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İÇİNDEKİLER- ARTICLE CONTENTS

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Investigation of The Relationship Between Healthy Life Style Behaviors and Body Mass Index of University Students

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Abstract

Aim: Obesity is one of the most important health problems in this century that affects many people of all ages and genders in the world. Particularly, the irregular eating habits of students, their orientation towards fast-foods and their sedentary lives are some of the reasons that trigger obesity as health problem. Therefore, more importance should be given to this topic and to get rid of obesity and lead a healthy life to prevent complications related to obesity in the population in adulthood. This study was carried out to determine the relationship between healthy lifestyle behaviors and body mass index of university students.

Method: The sample of the study included 632 students from Inonu University in the 2017-2018 academic year. A 20-question personal information form, anthropometric measurements and Healthy Lifestyle Scale (HLSS) were used to collect data. The data was analyzed by using independent sample t-test, Mann Whitney-U test, one-way Analysis of Variance and Kruskal Wallis-H test.

Results: The primary finding of the study is that inadequate physical activity and irregular dietary habits may affect stress level of the students. Moreover, when the relationship between the body mass index (BMI) and HLSS sub-dimensions of university students were analyzed, a statistically significant difference was found among BMI and sub-dimensions of dietary habits and health responsibility.

Conclusion: It can be concluded that physical activity and balanced diet play key roles in health. To avoid obesity and related complications in adulthood, University students should avoid consuming fast-food and increase their physical activity levels during their youth.

Key words: Healty life style behaviors, body mass index, university students.

INTRODUCTION

Nutrition is the consumption of basic nutrients that has been consumed in sufficient quantity and in a balanced way so that the body can improve health and thereby increases the quality of life. Adequate and balanced nutrition is essential for individuals healthy, economical and social improvement increased level of welfare (28).

Obesity, which is defined as an excessive accumulation of fat in the body, occurs as a result of unbalanced nutrition, that is, if the amount of energy taken with food is more than the amount of energy spent (21). Obesity may develop not only due to imbalance in the energy metabolism or sedentary lifestyle, but also due to genetic and familiar predisposition, birth weight, mother's history of diabetes, behavioral or socio-economic

factors (38). Although obesity rarely develops due to a primary disease (19), age, gender, marital status, smoking, alcohol consumption and sedentary lifestyle are also known to may cause obesity (39). For this reason, obesity is not a medical issue alone, but it is an important public health problem that should be considered with its socio-economic dimensions and not limited to individuals (26, 50).

The prevalence of overweight and obesity increases with accelerating rate all over the world and causes releated complications even in early ages (8, 37). According to the estimates of the World Health Organization (WHO), 70-80% of deaths in developed countries and 40-50% of deaths in underdeveloped countries are diseases caused by lifestyle behaviors (52). Some studies showed that the economic situation is also a factor affecting the healthy lifestyle (1, 54). In addition to a balanced diet, regular physical activity play an important role in a healthy life. Regular physical activity significantly reduces the risk of obesity by regulating the energy balance and thus lower the risk of many diseases, especially for cardiovascular system diseases (6, 39, 40). Therefore, accurate and reliable assessment of physical activity and its relationship with health is extremely important (41, 45).

Body Mass Index (BMI) which is a value obtained by dividing the individual's body weight (kg) by the square of the height (m2) (BMI = kg/m2), is a simple, easy and invasive method to determine obesity. Since BMI is an indicator that evaluates body weight according to height, it gives fast information about the distribution of fat in the body (36, 49). Although there are various studies investigating the relationship between the healthy lifestyles and BMI of children and adolescents in literature , studies on young adults at higher education are limited (7, 13). The university period is an important period in which the individual tries to become a young adult and passes adolescence and takes many decisions about lifestyle. In this period, it has been shown that technology and innovation reforms dietary and physical activity habits of university education (29). The vast majority of university youth are under intense stress due to the increasing demands from academic life, do not pay attention to their nutrition and perform inadequate physical activity. They also, consume foods with high energy, skip meals, prefer fast-food, do not consume vegetables, fruits, milk and dairy products at adequate amounts during this period (15). All these factors may negatively affect the physical and mental health of the young people, and their well-being (20, 32). Thus, determining the healthy lifestyle behaviors of the youth during this period and determining the effects on the body composition plays an important role for future life when they become adults. Therefore, the purpose of this study is to reveal the relationship between healthy lifestyle behaviors and BMI in university students.

MATERIAL AND METHOD

Sample

The descriptive type cross-sectional study was performed with University students in 2017-2018 academic year. Informed consent forms were taken from the students before participating in the study and all procedures were fulfilled accordance with the Declaration of Helsinki. A total of 632 students volunteered to the study and 151 students from the Faculty of Education, 202 from Faculty of Engineering, 157 from Faculty of Economics and 22 from Faculty of Science and Literature were included to the study.

Data Collection Tool

The socio-demographic characteristics of the participants such as age, gender, department, class, monthly income level, the number of individuals living in the family were determined by self questionary form. Health-promoting attitudes and behaviors in relation to the healthy lifestyle was determined by using Healthy Lifestyle Scale (HLSS) developed by Walker, Sechrist and Pender (47) and adapted to Turkish by Esin (17) was used. HLSS consists of six sub-dimensions of 48 items including dietary habit, self-realization, health responsibility, exercise habit, interpersonal support and stress management. According to the results of the exploratory factor analysis, the subscales of the scale explained 42% of the total variance and the factor load values of the items varied between 0.33 and 0.74. The fit indices obtained as a result of confirmatory factor analysis are as follows: GFI=0.87, AGFI=0.71, RMSEA=0.22, CFI=0.89. Cronbach Alpha coefficients of the scale ranged between 0.71 and 0.92. On the other hand, in order to calculate BMI, the heights of the participants were measured using 1 mm precision stadiometer and body weights using 0.1 kg precision with electronic scale. Finally, the calculated BMIs were evaluated according to WHO reference values (49).

Data Analysis

SPSS (IBM, New York, USA, version 21.0) was used for statistical analysis. Normality of data was tested by Shapiro Wilk analysis and independent group t-test, Mann Whitney-U test, one-way Analysis of Variance and Kruskal Wallis-H tests were used to determine the relationships between variables. The statistical tests were performed within the 95% confidence interval and significance level was set to $p<.05$.

Results

The purpose of this study is to examine the relationship between healthy lifestyle behaviors and BMI in university students. Findings obtained as a result of statistical analysis are given below.

Table 1. The relationship between age and HLSS subscales

Subscale	Age	n	$\bar{x}$±SD	χ^2	p
Diet Habit	17-18	75	14.30±3.57	6.875	.173
	19-21	298	14.51±3.82		
	22-24	166	15.22±3.28		
	25-27	93	14.34±2.74		
Self Realization	17-18	75	33.46±7.80	1.658	.891
	19-21	298	33.94±6.37		
	22-24	166	34.10±5.47		
	25-27	93	33.11±5.77		
Health Responsibility	17-18	75	25.27±6.11	2.124	.783
	19-21	298	25.89±5.23		
	22-24	166	25.84±4.86		
	25-27	93	26.05±5.35		
Exercise Habit	17-18	75	12.84±4.67	2.132	.791
	19-21	298	11.81±3.56		
	22-24	166	12.14±3.95		
	25-27	93	11.99±3.38		
Interpersonal Support	17-18	75	17.74±4.02	9.874	.082
	19-21	298	17.25±4.15		
	22-24	166	18.38±4.87		
	25-27	93	17.67±4.10		
Stress Management	17-18	75	18.97±4.65	2.561	.698
	19-21	298	18.35±3.73		
	22-24	166	17.67±4.11		
	25-27	93	17.21±3.53		
Total	17-18	75	122.58±30.82	2.948	.714
	19-21	298	121.75±26.86		
	22-24	166	123.35±26.54		
	25-27	93	120.37±24.87		

When the results were analyzed, it was seen that there was no statistically significant difference between the age of university students and the subscale of HLSS (Table 1).

Table 2. The relationship between gender and HLSS subscales

Subscale	Gender	n	$\bar{x}$±SD	χ^2	p
Diet Habit	Man	385	15.94±3.45	1.124	.278
	Woman	247	15.73±2.82		
Self Realization	Man	385	38.78±6.21	.648	.621
	Woman	247	38.11±6.01		
Health Responsibility	Man	385	27.24±5.38	1.351	.310
	Woman	247	26.61±4.78		
Exercise Habit	Man	385	13.32±4.10	.149	.911
	Woman	247	12.85±3.78		
Interpersonal Support	Man	385	18.87±4.97	1.192	.273
	Woman	247	18.34±3.82		
Stress Management	Man	385	19.32±4.21	2.148	.049*
	Woman	247	18.68±4.07		
Total	Man	385	133.47±28.32	1.379	.211
	Woman	247	130.32±25.28		

***p<.05**

According to Table 2, when the gender and HLSS subscales of the university students participating in the study were examined, a statistically significant difference was found between the gender and only the stress management subscales ($p<.05$). According to the results, it was observed that mean scores of male students were higher than those of female students in terms of stress management sub-dimension.

Table 3. The relationship between BMI and HLSS subscales

Subscale	BMI	n	$\bar{x}$±SD	χ^2	p	Mann-Whitney U test
Diet Habit	1) Underweight	81	14.78±2.93	8.783	.048*	5<1,2,3,4
	2) Normal	325	14.92±3.48			
	3) Overweight	120	14.95±3.23			
	4) Class I Obesity	55	15.47±3.93			
	5) Class II Obesity	51	11.71±1.15			
Self Realization	1) Underweight	81	34.51±6.67	3.249	.743	
	2) Normal	325	34.28±5.98			
	3) Overweight	120	34.41±5.53			
	4) Class I Obesity	55	33.78±7.48			
	5) Class II Obesity	51	31.78±2.67			
Health Responsibility	1) Underweight	81	25.38±3.91	9.982	.049*	5<1,2,3,4
	2) Normal	325	26.34±4.82			
	3) Overweight	120	25.67±4.53			
	4) Class I Obesity	55	24.72±7.57			
	5) Class II Obesity	51	22.58±3.38			
Exercise Habit	1) Underweight	81	13.28±2.90	5.864	.397	
	2) Normal	325	13.11±3.21			
	3) Overweight	120	12.78±3.49			
	4) Class I Obesity	55	12.47±2.95			
	5) Class II Obesity	51	9.67±1.48			
Interpersonal Support	1) Underweight	81	17.78±4.22	6.572	.237	
	2) Normal	325	17.49±4.18			
	3) Overweight	120	17.91±4.57			
	4) Class I Obesity	55	16.28±4.83			
	5) Class II Obesity	51	13.72±2.41			
Stress Management	1) Underweight	81	17.35±4.78	4.814	.594	
	2) Normal	325	17.82±4.67			
	3) Overweight	120	18.42±4.45			
	4) Class I Obesity	55	17.56±4.84			
	5) Class II Obesity	51	16.21±2.18			
Total	1) Underweight	81	123.08±25.41	6.591	.193	
	2) Normal	325	123.96±26.34			
	3) Overweight	120	124.14±25.08			
	4) Class I Obesity	55	120.28±31.60			
	5) Class II Obesity	51	105.67±13.27			

***p<.05**

When the relationship between BMI and HLSS subscales of university students participating in the study was examined, there was a statistically significant difference among the BMI and dietary habit and health responsibility subscales (Table 3). Class II Obese students have higher dietarial intake and health responsibility mean scores compared to students who are underweight, normal, overweight and class I obese.

Table 4. The relationship between department variable and HLSS subscales

Subscale	Department	n	$\bar{x}$±SD	F	p	Post-hoc Scheffe
Diet Habit	1) Faculty of Education	151	15.78±3.15	.432	.876	
	2) Faculty of Engineering	202	14.79±2.57			
	3) Faculty of economics	157	14.77±3.59			
	4) Faculty of Arts and Sciences	122	14.45±3.61			
Self Realization	1) Faculty of Education	151	34.07±5.94	1.751	.219	
	2) Faculty of Engineering	202	33.19±5.11			
	3) Faculty of economics	157	34.56±6.48			
	4) Faculty of Arts and Sciences	122	33.01±5.23			
Health Responsibility	1) Faculty of Education	151	26.22±4.97	1.148	.379	
	2) Faculty of Engineering	202	25.20±3.93			
	3) Faculty of economics	157	25.96±5.38			
	4) Faculty of Arts and Sciences	122	26.16±5.72			
Exercise Habit	1) Faculty of Education	151	11.53±3.17	4.428	.005*	2>3,1,4
	2) Faculty of Engineering	202	12.63±3.47			
	3) Faculty of economics	157	12.25±3.32			
	4) Faculty of Arts and Sciences	122	11.16±3.11			
Interpersonal Support	1) Faculty of Education	151	17.01±3.84	4.811	.004*	2>3,1,4
	2) Faculty of Engineering	202	18.19±3.78			
	3) Faculty of economics	157	17.61±4.15			
	4) Faculty of Arts and Sciences	122	16.09±3.89			
Stress Management	1) Faculty of Education	151	17.49±3.84	2.345	.097	
	2) Faculty of Engineering	202	17.96±3.79			
	3) Faculty of economics	157	18.26±3.92			
	4) Faculty of Arts and Sciences	122	16.81±3.67			
Total	1) Faculty of Education	151	122.10±24.91	1.417	.318	
	2) Faculty of Engineering	202	121.96±22.65			
	3) Faculty of economics	157	123.41±26.84			
	4) Faculty of Arts and Sciences	122	117.68±25.23			

***p<.05**

According to the department variable and the subscales of the HLSS, a statistically significant difference was found between the subscales of exercise habits and interpersonal support ($p<.05$). According to the post-hoc analysis, mean scores of the exercise habit and interpersonal support subscales of the students in faculty of engineering are higher compared to the students in faculty of economics, education and, arts and science.

Table 5. The relationship between Grade variables and HLSS subscales

Subscale	Grade	n	x̄±SD	F	p	Post-hoc Scheffe
Diet Habit	Freshman	149	15.48±2.81	.793	.592	
	Junior	179	15.28±3.48			
	Sophomore	154	15.11±3.32			
	Senior	150	15.37±3.43			
Self Realization	Freshman	149	34.90±5.67	1.584	.259	
	Junior	179	34.28±5.83			
	Sophomore	154	33.04±6.32			
	Senior	150	33.75±5.67			
Health Responsibility	Freshman	149	26.81±4.91	1.981	.236	
	Junior	179	26.91±5.29			
	Sophomore	154	25.48±4.78			
	Senior	150	25.89±4.56			
Exercise Habbit	Freshman	149	13.35±3.72	1.325	.397	
	Junior	179	12.67±3.21			
	Sophomore	154	11.81±3.43			
	Senior	150	12.56±3.63			
Interpersonal Support	Freshman	149	17.81±3.89	.436	.765	
	Junior	179	17.79±3.93			
	Sophomore	154	17.62±4.45			
	Senior	150	17.49±3.65			
Stress Management	Freshman	149	18.28±3.84	2.412	.048*	2>3
	Junior	179	18.64±3.97			
	Sophomore	154	17.51±3.91			
	Senior	150	17.72±3.83			
Total	Freshman	149	126.63±24.84	1.632	.193	
	Junior	179	125.57±25.71			
	Sophomore	154	120.57±26.21			
	Senior	150	122.78±24.77			

***p<.05**

When the grades of university students and the subscales were analyzed, a statistically significant difference was found between the grade and the stress management subscale ($p<.05$). According to the results, mean scores of the stress management subscale of the sophomores were higher than those of juniors (Table 5).

