor features have an important place in increasing performance by supporting technical skill (25, 33). If these skills and features are developed in a coordinated manner, a good performance level can be obtained from athletes, otherwise training for technical skills only or for increasing the level of biomotor features may not be sufficient for athletes. For this reason, training should be qualified to ensure the multi-faceted development of athletes with long and short term goals, with plans in line with the requirements of the branch. At the same time, making training plans that will develop these qualities at the right time and amount in accordance with the development period of the athletes and their level of readiness will contribute to the physical development of the athletes as well as their contribution to the sports performance.

In the literature, there are studies examining the biomotor ability and technical skills of badminton athletes separately, but there is no study examining the biomotor ability and technical skills together. This research was conducted to investigate the selected biomotor ability and technical skills of 10-11 year old badminton athletes and to determine the relationships between biomotor ability and technical skills

MATERIAL & METHOD

This study is a descriptive study aiming to determine the relationship between the biomotor ability and technical skill levels of 10-11 year old children playing badminton, and was conducted in the screening model. In the statistical processes of the study, pearson correlation was used for correlation analysis, independent-samples t test for binary groups comparisons, and one-way anova test for multiple group comparisons. Significance level was adopted as α = 0.05. The sample of the study consists of athletes in the 10-11 age group in Kayseri and Batman who are actively playing badminton and have a badminton playing history of at least 1 year. A total of 48 athletes aged 10-11 years old who participated in badminton training at least 3 days a week participated in the study regularly. All participants were informed about possible risks and details that may occur depending on the research and voluntary consent form was signed. The research was approved by the Inonu University health sciences ethics committee.

Data Collection Tools

Height, Weight Measurements and Calculation of Body Mass Index: Body meter and body weight were measured with electronic scales (16). Body mass index was calculated as Body Weight / height² (kg / m2) with the Pollock formula adopted by the World Health Organization (16, 24).

Reaction Time Test: Visual and auditory reaction time tests were measured with Hubbard brand reaction device. Before the test, a trial test was applied. The best value was recorded by taking the 2 replicate measurements of the participants (11).

Determination of Anaerobic Power: Vertical jump test was used to determine anaerobic power. Anaerobic power values were calculated using the Lewis formula and by using vertical jump results ($P = \sqrt{4.9} \times W \times \sqrt{D^n}$, W = Body Weight (kg), P = Anaerobic Power (Kg-m / sec), D^n = Vertical Leap distance). The result was recorded in kg.m / sec. (11, 34).

Hand Grip Strength Measurement: The hand grip force was measured with Takei brand hand dynamometer. The best score was recorded after the participant made 2 attempts with both hands (34).

Technical Skill Tests: The badminton test consisting of short service and clear strokes developed by French & Stalter and the badminton test developed by Lockhart & McPherson were used.

Agility T Test: To prepare the course, four cones are lowered as shown in figure 1. When the athlete is given a start command, he reaches the "B" cone straight from where the "A" cone is, and touches the "B" cone with his right hand. Then he runs to the left side with the side run in the direction of the "C" cone and touches the "C" cone with the left hand, then he contacts the right side with the "D" cone again with the right hand. Then he comes back to the "B" cone with a side run and comes back to the "A" cone after coming into contact with the left hand and comes back. As soon as it reaches the cone "A", the time is stopped. In this measurement, the athletes were fully rested and repeated 3 times and the best grades of the athletes were recorded (18, 30).

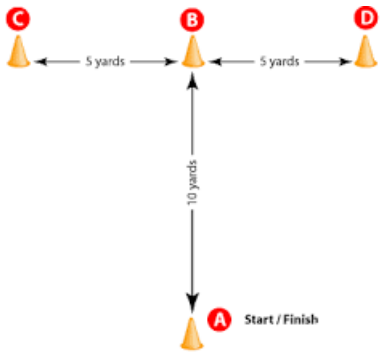

Figure 1. Agility T tesT

RESULTS

Data obtained from measurements made for some selected biomotor and technical skills of 10-11 years old badminton players are presented in tables below.

Table 1. Descriptive Statistics of Participants.

Variables	n	Min.	Max.	Mean	Sd.
Gender	48	1.00	2.00	1.39	0.49
Age (year)	48	10.00	11.00	10.54	0.50
Height (cm)	48	126.00	156.00	138.20	7.52
Weight (kg)	48	22.60	42.40	31.43	4.50
Spor Age (year)	48	1.00	4.00	1.66	0.97
BMI	48	12.08	21.63	16.25	1.92

The average age of the participants who participated in our study was 10.54 ± 0.50 years, the average height was 138.20 ± 7.52 cm, the average body weights were 31.43 ± 4.50 kg, the BMI was 16.25 ± 1.92, and the mean duration of badminton was 1.66 ± 0.97 years.

Table 2. Descriptive Statistics of the Participants' Biomotor and Technical Test Values.

Variables	n	Min.	Max.	Mean	Sd.
Agility (sec.)	48	11.46	14.90	12.97	0.76
Vertical Jump (cm)	48	15.00	35.00	26.20	4.78
Anaerobik Power (kg.m/cm)	48	25.51	48.52	35.41	5.61
Handgrip Left (kg)	48	10.10	27.10	16.26	3.91
Handgrip Right (kg)	48	7.60	31.00	16.93	4.081
French & Stalter	48	65.00	162.00	109.77	26.07
McPherson & Lockhart	48	77.00	117.00	91.93	8.90
Visual React. Right Hand(sec.)	48	2.00	4.10	2.83	0.50
Visual React. Left Hand (sec.)	48	1.80	4.00	2.90	0.41
Auditory React. Right Hand (sec.)	48	2.00	4.30	3.03	0.55
Auditory React. Letf Hand (sec.)	48	1.90	5.20	3.00	0.61

Agility t test average of the participants who participated in our study was 12.97 ± 0.76 sec. vertical jump average 26.20 ± 4.78 cm, anaerobic power 35.41 ± 5.53 kg.m/s handgrip strength left hand average 16.26 ± 3.90 kg. right hand average 16.93 ± 4.08 kg. French & Stalter badminton test average 109.77 ± 26.07 McPherson & Lockhart badminton test average 91.93 ± 8.90 visual reaction right hand average 2.83 ± 0.50 sec. visual reaction left hand average 2.90 ± 0.41 sec. auditory reaction right hand mean 3.03 ± 0.55 sec. auditory reaction left hand average 3.00 ± 0.61 sec. it was determined as.

Table 3. Difference Between Technical and Biomotor Parameters According to Gender of 10-11 Age Badminton Players

Variables	Gender	n	Mean	Sd	t	p
Agility (sec.)	male	29	12.86	0.78	-1.263	0.213
	female	19	13.15	0.72		
Vertical Jump(cm)	male	29	26.52	4.78	0.549	0.586
	female	19	25.73	4.88		
Handgrip Left (kg)	male	29	16.79	4.55	1,152	0.255
	female	19	15.47	2.57		
Handgrip Right (kg)	male	29	17.69	4.42	1.614	0.113
	female	19	15.78	3.27		
French & Stalter	male	29	104.14	24.57	-1.900	0.064
	female	19	118.37	26.59		
McPherson & Lockhart	male	29	90.10	9.17	-1.805	0.078
	female	19	94.74	7.91		
Visual React. Right Hand (sec.)	male	29	2.84	0.48	0.124	0.902
	female	19	2.83	0.55		
Visual React. Right Hand (sec.)	male	29	2.83	0.40	-1.516	0.136
	female	19	3.01	0.43		
Auditory React. Right Hand (sec.)	male	29	3.04	0.57	0.027	0.978
	female	19	3.04	0.54		
Auditory React. Left Hand (sec.)	male	29	3.01	0.62	0.085	0.933
	female	19	2.99	0.63		
Anaerobik Power (kg.m/cm)	male	29	34.58	5.41	-1.269	0.211
	female	19	36.67	5.82		

No significant relationship was found when the values between participants ' gender and the data obtained from the measurements were examined. (P> 0.05).

Table 4. Difference Between Technical and Biomotor Parameters of Participants According to Their Age

Variables	Age	n	Mean	Sd.	t	p
Agility (sec.)	10.00	22	13.02	0.85	-0.404	0.688
	11.00	26	12.93	0.68		
Vertical Jump (cm)	10.00	22	23.95	3.99	-3.304	**0.002**
	11.00	26	28.11	4.62		
Handgrip Left (kg)	10.00	22	14.66	3.16	-2.809	**0.007**
	11.00	26	17.63	4.02		
Handgrip Right (kg)	10.00	22	15.88	3.65	-1.676	0.101
	11.00	26	17.83	4.28		
French & Stalter	10.00	22	97.22	21.15	-3.391	**0.001**
	11.00	26	120.38	25.44		
McPherson & Lockhart	10.00	22	88.23	7.09	-2.849	**0.007**
	11.00	26	95.08	9.19		
Visual React. Right Hand (sec.)	10.00	22	2.95	0.58	1.445	0.155
	11.00	26	2.74	0.41		
Visual React. Left Hand (sec.)	10.00	22	2.98	0.37	1.259	0.214
	11.00	26	2.83	0.45		
Auditory React. Right Hand (sec.)	10.00	22	3.17	0.57	1.557	0.126
	11.00	26	2.93	0.52		
Auditory React. Left Hand (sec.)	10.00	22	2.99	0.68	-0.179	0.856
	11.00	26	3.02	0.56		
Anaerobik Power (kg.m/cm)	10.00	22	32.03	3.98	-4.588	**0.000**
	11.00	26	38.27	5.22		

While there was a significant relationship between the participants' ages and vertical jump, handgrip strength left hand, French & Stalter badminton test, McPherson & Lockhart badminton test and anaerobic power (p <0.05); There was no significant relationship between agility, handgrip strength right hand, reaction visual right, reaction visual left hand, reaction auditory right hand, reaction auditory left hand parameters (p> 0.05).

Table 5. Difference Between Technical and Biomotor Parameters of Participants According to Sports Age

Variables		n	Mean	Sd	ANNOVA	p	Groups	p
Agility (sec.)	1.00	30	13.13	0.77	1.941	0.137		
	2.00	7	13.01	0.68				
	3.00	8	12.64	0.69				
	4.00	3	12.25	0.53				
	Total	48	12.98	0.76				
Vertical Jump (cm)	1.00	30	25.93	4.99	0.180	0.909		
	2.00	7	26.71	4.19				
	3.00	8	27.12	3.60				
	4.00	3	25.33	8.50				
	Total	48	26.21	4.78				
Handgrip Left Hand (kg)	1.00	30	15.75	3.71	0.513	0.675		
	2.00	7	16.94	5.94				
	3.00	8	17.54	2.66				
	4.00	3	16.50	4.07				
	Total	48	16.27	3.91				
Handgrip Right Hand (kg)	1.00	30	16.49	4.13	0.349	0.790		
	2.00	7	17.98	6.04				
	3.00	8	17.31	2.49				
	4.00	3	18.00	1.97				
	Total	48	16.94	4.08				
French &Stalter	1.00	30	96.53	18.90	23.151	**0.000***	1-3	**0.000***
	2.00	7	109.86	12.50			1-4	**0.000***
	3.00	8	146.50	10.31			2-3	**0.000***
	4.00	3	144.00	13.22			2-4	**0.005***
	Total	48	109.77	26.08				
McPherson & Lockhart	1.00	30	87.07	5.54	23.756	**0.000**	1-2	**0.005***
	2.00	7	94.14	4.18			1-3	**0.000***
	3.00	8	103.37	6.21			1-4	**0.000***
	4.00	3	105.00	8.89			2-3	**0.003***
	Total	48	91.94	8.90			2-4	**0.008***
Visual React. Right Hand (sec.)	1.00	30	2.88	0.56	0.237	0.870		
	2.00	7	2.77	0.33				
	3.00	8	2.72	0.49				
	4.00	3	2.87	0.32				
	Total	48	2.84	0.50				
Visual React. Left Hand (sec.)	1.00	30	2.92	0.43	0.175	0.913		
	2.00	7	2.89	0.45				
	3.00	8	2.95	0.42				
	4.00	3	2.80	0.30				
	Total	48	2.90	0.42				
Auditory React. Right Hand (sec.)	1.00	30	3.14	0.48	1.439	0.244		
	2.00	7	2.80	0.58				
	3.00	8	3.04	0.75				
	4.00	3	2.60	0.52				
	Total	48	3.04	0.55				
Auditory React. Left Hand (sec.)	1.00	30	3.08	0.67	0.534	0.661		
	2.00	7	2.98	0.64				
	3.00	8	2.77	0.46				
	4.00	3	2.90	0.26				
	Total	48	3.00	0.62				
Anaerobik Power (kg.m/cm)	1.00	30	33.90	5.84	2.697	0.057		
	2.00	7	36.32	3.260				
	3.00	8	39.72	4.78				
	4.00	3	36.93	4.32				
	Total	48	35.41	5.611				

While there was a significant relationship between the sports age of the participants and the French & Stalter badminton test, McPherson & Lockhart badminton test ($p < 0.05$); No significant relation was found with vertical jump, agility, handgrip strength left hand and right hand, reaction visual right hand, reaction visual left hand, reaction auditory right hand, reaction auditory left hand and anaerobic power parameters ($p > 0.05$).

Table 6. Relationship Between French & Stalter and McPherson & Lockhart Technical Tests and Agility, Vertical Jumping, Anaerobic Power, Handgrip

Tests	Agility	Vertical Jump	Anaerobic Power	Handgrip Left Hand	Handgrip Right Hand
French & Stalter	**-0.454****	0.280	**0.474****	0.204	0.143
McPherson & Lockhart	**-0.500****	0.261	**0.463****	0.236	0.224
pearson correlation *p<0.05 **p<0.01					

While there was a negative relationship between the French & Stalter and McPherson & Lockhart technical tests of the participants and the agility t-test; a positive relationship was found with anaerobic power. No significant correlation was found between vertical jump, handgrip strength left hand and right hand and technical tests.

Table 7. Relationship Between French & Stalter and McPherson & Lockhart Technical Tests and Visual Reaction Right and Left Hand, Auditory Reaction Right and Left Hand

Tests	Visual React. Right Hand	Visual React. Left Hand	Auditory React. Right	Auditory React. Left
French & Stalter	**-0.316***	-0.090	-0.244	-0.237
McPherson & Lockhart	-0.156	-0.012	-0.075	-0.181
pearson correlation *p<0.05 **p<0.01				

While there was a significant negative relationship between the French & Stalter technical test and the reaction visual right hand of the participants; No significant relation was found between French & Stalter McPherson & Lockhart technical tests and reaction visual left hand, reaction audio right hand and reaction audio left hand.

Table 8. Relationship Between French & Stalter and McPherson & Lockhart Technical Tests and Gender, Age, Height, Weight, Sport Age and BMI

Tests	Gender	Age	Height	Weight	Sports Year	BMI
French & Stalter	**-0.454****	0.280	**0.474****	0.204	0.143	0.003
McPherson & Lockhart	**-0.500****	0.261	**0.463****	0.236	0.224	0.040
pearson correlation *p<0.05 **p<0.01						

While the participants had a negative relationship between French & Stalter and McPherson & Lockhart technical tests and gender; There was a positive relationship with height. No significant relation was found between age, weight, sports year and BMI and technical tests.

Table 9. Relationship Between Agility, Vertical Jumping, Anaerobic Power, Handgrip, Visual Reaction Right and Left Hand, Auditory Reaction Right and Left Hand and Gender, Age, Height, Weight, Sports Year BMI

Variables	Gender	Age	Height	Weight	Sports Year	BMI
Agility (sec.)	0.183	-0.060	-0.128	-0.075	**-0.332***	0.044
Vertical Jump (cm)	-0.081	**0.438****	0.281	-0.137	0.047	**-0.370****
Anaerobik Power (kg.m/cm)	0.184	**0.560****	**0.676****	**0.799****	**0.346***	**0.345***
Handgrip Left (kg)	-0.167	**0.383****	**0.571****	**0.377****	0.151	-0.066
Handgrip Right (kg)	-0.232	0.240	**0.490****	**0.292***	0.122	-0.057
Visual React. Right Hand (sec.)	-0.018	-0.208	-0.129	-0.049	-0.087	0.103
Visual React. Left Hand (sec.)	0.218	-0.182	-0.049	0.128	-0.038	**0.293***
Auditory React. Right Hand (sec.)	-0.004	-0.224	-0.040	-0.091	-0.224	0.057
Auditory React. Left Hand (sec.)	-0.013	0.027	0.081	0.159	-0.168	0.163

pearson correlation *p<0.05 **p<0.01

While there was a significant negative relationship between the agility t test and sports age of the participants; No significant relationship was found with gender, age, height, weight and BMI values. While a positive correlation was found between vertical jump and age, and a negative relationship with BMI; No significant relationship was found with gender, height, weight, and sports age. While there is a significant relationship between anaerobic power and age, height, weight, sports age and BMI; There is no relationship with gender. While the grip strength was found to be significant with the left hand with age, height, weight; No significant relationship was found with gender, sports age and BMI values. While grip strength is found to be significant with right hand, height and weight; No significant relation was found with gender, age, sports age and BMI values. No significant relation was found between the reaction visual right hand and gender, age, height, weight, sports age and BMI. While there was a significant relationship between the reaction visual left hand and BMI; There was no significant relationship between gender, age, height, weight and sports age. No significant relationship was found between the reaction auditory right hand and gender, age, height, weight, sports age and BMI. No significant relationship was found between the reaction auditory left hand and gender, age, height, weight, sports age and BMI.

DISCUSSION

The vertical jump average of the participants in our study was 26.20 ± 4.78 (male 26.52 ± 4.78 female 25.7 ± 44.88) cm. it was measured as in Badminton players, lower extreme strength must be in good condition. Because it allows the players to move quickly and explosively in various directions and jump high to strike (21). In the study conducted by Güven et al, lower values were determined compared to the study we did. It is thought that the low values are due to the low sports year of the participants included in the study. The values determined in the study conducted by Yüksel et al.(35) and Kızılet and Kızılet Bozdoğan (14) are similar to our study. While the values of amateur participants are similar to the work we have done in the study conducted by Kafkas et al.(15) the values of national players differ. This difference is thought to be due to the ability and performance required to be a national players.

Anaerobic power value of the participants who participated in our study was measured as 35.41 ± 5.53 (male 34.58 ± 5.41 female 36.67 ± 5.82) kg.m / sec. The values found by Revan et al. (29), Kafkas et al.(15) and Arabacı (3) are higher than our study. The reason for this difference is thought to be both due to high average age and high body weights.

The grip force left hand average of the participants participating in our study was 16.26 ± 3.90 (male 16.79 ± 4.55 female 15.47 ± 2.57) kg. gripping force right hand average 16.93 ± 4.08 (male17.70 ± 4.42 female 15.78 ± 3.27) kg. It was measured as. Handgrip force is important for all

sports that include catching or lifting. Also, as a general rule, people with strong hands tend to be strong in general. For this reason, this test is used as a general force test (12). The values found by Güven et al. (12), Kürkçü et al. (19), Cinthuja et al.(5), Kafkas et al.(15) are similar to the work we have done.

Agility T test average of the participants in our study was 12.97 ± 0.76 (male 12.86 ± 0.78 female13.15 ± 0.72) sec. it was determined as. Paradis (23) stated in his study that T test is a good measurement tool in measuring leg strength, speed and agility. In a study conducted by Singh et al. (31) it was found that there was a significant relationship between agility and badminton performance. Agility is a key factor in high-level badminton performance due to the various movement needs of the badminton game (14). While the values found by Ağaoğlu and Ergin (1), Kızılet and Kızılet Bozdoğan (14) are similar to the values of the female participants in the study, the values of the male participants were lower (better). This difference is thought to be due to the average age. In the study conducted by Cinthuja et al. it is thought that the low values are due to the low sports year of the participants.

Visual reaction right hand average of participants participating in our study was 2.85 ± 0.50 (male 2.84 ± 0.48 female 2.87 ± 0.55) sec. visual reaction left hand average 2.90 ± 0.41 (male 2.83 ± 0.40 female 3.01 ± 0.43) sec. auditory reaction right hand mean 3.04 ± 0.55 (male 3.04 ± 0.57 female 3.04 ± 0.54) sec. auditory reaction left hand mean was measured as 3.00 ± 0.61 (male 3.01 ± 0.62 female 2.99 ± 0.63) sec. The values found by Kafkas et al. (15) differ according to the study we have done. While the values of national players are lower, the values of amateur players are higher. This is thought to be due to the fact that amateur players' sports year are lower than the participants who participated in our study. Values found by Arabacı (1), Esen et al. (9), Revan et al. (29) are lower than our study. The reason for this is thought to be due to both the average age and the high year of sports.