Table 6. The relationship between number of people in the family and HLSS subscales

Subscale	Number of people in the family	n	x̄±SD	F	p	Post-hoc Scheffe
Diet Habbit	3	130	14.82±3.28	3.624	.028*	3>4,5
	4	222	14.58±3.41			
	5	147	14.91±3.38			
	6 and above	133	14.48±3.05			
Self Realization	3	130	34.87±5.45	1.128	.451	
	4	222	34.47±6.43			
	5	147	34.21±6.18			
	6 and above	133	34.36±5.79			
Health Responsibility	3	130	26.85±4.25	.481	.893	
	4	222	26.27±5.78			
	5	147	25.64±4.63			
	6 and above	133	25.89±4.56			
Exercise Habbit	3	130	13.45±3.25	4.563	.005*	3>4,5
	4	222	12.36±3.89			
	5	147	12.57±3.41			
	6 and above	133	12.43±3.56			
Interpersonal Support	3	130	18.93±3.61	3.349	.032*	3>6 and above
	4	222	18.28±4.47			
	5	147	17.65±4.18			
	6 and above	133	17.72±3.97			
Stress Management	3	130	18.61±3.77	1.911	.248	
	4	222	18.47±4.48			
	5	147	17.90±3.64			
	6 and above	133	17.62±3.81			
Total	3	130	127.53±23.61	2.984	.041*	3>4, 5, 6 and above
	4	222	124.43±28.46			
	5	147	122.88±25.42			
	6 and above	133	122.50±25.39			

***p<.05**

When the relationship between the number of people in the families of university students and the HLSS subscales were analyzed, a statistically significant difference was observed between the number of family members and the dietary habits, exercise habits, interpersonal support subscales and the total score of the scale (Table 6). Considering the results, the mean score of dietary and exercise habit subscales of those with three members in the family was higher than those of the four and five members in the family. When the mean scores of interpersonal support subscales are considered, three members in the family scored higher mean scores than those of six. Similarly, according to the total mean scores of HLSS, it was seen that the number of three people in the family get higher mean scores compared to those of others.

Table 7. The relationship between monthly income status and HLSS subscale

Subscale	Monthly income	n	$\bar{x}$±SD	F	p
Diet Habit	0-800 TL	78	15.28±3.90		
	801-1500 TL	175	15.35±3.21		
	1501-2500 TL	169	15.20±3.40	.324	.908
	2501-3500 TL	112	15.18±3.27		
	3501 TL and above	98	15.08±3.61		
Self Realization	0-800 TL	78	34.85±7.61		
	801-1500 TL	175	34.71±5.28		
	1501-2500 TL	169	34.64±5.73	.339	.882
	2501-3500 TL	112	34.21±6.81		
	3501 TL and above	98	35.12±5.90		
Health Responsibility	0-800 TL	78	26.48±6.71		
	801-1500 TL	175	26.64±4.23		
	1501-2500 TL	169	26.78±4.63	.437	.815
	2501-3500 TL	112	25.63±5.29		
	3501 TL and above	98	26.42±5.41		
Exercise Habit	0-800 TL	78	12.25±4.58		
	801-1500 TL	175	12.34±3.25		
	1501-2500 TL	169	12.11±3.34	.214	.981
	2501-3500 TL	112	12.28±3.68		
	3501 TL and above	98	12.05±2.99		
Interpersonal Support	0-800 TL	78	17.58±5.35		
	801-1500 TL	175	17.86±3.75		
	1501-2500 TL	169	17.24±3.64	.978	.471
	2501-3500 TL	112	16.91±4.23		
	3501 TL and above	98	17.83±3.67		
Eating Habits	0-800 TL	78	18.48±5.26		
	801-1500 TL	175	17.45±3.67		
	1501-2500 TL	169	18.32±3.45	.726	.684
	2501-3500 TL	112	18.12±4.34		
	3501 TL and above	98	18.04±3.78		
Total	0-800 TL	78	124.92±33.41		
	801-1500 TL	175	124.35±23.39		
	1501-2500 TL	169	124.29±24.19	.312	.918
	2501-3500 TL	112	122.33±27.62		
	3501 TL and above	98	124.54±25.36		

***p<.05**

There was no statistically significant difference between the monthly income status of the university students participating in the study and the sub-dimensions of HLSS (Table 7).

DISCUSSION

This study was conducted to determine the relationship between healthy lifestyle behaviors of university students and BMI. Primary findings showed that age and the sub-dimensions of HLSS did not show any relationship in BMI, whereas the gender and the stress management subscale of HLSS was strictly correlated to BMI. Men are more successful in stress management than women. Moreover, it was determined that the stress management mean score of the sophomore were higher than the juniors. Similarly, İlhan et al. (23) compared the mean scores of students' HLSS according to the grades; they found that mean scores of stress management of seniors were higher than freshman. Studies have also shown that women are more successful in stress management than men (22, 25, 40, 45). Moreover, Bilgin et al. (9) found that stress management of students studying at non-health departments was lower than those studying in health related departments. Considering these results, it is thought that university students have difficulties due to the intensity of academic activities and this situation negatively affects their stress levels.

BMI and subscale of dietary habits and health responsibility were closely related in the present study. It has been determined that the students who are underweight, normal weight, overweight and class I obese have higher dietary habits and health responsibility mean scores than those of class II obese. It is expected that individuals with low or normal BMI have a healthier profile (31). However,

it is reported that unhealthy eating habits and insufficient physical activity are common among university students regardless of BMI status (3). Bilgin et al. (9) reported that 15.5% of health department students and 10.5% of students in other departments were on the border of obese. While there was no relationship between HLSS and BMI in students studying in health related departments, a weakly positive relationship was determined between BMI and physical activity and nutrition scores of students in other departments. These findings are parallel to the literature (10, 31).

Ertop et al. (16) reported that adequate and balanced dietary status of the students did not positively affect mean scores of self-actualization, health responsibility, stress management, interpersonal support and dietary habit subscales. Cihangiroğlu and Deveci (11) found that as the age increases, health responsibility and interpersonal support subscale mean scores increase, junior and seniors have higher health responsibility mean scores than those of freshman and sophomores. Moreover, they reported that mean scores of dietary habit of non-smokers were higher than those of smokers. Similarly, İlhan et al. (23) found that mean scores of health responsibility subscales of seniors were higher than others and mean scores of diet habit subscale of juniors and seniors were higher than those of freshman. In the study of Pasinlioğlu and Gözüm (34), it was reported that the mean score of diet habits of women were higher than those of men. Arslan et al. (4) and Akça and Selen (2) reported that the relationship between nutrition and interpersonal scores of the students studying in the health departments did not change according to the gender variable while the average of the nutrition and interpersonal relationship scores of the female students in the non-health departments was higher than the men. Mazıcıoğlu and Öztürk (29) also determined that students who received nutrition education or attended conferences on nutrition fed more regularly. The results of Bilgin et al. (9) study conducted with university students are similar. Since women are more concerned and worried about their body image and weight status, they pay more attention to dietary management and nutrition than men (3, 46). Therefore, it can be said that the awareness about healthy lifestyle behaviors positively affects the nutritional habits of both female and male students due to the education they received.

In another study, students' consumption of vegetables-fruits and high-fat snacks did not change; however, frying-style food consumption has been reported to decrease (37). Çolak (12) reported that body weight of only females increased in favor of fat mass with increasing age, but not in male population where increase of body weight was mainly due to higher lean body mass. Moreover, it was found that those with high BMI had low physical activity levels (18). Akça and Selen (2) and Arslan et al. (4) showed in their studies that even though 2/3 of the students have normal BMI, the mean score of nutrition is still low. Almutairi et al. (3) showed that university students studying in both health and non-health departments generally have irregular or unhealthy eating habits such as skipping meals and choosing fast food-style foods. The fact that students mostly stay away from their families, in the dormitory or at home, may have negatively affected their eating habits and level of physical activity. Thus, the results of the study are compatible with the literature (3, 22, 23, 33, 42, 48, 51).

It is a fact that women have better health responsibility behaviors than those of men. This may be related to taking more responsibility and taking more protective attitude of women in the care of family members and houseworks originating from our traditional culture. We can say that the difference between the results of our study and other studies is due to the region where the studies are conducted, living standards, levels of nutritional knowledge and habits of the participants.

In our study, it was determined that mean scores of exercise habit and interpersonal support subscales of engineering faculty students' were higher than those of other faculties students'. When İlhan et al. (23) compared the mean scores of students' HLSS according to the grades; mean scores of interpersonal support subscale and HLSS total score of seniors were higher than freshman and sophomores.

The age and level of grade of students studying in non-health departments does not affect healthy life style behaviors. However, healthy life style behaviors of students studied in health related departments are positively affected as the age and grade levels of students' increase and it was determined that health responsibility and physical activity levels also increased. Moreover, with the increasing age and education level of students in

health related departments, it is thought that the lessons and practices they take increase and thus contribute to the awareness of healthy lifestyle behaviors. In the study of Zaybak and Fadıloğlu (54), it was determined that the total and mean score of health responsibility subscale of the health department students were higher than those of other departments. However, there was no relationship between gender and healthy life style in both groups. Bilgin et al. (9) stated that while the average of students' health responsibility scores in both health and non-health departments were higher than male students, it was observed that male students had higher physical activity scores than girls.

Ünalan et al. (44) found a statistically significant relationship between exercise habit, self-realization and diet habit subscale and HLSS total scores in students studying at health and social programs. Yurdatapan et al. (53) found the lowest mean score in the exercise subscale in the the students of science education. It is not surprising that physical activity is higher in male students. In a study, women's less active and more sedentary life than men it has been determined to tend to continue (46). However, with the influence of traditional culture, while women mostly focus on housework and spend most of time at home, men tend do do sports and exercise outside the home.

When the relationship between the number of people in the families of the students and subscales of the HLSS was examined, students whose family members are three was higher mean score of diet and exercise habit subscales than those of four and five (Table 6). When the mean score of interpersonal support subscales is considered, students whose family members are three has higher scores than those of six and above. Similarly, when we look at the total score of HLSS, it was seen that students whose family members are three had higher scores than the others. According to these results, it can be said that as the number of people in the family increases, healthy lifestyle behaviors decrease. Moreover, as the economic situation improves, positive health behaviors such as health-related courses, participation in physical activities and access to healthier foods appear to increase (10, 23, 31, 51, 54). Bilgin et al. (9) found that students in non-health departments with higher income level exibited more positive healthy behaviors compared to those with low income. However, it was detected that the monthly income of the students studying at health related departments did not affect their health behaviors. It is thought that the difference in healthy lifestyle behaviors between groups cannot be explained only with income level, and that health education received may affect healthy lifestyle behaviors of the students.

There was no statistically significant relationship between the monthly income status of the university students and the subscales of HLSS. Zaybak and Fadıloğlu (54) reported that students with good economic status had higher total scores of HLSS compared to those with low economic status. In other studies, it was stated that interpersonal support and positive health behaviors increases with increasing the economic status (14, 43). It has also been reported that as the income level decreases, the consumption of vegetables decreases and the consumption of fat and carbohydrates increases (5). In some studies, a linear relationship was found between weight loss and income level (5, 24, 35). We can say that the difference among the studies is due to different income levels of students.

Considering the results of the study, it may be recommended that university students who will be adults of the future should be informed about the dietary habits in order to live their lives as a healthy individual, encouraging and maintaining regular physical activity rather than a sedentary lifestyle, avoiding excessive consumption of sugar and a fast-food eating culture. As a result, university youth, which constitutes the most dynamic part of the society, can be transformed into a period when health-strengthening choices are made instead of behaviors that are harmful to health when smart decisions are made.

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Investıgatıon of Respiatory Parameters, Hand-Eye Coordinations And Body Mass Indexes of Superior Intelligence Students Between 8 and 9 Years

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Abstract

Abstract: The aim of this study was to investigate respiratory parameters, hand-eye coordination and body mass indexes of gifted students aged 8-9 years. The population of the research consists of 124 students from 23,228 students in the second year in Malatya. The research group consists of 73 students (37 girls and 36 boys). To determine students' intelligence levels as data collection tools Wechsler Intelligence Scale for Children (Savaşır and Şahin, 1995) was applied, Mir Spirolab III brand spirometer is used for measurement of the functions, dart was performed for hand-eye coordination and weight and height measurements were taken for Body Mass Index (BMI). One - way ANOVA was used for comparisons. Significance level was tested with $\alpha = 0.05$. The findings of the study showed that children with normal intelligence (n = 4) Wisc-r had a total of 105.75 ± 2.36; children with bright intelligence (n = 10) 114.30 ± 2.40; children with superior intelligence (n = 26) 124.30 ± 2.71; children with very high intelligence (n = 22) 134.18 ± 2.48; genius group (n = 11) children were found to score 145.73 ± 3.95. There was no statistically significant difference (p> 0.05) between FVC, FEV1, PEF, Dart mean and BMI according to intelligence groups of children. As a result, there was no significant difference between respiratory parameters, hand-eye coordination and BMI according to intelligence levels of 8-9 years old children. Therefore, it can be said that gifted children do not have any physical difference compared to the children in the other intelligence group.

Key Words: Gifted Children, Physical Characteristics, Wechsler Intelligence Scale.

INTRODUCTION

A gifted child is a person who is superior to his / her peers in most of his / her mental abilities or intelligence, who has a high level of creativity and has a high sense of duty in completing the work he / she started (1) . It was seen that gifted children gained personal awareness starting at an early age compared to their peers, and that the level of moral judgment and sensitivity to social and ethical values were realized at a higher level (13).

These children are children who are superior to 98% of a randomly selected cluster from their peer groups (1,12). In other words, they have been and will always be present in the society at a rate of approximately 2% (2).

According to the 1997 general census in our country, the ratio of gifted people to the general population is approximately 2.00%. According to the data of 1997, 80.400 in the 0-2 age group, 78.000 in the 3-5 age group, 131.400 in the 6-10 age group, 80.800 in the 11-13 age group, 81.400 in the 14-16 age group, a total of 452,000, 0-16 age group was superior. talented individuals (7).

In order for a child to be identified as gifted, he / she has to obtain a certain Intelligence Department (ZB) score from the scientific validity and reliability of the Wechsler Intelligence Scale (21) or Stanford-Binet Intelligence Scale (5). According to the Department of Intelligence score classification, 90-109 “normal intelligence”, 110-119 “brilliant intelligence”, 120-129 ”superior intelligence”, 130-

139 "very superior intelligence" and 140 and above are defined as "Genius (20,4,19.18).

It is accepted that gifted children are different from children with normal intelligence and the basic hypothesis when evaluating these children is that they have superior features in terms of physical, mental and social aspects (8,6,3). According to Çağlar (2004), the physical characteristics of gifted children are as follows:

"According to Ataman (1998), as a cluster, body structures are larger and healthier than their peers. Birth weights and lengths are above average. They are earlier than their peers in learning walking, speaking and other movement skills. Sensory organ disorders are less common. They are resistant to diseases. Their average lifespan is longer. They are strong and their response is faster in activities requiring coordination (12)."

According to Ataman (1998), as a cluster, body structures are larger and healthier than their peers. Birth weights and lengths are above average. They are earlier than their peers in learning walking, speaking and other movement skills. Sensory organ disorders are less common. They are resistant to diseases. Their average lifespan is longer. They are strong and their response is faster in activities requiring coordination (12).

According to Ataman's study on Turkish children aged 6-7 years in 1974, the height, weight, head anterio-posterio diameter and lung capacity measurements of the Gifted Cluster were found to be higher than those of the Under-Gifted Cluster and the difference was significant at $p < 0.05$ level. (10).

The aim of this study is to examine the physical characteristics of gifted students at primary level between the ages of 8-9 such as respiratory parameters, hand-eye coordination and body mass indexes according to the students in different intelligence groups.