The French & Stalter badminton test average of the participants in our study was found to be 109.77 ± 26.07 (male 104.14 ± 24.57 female 118.37 ± 26.59). Hastie et al. (13) preferred the use of clear inverse for two reasons in their study. The first of these reasons is the easy management of the test, and the second and most important reason is that it contains an important skill in the game of badminton. In their study, Hastie et al. (13) performed the clear test in 10 shots and determined the pre-test as 19.03 and the post-test value as 33.38. The values obtained from the posttest are similar to the percentage we did with our study. In their study, Demir et al. (6) investigated the effect of teaching fifth grade primary school students on badminton basic skills teaching with concept maps. They used the French & Stalter badminton test as a badminton practice test. By applying clear and short service shots as 10 shots, they determined the clear test as 11.95 in the pre-test, 11.37 in the post-test, and 8.62 in the pre-test and 5.46 in the post-test. These values are lower than the data obtained from our study, and this difference is thought to be due to the participants not being active players. In the study conducted by Farrow (10), French & Stalter badminton test values were 120.25 in males and 88.42 in females. According to the study we have done, while the values of male participants are high; the values of female participants are lower.

The McPherson & Lockhart badminton test average of the participants who participated in our study was determined as 91.93 ± 8.90 (male 90.10 ± 9.17 female 94.74 ± 7.91). The values found by Rana and Rajpoot (26), Zhu and Chen (36), Ding et al. (8), Singh and Mitra (32), Rasaniya and Chahar (27) are low compared to our study. The reason for this difference is thought to be due to the low sports history of the participants included in the study.

As a result, while the selected biomotor ability and technical skills of 10-11 year old badminton players were investigated, a significant relation was found between technical tests, agility and anaerobic power, and French & Stalter technical test and reaction visual right hand; No significant correlation was found between vertical jump, grip force left and right hand reaction visual left hand, reaction auditory right hand and reaction auditory left hand, and technical tests.

With the idea that it will contribute to the literature, the following are suggested;

It should be applied for badminton players of different ages and it should be determined whether the results differ.

Different technical skill tests and biomotor measurement methods should be applied for a similar age group and the direction of the results should be determined

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Player Transfer as an Outsourcing Activity in Sport: The Opinions of the Coaches and Managers

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Abstract

The popularity and accessibility of sports at global level allow the mobility (transfer) of athletes worldwide as labor force. This is called 'sport labor migration' and allows clubs to access a global market as an alternative to local market. In this study, foreign player transfer is accepted as an outsourcing. In this context, club managers and coaches were asked to evaluate their foreign player transfers in terms of outsourcing. The data were collected through the interviews conducted with the coaches and administrators of 9 teams, which were chosen through purposive sampling method among 16 teams playing in Turkish Women's Basketball League. The participants were asked to provide their opinions regarding the transfer of foreign players and evaluate them in terms of three basic functions of outsourcing: (1) cost minimization, (2) quality improvement and (3) resource access. According to the findings, while sports clubs can increase the quality of their teams through foreign player transfers that they can use globally, they can also reducing the player costs. Sports clubs should be able to manage foreign player transfers correctly not only in terms of sporting success but also in terms of their economic sustainability. The results of this study may reveal that the transfer of foreign players as outsourcing is seen as a successful activity of sports clubs.

Keywords: Foreign Player, Player Mobility, Labor Migration, Immigration, Productivity

INTRODUCTION

In today's world, sport is considered an important industry at global level because it brings millions of people together from six different continents. In economic terms, sport is now a business in which supporters are also a sort of customers because they play direct or indirect roles in the incomes of sports clubs or organizations from different resources such as sponsorships, broadcasting rights and ticket sales. This commercial dimension of sports have encouraged sports-based organizations to act like business enterprises. During this industrialization process, sports organizations are supposed to make strategical decisions for their economic activities. As a result, clubs have more responsibilities and they need to be managed more professionally. They also need to follow and apply recent trends in their management practices. Outsourcing is one of the postmodern trends that might provide a solution to meet such demands. Although outsourcing is a strategy applied in the world of business, 21st century sports clubs increasingly use this strategy in their activities.

The aim of this study is to contribute to the related literature by examining outsourcing practices of sports organizations and transfer of players as an outsourcing activity. In addition, as a result of the individual interviews made with the sports clubs' coaches and managers, the advantages and disadvantages of foreign player transfers have been tried to be revealed. This study was conducted within the Turkish Women's Basketball League, which is a top-level organization of Turkey.

Conceptual framework

When business enterprises hire experts or institutions to contract some of their activities –other than their basic activities-, we define this process as 'outsourcing' (32). Similarly, Hurley (20) defines outsourcing as "carrying out certain activities with the help of third party people or institutions" (p.53). The aim of outsourcing is to help an enterprise to focus on certain activities through which it can stand out and be unique. In addition, enterprises can get optimum benefit from their activities by contracting some of their secondary activities to other suppliers because they can use their limited budget more effectively for their basic activities. If they do not prefer to do so, they will have to distribute their limited budget among secondary activities such as marketing (25, 29), information technologies (41), accounting, security, car rental (32), logistics (19) or human resources (13), which will considerably decrease the productivity of the company. Nike is one of the companies that apply such a strategy. Although this company is known for its trainer production, manufacturing is completely carried out by other suppliers. The company only focuses on Research and Development (R&D) and marketing activities, which are considered the basic capabilities and activities of the company (32). Although the related literature presents various functions of and reasons for outsourcing in detail, three basic functions are commonly agreed in the studies: cost minimization, quality improvement and resource access (23).

'Cost minimization' is one of the priority aims of business enterprises in a competitive market. Khirallah (21) suggests that India has the potential to access cheap labor force in the field of information technologies. Therefore; he claims that it would be a low-cost choice if American companies employed their IT personnel by choosing among IT experts from this country. Another function is 'quality improvement'. The study conducted by Mukherji & Ramachandran (31) reports that an educational institution in India outsourced all its non-academic activities, which enabled the institution to focus on only educational and research-based activities. The last function 'resource access' is the basis of this study. Lee (23) explains this function with an example from the world of sports. He states that the young talents of baseball in Middle and South America outnumber those from other regions, so the clubs in the North outsource promising young baseball players from these regions.

Examples of outsourcing in sports

Outsourcing has recently been a popular practice in increasingly commodified sports industry (25). Today, sports clubs – especially football clubs- are among the large-scale companies with their capitals and profitability. The football teams listed by Forbes magazine in 2017 have a market value over billions of dollars, and they deserve more than simply being considered as sports teams (18). In other words, sports clubs now have a commercial identity and their management requires a more professional approach accompanied with a wider vision. Ekmekçi (15) emphasizes that there are many factors affecting the structure of sports organizations, and these factors should be managed professionally with a modern sports management mentality in mind.

Outsourcing is used for different purposes and under different names in sports, which is a multi-disciplinary field. Sports clubs today meet their certain needs through outsourcing such as ticket sales (24) food and drink services at stadiums (8), sponsorship contracts (11), travel organizations (42) and the generally marketing outsourcing (28). In addition, it is stated that some stakeholders take part in management process through outsourcing (4). On the other hand, Lee's (23) study is the first study to focus on sport labour migration from global outsourcing perspective. This study focuses on players as labor force in sports and suggests that supply of players from abroad should be considered a sort of outsourcing practice.

A different perspective of outsourcing activity in sports: Player transfer

The effects of globalization have allowed the evaluation of sports, which is a universal phenomenon, from a wider perspective. Today, a more professional approach to doing and managing sports is available when compared to the past, which was once characterized with an amateur spirit. At this point, we can conclude that sport is now evaluated as a labor force, and players are considered human resources at global level due to certain established standards (27). The presence of international laws regulating working conditions, social security practices and trade union rights (1) allows professional players to work in different

countries and have the same rights everywhere. As a result of these standards, athletes are now considered as a human resource at a global level (27). This situation is called 'international labor force migration' in the related literature (9, 23, 26, 27, 33, 34, 38).

Transferring football players is a common practice for sports clubs because it is a more practical and a quicker solution to short-term needs. Transfer practices may result in the circulation of local players among local clubs, and they can employ foreign players in their teams if they want. The sport which globalization has affected the most is football. The initial step towards industrialization is said to be 'Bossman Ruling' by European Court of Justice in 1995, which has given European Union citizen footballers the right for mobility not only among the clubs in the union (3, 37) but also a mobility at international level (2). At this point, UEFA warned member countries stating that the abundance of foreign players in local leagues may negatively affect the competition in these leagues and the attempts to train young talents (22).

There are also some rules regulating the possible number of foreign players in a team. In Turkey, the number of permitted foreign players in a team is determined by the federation of each sports branch. For example, according to the regulation published by Turkish Football Federation, Turkish football teams are allowed to have 14 players in the team, and all 11 players during a match can be foreign players as of 2015-2016 football season. Although this decision is seriously criticized, the weakened trust for local players and the shortage of local players at national team level are not, unfortunately, the primary concerns of clubs anymore. The rules regulating the number of foreign players in basketball are similar to those of football. As of 2016-2017 season, the clubs playing in Tahincioğlu Basketball Super League (the official highest level basketball league in Turkey) are allowed to have 8 foreign basketball players in the team and 6 foreign players during the match, which means that a team may consist of all foreign players during the matches. This situation is seriously criticized because teams are believed to lose their national team spirit. Yüce, Katırcı and Kuzu (43), in their study focusing on players' opinions regarding limiting the number of foreign players, conclude that the flexibility on the number of foreign players in a team may result in many disadvantages such as; less interest and fewer attempts for youth academy services, fewer local players to be trained for specific positions in teams, an increase in the number of naturalized players, more problems while building up the national team. In the Basketball Women's Super League (KBSL), this rule is 3 + 1 as of 2017-2018 season. However, in the Turkish Women's Basketball League (TKBL), which is a sub-league where foreign player limitations are much more stringent, teams have the possibility to play only '1' foreign player. This leads to the necessity of determining the needs in the most accurate way and accordingly making the decisions to be much more carefully. Despite these possible negative consequences, sports clubs increasingly prefer to transfer foreign players. Since football and basketball are more popular sports than others, the transfer activities in these two branches attract media's attention more. People curiously follow the details regarding the transfer of world-famous players in the media. Although transfer of foreign players are known to bring many indirect advantages, it is evaluated within the framework of three basic functions of outsourcing in this study; cost minimization, quality improvement and resource access.

In this study, foreign player transfer was considered as outsourcing in sports. Besides, the transfer policies of the basketball clubs and the use of foreign players are handled in accordance with the rule of only one foreign player in the Turkish Women's Basketball League (TKBL). In addition, individual interviews were made with the trainers and managers of sports clubs and the advantageous and disadvantaged aspects of foreign transfers were tried to be put forward.

METHODOLOGY

The aim of the study is to explore the opinions of the coaches and the administrators of the teams playing in Turkish Women's Basketball League (TKBL) regarding foreign player transfer as an outsourcing activity. The study also aims to focus on the following issues: how the clubs determine their transfer policies; how they manage their transfer activities; on what needs or criteria they base their player selection process; how the transfer costs affect the team budget; and their opinions about the performances of foreign players.

Participants

The population of the study consists of 16 teams playing in Turkish Women's Basketball League (TKBL). The participants are the executive administrators of 9 teams which were chosen by using purposive sampling method. This method means choosing the situations or participants that are more likely to provide rich data from an available population in order to carry out in-depth analysis (5). Table 1 presents the data about the list of the participant teams, and the duration and the dates of the interviews conducted.

Table 1. The teams interviewed, interview dates and durations

-	Clubs	Interview Date	Interview Duration
1	Mersin Basketbol Kulübü	27.02.2018	33 m. 04 sec.
2	Edremit Belediyesi Güre Spor Kulübü	09.03.2018	17 m. 57 sec.
3	Urla Belediyesi	10.03.2018	37 m. 18 sec.
4	Ferko Ilgaz Hotel KSBK	15.03.2018	30 m. 06 sec.
5	Mersin BŞB. Gelişim Spor Kulübü	18.03.2018	21 m. 39 sec.
6	Bayraklı Belediyesi	21.03.2018	18 m. 03 sec.
7	Çankaya Üniversitesi	23.03.2018	49 m. 09 sec.
8	İzmit Belediyesi Spor Kulübü	23.03.2018	18 m. 26 sec.
9	Kırçiçeği Bodrum Basketbol Kulübü	27.03.2018	53 m. 42 sec.

Data collection and Data Analysis

The data in this qualitative research were collected through individual interviews conducted with the coaches and the administrators of 9 teams playing in Turkish Women's Basketball League (TKBL). Qualitative methods were used for both of the studies because qualitative research enriches the scholarly field through multiple viewpoints. Interview technique is often used as an oral data collection method in qua1litative research (7). A semi-structured interview form which consists of 14 questions was used to collect data. It was prepared by the researchers according to the aims of the study after a detailed literature review and edited by experts from the field. The participants were asked open ended questions in these semi-structured interviews.

As can be seen on the Figure 1, outsourcing has three basic functions: cost minimization, quality improvement and resource access (23). The interviews were conducted to carry-out an in-depth analysis of these three dimensions, which are considered the reasons for applying outsourcing.

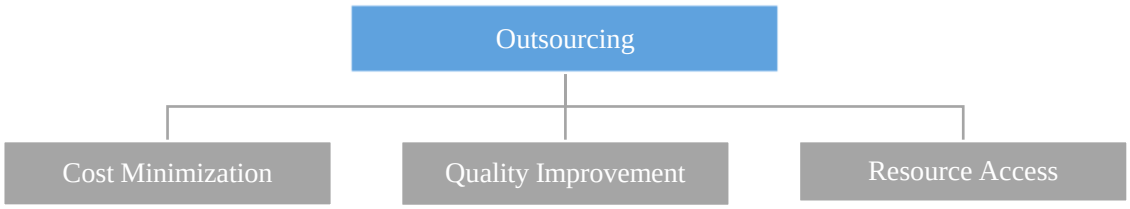

Figure 1. Three basic functions of outsourcing

The researchers asked for permission for voice recording, and the participants were informed that the recorded data would be used only for scientific purposes. The recorded data was transcribed by the researchers themselves on that day. The transcribed data were uploaded to a computer and analyzed in terms of the three dimensions of outsourcing (cost minimization, quality improvement and resource access), which is the main theme of the study.

FINDINGS

Cost minimization

The coaches and the administrators interviewed reported that they are quite satisfied with their performances to a great extent. At this point, the researchers tried to make inferences about whether foreign players have cost minimization effect. In this respect, when the replies provided by the participants for the question "What are your comments on foreign player costs in the league in general?" are considered, it can be concluded that there is a consensus on the idea that although

foreign player transfer is costly at the beginning, it, in fact, results in cost minimization in the long term.

> Let me say like that. Our foreign player is awesome. Since she plays the center, it is difficult to replace her with a local player. How many tall Turkish players are there like her? If you want to have a Turkish player of the same quality for that position, you may pay the same amount of money or even more. I think we reduce the cost. Because foreign player portfolio is wider than that of local players. (P1)

> In other words, the cost is worth in terms of productivity; even better. In this respect, the cost reduces the total amount, and productivity is quite high when the work done is considered. In other words, I personally believe that having foreign players is a good idea. (P3)

> They make them win the games. And the club earns money after these wins. She amortizes her own cost. A qualified foreign player, I think, does not waste your budget. It even adds to your budget. (P4)

> In fact, I get a foreign player in position 4. Number 5 position must be the Turkish. But do you know that a more quality Turkish number 5 is more expensive than a foreign player. So, naturally, we tend to transfer foreign players. I am very sincere in that opinion. I tell this as a player who played basketball for 27 years in this position. It is certain that the player we transfer is low in cost but high in efficiency. So, I believe that we are doing well. (P6)

> I think it is costly in monetary terms, but I don't think it is too costly. The reason is the difference in quality. If you transfer a Turkish player of this quality, she is more costly. What I mean is here is this… I do not see any harm sharing this opinion. For instance, my foreign player costs 40.000 TL. But I am not sure whether I can get the same performance from players (he means Turkish players) for whom I spend 200.000 TL and 250.000 TL. Question mark! To me, we minimize the cost. That is what I mentioned above. If I were, I would increase the number of foreign players. Because, Turkish players are more expensive. Turkish players are very expensive indeed. (P8)

Quality improvement

The second part of the interviews with the participants involves comments regarding quality improvement through outsourcing.

When the participants were asked "Do you think that foreign players increase the quality of your team?" majority of them stated that foreign players are indispensable for teams, and they cannot be successful in the league without them. In addition, they made comments on the reasons for the differences between local and foreign players in terms of quality.

> Exactly, exactly! If you don't have a foreign player in that position, you fall to 10th rank in the standings…Think that we are playing without having a foreign player. If we continue to have only Turkish players in our team, we may not need them one day, but who can stand failure for a long time? being up in the standing is important. So, I believe that they improve the quality. "You cannot be the champion without them (especially Americans). We relegate! (P1)

> They are special players. They have mean basket score, rebound over 15. I worked with high quality local players as well. Even they do not have the same effect as foreign players. They cannot contribute to the game like them. (P3)

> "Absolutely. So true. I mean, the quality of foreign players. Especially, if they are quality enough, they boost the team in terms of training, performance and professionalism." (P8)

> They certainly do. The quality foreign player, strong character certainly do increase the quality. Also, not every foreign players improve the quality. There are very problematic foreign players as well. For example, they have various problems such as alcohol or smoking, which cause serious problems in the team. The most important thing is character. If the foreign player has a strong character, this incredibly increases the productivity of the team. (P9)

The findings reveal that the participants generally gave positive replies to the questions related to the quality of foreign players.

Resource access

The questions about the last function of outsourcing – resource access- focused on the use of resources such as the country, league or the manager; or whether a scout team exists or not. The replies provided for the question "Which resources (country, league, manager etc.) do you access while choosing foreign players for your team?" can be presented as follows:

> There is no basketball culture at all. Let it be Number 5, let it be an American. If you consider strength, basketball depends on strength. Nothing can compare to the strength of a black player. Because they are very strong. I think they were born to be basketball player. No club in Turkey has this yet. Scout has not been an option in Turkish yet. Because we do not have a budget for that. No youth academies. There are not youth academies in real sense! We receive offers from managers. We chose among them. (P1)

> "While I choose a foreign player, I prefer white Americans. Their cultural level is generally "high culture", it is better." "I chose the player myself." (P2)

> Due to managers. Americans are more suitable for our game style. We are trying to play same basketball like NBA. That is, let the tall player get the ball and score the baskets, let her be close to the basket. (P7)

> Generally, Americans are preferred. If you want a player, you cannot look for one by yourself and say to the player: "I want to transfer you". You can't do that. So, you have to contact a manager and he manages the transfers. (P9)

DISCUSSION

First of all, as for 'cost minimization' function, local players are more expensive than their real value because of the shortage of available players. Because of high transfer fees of local players, foreign player transfer is likely to reduce player costs. In addition, the wins due to high performances of foreign players played a great role in increasing the incomes of the clubs, which means that these players amortize themselves in time. In this study, when the opinions of the coaches and managers of basketball clubs were examined, it was revealed that domestic players demand higher wages when the costs of domestic and foreign players were compared. It is possible to reduce the cost indirectly by foreign player preference. (P1, P3, P4, P6 and P8)

On the other hand, considering the performances of foreign players for their costs, it may cause the costs of domestic players to decrease after a while. Before the rule specifying the possible number of foreign players in Turkish Super League was published, the transfer fees paid for local players were often discussed and criticized because there were serious restrictions on the number of permitted foreign players in a team. The Union of Football Clubs in Turkey also suggested then that transfer fees paid for players became more realistic when the rules about foreign players were revised (12). Yüce, Katırcı and Kuzu (43), in their study, collect the data regarding the opinions of local players about foreign players. They report that a majority of the participants believe that one of the effects of transferring foreign players might be lower transfer fees paid to local players. These results support the findings of this study with regards to the possible factors affecting cost minimization function.

As for 'quality improvement' function, it can be concluded that although 'achievement in sports' is a relative term, the quality increases because foreign players are more experienced due to their experiences at international level. The interviews revealed that the teams are satisfied with the performances of the foreign players they transferred. (P1, P3, P8, and P9) This satisfaction is also explained statistically on Table 2.

Table 2. End-of-season statistics for the foreign players in the teams

	Matches played	Duration of play	Mean (Individual score/Team Score)	Mean (Rebounds)	Mean (Assists)	Percentage (Score)
Player1	19	28′ 46″	13,8 / 69	11,1	1,31	%20
Player2	19	32′ 19″	20,3 / 74,9	11,1	4	%27,1
Player3	32	34′ 23″	20,5 / 67,8	11,4	1,78	**%30,23**
Player4	20	**35′ 55″**	17,6 / 63,1	12,1	1,65	%27,89
Player5	9	**36′ 06″**	30,3 / 63,7	12,1	2,33	**%47,56**
Player6	29	**36′ 29″**	22,2 / 69,4	11	1,44	**%31,98**
Player7	33	**38′ 21″**	17,7 / 67,3	10,9	3,66	%26,30
Player8	39	**37′ 19″**	19,9 / 69,6	10,4	2,56	%28,59
Player9	29	33′ 33″	18,7 / 70,7	9,5	1,31	%26,44

*Data retrieved from Turkish Basketball Federation / Teams Stats

When the above statistics are examined, it can be concluded that the mean basket scores of foreign players constitute quite a higher percentage of overall basket scores. When we look at the end-of-season statistics in Table 2, it is seen that a single foreign player constitutes 25% to 50% of the team's percentage. It was also reflected in the statistics that eight of the nine teams played its foreign player 30 minutes or more per game, and five of the nine teams played its foreign players over 35 minutes.