MATERIAL & METHOD

The descriptive method was adopted in the research. As a result of observations and screenings by classroom teachers from 23,228 students studying in the 2nd year of primary school in Malatya, the research universe was carried out by 4 expert staff within the Malatya Guidance Research Center (RAM). The Wechsler Intelligence Scale for Children (WISC-R) was administered to 124 students. The sample of the study consists of 73 students (37 girls and 36 boys). Wechsler Intelligence Scale for Children (16) was applied to determine students' intelligence levels as data collection tools, Mir Spirolab III brand spirometer was used for lung function measurement, dart shot was used for hand-eye coordination and weight and height measurement for Body Mass Index (BMI). It was obtained. The Wechsler Intelligence Scale for Children (WISC-R) was developed by Wechsler in 1949 and revised in 1974. Wisc-R; It consists of two parts: Verbal and Performance. Standardization of WISC-R on Turkish children was performed by Savaşır and Şahin on a sample of 1639 people in the 6-16 age group. Two half test reliability was 0.97 for the Verbal Intelligence Division, 0.93 for the Performance Intelligence Division and 0.97 for the Total Intelligence Division (16). According to the IQ score taken from intelligence measurements, 90-109 "normal intelligence", 110-119 "brilliant intelligence", 120-129 "superior intelligence", 130-139 "very superior intelligence" and 140 and above "Genius tanımlan are defined according to intelligence classification. (20,4,19,18). In this study, this intelligence classification was used. Prior to spirometric measurements, the students were screened about the content and application of the test. In the measurements, the students were seated on a chair, pegs were attached to their noses and the exercise was given by giving information about maximum breathing. During the measurements, students were verbally motivated. All measurements were performed after sitting in the sitting position with the nose closed by a pincer, allowing the patient to become accustomed to this type of respiration by breathing a few breaths in a pale volume connected to the spirometer with a mouthpiece.

Then, two measurements were taken from the student and the best measurement was evaluated. In the FVC measurement, subjects were asked to breathe normally several times and then perform the strongest expression possible after a very deep inspration. In spirometry measurements, FVC (forced vital capacity), FEV1% (forced air expiration in 1 second) and PEF measurements were evaluated. For the hand-eye coordination of the students, a demonstration was made about how to shoot darts hanging on the wall at a height of 1m from the

ground at a distance of 2 m , a demonstration was made about how to shoot darts hanging on the wall, and then the students were given 6 test shots. Six shots were made to the students. In order to determine the hand-eye coordination of the student, it was fixed to a metal table at a height of 1.40 m and 2 m away. And at a distance to a metal table determined by measuring 6 darts in the specified size of hits and hit points were collected by the average of the total score. Prior to this, all students were given 3 trial rights. The ages of the students were determined and recorded by looking at their identity information. To determine the BMI, a portable digital weight measuring device with a sensitivity of 0.1kg was used for weight measurements. Body weight of subjects; In the anatomical posture, appropriate sports clothes were measured as "kg, provided that the feet were naked or thin clothes. Portable height measuring device was used for height measurement. The measurements were recorded as "cm. In addition, BMI was taken by Body Composition Analyzer with Bioempedance method to determine BMI.

Bioelectrical impedance analysis was performed by allowing the participants to climb up to the device with bare feet without suitable clothes and metal parts on them. In statistical comparisons, the variables were given as descriptive statistics, and one-way analysis of variance (Annova) was used in multiple tests. A = 0.05 was chosen as the level of significance.

RESULT

The aim of this study was to investigate the respiratory parameters, hand-eye coordination and body mass indexes of gifted students aged 8-9 years. In this study, a total of 73 students (37 females and 36 males) were identified with the wiscar intelligence scale. levels, age, height, weight, BMI, hand-eye coordination and respiratory functions are presented in the tables below.

Table 1. Intelligence scores, weight and height distribution of students according to their intelligence status

Variables	Intelligence States	N	X	SS
WISC-R Verbal ZB score	Normal İntelligence	4	109.75	4.78
	Bright İntelligence	10	116.20	9.40
	Superior İntelligence	26	125.12	7.79
	Outstanding İntelligence	22	133.59	6.13
	Genius	11	147.36	5.88
	Total	73	128.96	12.47
WISC-R Performance ZB score	Normal İntelligence	4	100.75	9.09
	Bright İntelligence	10	109.80	9.00
	Superior İntelligence	26	120.19	7.37
	Outstanding İntelligence	22	127.73	6.33
	Genius	11	135.09	7.51
	Total	73	122.22	11.62
WISC-R Verbal ZB score	Normal İntelligence	4	105.75	2.36
	Bright İntelligence	10	114.30	2.40
	Superior İntelligence	26	124.30	2.71
	Outstanding İntelligence	22	134.18	2.48
	Genius	11	145.73	3.95
	Total	73	128.08	11.22
Weight (kg)	Normal İntelligence	4	27.00	1.41
	Bright İntelligence	10	26.40	3.68
	Superior İntelligence	26	31.50	6.36
	Outstanding İntelligence	22	30.45	5.70
	Genius	11	30.54	7.58
	Total	73	30.09	6.04
Height (m)	Normal İntelligence	4	1.29	0.06
	Bright İntelligence	10	1.28	0.04
	Superior İntelligence	26	1.30	0.04
	Outstanding İntelligence	22	1.29	0.04
	Genius	11	1.29	0.04
	Total	73	1.29	0.04

In Table 1, the average score of WISC-R verbal IQ from Wechsler Intelligence Scale for Children was 128.96 ± 12.47; average performance , performance score 122.22 ± 11.62; in total, the average score of IQ was 128.08 ± 11.22.

According to the WISC-R test results of the children participating in the study, the average WTC-R total score of children with normal intelligence (n = 4) was 105.75 ± 2.36; children with bright intelligence (n = 10) 114.30 ± 2.40; gifted children (n = 26) were 124.30 ± 2.71; children with very high intelligence (n = 22) were 134.18 ± 2.48; genius group (n = 11) children were found to score 145.73 ± 3.95.

In Table 1, the average weight of the children participating in the study was determined as 30.09 ± 6.04 and their height was 1.29 ± 0.04 (meters).

Table 2. Comparison of the parameters of respiration. dart and bki according to students' intelligence

Variables	Gender	N	X	SS	F	p
FVC	Normal İntelligence	4	2.15	0.19	1.848	0.130
	Bright İntelligence	10	1.91	0.34		
	Superior İntelligence	26	2.01	0.23		
	Outstanding İntelligence	22	1.86	0.28		
	Genius	11	1.85	0.26		
	Total	73	1.94	0.27		
FEV1	Normal İntelligence	4	1.87	0.45	1.039	0.394
	Bright İntelligence	10	1.64	0.30		
	Superior İntelligence	26	1.76	0.22		
	Outstanding İntelligence	22	1.70	0.26		
	Genius	11	1.63	0.28		
	Total	73	1.71	0.27		
PEF	Normal İntelligence	4	3.02	0.52	0.198	0.939
	Bright İntelligence	10	3.11	0.99		
	Superior İntelligence	26	3.23	0.72		
	Outstanding İntelligence	22	3.09	0.76		
	Genius	11	3.05	0.62		
	Total	73	3.13	0.74		
Dart Average	Normal İntelligence	4	3.33	1.73	1.000	0.414
	Bright İntelligence	10	3.20	1.68		
	Superior İntelligence	26	4.14	2.91		
	Outstanding İntelligence	22	3.35	1.36		
	Genius	11	2.72	1.75		
	Total	73	3.51	2.16		
BMİ	Normal İntelligence	4	16.12	1.67	1.691	0.162
	Bright İntelligence	10	15.98	1.21		
	Superior İntelligence	26	18.38	3.09		
	Outstanding İntelligence	22	18.18	3.14		
	Genius	11	18.09	3.28		
	Toplam	73	17.82	2.96		

Table 2 shows the mean FVC of the children participating in the study was 1.94 ± 0.27; The average FEV1 was 1.71 ± 0.27; The mean PEF was 3.13 ± 0.74; The mean darts were 3.51 ± 2.16 and the mean BMI was 17.82 ± 2.96. There was no statistically significant difference (p> 0.05) between FVC, FEV1, PEF, Darts and BKI according to students' intelligence.

DISCUSSION & CONCLUSION

In our study, the average score of WISC-R verbal IQ was 128.96 ± 12.47; average performance performance score 122.22 ± 11.62; In total, the average IQ score was 128.08 ± 11.22. Tan and colleagues in their study in the province of Ankara

between the ages of 6-12 Science and 59 gifted children who were selected to Art Center had the average verbal IQ score of 133,71 ± 7,45; The mean score of performance IQ was 134.46 ± 8.25; found that the total IQ average score was 139.63 ± 6.37 (17). The intelligence scores of the children in our study Tan and his colleagues. their intelligence score was lower than the children. It is thought that this situation may have been due to the fact that among the more students in Ankara province, Malatya is selected among the Science and Arts Center students. Table 2 shows the mean FVC of children was 1.94 ± 0.27; The average FEV1 was 1.71 ± 0.27; The mean PEF was 3.13 ± 0.74; The average darts were 3.51 ± 2.16 and the average BMI was 17.82 ± 2.96. There was no statistically significant difference (F> 0.05) between FVC, FEV1, PEF, Darts and BKI according to students' intelligence.

According to the study conducted by Ataman on 6-7 years old Turkish children, the height, weight, and lung capacity measurements of the Gifted Cluster were found to be higher than those in the sub-normal cluster, and the difference was found to be significant at p <0.05 (10). These results do not match the results of our study. In a study conducted by Esmaili and his colleagues. In children aged 7-11, the average BMI was 18.08 (9).

In the study conducted by Kalkavan and his colleagues. In basketball players in the 9-13 age group, FVC was found to be 1.63 ± 3.38 and FEV1 was 1.55 ± 3.23 (11). Although there is a parallel between FVC and FEV1 values in this study and the results of our study, it is thought that the reason for the increase in the values of the athletes measured in the above-mentioned study is that they actively participate in a branch. In their study conducted by Özgül and her colleagues. On children aged 10-14 years in swimming, the mean scores of pulmonary function tests were found to be 1.85 ± 0.42, 1.88 ± 0.41, FEV1, 1.88 ± 0.41 78 ± 0.38, they found that after training 1.80 ± 0.40 (14).

The results of our study showed a parallel between the FVC and FEV1 values between the swimmer group in this study.

In a study conducted by Robben and colleagues. On 27 children (12 boys, 15 girls) who were active in different sports branches in the 7-12 age group, FVC2.3 ± 0.3lt, FEV1 1.9 ± 0.2lt, PEF 3.6 ± 0.6 lt in girls and FVC in girls 1.9 ± 0.43lt, FEV11.6 ± 0.3lt, they found that the PEF 3.0 ± 0.5l (15).

The aim of this study was to compare respiratory parameters, hand-eye coordination and body mass indexes of gifted students aged 8-9 years. As a result, there was no significant difference between respiratory parameters, hand-eye coordination and BMI according to intelligence levels of 8-9 years old children. Therefore, the prominent physical characteristics of gifted children mentioned in the screening of studies on the field review were not found in gifted children in our study.

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The Effect of Bicycle Training Program on Aerobic and Anaerobic Performance

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Abstract

The aim of this study is to determine the effect of cycling exercise program applied to young adults for eight weeks on aerobic and anaerobic performance. Fourteen volunteer, non-smokers, moderately active men aged between 19-23 participated in the study. The aerobic performance of the participants before and after the training program was determined by 20-meter shuttle running test and their anaerobic performance was determined by Wingate anaerobic power test. The training program consisted of 40-60 minutes cycle ergometer exercise performed 3 times weekly for 8 weeks at a work load corresponding to 60-80% of the maximal heart rate. The pre-post data were compared using the Wilcoxon paired signed ranks test. According to the findings of the study, there was no significant difference in body weight, body mass index, minimum strength and fatigue index values ($p>0,05$), while there was a significant difference in the maximum oxygen uptake (VO_2 max), peak power and average power values in the pre-test and post-test scores ($p<0,05$). As a result, it can be said that regular cycling exercise program improves aerobic and anaerobic performance positively.

Key words: Wingate anaerobic power test, aerobic power, bicycle training program.

INTRODUCTION

Scientific evidence showing the beneficial effects of exercise is indisputable, and the benefits of exercise are far greater than the risks of exercise in most adults. To improve and maintain physical fitness and health, a regular training program that includes cardiorespiratory, resistance, flexibility and neuromotor exercise training, beyond daily life activities is required for most adults (8). Endurance training that improves oxygen delivery from the atmosphere to the mitochondria and enables adaptations of the cardiovascular and neuromuscular systems, which allows for tighter regulation of muscle metabolism, improves peak oxygen consumption, increases the capillary density of the working muscle, increases blood volume and reduces heart rate during exercise at the same absolute intensity (14,15). Sport-specific training programs are designed to optimize the skills of the players, and must comply with the physiological and energetic demands of a particular sport. For most sports, adenosine triphosphate-phosphocreatine (ATP-PC), glycolytic and oxidative phosphorylation systems play an important roles. The first two energy systems are the main source of ATP during high-intensity exercise, while the mitochondrial system plays an important role in the recovery period (36).

It is stated that designing high intensity exercise programs can be an important success factor and high intensity training programs are especially critical for improving cardiac function. Although high-intensity exercise appears to lead to greater beneficial adaptations in the cardiovascular system, it is still unknown whether this type of training is safe in larger patient groups than in low-to-moderate training, and whether it affects the complication rates in patients more positively (34). For a certain level of energy expenditure, the high intensity training program causes more subcutaneous fat loss compared to the moderate intensity training program. From a clinical point of view, the most suitable program for individuals at risk of health problems or obese people who are unable to exercise is a low-intensity exercise program with a progressive increase in duration and frequency of sessions (29). Although high-intensity training is stated to be more effective in increasing

relative peak oxygen consumption and providing higher cardiovascular benefits than continuous endurance exercises, both training methods support health (13).

Regular training results in an increase in the anaerobic performance of athletes. This improvement in anaerobic performance is the increase in the efficiency of the ATP-PC and lactic acid system. Therefore, the energy resources and ability of the athlete to use these resources are important factors for a good athletic performance (23). Continuous endurance training increases performance during functions based on aerobic energy metabolism, while high intensity interval studies provide more effective use of aerobic and anaerobic energy systems. Studies have indicated that these training increases oxygen uptake and activities of mitochondrial enzymes that produce energy in skeletal muscles (2). The aim of this study is to determine the effect of cycling exercise program applied to young adults for eight weeks on aerobic and anaerobic performance.

MATERIAL & METHOD

Subjects: Fourteen volunteer, non-smokers, moderately active men aged between 19-23 participated in the study. The study was carried out in accordance with the Helsinki Human Rights Declaration and the informed consent was obtained from the participants. Performance evaluation tests were carried out on different days, two days before the training program and two days after the end of the program.

Determination of aerobic performance: The aerobic performance of the individuals participating in the study was determined by 20-meter shuttle running test (16). It is a test that starts with 8.5 km/h and the running speed increases by 0.5 km/ h per minute. The participants were asked to cover 20 m per signal. The test was terminated when the participant failed to overlap the two signals or when he left the test. At the end of the test, the tours completed by individuals were counted and the estimated VO_2 max value of the subject was found in ml/kg/min from the evaluation table.

Determination of anaerobic performance: Anaerobic performance of individuals was determined by Wingate anaerobic power test. This test is a supramaximal test involving pedaling at maximum speed against a constant load based on body weight for 30 seconds. The test was carried out on a computer linked mechanical bicycle ergometer (Monark 894-E). The seat length was adjusted for each participant, and after 5 minutes 50 watt 50 rpm warming up on the bicycle ergometer, the weight corresponding to 7.5% of the body weight was placed on the pan. When the participant was ready, he was asked to cycle maximally, when the speed of 150 rpm was reached, the weight was automatically reduced and he was asked to maintain the pedal speed for 30 seconds. Subjects were verbally motivated during the test. Peak power (= maximum anaerobic power, the highest mechanical power obtained in any five-second time frame generated during the test), average power (= maximum anaerobic capacity, average power generated during the test) and minimum power (=lowest mechanical power achieved during any five-second time period generated during the test) was calculated by the software program on the computer. The fatigue index was calculated by the following formula: ([highest peak power − lowest peak power] × 100)/highest peak power (23,24).