On the other hand according to the Lee (23), the presence of foreign players in a team will increase the quality of the league and the related organizations in that country. The participant administrators and coaches agreed that the league they competed in has a significant brand value. They even stated that Bilyoner.com Women's Basketball Super League (KBSL) is the best league in Europe. Indeed, in the Eurocup Women's League, the last two years champion (2016/2017 Yakın Doğu Üniversitesi, 2017/2018 Galatasaray) became the Turkish teams. In the Women Euroleague, the top-level league, Turkish teams played final series 3 times in the last 5 years and won one of them.

Resource access function also brings certain advantages such as the freedom to choose from a global market rather than from a limited pool of local players and meeting the needs of the clubs in a more logical way. Also called 'labor migration' in the field of sports, this situation enables the authorities of women's basketball to benefit from a wide range of resources.

The majority of the administrators interviewed reported that they preferred Americans as foreign players for transfers (P1, P2, P7 and P9). As can be seen in the report (16) released by FIBA in 2018 which is place in Table 3, Americans who play in Turkey are playing an average of 25.9 minutes per match. In addition, the number of foreign players in this league accounted for 53% of the overall league.

Table 3. Player profiles of the Turkish Basketball League

	Number of Players	Average Age	Points Per Game (min)
Local	119	24,0	10,1
Foreign (US)	86	28,4	25,9
Foreign (Non US)	48	28,4	21,2

*Data retrieved from FIBA International Basketball Migration Report 2018 (16)

Ben-Porat (2), evaluates the concept of 'foreign player' within the framework of temporary residency (sojourners) rather than an immigration practice. However, football clubs – especially those playing in the world famous leagues – now search for young talents in Africa, Latin America (9, 33), and Iceland (15) and transfer them to train according to the principles of their club culture. Rosas and Gerrard (35), in their study, report that a considerable number of players playing in Spanish La Liga come from different regions of the world rather than from their own youth academy training programs. Although such a 'resource access' practice is considered a neocolonialist* mentality (23, 27), it matches with the 'resource access' function of outsourcing in general. Similarly, NBA draft system allows players from Europe and the Far East to transfer to American basketball teams (36). Thanks to this system, many European and Asian basketball players have transferred to NBA teams. Although the NBA Draft System began in 1985, the most striking example as a milestone in the draft system is the transfer of Yao Ming from China to Houston Rockets in 2002 (30). In FIBA's International Basketball Migration Report 2018 for European basketball (16), it is seen that Spain is the country that played the most foreign players in its league. (Figure 2).

*Neocolonialism: The use of economic, political, cultural, or other pressures to control or influence other countries, especially former dependencies (Oxford Online Dictionaries).

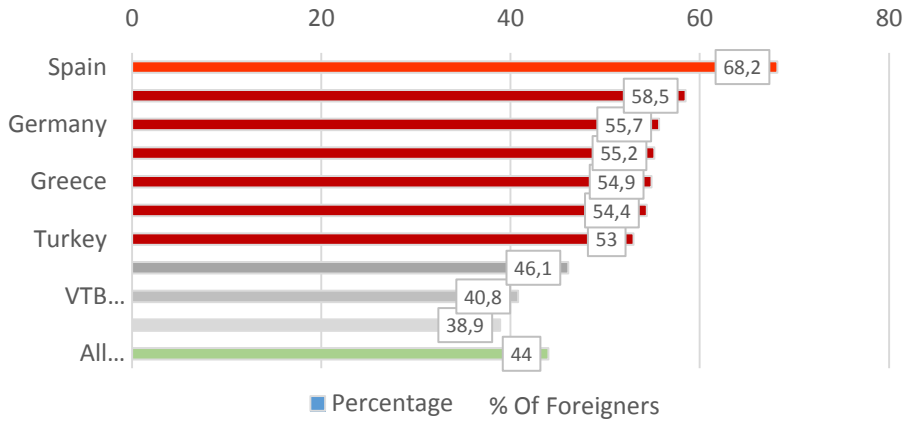

Figure 2. Number of foreigner of the basketball leagues (all leagues)

Just like all other management strategies, outsourcing also has both advantages and disadvantages. One of the disadvantages that might be observed in 'resource access' function is that clubs get used to transfer players instead of training their own players in youth academies. As seen, because of the rule stating that it is possible to have only one foreign player in Turkish Women's Basketball League, the clubs prefer to transfer foreign players for center position, which is a big obstacle for the training of long local players. Unfortunately, this situation is a clear evidence for the concern that that there will be more demand for tall players at national team level in near future. Yüce (42), in his study focusing on the opinions of sport authorities about foreign players, concluded that preferring foreign players will negatively affect the national teams' quality in the long term. Unfortunately, many short but young talents who were not noticed due to the policy of Turkish Basketball Federation to train tall basketball players could not get any place in league teams and national teams. In order to avoid such problems, Turkish Basketball Federation launched a sports development project in 2017, which aimed to make basketball an effective tool for social education and train young people for perfection both in sports and academic areas. The report titled 'National Basketball Movement' (39) presented the findings of 51 interviews – 43 local and 8 international- with a group of people including representatives from different cities, referees, coaches, administrators, sports school owners, physical education teachers and academicians. In one section of the report, it was highlighted that because clubs often prefer foreign players, local players play less time in the matches, which hinders their professional developments to a great extent. Similarly, Lee (23), in his study, reported that Korean basketball teams often transfer foreign players through outsourcing for guard and center positions. He also stated that although the transferred players have positive effects such as being a leader in the team and increasing overall team performance, young players of Korean basketball in guard and tall players (center) positions lose their advantages and the new talents will be discovered less and less.

CONCLUSION

The popularity and accessibility of sports at global level allow the mobility (transfer) of athletes and players worldwide as labor force (10). This situation is called 'labor migration in sports' and allows clubs to access a global market as an alternative to a limited local market. CIES Football Observatory, which is a research group under International Centre for Sports Studies – CIES, published a report titled 'World expatriate footballers' in May 2017 (6). According to this report, there are '12,051' foreign football players who play in 137 leagues in 93 countries worldwide. CIES authorities state that the increasing number of foreign players plays an important role in the establishment of a sustainable and universal football world. As a matter of fact, according to the report prepared by benefiting from FIFA Transfer Matching System (TMS), in 2018, clubs reached a total amount of 7.03 billion dollar for transfer (17). This enormous figure shows the economic aspect of player mobility in sport. As a result, it can be said

that outsourcing in sports is a necessity in postmodern sports environment and the results of activities in these transfer processes are seen as outsourcing as a strategic movement used in modern management. In line with this requirement, in the process of outsourcing, sports clubs must accurately identify the advantages and disadvantages of the move.

The results of this study can make significant contributions to reveal the relationship between outsourcing in sport (especially football and basketball) and its necessity and efficiency.

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Sports Injuries Seen in Korfball Players: Assessment of Injuries' Areas and Types

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Abstract

The aim of this study is to investigate sports injuries seen in korfball players according to injuries' areas and types. A total of 118 (55 female, 63 male) Korfball players participated in the study voluntarily. The mean age of the athletes was 21.26±1.90 years, the mean height was 176.73±10.16 cm and the mean body weight was 69.75±12.87 kg. The Scandinavian Musculoskeletal Questionnaire (NMQ) was used to assess the disability of athletes. The body was divided into nine sections: neck, shoulder, elbow, wrist, back, waist, hip-thigh, knee, foot-ankle. Statistical package program was used to evaluate the data. The results were evaluated using frequency distribution and percentage distribution. When the highest frequency of injury was seen in 33.9% (n=40) of the foot-ankle, 19.5% (n=23) of the knee and 10.2% (n=12) of the back. The frequency of injury types by region is seen in the foot-ankle with 34.7% (n=41), knee with 19.5% (n=23), and in the back with 9.9% (n=12). According to the total frequency of injuries, it is seen that the biggest ratio is strain with 33% (n=39), sprain with 28% (n=33) and muscle pain with 14.3% (n=17). It has been found that a large proportion of injuries occur during training. The most common injuries were observed in the foot-ankle, knee and back regions. It is seen that 31.2% (n=37) of the athletes are treated in health institutions. Foot-ankle and knee injuries are the most common causes of injuries. As a result, it was determined that most of the korfball players were injured from foot-ankle, knee, back regions and the majority of these injuries occurred during trainings. It can be said that Sports Scientists can organize training programs according to the anatomical structures and physical characteristics of the athletes by taking care of good warm-up exercises before starting the trainings and competitions and in this case they can minimize disability.

Key Words: Korfball, Sports Disabilities, Injuries.

INTRODUCTION

Korfball was invented in 20th century, then designed and inspired from a basketball-like game played by women during a summer course in Sweden. The inventor introduced the game under the name of "Korfball" which became a Dutch word meaning "basket" (1). In 1970, the International Korfball Federation was a popular sport played in 69 countries on 5 continents, while there were 4 members in Europe (2). It is the only team sport where high speed movements, sudden changes of direction and motor skills are used at the highest level and men and women play at the same time. The arrival of Korfball to our country was in the last of 20th century. As of now, more than 30 clubs and school teams are struggling as super league and first league in our country (3).

In general, sports injuries are a common name given to any kind of damage that occurs as a result of encountering resistance that cannot be met by tissues in whole or in part of the body (4,5). These damages can occur during daily sports activities as well as during training or competition (6). It is possible to divide sports disability into two groups as individual factors and environmental factors (7). These individual factors such as age, gender, joint restriction, anatomical problems, previous injuries, inadequate training and lack of flexibility, inequality

of force distribution, overload and malnutrition, inadequate body preparation, inaccurate branch-specific technique, psychological (concentration) 40% of sports injuries (8). Environmental factors include sports ground and areas, equipment, heat, seasons, humidity, wind, climate management, competition management, wrong training technique, misdirection of trainers (9, 10). The type and regions of injury vary according to the physical structure and age of the athlete. For this condition, which affects the lives of athletes negatively, physicians and sports health professionals should know the type of disability and appropriate treatment method and apply a treatment plan accordingly (11).

In line with this information, the aim of our study is to investigate the injury regions and types of korfball players.

MATERIALS AND METHODS

118 (55 female, 63 male) Korfball players participated to the study voluntarily who play in University Teams. The mean age of players was 21.26±1.90 years, the mean height was 176.73±10.16 cm and the mean body weight was 69.75±12.87 kg. The Nordic Musculoskeletal Questionnaire (NMQ) was used for assessing the injuries of players which had been proven reliability and validity before. In the survey, nine body parts were divided into neck, shoulder, elbow, wrist, back, waist, hip, thigh, knee, foot and ankle. The questionnaire was filled in by personal interview method. The questionnaire questions the injuries experienced by the athlete in the last year.

Statistical Analysis

Statistical package program was used to evaluate the data. Results were evaluated with frequency and percentage distribution values.

FINDINGS

Table 1. Evaluation of the Frequency of Injuries in Body Parts

Body Parts	n	%
Neck	3	2.5
Right Shoulder	9	7.6
Left Shoulder	1	.8
Both Shoulders	1	.8
Elbow	2	1.7
Right Hand-Wrist	2	1.8
Left Hand-Wrist	1	.8
Back	12	10.2
Waist	8	6.8
Hip-Thigh	-	-
Knee	23	19.5
Foot-Ankle	40	33.9

When the Table 1 is examined, it is respectively seen that the most frequent injuries are in the foot-ankle, 33.9% (n=40), knee, 19.5% (n=23), and 10.2% (n=12).

Table 2. Frequency of Injury Types According to Regions and Rates According to Total Injury Frequency

	Bruise-Beanie		Strain		Injury		Muscle Pain		Muscle Tear		Sprain		Others		Total	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Neck	-	-	-	-	-	-	2	1.7	-	-	-	-	-	-	2	1.7
Shoulder	-	-	6	5.1	-	-	4	3.4	-	-	-	-	1	.8	11	9.3
Elbow	-	-	2	1.7	-	-	-	-	-	-	-	-	-	-	2	1.7
Hand-Wrist	-	-	3	2.5	-	-	-	-	-	-	-	-	-	-	3	2.5
Back	1	.8	3	2.5	-	-	7	5.9	-	-	-	-	1	.7	**12**	**9.9**
Waist	-	-	5	4.2	-	-	3	2.5	-	-	-	-	-	-	8	6.7
Hip	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Knee	-	-	16	13.6							2	1.7	5	4.2	**23**	**19.5**
Foot-Ankle	4	3.4	4	3.4	-	-	1	.8	1	.8	31	26.3	-	-	**41**	**34.7**
Total	5	4.2	**39**	**33**	-	-	**17**	**14.3**	1	.8	**33**	**28**	7	5.7		

In Table 2, it is seen that the frequency of injury types according to regions occurred in the foot-ankle with a total of 34.7% (n=41), knee with 19.5% (n=23), and in the back with 9.9% (n=12). According to the total frequency of injuries, it is seen that the biggest ratio is strain with 33% (n=39), sprain with 28% (n=33) and muscle pain with 14.3% (n=17).

Table 3. Frequency and Time of Injury Occurrence

Body Parts	In Trainings		In Competition		Others	
	n	%	n	%	n	%
Neck	1	.8	-	-	1	.8
Shoulder	8	6.8	2	1.7	1	.8
Elbow	2	1.7	-	-	-	-
Hand-Wrist	2	1.7	1	.8	-	-
Back	10	8.5	2	1.7	-	-
Waist	6	5.1	-	-	2	1.7
Hip	-	-	-	-	-	-
Knee	11	9.3	7	5.9	5	4.2
Foot-Ankle	25	21.2	16	13.6	-	-
Total	**65**	**55.1**	28	23.7	9	7.5

When Table 3 was examined, it was found that a large proportion of injuries occurred during trainings. The most common injuries were observed in the foot-ankle, knee and back regions.

Table 4. Frequency and Rates of Application to Health Care Units Due to Injury

Body Parts	True	%
Neck	1	.8
Shoulder	2	1.7
Elbow	-	-
Hand-Wrist	3	2.5
Back	1	.8
Waist	-	-
Hip	-	-
Knee	10	8.5
Foot-Ankle	20	16.9
Total	**37**	**31.2**

When Table 4 is evaluated, it is seen that 31.2% (n=37) of the injuries suffered by players were treated in health institutions. Injuries occurring in the foot-ankle and knee regions are the most common types of injuries applied to the health institution.

DISCUSSION

As the characteristics and likelihood of disability are not the same for all sports, it is true for all sports to know how the disability occurs, to prevent disability and to encourage other athletes to play fair.

In general, too many injuries occur in the lower extremity in sports branches, respectively in the knee, ankle and hip. The causes of these injuries are generally reported as muscle bruises, muscle tears, tendon and ligament tears, fractures and dislocations in the bones (12).

In our study, when the injury parts of the players were evaluated, the most injuries were 33.9% (n=40) ankle-foot, 19.5% (n=23) knee and 10.2% (n=12) back parts. It is seen that the frequency of injury types according to regions occurs in foot-ankle with 34.7% (n=41), knee with 19.5% (n=23), and back with 9.9% (n=12). According to the total frequency of injuries, it is seen that the biggest ratio is strain with 33% (n=39), sprain with 28% (n=33) and muscle pain with 14.3% (n=17). Injuries occured in Korfball were found during training with a great rate of 55.1 (n=65). The most common injuries in the trainings are seen in the foot-ankle, knee and back regions. It is seen that 31.2% (n=37) of the players' injuries were treated in health institutions. Foot-ankle and knee injuries are the most common causes of injuries.

When similar studies in the literature are examined; Alp et al. stated that the frequency of injury types according to regions occurs in foot-ankle with 27.2% and knee region with 26.7%. According to the total frequency of injuries, it was seen that the biggest ratio was bruise-bereft with 69.9%, strain with 53.9% and muscle pain with 28.3%. In the present study, it was found that most of the injuries were during the trainings (13). Goh.Sl et al. receorded 63 injuries, then the most common damage was found in 64% of soft tissues and sprains(14). One third of the injuries were seen in the lower extremity, especially in the knee and back. McKay et al. they found that ankle sprain is the most common injury and this injury is due to lack of sports shoes or strength (15). Kocaman et al. in thir study that one the most injured areas of the athletes was the back as 16.1% (n=35) (16). In a study by Ergün et al. (17), while the majority of the injuries (79.5%) were seen in the lower extremities, thigh (31.8%), hip/groin (25%), waist (11.4%) injuries were the most common localizations of injuries and the regions followed respectively as ankle (9.1%), knee (6.8%), calf and neck (6.8%), lower leg (4.6%), chest (2.3%) and foot (2.3%). In another study, it was found that 31.2% of the foot/ nkle and 15.1% of

knees were the most common body regions where disability occurred (18). Hawkins and Fuller (19) found that 391 injuries during the competition were 37% injury, 21% sprains, 4% fractures and 2% tissue ruptures. These injuries were determined to be in regions of 23% thigh, 15% knee, 12% leg, 7% foot, 6% trunk, 3% head, 2% upper extremity, 3% hip.

Acak et al. (20) stated that the most injuries occur U-19 athletes had 55% in technical-tactical studies and 38.7% in condition exercises; U-21 athletes 53.4% in technical-tactical studies and 38.4% in fitness exercises. Taking necessary measures to reduce this ratio, they suggested that the training plans should be revised according to the existing athletes, field and material opportunities. In this study, the upper extremity injury rate of the athletes is 28.6%. The ratio of lower extremity injury regions was 71.4%. Accordingly, when the lower extremity regions are examined, ankle injuries, 16% lower legs, 15.15% upper legs and 15.2% knee injuries are prominent. As the main reason for the occurrence of these injuries; collision, loss of balance, air ball struggle and uncontrolled intervention. In the study of Bayraktar et al. (21) these were reported to have been injured as 78.8% of the athletes during the competition in the lower extremity, 21.2% other regions; 82.1% of the lower extremities during training 19.9% of the other region injuries. Şeker (22) reported that 56.97% of the injuries occurred in training and 43.03% of the injuries occurred in matches. Similar to these studies, Hägglund (23) reported that the injuries were 46% in the competition and 54% in training. Junge and Dvorak (24) reported that the frequency of injuries of athletes mostly occurred in lower extremity with 70%, followed by head and neck with 13% and upper extremity with 10%. They reported that the most common areas of disability occur in the leg with 11%, ankle sprain with 10%, and inguinal pain with 8%. Hoff and Martin (25) found that 24.3% of athletes should receive medical assistance after injury and in general 66.6% of injuries were caused by physical contact between players. In another study, it was found that ankle was the most intensely injured area due to intense one-to-one contact with the competing athlete in the game (26). When all these studies are examined, it is seen that although the athletes are in different branches, it is similar to our study in terms of the high incidence of injury during training.

In many studies, ankle is the most common type of injury. Fong et al. The study examined 227 sports injuries. 70 different sports from 38 countries were examined and it was found that ankle was the most easily injured area. Studies have shown that the ankle is referred to be the most frequently injured place after the knee and sprains are the most common in the wrist (27). Kauzlaric (28) reported 26% of athletes foot pain. In Maehlum's (29) study, it was found that 24% of ankle sprains were the most common injuries. In another study, it was found that a large proportion of the injuries occurred in the lower extremities and occurred in the ankle region with a maximum rate of 35% (30). Tenvergert et al. (31) reported that lower extremity injuries occur mostly in the ankle and foot region. In many countries; found that the majority of sports injuries occur in the fingers (50%) and the ankle (15%) (32). In order to determine the causes of injuries, 543 male and 436 female students were found to have the most knee and ankle regions in which they encountered injury (33). Chomiak et al. (34) reported that 29% of the injuries were in the knee region. It has been reported in their study that the highest probability of injury for the athletes were in the ankle and knee regions. Researches show that the type of sport involved (contact-contactless), the duration of sporting activity, the role of the opponent and his teammates affect the injuries. In this study, it was observed that the number of athletes applying to health centers was higher in branches where contact with competing athletes was higher (35). In this respect, we think that there is a similarity between the literature and our study.

CONCLUSION

As a result, it was found that most of the Korfball players were injured from foot-ankle, knee and back regions, the majority of these injuries and injuries occurred during training and they applied to health institutions about these issues. Sports Scientists are advised to organize their training programs according to the anatomical structure and physical characteristics of athletes by taking care of good warm-up exercises before starting the training and competitions, and it can be said that they can minimize disability. Strength training to strengthen the muscle structure to be performed in the regions where the most disability occurs in the Korfball should take place as a separate part of the training. Trainers and players had better pay attention to the

level of load during training, especially overloading these areas should be avoided.