Training Program: The training program consisted of 40-60 minutes cycle ergometer exercise performed 3 times weekly for 8 weeks at a work load corresponding to 60-80% of the maximal heart rate. The target heart rate of the subjects were monitored with a polar pulse control monitor in each training. Stationary and non-resistance exercise bikes were used in training.

Table1. Training program

Weeks	Duration (min)	Intensity (%)	Frequency (day/week)
1	40	60-65	3
2	45	60-65	3
3	45	65-70	3
4	50	65-70	3
5	50	70-75	3
6	55	70-75	3
7	55	75-80	3
8	60	75-80	3

Statistical Analysis

Mean and standard deviation values of the participants were calculated. Whether the data is normally distributed or not is determined by Kolmogorov Smirnov Test. As a result of the test, it was determined that the data did not show normal distribution and the pre-post data were compared using the Wilcoxon paired signed ranks test, which is one of the non-parametric tests, was used.

RESULTS

The average and standard deviation values of some variables of the participants whose average age is 21 ± 1.24 years and height average is 176.7 ± 6.62 cm are given in Table 2.

Table 2. Changes of some variables before and after the training program of the subjects participating in the study.

	Pre-test	Post-test	
Variables	**Mean+SD**	**Mean+SD**	**p**
Body weight (kg)	66,91±8,17	66,45±7,70	0,344
BMI (kg/m²)	21,49±2,77	21,32±2,58	0,281
VO_{2max} (ml/kg/dk)	44,40±5,55	45,75±6,40	0,048*
Peak power (W/kg)	10,65±0,62	11,30±0,93	0,013*
Average power (W/kg)	7,78±0,39	8,21±0,44	0,006*
Minimum power (W/kg)	4,80±0,36	5,09±0,46	0,079
Fatigue index (%)	54,81±4,06	54,63±5,83	0,778

*p<0,05, SD: Standard deviation, BMI: Body mass index

VO_{2max}: Maximum oxygen consumption

According to Table 2, while there was no significant difference in body weight, body mass index, minimum power and fatigue index values (p> 0.05), there was a significant difference in the pre-test and post-test scores of VO_2 max, peak power and average power values (p <0.05) has been determined.

DISCUSSION & CONCLUSION

The most important finding of this study is that the bicycle exercise program applied for 8 weeks increases maximal aerobic and anaerobic power. In addition, body weight, body mass index, minimum power and fatigue index values were not affected by the training program.

The results indicated a specific enzymatic response to each of endurance training despite a similar increase in VO_2 max (7). High intensity aerobic endurance training is significantly more effective than moderate and low intensity training in improving VO_2 max in healthy young adults. Changes in VO_2 max are compatible with changes in the stroke volume, indicating a close connection between the two (10,12). In a different study,

significant differences were found between the 85% and 75% groups and the control group as a result of cycling exercises performed at different intensities in young men (65%, 75% or 85% of maximum heart rate, 3 days a week). No significant difference was found between the 65% group and the control, or between the 75% and 85% group. Researchers have concluded that in order to reveal significant changes in VO_2 max, it is necessary to work at least 75% of the maximum heart rate (4). Contrary to these studies, Meyer et al (18) reported that low and medium intensity walking and jogging training for 12 weeks increased VO_2 max similarly. Studies comparing both interval and continuous training regimes have demonstrated similar adaptations for increases in VO_2 max in the two types of training programs (5,6,20,22). In a different study, it was stated that the continuous running method was more effective than the interval running method in reducing body weight, and both methods showed similar positive effects in reducing body fat percentage and improving aerobic capacity (25). Yüksel et al (35) found that after the training program, which is applied regularly for three weeks a week for eight weeks, the continuous running method affects body weight, body fat percentage and aerobic power values, while interval training does not affect body weight, body fat percentage and anaerobic power values. Contrary to these studies, it has been reported that the gains in Vo_2 max are higher in the interval training group than in the continuous training group (9,19). Similarly, interval training programs were found to be more effective than low-intensity continuous training in cardiac patients (26,30,33). However, twelve weeks of high-intensity interval training is an effective training stimulant to improve cardiovascular fitness and glucose tolerance, but less effective than prolonged training in the treatment of hyperlipidemia and obesity. Also, unlike strength training, the twelve-week interval training program has no effect on muscle mass or skeletal health (21). Green et al (11) observed increases in VO_2 max at the end of the first 3 weeks after prolonged submaximal cycling exercises, and increased more in VO_2 peak at the end of 9 weeks. The researchers also reported that the prolonged submaximal training program increased the potential for β-oxidation, oxidative

phosphorylation and glucose phosphorylation. In our current study, continuous cycling exercise training significantly increased VO_2max. Unlike these studies, Williams et al (32) reported that neither the eight-week sprint interval running program nor the continuous cycling ergometer program significantly improved the maximal or submaximal indicators of aerobic performance in prepubertal boys.

Anaerobic capacity depends on training background and can be increased by 10% with a proper training program for 6 weeks. In addition, there is a close relationship between a high anaerobic capacity and a high anaerobic energy release (17). Low-volume high-intensity interval training provides moderate improvement in the aerobic power of active non-athletic and sedentary people. The meta-analysed effects of high intensity interval training on Wingate peak and mean power were unclear (31). As performance in Wingate anaerobic test is dependent on phosphagenic, glycolytic and, partially, oxidative metabolism, these data indicate that at least one of these energetic systems had improved after interval training. Twenty-seven minutes of cycling at 80% VO_2 max applied with 3 sessions per week for 6 weeks provided sufficient stimulus to significantly improve markers of anaerobic and aerobic performance in recreationally active college-aged men (36). Similarly, VO_2 max and anaerobic power variables increased statistically significantly in young male basketball players in interval training, continuous running and technical training groups (1). Burgomaster et al (3) reported that VO_2 max increased significantly in the sprint interval (6 weeks, 3 times a week, 6x30 sec wingate) and in the continuous cycling group (6 weeks, 5 days a week, 40-60 min per day, 65% VO_2 max intensity cycling). They stated that the peak power that occurred during the Wingate test increased in both groups and the average power values increased only in the interval group. In our current study, as a result of continuous cycling exercise training, maximum anaerobic power (peak power) and capacity (average power) values increased significantly. Contrary to these studies, Tabata et al (27) stated that moderate intensity endurance training performed for six weeks does not affect anaerobic capacity while developing aerobic capacity, but six-week high intensity interval training can improve both anaerobic and aerobic energy systems, possibly by applying intense stimuli to both systems. Tanisho and Hirakawa (28) found that after cycling exercise training performed 3 times a week for 15 weeks in male college students, VO_2 max significantly increased in both continuous (20-25 min) and interval (10x10 sec, 20 sec rest) groups. In addition, although maximal anaerobic power increased in both groups, it was found statistically significant in the interval group. The contradictions between the researches on this subject can be explained by the different types of training programs, duration, intensity and measurement methods, as well as that the subjects participating in the research consisted of different groups.

Our study has some limitations. The first is that the training program is limited to eight weeks. The second is that aerobic performance is determined only by the field method.

As a result, it can be said that the eight week continuous cycling exercise program increases both aerobic power and anaerobic power and capacity.

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The Effect Of Stretching Exercises Applıed Following 6 Week Aerobıc Exercise On Women In Various Age Groups

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Abstract

Objective: This study was carried out to determine the differences between exercises of women in different age groups. Material and Methods: Aerobic exercise was administered to 20 exercise and control groups each at ages ranging between 17-24 and 30-45. Before and after the study, Sit and Reach Test, Shuttle test, BMI measure were carried out. Results: In terms of BMI, there was a significant difference between pre-test and post-test and there was no difference in BMI between middle-age exercise and young age exercise and young age control group. When all age groups were evaluated in terms of shuttle movement, no difference was found between exercise groups, and there was a significant difference between exercise and control groups. It was observed that there was a significant difference between pre-test and post-test in terms of the length of the long jump and double leg sit length test and there was a significant increase in the elasticity values of the exercise groups in the scale score. Conclusion: This study showed that the flexibility of join to movement of the individuals can be improved with the appropriate stretching exercises after warming, and that these exercises can be applied in every age group.

Key words: Aerobic Exercise, Flexibility, Women

INTRODUCTION

As the age increases the loss of muscle strength occurs and this affects physical performance negatively. The flexibility feature is at the top of the physical fitness components that are wanted to be developed by athletes and many methods are used for the development of this feature. These methods are PNF (Proprioceptive neuromuscular facilitation) that includes athletes' use of contraction and stretching together, ballistic stretching involving rhythmic springing after a short stretch and stretching methods consisting of dynamic movements at a slow pace, similar to the movement to be made (5,6,17,19).

Flexibility is defined as the maximum possible joint movement width taking place in one or more joints (14). Body composition, muscle strength and flexibility are among the health-related physical fitness parameters, and insufficiency in these parameters can be experienced with age. İn this sense, maintaining and increasing the level of physical activity is the most important criterion of healthy aging (18). Energy expenditure decreases with advancing age and the metabolic rate slows down, and the biggest reason of that is the decrease in physical activity level with age as well as an inactive and sedentary lifestyle (2).

It is stated that warm-up and stretching exercises are considered as a means of preparing musculoskeletal systems for activity before physical activity, and this is also an important part of fitness and exercise warming due to their possible effects on injury and performance (3, 13).

It has been stated in many studies that flexibility studies have numerous benefits on human body in many aspects such as biological, physiological, psychological and philosophical aspects (1).

Stretch types are examined in 5 groups: passive stretching, active stretching, static stretching, pnf stretching, and dynamic stretching. Passive

Stretching occurs when a person is being stretched by an assistant while active stretching is the situation during which a person stretches him/herself without an assistant (10). Static Stretching; static flexibility is determined by direct or indirect measurement of joint range of motion. The static flexing requires waiting at the point where you cannot extend further after stretching as much as possible and (11). PNF Stretching; the main principle of the PNF technique is a technique in which a muscle will relax to maximum after contraction to a maximum and can be used in exercises that mobilize muscles in the shortened position. Dynamic Stretching is a measure of resistance to movement. There are few studies on the determination of dynamic flexibility. It includes controlled movements to increase the movement angle of a certain part of the body (11).

This study was conducted to determine the level of flexibility difference between the sedentary women in different age groups of stretching movements after six weeks of warming.

MATERIALS AND METHODS

A six-week aerobic exercise program was applied to the exercise group of women who are risk free related to exercise and with no experience of menopouse with age ranges of 17-24 and 30-45, and 20 control groups in the same age ranges. Eight different stretching movements were performed in sets of three. Each set was conducted by waiting for 10 seconds in each movement. Sit and Reach Test, Shuttle Test, Long Jump and BMI were measured before and after the study.

Sit-Reach Test; It involves sitting on the floor with feet extended straight forward. Both knees are locked and pressed flat on the floor. With the palms facing down and hands on top of each other or side by side, the hands are extended as far as possible along the measuring line. After making sure that the hands remain at the same level, one hand should not be extended further than the other, and this position is held for one to two seconds while the distance is recorded and the measurement is taken after making sure that there is no jerky movement (15).

Shuttle Test; the person is placed in the supine position on the cushion, the knees are placed at an angle of about 140 degrees and the arms are bent and the hands are placed on the nape. It is evaluated as one point when the person's elbows are raised with their legs parallel. The number of movements performed in 60 seconds was considered as the highest number of repetitions.

Long Jump; the measurement was made by measuring the distance between the toe at the starting line on a non-slippery surface and the heel of the subject.

Statistical analyses were evaluated in SPSS program. In order to evaluate the changes in the responses of the exercise group to the pre-test and post-test exercises over time, ancova analysis in repeated measures were conducted and Bonferronni control method showing the difference between the study groups was applied and the results which emerged were shown on the figures and tables. Results were evaluated by 95% confidence interval but significance was evaluated at $p<0.001$ and $p<0.05$ level.

FINDINGS

Table 1. Summary Ancova Main Effect of Groups of Dependent Variables on Shuttle, BMI, Long Jump and Double Leg Sit extend.

Summary Ancova Main Effect of Shuttle Dependent Variable based on Groups					
Source of variance	**Df**	**SS**	**MS**	**F**	**p***
Shuttle Pre-tests	1	3946.264	3946.264	451.612	0.000
Group	4	505.872	126.468	14.473	0.000
Error	35	305.836	8.738		
Summary Ancova Main Effect of BMI Dependent Variable based on Groups					
BMI Pre-test	1	491.174	491.174	2518.826	0.000
Group	4	7.720	1.930	9.898	0.000
Error	35	6.825	0.195		
Summary Ancova Main Effect based on Long Jump Groups					
Long Jump Prediction Pre-test	1	7265.854	7265.854	742.619	0.000
Group	4	389.046	97.262	9.941	0.000
Long Jump Prediction + Group	3	300.759	100.253	10.247	0.000
Error	32	313.091	9.784		
Double Leg Sit Extend Test Summary Ancova Main Effect based on Groups					
Double leg (Sit extend) Pre-test	1	1936.885	1936.885	3241.327	0.000
Group	4	74.550	18.637	31.189	0.000
Error	35	20.915	0.598		

***p<0.001

Table 2. Shuttle, BMI, Double Leg Sit Extend Dependent Variable Pairwise Comparison based on Groups.

Pairwise Comparison of Shuttle Dependent Variable based on Groups				
Group	**Prediction**	**Standard Error**	**p***	**95% Confidence Interval**
Middle Age Exercise - Middle Age Check	7.513	1.330	0.000	(3.793, 11.232)
Young Age Exercise - Young Age Check	6.374	1.357	0.000	(2.578, 10.169)
Middle Age Exercise - Young Age Exercise	1.048	1.435	1.000	(-2.965, 5.060)
Middle Age Exercise - Young Age Check	7.421	1.345	0.000	(3.659, 11.184)
Pairwise Comparison of BMI Dependent Variable based on Groups				
Middle Age Exercise - Middle Age Check	-0.860	0.214	0.002	(-1.460,-0.261)
Young Age Exercise - Young Age Check	-0.762	0.200	0.003	(-1.320,-0.203)
Middle Age Exercise - Young Age Exercise	0.080	0.275	1.000	(-0.687, 0.848)
Middle Age Exercise - Young Age Check	-0.681	0.255	0.068	(-1.394, 0.031)
Double Leg Sit Extend Test Pairwise Comparison Between Groups				
Middle Age Exercise - Middle Age Check	2.117*	0.346	0.000	(1.149,3.084)
Young Age Exercise - Young Age Check	3.154*	0.626	0.000	(1.405,4.903)
Middle Age Exercise - Young Age Exercise	-0.683	0.346	0.337	(-1.651,0.284)
Middle Age Exercise - Young Age Check	2.081*	0.346	0.000	(1.113,3.048)

***p<0.005

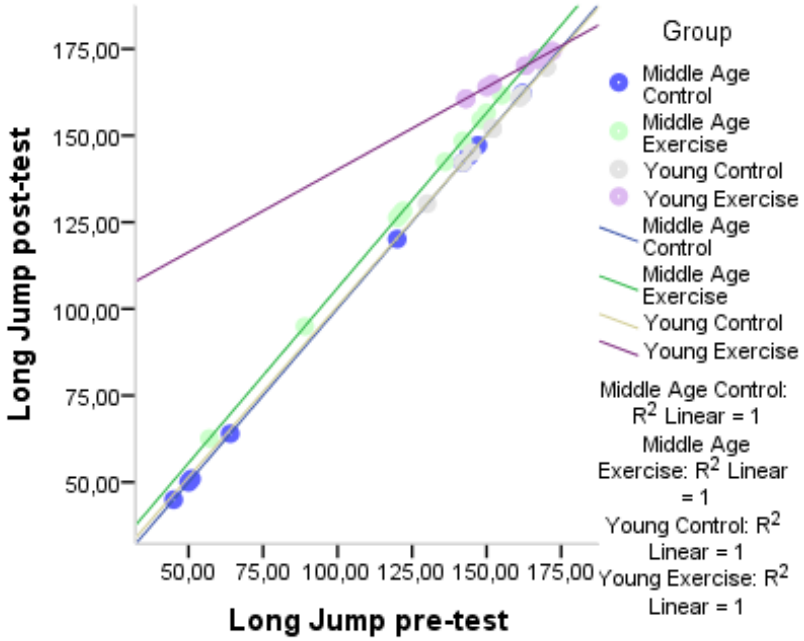

Figure 1. Long Jump

It was found that there was a significant difference between pre-test and post-test in the main ancova effect of shuttle, BMI and double leg sit extend test based on group summary F (1.35 = 451.612, p <.0001), F (1.35 = 2518.826, p <.0001), F (1.35 = 3241.327, p <.0001). It was also revealed that the working group variable was significant in terms of post-test F (4.35 = 14.473, p <.0001), F (4.35 = 9.898, p <.0001), F (4.35 = 31.189, p <.0001).

It was found that there was a significant difference between the pre-test and post-test F (1.32 = 742.619, p <.0001) in the summary ancova main effect table based on groups of long jump variable. The post-test F (4.32 = 9.941, p <.0001) was also significant based on study group variable. In addition, at the beginning of the test, it was found that the prediction and group total in terms of post-test F (1.32 = 10.247) was significant (Table 1).

When the average of the post test of the participants were compared in terms of shuttle and double leg sit extend test, shuttle difference between middle age exercise and control group was 7.513 (p <.0001). For young age exercise and young age control 6.374, double leg- sit extend differences in same age groups is 2.117-3.154. When all age groups were evaluated, there was no difference between the exercise groups but there was a significant difference (p<.0001) between the exercise and control groups in terms of shuttle movement and double leg extend test (Table 2).

When compared in terms of BMI, the difference between middle age exercise and control group was -0.860 (p <.0005) and the difference between young age exercise and young age control was -0.762. There was no difference between middle age exercise with young age exercise and young age control group in terms of BMI (Table 2).

In the comparison graph between the groups, it was observed that there was a similarity between the pre-test and post-test in the exercise age groups and there was a significant increase in the scale score. Also when the exercise group Bonferronni control method was compared with the control group, the difference was seen to be significant (Figure 1).

DISCUSSION

In many studies, it is argued that warming up movements have a positive effect on flexibility performance and provide an opportunity to prepare the person for the psychological and physiological activity. When the studies examining the relationships between flexibility and performance are analysed, it is seen that there are many short-term studies on this issue (12).

Studies conducted in the dynamic and static stretching are said to create similar effects. However, it is clearly mentioned in the books and articles that chronically applied studies have controversial results and that chronic studies have negative effects on muscle structure (16).

It was observed that Kokkonen and et. al. (7) achieved 16% increase in the sit-extend flexibility test after 6 repetitive static stretching exercises applied to the athletes with an average age of 22 for a period of 15 sec. This study supports the results of our research. In another study conducted, it was found that there was a slight increase in the range of motion of the hamstring exercises applied statically for six weeks and that this did not have a positive effect on power competence (4). As a result of the different warm-up exercises performed for six weeks, the stretching exercises were examined in the young and middle age sedentary women categories. Sit extend test, long jump and shuttle pre-test and post-test significant differences were observed and sit-extend test pre-test results showed that the flexibility levels of young women were better than those of middle-aged women. This result shows and supports the general idea of loss of the flexibility at the elderly age. Considering the pre-test and post-test evaluation of the shuttle test conducted, it was determined that the exercises performed had an effect on endurance performance.

O'Sullivan and et. al. (9) examined the effect of general warming on hamstring flexibility and argued that general warming have a significant positive effect on hamstring flexibility on individuals even after regional injuries. They also stated that a jogging type warming positively affects muscle stiffness and movement angle (8,9).

Significant differences were found between the young and middle age group after long jump pre-test and post-test results were evaluated, which is another research experiment. It was found out that there is more progress in the young age group. It was also discovered that the effect of body mass index on long jump test and the exercises performed as a result of research had a positive effect on plosive force.

RESULT

In this study, it was found that flexibility is a feature that should exist at any age in order to facilitate the works in our daily lives and that the flexibility which disappears for some age groups can be regained after some warm ups. It can be said that for a healthy body such programs should be regularly applied and repeated in middle and older aged women. It has been concluded that exercise has a significant effect in all age groups, and if there is no harm medically, a person can exercise regardless of age. Exercise has many positive as well as physiological effects. Intense tempo, stress, and anxiety level affect people physically and spiritually and decrease one's quality of life. It is thought that it would be effective to carry out studies including home programs in addition to salon exercises with holistic approach to improve the quality of life of a person by doing exercise to maintain health and reduce stress and anxiety levels.

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Examining the Effectiveness of Mindfulness Based Training Program on Female Handball Players' Psychological Skills and Coping with Stress Strategies

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Abstract

The aim of this study was to examine the effectiveness of a mindfulness-based training program on female handball athletes' psychological skills and strategies to cope with stress in sport. In the study, as a quasi-experimental method, pre-test, and post-test models without a control group were used. The study group consists of 9 female handball players who play in the Antalya Muratpaşa Municipality Women's Handball Team. In the research, a personal information questionnaire, the Athletic Coping Skills Inventory and Coping Strategies in Sport Competition Inventory were used to collect data as pre-test before the program and as post-test at the end of the program. In the study, the Mindfulness-Based Training Program was implemented once a week as group training, consisting of 8 sessions lasted 60 minutes each. Wilcoxon Signed Rank Test was used to test the significance of the scope difference. As a result of the study, after the program, there was a significant difference in terms of ability to cope with adversity, coachability, concentration, goal setting and mental preparation, and being free from worries. Moreover, a significant difference between pre-test and post-test scores of the task-oriented coping dimension in Sport Competition Inventory was noted.

Key Words: Mindfulness, coping strategies with stress, psychological skills

INTRODUCTION

Increasing the performance of athletes has been one of the most significant fields of study in sports science. It is noted that performance in sport is largely affected by athletes' ability to be "mindful". Being mindful for athletes means remaining in the present, and being centered and relaxed regardless of what happens during the competition (32). Recent studies conducted in the field reveal that mindfulness-based practices have become prominent as an effective method for increasing the performance of athletes (19, 21). In this sense, mindfulness interventions designed to assist athletes in increasing their performance are new practices. Studies in sports psychology have shown that there is a relationship between mindfulness and sports performance (22) and also optimum performance in sports is linked to the present focus (33). Mindfulness interventions applied to improve performance in sports generally focus on psychological training techniques, attention and optimum performance (30).

Success and performance in sports are affected by stress factors, such as mental or physical mistakes, pain, disease, being cheated by opponents or seeing them succeed, being penalized by the referee and being challenged by the trainer (4). Stress consists of physiological, behavioral,

emotional and cognitive patterns of reactions against real or imagined stimulants that are perceived as putting the individual at risk or harm his/her well-being (23). On the other hand, mindfulness plays an important role in reinforcing the psychological and physiological well-being of the individuals (35). There are many definitions of mindfulness in literature. According to Bishop et al. (7), mindfulness is defined as the individual's ability to self-regulate oneself regarding momentary mental states and mental processes. Linehan and Dimidjian (25) state that mindfulness includes, "the intentional process of observing, describing and participating in reality, nonjudgmentally, in the moment, and with effectiveness." On the other hand, Kabat-Zinn (20) defines mindfulness as "paying attention in a particular way: on purpose, in the present moment, and non-judgmentally."

Mindfulness teaches athletes to focus on the moment instead of dwelling on the mistakes of the past and potential consequences of those mistakes. By focusing on the moment, athletes can pay more attention to the cues about their performances, and they can more easily ignore the factors that distract them (36). Most of the traditional cognitive-behavioral strategies include techniques, such as thought-stopping, self-talk, goal setting and imagery (6, 10, 40). However, recent studies have shown that these techniques have limited impact on the athletes' abilities to improve their performances (14). As a technique that helps athletes to focus on the moment (18), mindfulness makes it easier for them to improve their performance to the optimal level. Therefore, it has been found that mindfulness practices are effective for increasing performance in various branches of sports that require focusing, such as golf (5), marksmanship (19) and archery (21).

While mindfulness practices have an important role as strategies to cope with stress, it has also been proven that they have a calming effect on the nervous system, helping to switch off the stress response and bring the individual back into balance. They also train individuals to become more aware of stress signals in the body, giving them the chance to respond more effectively (39). In addition, they provide significant information about the assessment of an athlete's stress stories, life events, daily stress variables and previous stress stories (2). Another study has highlighted topics, such as referee decisions, contests, impact of trainers and teammates, managerial and administrative decisions, social support, accommodation, travel, diet, education, and financial and time pressure as organizational stress sources (16). While it is common for athletes to be able to cope with stress, it often has major effects on their performance. The negative consequences of stress can be minimized with the help of mindfulness (32).

Competing at an elite level is a situation that requires the athlete to spend a great deal amount of time and intense effort. While doing this, it is normal for the athlete to experience stress and it is one of the most important factors affecting performance in sports. It can be said that mindfulness levels are also effective in improving the psychological skills of athletes and generating strategies to cope with stress. So, due to the absence of studies on mindfulness-based psycho-education programs on athletes in the Turkish literature, it is thought that examining the effectiveness on psychological skills of the mindfulness-based training program prepared within the scope of the research and the strategies to cope with stress in sports will contribute to the literature. Therefore, the main objective of this study is to assess whether mindfulness-based training programs improve the psychological abilities of women handball players and their strategies to cope with stress. Through the exercises incorporated in mindfulness-based programs, it is ensured that athletes focus on the moment and avoid judging their past, which is thought to increase their attention level and hence, reduce the stress level.

METHOD

This research is an experimental study that aims to analyze the effectiveness of an 8-week program, developed based on mindfulness-based stress reduction and mindfulness-based cognitive therapy approaches, on a female handball team's psychological skills and their strategies to cope with stress. In the design of this research, a quasi-experimental design has been employed.

Research Group

The subjects of the study consist of the members of the female handball team of the Municipality of Muratpaşa, Antalya. The research group was determined using the convenient sampling method. The women athletes who volunteered (in line with the opinions of the trainer) constitute the experiment group of the study. The total number of participants is 9. The sportive experience of the participants varies between 7 and 14 years (mean = 9.78). The

participants are between the ages of 18 and 25, and the average age is 20.22 (ss= 2.64).

Data Collection Tools and Procedures

Moreover, Akdeniz University, Scientific Research and Publication Ethical Committee approved the study (decision number 60). Before first session of the psycho-education program, the pre-test was applied to participants to measure psychological skills and strategies to cope with stress. Post-test was applied at the end of the program to examine the impact of the prepared mindfulness-based training program.

The Athletic Coping Skills Inventory

The Athletic Coping Skills Inventory (ACSI-28), developed by Smith, Schutz, Smoll and Ptacek (1995), was adapted to the Turkish culture by Erhan, Bedir, Güler and Ağduman (15). The inventory is a self-assessment tool that was developed to assess the psychological skills of athletes. The Athletic Coping Skills Inventory, consisting of 28 items, has 7 sub-dimensions, which are coping with adversity, coachability, concentration, confidence and achievement motivation, goal setting and mental preparation, peaking under pressure and freedom from worry. The Cronbach's Alpha coefficient, obtained in reliability studies, is .85. The Cronbach's Alpha coefficients for the subscales of coping with adversity, coachability, concentration, confidence and achievement motivation, goal setting and mental preparation, peaking under pressure and freedom from worry are .62, .51, .59, .60, .62, .71 and .50, respectively.

Coping Strategies in Sport Competition Inventory

I'Invantaire des Stratégies de Coping enCompétition Sportive (ISCCS), developed by Gaudreau and Blondin (2002) in Canada, was adapted to the Turkish culture by Arsan (3). The inventory, developed to assess the athletes' strategies to cope with stress during competitions, consists of 39 items. It has 10 subscales and is classified under three dimensions: Task-oriented coping (mental imagery, effort expenditure, thought-control, seeking support, relaxation, logical analysis), distraction-oriented coping (distancing, mental distraction) and disengagement-oriented coping (venting of unpleasant emotions, disengagement). The Cronbach's Alpha coefficients for the subscales vary between .61 and .76.

Data Analysis

In the pre-test and post-test score comparisons of the study group, the Wilcoxon Signed Rank Test, which is a nonparametric statistical technique that is used to test the significance of the scope difference, was employed. Analysis of quantitative data was conducted with the use of the Statistical Package for Social Sciences (SPSS 20.0). Athletes who prefer to participate in the study voluntarily are included in the mindfulness- based training program. Thus, the control group could not be formed because the number of people in the study group was limited and only consists of inequivalent female handball players.

The Preparation of the Program

The mindfulness-based skills development program is a psycho-education program planned to be a 60-minute weekly session for 8 weeks to develop athletes' psychological skills and strategies to cope with stress. Mindfulness-based Stress Reduction (MBSR) and Mindfulness-based Cognitive Therapy Techniques (MBCT) were mainly used in the preparation of the Mindfulness-Based Skills Development Program. Researchers used many resources to develop the program (9, 11, 12, 13, 24, 31). The content of the program was prepared by taking relevant theoretical views into consideration. While creating the content of the group sessions, sequence in the session themes is predetermined based on MBCT and sequence in mindfulness practice is determined based on MBSR. The program started with the most basic mindfulness practices. Then, it is followed by meditation practices such as eating and walking meditations that athletes can practice in their daily lives and it is finished with the unconditional acceptance practice. The purpose of each session was prepared by determining the target thoughts, emotions and behaviors expected to be achieved by female handball players. In order to apply mindfulness in their daily lives, they were told to ask the question "Where am I now and what am I doing now?" Thus, it was stated that they can easily focus their attention on themselves and their current experiences while acting automatically without realizing what they are doing during the day. Moreover, Ch'an always includes being calm, well-balanced and disciplined (27). When Ch'an application is carried out regularly, it helps the

individual to respond more effectively to the situations that he encounters daily by providing the improvement of power, elegance and self-confidence in the individual (26). On the other hand, loving kindness meditation helps the individual to develop positive emotions by incorporating a strong friendship towards herself and others and it allows others to accept unconditionally with their all aspects. This practice allows the mind to relax from past and future pressures by helping the individual to break his mental habits and his own judgements (8).

The homeworks to be assigned to participants at the end of groups sessions, and information and exercises to be provided to participants in each session were determined (Table 1).