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Nutritional Habits According to Gender, Stage of Exercise Behavior and BMI

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Abstract

The aim of this study is to investigate the personal nutritional habits of university students according to gender, BMI and exercise behavior stage. For this purpose, 348 female (age; 22.25±3.67 years) and 362 male (age; 22.49±3.28 years) students filled two questionnaires. First to determine the nutritional habits Personal Nutritional Assessment Questionnaire (PNAQ) was used. A total of 13 and below scores from the PNAQ are poor, 14-18 points are moderate, 19-23 points are good, and 24-25 points are excellent. Secondly, Exercise Stages of Change Questionnaire (ESCQ) was used to determine which stage of readiness the participants are currently in. The "stage based" handouts define the level of readiness and provide useful information on how to increase the amount of physical activity in life. Independent t-test, one way variance analysis and LSD tests were used in statistical analysis. The PNAQ's total nutritional score was found to be 16.26 in females and 16.17 in males, that is, moderate level. There was no statistically significant difference of the total nutritional scores according to gender ($p>0.05$) only a significant difference was found only in "milk" related sub-dimension, according to gender ($p<0.001$). Nutrition scores according to BMI did not differ in the sub-dimension of "meat or alternative nutrition", while nutrition scores in other categories differed statistically according to BMI ($p<0.001$). According to the stage of exercise behavior, the nutritional scores of students who are at the stage of pre-contemplation, contemplation and preparation are significantly lower than those in the stage of action and maintenance ($p<0.001$). As a result, nutrition levels of university students do not change much according to gender, but differ according to the BMI and to the stage of exercise behavior. The level of nutrition is moderate in those who are physically inactive and good in those who are active. Certain changes should be made in the diet of university students. It is thought that they should be educated about nutrition education, changing their eating habits, doing sports and being fit.

Key Words: Nutrition, Exercise, BMI

INTRODUCTION

People often tend to eat in their spare time. They may focus their attention on meals. The level of attention varies by age. Eating too much can cause changes in anthropometric properties and their health may deteriorate (1, 6, 7). Nutrition is the ability to take and use the items necessary for a person to live long, growing, developing, healthy and productive. Scientific studies have proven that people need more than forty nutrients in order to live healthy (29). Balanced nutrition occurs when a person is taken from different food components in desired proportions to meet their energy and nutritional needs (25). It should come from sources that provide enough energy, carbohydrates, protein, fat, and micronutrients, and a wide variety of foods (27). Adequate and balanced eating habits are essential for good physical performance as well as health (30, 33). Malnutrition is an important risk factor for non-communicable diseases such as cardiovascular diseases, diabetes and some types of cancer (17, 32). It is observed that especially in our country in the researches related to nutritional habits of young people; very serious problems related to nutrition were experienced during this period. It has been determined that students generally do not pay attention to meals, eat a single meal, consume more foods such as sandwiches and bagels, economic difficulties are effective in the problem of inadequate and unbalanced nutrition, and that the students staying in the dormitories do

not feed well due to poor dormitory conditions (11, 15, and 16).

In the study of Yılmaz and Özkan's (35) examining the eating habits of University Students, it was determined that 78.9% of the students did not believe that they were fed healthy. He concluded that the students were fed unbalanced. Although inadequate and unbalanced nutrition is an important problem in our country, university students are one of the groups with the highest nutritional problems. University life is the beginning of a new era in nutrition, as in many other issues in the life of young people. The fact that their lives become faster causes unhealthy and irregular feeding behaviors (13). Sezek et al. (31) stated that approximately one third of the students prefer their favorite food regardless of their importance in terms of health, and Kumartaşlı (20) likewise attach importance to the food they like and satisfy the students in their food preferences. The fact that students highlight "saturation" and "favorite food" in their food preferences show that they do not pay attention to the health-related elements of the meals such as nutritional value and material quality. Undoubtedly, this situation can be considered as a manifestation of students' malnutrition knowledge and habits (5, 13).

While the eating habits of the students continue as required by family life before the university, the lifestyle that changes with the university can also change the feeding behavior of the students (19). Changing nutritional behavior can affect the mental and physical condition of the university student, as well as indirectly affect school performance. For these reasons, it is very important to determine the nutritional information and habits of university students and to develop appropriate suggestions (12). University students are named as the first group after childhood, which is in the stage of transition to adulthood (4). In addition to the education they will receive, many of the students will have to change their lives and their diet in order to get used to a different environment. It is important to determine the nutritional tendencies of the students, to regulate the nutritional habits in the adulthood and to prevent possible disorders that may be caused by inappropriate nutrition.

There are many factors that enable individuals to participate in physical activity. These are being healthy, losing weight, looking good, social interaction, being popular, etc. (2, 3). Based on the Trans theoretical Model, people's attitudes toward exercise are classified into five different stages of change: people "with no intention to exercise" (Pre-contemplation), people "with the intention to exercise but not in action" (Contemplation), people who "intend to take action in the next month" (Preparation), people who "participate in regular exercise for a period of less than six months" (Action), and people who "participate in regular exercise for more than six months" (Maintenance),(22). Recently, the research on physical activity adherence has shifted its focus to understanding the intentions that motivate people to engage in exercise and identifying the opportunities in the neighborhoods where people live (22, 28).

University students are one of the risky groups related to unhealthy nutrition. University students are in a critical period when forward-looking nutritional habits are established (18). In this study, it was aimed to investigate the personal nutrition habits of university students according to gender and whether they are active or not.

METHOD

Participants: In this study, 348 female (age; 22.25±3.67 years) and 362 male (age; 22.49±3.28 years) students studying in different departments at Ondokuz Mayıs University filled two questionnaires. First to determine the nutritional habits Personal Nutritional Assessment questionnaire (PNAQ) was used. Secondly Exercise Stages of Change Questionnaire (ESCQ) was used to determine which stage of readiness the participants are currently in.

Personal Nutritional Assessment Questionnaire (PNAQ): The questionnaire (26) was translated into Turkish by Şener and İmamoğlu (33) and adapted to Turkish cuisine. The questionnaire consists of 5 parts to determine the nutritional status of people. It includes 25 items, including 6 items covering meat or its alternative, 4 items covered by milk-related options, 5 items of vegetable and fruit options, 5 items of cereal options, and 5 mixed items. Each item called yes is given 1 point and the score in that option is calculated by adding up. According to the scale sub-items and total score, it was scored as poor, moderate, good and excellent. In the questionnaire evaluation scores of subscales, 5 points are "excellent", for "meat or its alternative", "vegetable and fruit options", "grain options" and "mixed sub-dimension"; 4 points are excellent for "milk related options". Again, 4 points are "good" (3

points in milk option), 3 points are "moderate" (2 points in milk option) and 2 points and below (1 point in milk option) are considered "poor". A total of 13 and below scores from the nutrition questionnaire are considered to be poor, 14-18 points are moderate, 19-23 points are good and 24-25 points are evaluated as excellent. These questions show how good or bad you are in nutrition. If your score is in the poor or moderate category, it is stated that some changes should be made in your diet (26).

Exercise Stages of Change Questionnaire (ESCQ): The "Exercise Stages of Change Questionnaire" (ESCQ) developed by Marcus et al. (21) aims to determine the individual's exercise behavior steps. The validity and reliability study of the Turkish version of ESCQ was done by Cengiz et al. (9). The four items in the questionnaire, where the participants' attempts to exercise are determined, are answered as yes / no. Individuals' intention to exercise and their habits of participating in the exercise are divided into five different exercise behavior steps according to their responses to the items: Pre-Contemplation, Contemplation, Preparation, Action, and Maintenance (21). The test-retest value (ICC = .80) for the reliability of the survey was found to be high (9).

Statistical analyses

SPSS 24.00 package program was used in the statistical evaluation of the study. Kolmogorov-Smirnov test was performed to test whether the data was normally distributed and it was determined that the data showed normal distribution. One way Anova and Independent Sample t test was used for comparisons. As a result of the reliability analysis, the total Cronbach Alpha coefficient of the questionnaire was found to be 0.80. This result shows that the survey results are reliable.

Body Mass Indexes (BMI); BMI = Calculated using the formula Weight (kg) / Height (m2).

RESULTS

Average values of the anthropometric characteristics, standard deviations and other comparison results are presented respectively in the tables below.

Table 1. Age, Height and Body Weight According to Gender

Parameter	Gender	n	Mean	Standard Deviation	t-test
Age (years)	Female	348	22.25	3.67	0.15
	Male	362	22.49	3.28	
Body Height (cm)	Female	348	163,34	5.43	-10.23**
	Male	362	173.10	5.48	
Body weight (kg)	Female	348	60.35	8.69	-12.18**
	Male	362	74.04	9.21	
BMI (kg/m²)	Female	348	22.71	4.11	-7.52**
	Male	362	24.74	4.97	

** p<0,001

The ages of the participants in the study were determined as 22.25 years for women and 22.49 years for men. Body Mass index values of the participants were found 22.71 kg / m2 in women and 24.74 kg / m2 in men. A statistically significant difference was found between height, body weight and Body Mass index values of the participants according to gender (p <0.001).

Table 2. Comparison of Nutritional Scores of Students by Gender				
Subscales and total	Gender	Mean	Standard Deviation	t-test
Meat or alternative	Female	3.96	1.06	1.80
	Male	3.60	1.47	
Options related to milk	Female	2.28	1.07	-3.30**
	Male	2.75	0.85	
Vegetable and fruit options	Female	3.46	1.16	0.71
	Male	3.32	1.32	
Grain options	Female	3.29	0.93	1.44
	Male	3.08	0.96	
Mixed	Female	3.29	0.88	-0.78
	Male	3.42	1.28	
Total	Female	16.26	3.11	1.19
	Male	16.17	2.73	
* P<0,001				

When the nutritional scores were compared between the genders according to the sub-dimensions, "milk-related options" were found better in males ($p < 0.001$), while other sub-dimensions and total scores did not differ between the genders ($p > 0.05$).