Table 1. The content of the mindfulness-based skills development program

1st Session: Introduction to Mindfulness Concepts • Introduction • Introduction of the Mindfulness-Based Skills Development Program • Setting group rules • A theoretical introduction to mindfulness • Explanation of daily mindfulness practices • Application of mindfulness exercises (9) • Informing about tasks and practices • Assignment of the breathing exercise as homework	**2nd Session: Breath and Body Awareness** • The significance of breathing and body awareness • Awareness of emotions, behaviors and thoughts. • Principles and benefits of awareness • The significance of being in the moment • Performance check list (9) • Mindful breathing (9, 11, 17, 24) and body-focus exercises (12) • Assignment of breathing exercises and body-focus exercises as homework
3rd Session: Ch'an Meditation • The significance of Ch'an meditation in stress reduction • Mindfulness Movement meditation • Ch'an meditation (34) • Application of Ch'an meditation and assignment of the Ch'an meditation as homework	**4th Session: Let go of thoughts** • Thought tracking exercises • Imagination (River meditation) (13) • Sounds and Thoughts Meditation • Assignment of the Sounds and Thoughts meditation as homework (41)
5th Session: Focusing • Application of mindfulness to daily life • Focusing on five senses (24, 39) • The Chocolate Meditation • Assignment of the Eating Meditation as homework	**6th Session: Walking Meditation and Thought Stopping** • Formal walking meditation (8, 12) • "6 Things to Focus" Practice (12) • Thought stopping exercise • Assignment of the daily mindful walking exercise as homework
7th Session: Loving Kindness Meditation • Information about the Loving Kindness Meditation • Loving Kindness Meditation (8) • Assignment of the Loving Kindness Meditation as homework	**8th Session: Wrapping up: Summary and Conclusion** • Assessment of the program • Integrating awareness methods in daily life (tooth-brushing, eating etc.) (24) • 3-Minute Mindful Breathing Space Practice (28) • Sharing experience • Sharing the experience regarding all homework assigned in previous weeks • Receiving feedback

Application of the Program

The application of pre-test forms for the experiment group was completed in October, 2017; and the application of post-test forms was completed in December, 2017. The study started with 9 women handball players who attended all sessions of the program. The experiment group was given a group session on mindfulness-based skills development for 60 minutes a week. They were given a pre-test and a post-test to measure their psychological skills and their strategies to cope with stress in sports to assess the effectiveness of the mindfulness-based skills development program.

FINDINGS

Pre-test and post-test means scores of psychological skills and the strategies to cope with stress are shown in Table 2.

Wilcoxon signed rank test was used to compare pre-test and post-test values for the psychological skills. The analysis results as shown in Table 3.

Table 2. Pre-test and post-test values for psychological skills and the strategies to cope with stress.

	Pre-test	Post-test
Sub-scales	**Mean**	**Mean**
Coping with adversity	9.22	11.89
Coachability	11.11	13.44
Concentration	9.56	12.67
Confidence and achievement motivation	12.89	13.44
Goal setting and mental preparation	10.33	11.89
Peaking under pressure	10.89	12.11
Freedom from worry	8.22	10.22
Task-oriented coping	81.78	98.22
Distraction-oriented coping	19.67	22.78
Disengagement-oriented coping	19.11	18.11

Table 3. Wilcoxon signed rank test results of the pre-test and post-test scores for the psychological skills.

The sub-scales of the athletic coping skill inventory	Ranks	n	Mean Rank	Sum of Ranks	Z	p
Coping with adversity	Negative Ranks	1	2.00	2.00	-2.446	0.014*
	Positive Ranks	8	5.38	43.00		
	Ties	0				
	Total	9				
Coachability	Negative Ranks	0	0.00	0.00	-2.539	0.011*
	Positive Ranks	8	4.50	36.00		
	Ties	1				
	Total	9				
Concentration	Negative Ranks	0	0.00	0.00	-2.684	0.007*
	Positive Ranks	9	5.00	45.00		
	Ties	0				
	Total	9				
Confidence and achievement motivation	Negative Ranks	1	6.50	6.50	-1.318	0.187
	Positive Ranks	6	3.58	21.50		
	Ties	2				
	Total	9				
Goal setting and mental preparation	Negatif Sıra	1	1.50	1.50	-2.345	0.019*
	Pozitif sıra	7	4.93	34.50		
	Eşit	1				
	Toplam	9				
Peaking under pressure	Negative Ranks	1	7.50	7.50	-1.481	0.139
	Positive Ranks	7	4.07	28.50		
	Ties	1				
	Total	9				
Freedom from worry	Negative Ranks	0	0.00	0.00	-2.539	0.011*
	Positive Ranks	8	4.50	36.00		
	Ties	1				
	Total	9				

*$p<0.05$

According to the test results provided in Table 3, the results of the Wilcoxon Signed Rank Test applied for the Athletic Coping Skill Inventory of the experiment group revealed that there was a significant difference between the pre-test and post-test scores of the athletes in terms of coping with adversity, coachability, concentration, goal-setting and mental preparation and freedom from worry. When the rank sums of the variation scores are taken into consideration, the difference observed in positive ranks is in favor of the post-test scores.

Wilcoxon signed rank test was used to compare pre-test and post-test values for the strategies to cope with stress. The analysis results as shown in Table 4.

Table 4. The wilcoxon signed rank test results of the pre-test and post-test scores for the strategies to cope with stress.

The sub-scales of the coping strategies in sport competition inventory	Ranks	n	Mean Rank	Sum of Ranks	Z	p
Task-oriented coping	Negative Ranks	0	0.00	0.00	-2.524	0.012*
	Positive Ranks	8	4.50	36.00		
	Ties	1				
	Total	9				
Distraction-oriented coping	Negative Ranks	2	3.25	6.50	-1.630	0.103
	Positive Ranks	6	4.95	29.50		
	Ties	1				
	Total	9				
Disengagement-oriented coping	Negative Ranks	5	5.80	29.00	-0.773	0.439
	Positive Ranks	4	4.00	16.00		
	Ties	0				
	Total	9				

*$p<0.05$

According to the test results provided in Table 3, the results of the Wilcoxon Signed Rank Test applied for the Coping Strategies in Sport Competition Inventory of the experiment group reveal that there was a significant difference between the pre-test and post-test scores of the athletes in terms of task-oriented coping skills. When the rank sums of the variation scores are taken into consideration, the difference observed in positive ranks is in favor of the post-test score.

DISCUSSION

In this study, the aim was to assess whether there is a significant difference between the psychological skills assessment scores of the athletes in the experiment group before and after the application of the Mindfulness-Based Skills Development Program. It has been shown that there is a significant difference between the pre-test and post-test scores, obtained from the Athletic Coping Skills Inventory, in terms of coping with adversity, coachability, concentration, goal setting and mental preparation and freedom from worry. Bernier, Thienot, Cordon and Fournier (5), studied the effects of the psychological skills training, based on mindfulness-based acceptance and mindfulness-based cognitive therapies, on the performance of elite golfers, and the study showed that the mental skills of the athletes in the experiment group were improved. It was also found by other researchers that optimal performance is related to being present and now (22). This finding is consistent with the results of other studies. A study where the relationship between the optimal performance and the emotional state of the athletes was assessed after the application of a mindfulness-based training program to the athletes of various branches (rugby, tennis, hockey, sprinter, hammer thrower), revealed that mindfulness training has a positive effect on the goal setting and emotional control skills of the athletes (1). These findings are consistent with the findings of the current study. Similarly, Kee and Wang (22) also found that as the mindfulness level increases, there is also an increase in the scores of mental skills such as attention control, emotional control, goal-setting and self-talk. Similarly, a study by Terzioğlu and Çakır (37), on the effects of a mindfulness-based training developed for elite archers, looking at the mental skills and mindfulness levels of these athletes, showed that after the application of the program, there was an improvement in the athletes' levels of relaxation, activation, competition planning and refocusing dimensions of the mental skills test.

This study also examines whether there was a significant difference between the athletic coping skills of the athletes in the experiment group before and after the application of in the mindfulness-based training program. It was found that there was a significant difference between the (athletes' pre-test and post-test scores of task-oriented coping skills in the favor of post-test scores. A study by John, Verma and Khanna (19) on the relationship between mindfulness meditation therapy and pre-competition anxiety for elite male archers shows that there is a significant decrease in the pre-competition anxiety in connection with the salivatory cortisol which is a physiological indicator of stress. Similarly, in a study where the effects of mindfulness-based performance enhancement on

the optimal performance and psychological properties of recreational archers and golfers were examined, it was found that there was a decrease in somatic anxiety levels of archers. It was also shown that there is a positive relationship between optimal performance and mindfulness levels (21). Another study by Thompson, Kaufman, De Petrillo, Glass and Arnkoff (38), where a mindfulness-based performance enhancement program was developed to improve the athletic performance and psychological aspects of athletes, it was found that there was a significant increase in the finish times and mindful behaviors of runners and that there was a decrease in their irrelevant thoughts and task-related concerns. These findings are consistent with the findings of this research. A study on 483 elite athletes in various branches of sports shows that there is a negative relationship between mindfulness and stress, and a positive relationship between mindfulness and achievement in sports (29). A study carried out by De Petrillo, Kaufman, Glass and Arnkoff (14), to determine the effect of a mindfulness-based performance enhancement program on long distance runners over a 4-week period, shows that there is a decrease in the sport-anxiety related worry level of the experiment group.

A review of the literature shows that studies in the field of sports psychology generally focus on goal-setting, self-talk, imagination and physical relaxation, which are traditional psychological training techniques of athletes. Mindfulness-based practices are important for increasing the attention and self-control ability of the athletes. In this aspect, mindfulness in sports differs from traditional methods in terms of accepting negative thoughts and disturbing emotions without judging them and presents an alternative technique. Based on the findings in the literature, it can be suggested that through mindfulness-based practices, an increase in athletes' focusing on the present moment and concentration skills, and a decrease in their stress level can be achieved. In fact, there has been increasing interest in mindfulness-based training programs; however, there is still a limited number of studies about the effects of mindfulness-based group programs on athletes in Turkey. In this sense, this study is the first one to focus on the effectiveness of a mindfulness-based training program on a women's handball team in Turkey. Therefore, it is thought that the findings of this study will contribute to the literature in the field. The results demonstrate that the Mindfulness-Based Training Program is effective for the athletes in terms of coping with adversity, coachability, concentration, goal setting and mental preparation, freedom from worry, and task-oriented coping skills as a way of coping with stress. While the current study presents some useful findings for the future, there are certain limitations that need to be considered when these findings are interpreted. First of all, this study includes only an experiment group. Since there is no control group, it is not clear whether the change is due to the time or application. Moreover, in this study, mindfulness-based training program was implemented during the training periods of athletes. It is also important the mention that the working group consists of only female. Lastly, the subscales on Coping Strategies in Sport Competition Inventory has reliability coefficient of .61 can be noted as another limitation of the study. Despite these limitations, there can be some recommendations for future studies. In light of the finding that mindfulness increases the ability of concentration and coping with adversity, mindfulness-based programs with different exercises can be prepared to improve the performance and focus skills of athletes. Therefore, it can be recommended to apply mindfulness-based interventions in individual and team sports that are professionally carried out starting from the infrastructures in the field of sports. In addition, it can be done in practice for coaches in coaching courses organized by federations. To the best of authors' knowledge, studies about the effects of group programs prepared based on mindfulness on athletes have not been found in the literature in Turkey. Comparison can be made with this study by applying mindfulness based training program on different sports branches and male athletes. For future studies, it is strongly recommended that the effectiveness of the mindfulness based training program can be compared by taking follow up measurements.

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Determining Effect of Plyometric Exercises on Various Motoric Characteristics for Woman Volleyball Players

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Abstract

The aim of this study is to investigate the effect of plyometric training on the agility, vertical jump and 20 meter speed tests performance and volleyball performance of female volleyball players. The study was carried out on 14 female athletes from the 13-14 age group of Izmit DSI Sports Club whose sports age was 3.5 ± 0.70 years. Athletes were randomly divided into two groups as experimental (n=7) and control (n=7). Volleyball-specific technical-tactical trainings and plyometric training program were applied to the experimental group for 8 weeks, 3 days a week and 90 minutes in scope. The control group continued only 90 minutes of volleyball training. Prior to plyometric training, both groups were given agility, vertical jump and 20 meter speed tests as pre- and post-tests. First and last test values of the groups were determined and descriptive statistics were made by using SPSS 22.0 statistical package program. Wilcoxon test was used to compare the first and last measurements of the groups, and Mann-Whitney U test was used to compare the data of the control and experimental groups. According to the data obtained, when the experimental group first test and last test were compared, it was found that there was a statistically significant increase in vertical jump and illionis agility test results ($p<0.05$). There was no statistically significant difference between the 20 meter speed test values of the experimental group and all variables of the control group ($p>0.05$). There were statistically significant differences between the two groups in the comparison of the final measurement values of 20 meters speed, vertical jump and illinois agility test between the groups ($p<0.05$). As a result, it can be said that 8-week plyometric training has a positive effect on the speed, agility and vertical jump performance of volleyball players in the 13-14 age group.

Keywords: Volleyball, plyometric, vertical jump, agility.

INTRODUCTION

Today, with a history of more than a century, volleyball is a complex team game that requires multi-faceted sports skills and with constantly changing positions (12). Considering the necessity of playing time, correct and quick play in volleyball, it is necessary to have all the basic motoric features such as general strength, endurance, speed, agility and coordination(18). When examining the structure of this branch, it is necessary to have the ability to perform skills such as rapid and sudden movements, maintaining balance, vertical jumps, changing direction and making quick decisions in a harmonious manner. Therefore, these traits need to be run and developed in relation to each other in training (2,18,27,7).

Improving the height of the jump in training exercises is one of the main goals of most coaches. Therefore, both training scientists and coaches have developed working models that improve the jump height. One of the commonly used training methods in these study models is plyometric training (29). Plyometrics are also training techniques used by athletes to increase power and explosiveness in all sports (10). Since volleyball is an 'interval sport'', in which consecutive application of short-term maximal loading and appropriate rest periods are available (24), coaches and training scientists apply plyometric exercises as a training method to improve the jump level of athletes.

In literature, there are studies showing that plyometric training can contribute to improvements in vertical jump performance, acceleration, muscle strength, leg strength, increased joint awareness and general proprioception (22, 20, 24, 16, 8, 5,28). However, there are also studies that show that it is an effective form of training that develops branch-specific biomotoric properties for sport branches that require force and speed such as sudden running and direction changes (3, 25, 21, 11, 26, 4, 23). It is thought that athletes can not only use plyometric exercises to break the monotony of training, but they can also improve their strength and explosiveness while trying to be more agile (20).

From this point of view; the aim of this study was to determine the effects of plyometric training program on vertical jump, agility and 20 m sprint of volleyball players in women aged 13-14 years.

MATERIAL AND METHOD

The study group consisted of 14 volleyball female volleyball players with a sports age of 3.5 ± 0.70 years in the 13-14 age group playing volleyball in Izmit DSI Sports Club. Athletes were randomly selected and divided into two groups: experiment (n = 7) and control (n = 7). In addition to the technical-tactical trainings specific to volleyball for 90 minutes, 3 minutes a week for 8 weeks, a 20-minute plyometric training program was applied to the experimental group (Table 1). The control group received only 90 minutes of volleyball-specific technical-tactical training.

Table 1. 6 Weeks Plyometric Training Protocol

Week	Training Days	Exercise Number	No of Repeats x Set Number	Rest Between Repeats (s)	Rest Between Sets (min)	Total Jump
1. Week	1.	1, 2, 3, 4, 5, 6	10x1	60		60
	2.	1, 2, 3, 4, 5, 6	10x1	60		60
	3.	1, 2, 7, 8, 10, 11, 12	10x1-5x1	60		60
2. Week	4.	14, 15, 9, 11, 12	10x2-5x2	60	2	70
	5.	14, 15, 9, 11, 12	10x2-5x2	60	2	70
	6.	14, 15, 9, 11, 12	10x2-5x2	60	2	70
3. Week	7.	8, 14, 16, 18, 21, 22	10x2-5x2	60	2	80
	8.	8, 14, 16, 18, 21, 22	10x2-5x2	60	2	80
	9.	8, 14, 16, 18, 21, 22	10x2-5x2	60	2	80
4. Week	10.	8, 15, 16, 21, 18	10x2-5x2	60	2	90
	11.	8, 15, 16, 21, 18	10x2-5x2	60	2	90
	12.	8, 15, 16, 21, 18	10x2-5x2	60	2	90
5. Week	13.	8, 15, 21, 23, 13	10x2-5x2	60	2	90
	14.	8, 15, 21, 23, 13	10x2-5x2	60	2	90
	15.	8, 15, 21, 23, 13	10x2-5x2	60	2	90
6. Week	16.	7, 8, 10, 16, 17, 18, 21	10x2-5x2	60	2	90
	17.	7, 8, 10, 16, 17, 18, 21	10x2-5x2	60	2	90
	18.	7, 8, 10, 16, 17, 18, 21	10x2-5x2	60	2	90
7. Week	19.	14, 15, 21, 13, 16, 17, 18	10x2-5x2	60	2	100
	20.	14, 15, 21, 13, 16, 17, 18	10x2-5x2	60	2	100
	21.	14, 15, 21, 13, 16, 17, 18	10x2-5x2	60	2	100
8. Week	22.	7, 8, 17, 21, 23	10x2	60	2	100
	23.	7, 8, 17, 21, 23	10x2	60	2	100
	24.	7, 8, 17, 21, 23	10x2	60	2	100

The plyometric movements applied to female volleyball players were tabulated as follows (Table 2).

Table 2. Plyometric Exercise Table

1. Double foot forward and backward jump at obstacle
2. Double foot right and left jump at obstacle
3. Jump forward and backward with the right foot in the obstacle
4. Jump forward and backward with the left foot in the obstacle
5. Jump right and left with the right foot in the obstacle
6. Jump right and left with the left foot in the obstacle
7. Squat jump
8. Jump pulling knees to chest
9. Obstacle jump between height with double foot
10. Double foot jump on rings
11. Zig-zag jump right foot
12. Zig-zag jump left foot
13. Obstacle jump and jump into the vault
14. Commando dance
15. Burpee
16. Jump and obstacle jump by changing feet in rings
17. Jump from the vault and jump the obstacle
18. Double leg obstacle jump
19. Right foot obstacle jump
20. Left foot obstacle jump
21. Vault jump
22. Right and left foot jump obstacle from different heights
23. Zig-Zag double feet jump on rings

Before and after the 8-week training program, vertical jump, illionis agility and 20 m sprint tests were applied to both groups as first and last tests. These test protocols are;

Vertical Jump Test: The athlete stretched his hands up on the wall and chalked the wall at the level of the middle finger; and made a marking with chalk on the wall by leaping from the point where it was located. The best results were recorded after 2 trials (6).

Illinois Agility Test: In a 10m long and 5m wide course, 4 cones were used at the beginning, at the finish, and at the turning point of both. The other 4 cones were placed in the middle with 3.3m intervals. The athletes exited the start cone by starting the stopwatch with the start command, and the stopwatch was stopped when the chest sections reached the end cone level. The best results were recorded after 2 trials (20).

20 Meter Speed Test: The speed performance of the subjects was determined by 20 meter speed test. In the 20-meter course, the start command is exited behind the designated area for the start and the stopwatch is started. The stopwatch was stopped when the athlete reached the finish at chest level. The best results were recorded after 2 trials.

Analysis of Data

Using the SPSS 22.0 statistical package program, Wilcoxon test and Mann-Whitney U test were used for the comparison of the first and the last measurements and descriptive statistics. Significance level was set at $p < 0.05$.

FINDINGS

The findings of the research are presented in the tables below, respectively.

Table 4. Analysis Results of First and Last Measurements of Research Group

		Experiment			Control		
Variables	**N**	**X**	**Sd**	**p**	**X**	**Sd**	**p**
Age (year)	7	13.57	0.53		13.43	0.53	
Height (m)	7	1.63	0.04		1.58	0.06	
Weight (kg)	7	53.37	3.52		50.87	4.73	
20 m Sprint (sec) First	7	4.33	0.15	**0.18***	4.51	0.19	0.61
20 m Sprint (sec) Last	7	4.23	0.16		4.49	0.22	
Vertical Jump (cm) First	7	29.71	4.54	**0.02***	27.43	2.7	0.23
Vertical Jump (cm) Last	7	34.71	4.92		28	3.06	
Illinois Agility (sec) First	7	17.78	0.77	**0.02***	18.22	0.5	0.50
Illinois Agility (sec) Last	7	15.79	1.08		18.18	0.46	
*p<0.05							

In the study, when the first and last test values of the experimental group were compared, 20 m sprint test, vertical jump and Illinois agility test were found to be statistically significant ($p<0.05$). There was no significant difference in the control group ($p>0.05$) (Table 4).

Table 5. Experimental and Control Groups Comparison Results of the Last Measurement Values

Variables	Groups	X	Sd	p
20 m Sprint (sec) Last	Experimental	4.23	0.16	**0.03***
	Control	4.49	0.22	
Vertical Jump (cm) Last	Experimental	34.71	4.92	**0.01***
	Control	28	3.06	
Ilinois Agility (sec) Last	Experimental	15.79	1.08	**0.00***
	Control	18.18	0.46	

*p<0.05

In the study, it was found that there was a statistically significant difference between the two groups in the comparison of 20 m speed, vertical jump and Illinois agility test last measurement of the experimental and control groups ($p<0.05$) (Table 5).

DISCUSSION AND CONCLUSION

In this study, the effect of 8-week plyometric exercises on the performance of female volleyball players between the ages of 13-14 was investigated and the results obtained were compared with the other studies in the literature.

Akçınar's (1) study showed that Illinois agility test was used as a post-test (13.30 ± 0.66 sec) in plyometric studies in 11-12 age group athletes twice a week in different directions. control group reported a significant difference in posttest (14.27 ± 0.60 sec) comparison; In addition, it concluded that plyometric studies had a positive effect on training planning in this age group. Bayraktar (5), volleyball players at the end of a 14-week plyometric study experimental group pre-test and post-test values taking 3 steps vertical jump (6.92 ± 6.25 cm) and active jump (6.17 ± 4.72 cm) statistically reported a significant difference ($p<0.05$).

Aykora and Dönmez (3) reported that there was a statistically significant difference in the mean values of vertical and initial test measurements (1.66 ± 0.88 cm) in plyometric exercise according to Tabata protocol in volleyball players aged 16-17 ($p<0.05$). Although the age groups of female volleyball players were different in the literature, it was found that plyometric exercises improved the jump performance of volleyball players. Büyükipekçi (9) in his study, the values obtained in the agility measurements of female volleyball players were compared and accordingly; There was a statistically significant difference between first and second measurements ($p<0.05$). The results obtained in the literature support this study.

Baktaal (4), 16-22 age group female volleyball players in the 6-week season added to the training program plyometric studies, vertical jump values are higher than the initial values added that the added plyometric exercises may have a positive effect on the jump performance.

Miller et al. (20) reported that 6-week plyometric training can be an effective training technique to improve athletes' agility, and improvements in agility may be beneficial for athletes during the final pre-season preparation stage. Pancar et al. (23) reported that the 8-week plyometric training program applied in addition to handball training was significant in favor of the posttest (29.71 ± 3.58 cm) in the vertical jump performance of female handball players in the 12-14 age group ($p<0.05$). Similarly with this study, plyometric training applied to athletes of the same age group, although in different branches in the literature, showed a significant increase on the vertical jump values of athletes.

Harput et al. (15), in their research on the effect of pliometric training on female volleyball players on balance, jump distance and hamstring quadriceps rate, at the end of 6 weeks plyometric training, a significant difference was found in the parameters selected in the experimental group and it was concluded that it could be effective in increasing

sports performance($p<0.05$). Turgut et al. (28), they concluded that the 12-week low-intensity plyometric exercises that they apply to 11.1 years age volleyball players are effective on balance performance ($p<0.05$).

Gül et al. (13), 8-week plyometric training applied to tennis athletes is effective on ITN tennis performance, Gül et al. (14), plyometric training, which they applied to basketball players for 8 weeks, was found to be effective on vertical and horizontal jump, hand grip, sit & stretch flexibility test performance, Öztin et al. (19), they found significant improvements in vertical and horizontal jump, 30 m speed, anaerobic power, 20 m shuttle, body density, body fat percentage and lean body weight($p<0.05$). Bozdoğan and Kızılet (7), in their study on the effect of 8-week plyometric training applied to badminton athletes on agility, coordination, jump performance and biomotor properties, at the end of the training, it was determined that they provided improvement in the parameters determined in the plyometric training group. It was stated that there was a significant difference in the values of multiple and fixed jump, left foot forward jump, standing long jump and yo-yo intermittent recovery test values ($p<0.05$).

Thakur et al. (27), in their research on the effect of plyometric and weight training applied to students of physical education and sports department on the vertical jump performance, It has been reported that the plyometric and weight training of the data obtained as a result of the 6-week training of the students aged 18-21 provided significant improvements. They concluded that plyometric exercises are a viable training method and can be beneficial in the performance of vertical jump in athletes. Özmen and Aydoğmuş (18), in their research that they investigated the effect of plyometric training applied to badminton players on adolescent period on agility and squat jump performance, found that the plyometric group showed more improvement (6%) than the control group and plyometric training improved agility and jump performance in adolescent badminton players ($p<0.05$).

As a result of the study, it was found out that plyometric trainings applied together with volleyball-specific exercises for 8 weeks improved 20-meter speed, agility and vertical jump performance in 13-14 age group volleyball players. In this context, it can be said that plyometric exercises can positively affect the speed, agility and jump performance of female volleyball players.

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Determination Of Physical Activity Level In The Caregiving Of Schizophrenia Patients

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Abstract

The aim of this study was to evaluate the physical activity levels of the caregivers of the schizophrenic patients.This research was descriptive and was conducted with face-to-face interviews with relatives of schizophrenia patients enrolled in a Community Mental Health Center. The sample of the study consisted of 124 individuals who agreed to participate in the study. Socio-demographic data form and International Physical Activity Questionnaire were used for data collection. In order to evaluate the demographic data of the study, t-test and Kruskal-Wallis test were used in order to evaluate the relationship between number and percentage distributions, socio-demographic characteristics and International Physical Activity questionnaire. The mean age of the participants was 38,26 ± 4,26, 61,32% female, 38,68% male, 34,65% married, 81,65% single, 10,47%. 27.49% are primary school / middle school, 33% are high school and 29.04% are university graduates. When the body mass index of the participants was evaluated, 65.35% were overweight, 54.95% were inactive and 33.85% were given care for 6-10 years. When sociodemographic and physical activity levels are compared; 41,17% of women, 19,18% of those with care years 1-5 years and 52,46% of overweights were found to be inactive in terms of physical activity and the difference was statistically significant ($p < 0,05$). In our study, it was observed that the sociodemographic characteristics of the participants significantly affected the physical activity level.

Keywords: Schizophrenia, Caregiver, Physical activity level

INTRODUCTION

Schizophrenia is a brain disease that causes deviations in emotions and thoughts and behavior. Schizophrenia is an important discomfort that needs to be taken into account and causes the person to get away from the outside world. Generally, symptoms occurring between the ages of 15-35 can be observed as being away from friends and family, decreasing school success, nervous behavior and behavioral changes (3). The majority of patients with schizophrenia may require the care of another person in a semi-dependent or dependent manner. When considered as a family system, there is a continuous interaction between the parts of the system and the change in the patient individual in the case of illness affects the whole family. The fact that an individual in the family has schizophrenia may disrupt the existing balance of the family by creating severe stress in family members (5). When the disease occurs, one of the members of the family has to take care of the sick individual. The movement of the care of patients with schizophrenia and other mental disorders in the community has brought about serious changes in the last 10 years. Families are often exposed to various stresses every

day due to unexpected and strange behavior of patients (7). At the same time, because of domestic conflicts and stigmatization in the care-giving process and environmental factors, they live in isolation, emotional frustration (such as guilt and loneliness). Giving care is a process that is difficult and brings heavy loads to the caregiver. The key person who supports the patient and is usually the most caring person is defined as the primary caregiver. Epidemiological data show that women are the main caregiver in schizophrenia and women are the most common (2). Health protective and enhancing effect, with daily activities; physical activity is planned, repeated and regular. Such physical activity is also called exercise (2,9). Active life as much as possible is the first step of a healthy life (4). However, long-term care for a patient with schizophrenia causes the person to take him out of priority and take all his time to his patient (12). These difficulties may cause caregivers to experience feelings such as burden, depression, anxiety, burnout, physical health deterioration, social isolation and economic difficulties, stress, shame, guilt, helplessness, anxiety, fear, strain, anger, loss and hopelessness. In the studies conducted with caregivers, the incidence of chronic diseases is increasing in individuals due to their physical and social burden (1). Therefore, caregivers should be more physically active to provide better care for them and their caregivers. This study was conducted to evaluate the physical activity levels of caregivers of individuals with chronic mental illness.

Research Questions

1. What are the physical activity levels of caregivers?

2. Does it affect the sociodemographic characteristics and physical activity levels of caregivers?

METHOD

The research descriptive relational type is planned. The universe of the study was composed of caregivers of individuals with chronic mental illness registered to a Community Mental Health Center. The sampling method of the universe was used to determine the sample of the study. Because the prevalence was not known, the incidence of the event was 50%, 5% standard deviation and 95% confidence interval. In the collection of data; International Physical Activity Questionnaire Short Form was used to evaluate the physical activity levels of the individuals and the information form prepared by the researchers who question socio-demographic information.

Personal Information Form

The Personal Information Form included demographic questions such as age, gender, educational status, marital status, year of care and body mass index.

International Physical Activity Questionnaire

In this study, the International Physical Activity Questionnaire short form was used to determine the physical activity levels of the individuals. For this survey, conducted by the International validity and reliability study of Craig et al, validity and reliability study of university students in Turkey are made by Ozturk (6). In the evaluation, it is taken into consideration that each activity is performed for at least 10 minutes in one time. The minutes, days and Metabolic Equivalent (MET) values (multiples of resting oxygen consumption) are multiplied and a score is obtained as MET-minute / week. Physical activity levels were not physically active (<600 MET / min), with low physical activity (600 - 3000 MET-min / week), and physical activity level (> 3000 MET-min / week). In calculating the energy consumption related to physical activities, the weekly duration of each activity (minutes) and the MET energy values generated for the International Physical Activity Survey were multiplied. Thus, energy consumption for each individual for severe, moderate, walking, sitting and total physical activities was obtained in MET-min / Week unit.

Collection of data

The data of this study were collected from face to face interview technique from adult individuals who came to an institution.

Ethical of Research

The study was started after the consent of the ethics committee and the consent of the individuals were taken. Verbal permissions were obtained from individuals before starting the study. The purpose of the research, the duration of the research and the procedures to be done during the research briefly explained in a language to understand the ile Illuminated Consent principle, the patients can be withdrawn from the research at any time by specifying the ın Autonomy principle, the individual information will be protected after sharing with the researcher, Privacy and Privacy Protection principle

has been fulfilled. Before giving the forms to be used in the research, necessary explanations were made orally, and during the application, attention was paid to create a quiet environment with little warning.

Evaluation of Data

After the data were collected, the SPSS 21 program was entered by the researchers and the total scores of the total and scale sub-dimensions taken from the scale were calculated by the researchers. In order to evaluate the demographic data of the study, chi-square test was used to evaluate the relationship between number and percentage distributions, socio-demographic characteristics and International Physical Activity questionnaire. The results were evaluated at 95% confidence interval and p <0.05 significance level.

RESULTS

The mean age of the participants was 38,26 ± 4,26, 61,32% female, 38,68% male, 34,65% married, 65,35% single, 10,47% illiterate 27,49% are primary / secondary school graduates, 33% are high school graduates and 29,04% are university graduates. When the body mass index of the participants was evaluated, 65,35% were overweight, 54,95% were inactive and 33,85% were given care for 6-10 years (Table 1).