Table 3. Comparison of Nutrition Points by BMI Category					
Subscales and total	BMI category	n	Mean	Standard Deviation	F/LSD
Meat or alternative	19 kg/m² and below (1)	96	3.66	1.06	1.12
	20-22 kg/m² (2)	272	4.00	1.20	
	23-25 kg/m² (3)	252	3.73	1.29	
	above 25 kg/m² (4)	90	3.30	1.59	
Options related to milk	19 kg/m² and below (1)	96	1.74	0.78	21.15** 1<2,3,4 2,4<3
	20-22 kg/m² (2)	272	2.87	0.93	
	23-25 kg/m² (3)	252	3.10	1.06	
	above 25 kg/m² (4)	90	2.72	0.84	
Vegetable and fruit options	19 kg/m² and below (1)	96	3.10	1.12	16.24** 1,4<2,3
	20-22 kg/m² (2)	272	3.57	1.31	
	23-25 kg/m² (3)	252	4.38	0.50	
	above 25 kg/m² (4)	90	2.74	1.38	
Grain options	19 kg/m² and below (1)	96	2.84	0.75	6.94** 1,4<2,3
	20-22 kg/m² (2)	272	3.29	0.87	
	23-25 kg/m² (3)	252	3.83	1.53	
	above 25 kg/m² (4)	90	2.96	0.72	
Mixed	19 kg/m² and below (1)	96	2.93	1.00	7.62** 1,4<2,3
	20-22 kg/m² (2)	272	3.73	1.03	
	23-25 kg/m² (3)	252	3.65	0.65	
	above 25 kg/m² (4)	90	3.01	1.35	
Total	19 kg/m² and below (1)	96	14.24	2.80	17.,13** 1,4<2,3
	20-22 kg/m² (2)	272	17.46	2.67	
	23-25 kg/m² (3)	252	18.69	1.78	
	above 25 kg/m² (4)	90	14.73	2.98	
**p<0.001					

In this study, nutritional scores according to the BMI category did not show a statistically significant difference in the "meat or alternative" sub-dimension ($p > 0.05$). In the sub-dimension of "milk", the group scores of BMI 19.00 kg/m2 and below were found to be significantly lower than other groups ($p<0.001$). The "vegetable and fruit", "grain options" subscale scores and "total nutrition" scores of the group with a BMI of 19 kg/m2 and below and the group with a 25 kg/m2 were significantly lower than the other groups ($p<0.001$). In "mixed size", the scores of the groups with BMI values of 20-22kg/m2 and those with 23-25 kg/m2 are statistically significantly higher than the other groups ($p < 0.001$).

Table 4. Distribution of Nutrition Points According to Stage of Exercise Behavior					
Sex	Stage of Exercise Behavior	n	Mean	Standard Deviation	F/LSD
Female	Pre-contemplation (1)	68	14.12	3.10	30.87** 1,2,3<4,5
	Contemplation (2)	86	14.21	2.81	
	Preparation (3)	77	14.35	2.80	
	Taking Action (4)	59	19.14	2.89	
	Maintenance (5)	58	19.48	2.78	
	Total	348	16.26	3.32	
Male	Pre-contemplation (1)	62	14.09	2.69	29.33** 1,2,3<4,5
	Contemplation (2)	75	14.15	2.56	
	Preparation (3)	82	14.29	2.78	
	Taking Action (4)	76	19.11	3.81	
	Maintenance (5)	67	19.21	2.75	
	Total	362	16.17	3.32	
*p<0,001					

In this study, according to the stage of exercise behavior, the nutritional scores of students who are in "Pre-contemplation", "Contemplation" and "Preparation" levels are significantly lower than those in "Taking Action" and "Maintenance" level in both females and males (p<0.001).

Table 5. Distribution of Those Who Say Yes and No to the Nutrition Questionnaire					
Parameter	Questions	Yes		No	
		n	%	n	%
Meat or alternative	Do I limit the consumption of meat, fish, poultry and eggs to 1-2 times a day?	520	73.24	190	26.76
	Am I eating 3 or less red meat a week?	340	47.89	370	52.11
	Do I separate the meat fat before cooking?	435	61.27	275	38.73
	Do I limit the consumption of up to 3 or 4 eggs a week, including its use in other meals?	390	54.93	320	45.07
	Occasionally, do I buy dried legumes and dried nuts instead of meat for protein needs?	545	76.76	165	23.24
	Do I usually cook meat, fish and poultry by boiled, grilling or baking instead of frying?	450	63.38	260	36.62
Options related to milk	Do I buy 2 or more milk or dairy products equivalent to this?	540	76.06	170	23.94
	Do I drink or use low-calorie or low-fat milk?	343	48.31	367	51.69
	Do I limit ice cream or iced milk 2 or more times a week?	380	53.52	330	46.48
	Do I consume butter or margarine in less than 3 teaspoons per day?	519	73.10	191	26.90
Vegetable and fruit options	Do I consume at least half a cup of fruit juice and fruit drinks daily?	549	77.32	161	22.68
	Do I eat dark green leafy and dark orange vegetables at least once a day?	511	71.97	199	28.03
	Do I eat fresh vegetables and fruits daily?	509	71.69	201	28.31
	Do I cook your vegetables without oil and calories?	398	56.06	312	43.94
	Do I eat more fresh fruits instead of cakes, biscuits and various pastry products?	438	61.69	272	38.31
Grain options	Do I usually eat white bread?	537	75.63	173	24.37
	Do I usually eat cereal products (whole meal flour) rich in fiber?	450	63.38	260	36.62
	Do I eat sugar-free or low-sugar cereals?	412	58.03	298	41.97
	Do I use brown rice instead of white rice?	405	57.04	305	42.96
	Do I consume at least 4 meals of bread or cereals every day?	452	63.66	258	36.34
Mixed	Is my optimal weight 2.5-5 kg more than your height?	533	75.07	177	24.93
	Do I consume less than 45 grams of alcohol daily (Would I prefer not to consume at all?)	520	73.24	190	26.76
	Do I avoid adding salt to food after cooking and do I prefer foods with little or no salt?	509	71.69	201	28.31
	Do I avoid white sugar foods?	390	54.93	320	45.07
	Do I always eat breakfast with at least cereal milk, eggs and toast, or other carbohydrate combination with fruit or juice?	443	62.39	267	37.61

Answers to the questions in nutrition questionnaire are examined and given as percentage in the table 5.

DISCUSSION

In this study, personal nutritional habits of university students were investigated according to gender, exercise behavior level and BMI. The nutritional score of females was found to be 16.26 and males as 16.17. There was no statistically significant difference between the total nutritional scores of males and females according to gender ($p > 0.05$). According to the scale assessment, 14-18 points are accepted as medium (33). It can be said that the nutrition of students studying in different faculties is at a moderate level. When the nutritional scores of the sub-dimensions were compared between the genders, "milk-related options" were found better in males, while the other sub-dimensions did not differ between the genders. Nutrition education can be realized both with the cultural flow formed depending on the interaction of the individual's family and social environment, and with formal and non-formal education units (13). Similar studies were found with this finding of our study in the literature. While it was stated in the 1995 Monaco Consensus that the subject of sports nutrition was the issue, male athletes were fed better than women (14), the perception of overweight was higher in female students and the rate of dieting in the last year was higher in female students (24).

Contrary to our study, Sarıoğlu et al. (29), although female athletes show good eating habits than males, they are in the category of malnutrition. In addition, it was found that the nutrition scores of the School of Physical Education and Sports students were at a bad rate. İmamoğlu et al. (18) found in another study that individuals did not have good eating habits, and females were found to have better eating habits than males. However, although female athletes show good eating habits than men, it is stated that they are in the category of malnutrition. Vançelik et al. (34) stated that the mean score of nutritional habit in university students was higher in males, and the average of nutritional knowledge was higher in females.

In their study, Bayraktar et al. (8) stated that university students' nutritional knowledge was sufficient, but their feeding habits were inadequate. Onurlubaş et al. (23) determined that 36.0% of university students believed that they were healthy and 64.0% did not. In this study, it was observed that the scores obtained according to the PNAQ evaluation were in the moderate and poor range. Nutritional mean score was not found in any dimension in good and excellent condition. It can be said that it is imperative to provide information and support to those participating in the research on nutrition.

It has been stated in the sources related to nutrition published in our country that the normal Body mass index is between 20-24.9 kg / m2 (36). In this study, nutrition points according to BMI category are similar in "meat or alternative" sub-dimension. In terms of "milk", the milk consumption of the group, who's BMI was 19 kg/m2 and below, was lower than the other groups. It can be thought that the consumption of milk for the weak people is low. The "vegetable and fruit" and "grain options" subscale scores of the group with a BMI of 19 kg/m2 and below and the group with a height of 25 kg/m2 were lower than the other groups. Those with low consumption of vegetables and fruits may think that they are prone to a weaker or fatter body. Similar results were found in vegetable and fruit options in grain options. In "mixed" sub-dimension, the nutritional status of groups with BMI values of 20-22 kg/m2 and groups with 23-25 kg/m2 is better than other groups. When the "total nutrition" scores were examined, the nutritional status of the group with a BMI of 19 kg/m2 and below and the group with a 25 kg/m2 was found worse than other groups. It is concluded that in general, poor nutrition will make people either weak or fat.

In this study, according to the stage of exercise behavior, the nutritional scores of students who are in "Pre-contemplation", "Contemplation" and "Preparation" levels are significantly worse than those in "Taking Action" and "Maintenance" stage in both females and males. According to the questionnaire total evaluation score, it can be said that those who are at the stage of "Pre-contemplation", "Contemplation" and "Preparation" have a moderate level of nutritional status, and those who are at the "Taking Action" and "Maintenance" level have a good level of nutritional status. Those who are in the "Taking Action" and "Maintenance" stages are highly likely to be active athletes. According to the stage of exercise behavior, no research has been found to examine the nutritional status. But in other respects, stage of exercise behavior has been studied in the literature. For example in the study of Dilek et al., (10), the aggression levels of university students football spectators were found to decrease as the

level of activity increased according to the stages of behavior change.

In this study answers to the questions in nutrition questionnaire are examined and given as percentage. Occasionally, the rate of those who take dried legumes and dried nuts instead of meat for protein needs is 76.76%. The rate of individuals who take 2 or more milk or dairy products equivalent to this is 76.06%. The proportion of those who consume at least half a cup of fruit juices and fruit drinks daily, those who eat dark green leafy and dark orange colored vegetables at least once a day and those who eat daily fresh vegetables and fruits are above 70%. Generally, those who consume white bread are 75.63%. Those who find their weight 2.5-5 kg more than their height are 75.07% (Table 5). Altın (4) stated that, considering the nutritional habits of university students, men are at moderate risk in terms of obesity and women are at high risk. In this study, it was stated that there were excess weight and it was observed that white bread consumption was also high. According to Table 5, it is seen that there are errors or deficiencies in the students' nutrition within the lack of nutritional information or the shortage of possibilities. Korkmaz (19) stated that university students do not have regular eating habits.

Conclusion: As a result, although the university student's nutritional levels did not change much according to gender, it was found that they differed according to the stage of exercise behavior. The level of nutrition is moderate in those who are in physically inactive and good in those who are active. Certain changes should be made in the diet of university students. It is thought that they should get nutrition education, change their eating habits, do sports and be informed about the criteria of being fit.

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