Table 1. Distribution of Socio-Demographic Characteristics of Caregivers

Characteristic	Number	%
Gender		
Female	76	61.32
Male	48	38.68
Marital status		
Married	43	34.65
Single	81	65.35
Educational status		
Literate	13	10.47
Elementary / Middle School	34	27.49
High school	41	33.0
University	36	29.04
Year of care		
1-5 years	49	42.14
6-10 years	42	33.85
11 years and above	33	24.01
Body Mass Index		
Normal weight	43	34.65
Overweight	81	65.35
Physical Activity Level		
Minimal Active	56	45.2
Inactive	68	54.8

When sociodemographic and physical activity levels are compared; 41,17% of women, 19,18% of those with care years 1-5 years and 52,46% of overweights were found to be inactive in terms of physical activity and the difference was statistically significant (p <0,05). It was found that 39.49% of the singles were minimally active and the difference was statistically significant (p <0.05) 23.37% of high school graduates were found to be minimal active and the difference was not statistically significant (p> 0.05). (Table 2).

Table 2. Evaluation of Physical Activity Levels of Participants according to Sociodemographic Characteristics

Characteristic	Inactive (<600 MET- min / week)	Min Active (600-3000 MET- min / week)	Test Value
Gender	**Number (%)**	**Number (%)**	
Female	25 (% 20.15)	51(% 41.17)	**X^2:1.275**
Male	31 (% 24.98	17(% 13.78)	**p:0.01***
Marital status**			
Married	12 (% 9.67)	31 (% 24.98)	**X^2:2.423**
Single	48 (% 39.49)	33 (% 25.86)	**p:0.02**
Educational status			
Literate	5 (% 4.03)	8 (% 6.44)	X^2:0.476
Elementary / Middle School	10 (% 8.06)	24 (% 19.43)	p:0.20
High school	29 (% 23.37)	12 (% 9.63)	
University	23 (% 18.53)	13 (% 10.51)	
Year of care**			
1-5 years	11 (% 8.86)	38 (% 33.28)	**X^2:0.756**
6-10 years	12 (% 9.67)	30 (% 24.18)	**p:0.03***
11 years and above	6 (% 4.83)	27 (% 19.18)	
Body Mass Index**			
Normal weight	11 (% 8.86)	32 (% 25.79)	**X^2:3.751**
Overweight	16 (% 12.89)	65 (% 52.46)	**p:0.01***

*P<0.05 ** Yates corrected chi-square analysis was performed because the observed number is less than 25 in the numbers.

DISCUSSION

Giving care is a process that is difficult and brings heavy loads to the caregiver. The key person who supports the patient and is usually the most caring person is defined as the primary caregiver. Epidemiological data show that women are the main caregiver in schizophrenia and women are the most common (13,14). In our study, it was found that female caregiver rate was higher than male. The aim of this study was to determine the physical activity level of caregivers in schizophrenia patients.

In our study, it was observed that males were more active than females in terms of physical activity. Lloyd et al. (5), in which the caregivers determined the level of physical activity, it was reported that males were more active than females in terms of physical activity. It can be thought that the daily work of men is more than women. In our study, it was observed that singles were more active than married and physically active. (11). It may be related to men's efforts to continue their social lives and to adopt more planned work. Since women have other responsibilities to carry out at home, it can be thought that women's time is shortened.

In our study, it was found that the caregivers of the patient for 1-5 years were inactive in terms of physical activity. Rogers et al. (7) and Uribe et al. (10), similar to our study findings, it is reported that individuals who are just starting to give care are more passive in terms of physical activity and that they do not have time to devote themselves to care due to inadequacy and inadequacies created by caregiving. The results of these studies are similar to our findings.

In our study, it was observed that overweight individuals performed less physical activity than normal weight. Wang et al. (12) and Selçuk and Avcı (8) reported that overweight individuals were more passive in terms of physical activity. Caring for people with chronic mental illness is a condition that forces caregivers and changes their lives. In the first years, caregivers are much more tired and have more burdens. For this reason, they seem to have difficulty in giving time to themselves.

CONCLUSION

In our study, it was observed that the level of physical activity varied significantly according to the sociodemographic characteristics of the participants. In terms of physical activity, women, singles, caregivers for 1-5 years and overweight are in the risk group. Therefore, it is considered that it is important to support caregivers of individuals with chronic mental illness in terms of physical activity and to organize the services to be provided to them.

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Anthropometric, Morphometric and Posture Evaluation of The Tallest Living Person In The World: A Case Report

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Abstract

This study aims to identify the anthropometric and morphometric characteristics and reveal the postural disorder of the male case called S.K who was diagnosed with Gigantism (pituitary gigantism) caused by hypersecretion of pituitary tumor-related growth hormone and entitled as the tallest person alive in the world with a height of 2.51 cm in the Guinness World Records in 2009. Height, weight, body mass index, upper extremity lengths, lower extremity lengths, skinfold thickness, upper and lower extremity diameters, upper and lower extremity perimeters, chest depth and hand grip strength were measured for anthropometric measurement. 8 different body segments were calculated and analyzed using The Posture Screen Mobile® application for posture evaluation. Disorders in these segments were identified based on forwarding tilt of head (Anterior/Lateral -AL), position of head (A-L), tilt and position of shoulder (A-L), position of ribcage (left-right), position of pelvis (left-right), pelvic tilt (left-right) and load on the head (lb. and kg) (Figure 1.). The measurements revealed that the case surprisingly had anthropometric and morphometric values above normal human dimensions and that, there was also no other living human being with numerically the same values. (Table 2-8). As a result, since the fact investigated has an extreme length due to gigantism, he has taken his place in the Guinness Book of Records as the world's longest living person with a long length.

Key Words: The tallest human, gigantism, pituitary gland, posture, anthropometry

INTRODUCTION

Anthropometry refers to a set of systematic measurement techniques used for measuring the human body and skeleton sizes quantitatively (5). It is generally considered as the conventional, and perhaps, the main tool of biological anthropology. All people on earth are from the same species; however, none of them are exactly the same in terms of measurable characteristics. A number of differences are seen in all including genetically identical twins (monozygotic). Such differences tend to undergo changes over the period from birth to death. Since skeletal development in times of health and illness is affected by some factors based on geographical differences, there are significant differences between skeletal rates. Anthropometry is another approach that refers to direct quantitative expression of the shape of human body (20). Moreover, anthropometric characteristics are known to be directly related with to gender, shape and form. The Internal structure of body and tissue components are generated with the effect of environmental and genetical factors (1).

Posture

It is defined as the combination of each movement in the body and positions of joints that create such movements, and is also considered as an indication of the person's body structure. Height is regarded as one of the most important variables that express the size of human beings (7). Height is generally defined as distance, and expresses a standing upright position starting from the sole up to the top of head (23). Excessive increase in height

that occurs before adolescence results in Gigantism, also known as pituitary gigantism, caused by hypersecretion of growth hormone (GH). (9).

Case

Officially entitled as the tallest living person on earth in the "Guinness World Records" in 2009 with a weight of 158 kg and height of 2 m and 46 cm, thirty-seven-year-old male case, S.K., applied to the hospital at the age of six with the complaints of headache and loss of vision in left eye. The results of the examination showed that he had a tumor in his pituitary gland. He was diagnosed with Gigantism (Pituitary Gigantism) due to hypersecretion of growth hormone (GH) caused by a tumor in pituitary gland (26). Acromegaly and gigantism are considered as a quite rare condition observed throughout the human history, which typically results from chronical excessive generation and secretion of growth hormone, and pituitary tumor. Some severe gigantism cases from past years in literature are shown in Table 1. Since the increase in height continued after the establishment of diagnosis, the height was measured as 2.51 cm two years later, and thus data in the Guinness World Records was updated. The case also holds the record for having the biggest hands in the world with 28.5 cm (left and right). The length of the foot is 35.5 cm. (right), 36.5 cm. (left) and his shoe size is 60 (17). It was found that a gamma knife surgery was performed at the Virginia University, USA, in August 2010, on the tumor affecting the pituitary gland, which stopped the generation of growth hormone and prevented the further increase in the height successfully. This study aims to perform an extensive analysis on the anthropometric parameters of the case which were not measured previously, as well as his posture (18).

Table 1. Cases of Excessive Jigantism that Started Growth in Early Childhood

Name	Country	Sex	Birth Year	Birth Weight (kg)	Abnormal Growth Age (Year)	Last height Measure (cm)
Martin Van Buren Batesa	U.S.A.	M	1837	Normal	< 4	222
Anna Haining Swana	Canada	F	1846	8.1	< 4	227
Ella Kate Ewing	U.S.A.	F	1872	3,4	7	225
Fedor Andreevich Machnow	Russia	M	1878	*NA	5	239
Edouard Beaupré	Canada	M	1881	4,1	3	251
Joh(a)n Aasen	U.S.A.	M	1890	*NA	< 8	218
Albert Johan Kramer	Netherland	M	1897	8,5	< 7	238
Robert Pershing Wadlow	U.S.A.	M	1918	4,1	< 3	272
Cecil Boling	U.S.A.	M	1920	Normal	< 7	235
Rigardus Rijnhout	Netherland	M	1922	Normal	> 3	238
Sandra Elaine (Sandy) Allen	U.S.A.	F	1955	2.95	3	232
Dolores Ann Pullard	U.S.A.	F	1946	Normal	4	227
Zeng Jinlian	China	F	1965	Normal	< 1	249
Yao Defen	China	F	1972	2.8	< 3	234

M=Male F=Female NA=Not Applicable (2)

Ethics: A written consent was received from the case upon provision of detailed information about the study orally.

METHOD AND MATERIAL

Anthropometric Measurements

Height

The distance from the top of head to the floor was measured in cm. at anatomic position using a body tape measure that has a reel system and is inflexible with a width of 7 mm. (19,21)

Body Weight

Weight was measured with a naked top and minimal clothing on the lowers part of the body using a Tanita (model BC545N) scales with a sensitivity of 100 gr. (19,21)

Body Mass Index

BMI (kg/m2) = weight (kg) / height2 (m2)

Measurement of Length of Upper Extremities

All length measurements were performed using a body tape measure that has a reel system and is inflexible with a width of 7 mm. (19,21)

Arm

The distance between acromion and olecranon was measured using a body tape measure at standing position with the arms parallel to the ground and shoulder muscles and arms are relaxed (19,21).

Forearm

The distance between olecranon and styloid projection of distal radius was measured using a body tape measure with the forearm parallel to the ground at a 90º angle (19,21)

Hand length

The distance between the styloid projection of radius and edge of the 3rd finger was measured over the dorsum of the hand using an inflexible tape measure (19,21).

Arm Span

The case was asked to lay on his back on the floor and spread his arms, then the distance between the edges of middle fingers of both hands was measured using a tape measure (21).

Measurement of Length of Lower Extremities

Real Lower Extremity

Distance from the spina iliaca anterior superior to inner malleolus using a tape measure (21).

Functional Lower Extremity

Distance between belly button and inner malleolus was measured using a tape measure in order to find the length difference of functional lower extremity (21).

Thigh

Distance between the upper edge of patella and center of inguinal ligament was measured using a tape measure (12).

Leg

Distance between the tibial plateau and floor was measured in standing position using a tape measure (21).

Foot

Distance between the heel and longest toe was measured laterally at standing position (21)

Skinfold Thickness

Measurement was performed using a Holtain skinfold caliper. For the reliability purposes, measurement was performed from between the thumb and index finger at a location 1 cm. away from the measurement point. Two measurements were performed on each region taking care to keep the holding pressure the same until the end of measurement. There was a waiting period between two measurements. All measurements were performed on the right side of the body while the case was at standing position. Skinfold measurement was performed on a total of 7 regions. These are listed as follows (19,21).

Chest

It was performed at the middle point of distance between nipple and front axillar line.

Subscapular

It was measured diagonally from under the scapula at an angle of 45º.

Axillary

Measurement was performed parallel to the ground at the intersection point of xiphoid projection under sternum and middle axillary line.

Triceps

A vertical measurement was performed at the middle point between acromion and olecranon with the elbows extended and arm muscles relaxed and close to the body.

Abdominal

A vertical measurement was made laterally from a point that is 2-3 cm. under the belly button.

Suprailiac

It was measured diagonally from the top of crista iliaca at an angle of 45º.

Diameter Measurements

For the diameter measurements of case, anthropometric caliper was used; pressure was applied as the arms of caliper compressed the soft tissue, and diameter was measured from between specific bone projections at a total of 7 regions. These are listed as follows (21).

Shoulder

Ends of caliper were placed on the most swollen part of the deltoid muscle, and measurement was performed at standing upright position with arms free on the sides.

Biacromial

Arms of caliper were placed on the lateral points of acromion projection and measurement was performed at standing position with arms free on the sides by determining the maximal width from posterior.

Elbow

Distance between the lateral and medial epicondyles of humerus was measured at 90º flexion and forearm supination position by applying a little pressure.

Wrist

Length between the styloid projection of radius and ulna was measured.

Bitrochanteric

With the arms free and close to body, arms of the caliper were placed on the lateral parts of acromion, and maximum width was measured and recorded with pressure on the soft tissue.

Biiliac

Measurement was performed from posterior at standing position with arms crossed on the chest and ends of the caliper on crista iliac so that they form a downward angle of 45º.

Knee

At sitting position with 90º knee flexion, ends of the caliper were placed on the medial and lateral condyles of femur, and the distance in-between was measured by pressing firmly.

Ankle

Measurement was performed at a standing upright position by placing the caliper ends on the projected points of medial and lateral malleolus.

Circumference Measurements of Upper and Lower Extremities

All circumference measurements were performed using a body tape measure that has a reel system and is inflexible with a width of 7 mm. (21)

Head

The distance between the most projected point of occipital bone and the most projected point over the eyebrows was measured (21).

Neck

Measurement was performed at anatomic position from the narrowest point under the thyroid cartilage (21).

Shoulder

Measurement was performed on the most swollen part of the deltoid muscle at standing upright position with shoulder muscles relaxed and arms free (21).

Arm

The middle point between acromion and olecranon was marked at standing position, and measurement was performed on the most swollen point of the muscle (21).

Forearm

Arms were dropped down, and measurement was performed on the most swollen point of the muscle based on the styloid projection of ulna bone (21).

Wrist

Distance between the distal styloid projection of olecranon and radius bone was measured at 90º flexion with palms facing each other (21).

Chest

Measurement was performed at the xiphoid projection right under the axillar region in normal respiration phase with the feet spread at shoulder width and arms in abduction (21).

Abdomen

Measurement was performed over the belly button with the tape parallel to the floor and not compressing the tissues (21).

Hip

Tape measure was placed on the widest part of hip parallel to the floor without compressing the tissues (21).

Thigh

With 90º knee flexion, proximal end of inguinal region and patella was marked, and measurement was performed on the most swollen point of muscle (21).

Knee

Measurement was performed on the middle line of patella after one knee was bended slightly and body weight was transferred to the other knee (21).

Leg

The case sat on a high armchair so that his legs dropped down and spread his feet for about 20 cm, then the measurement was performed 10-15 cm over the medial malleolus without compressing the tissues (21).

Ankle

At upright position with bare feet, tape measure was placed on the top of malleolus and the thinnest part of ankle, and measurement was performed without compressing the soft tissue (21).

Chest Depth

At standing position, measurement was performed at the intersection point of 3rd and 4th sternum on the left side of case by placing one end of a wide-spread caliper on the sternum and the other end on the spinous process at the back (8).

Hand Grip Strength

A Cambry (Model EH101) digital hand dynamometer was used, which was capable of measuring strength between 5.0 and 100 kg. With arms having an angle of 10º -15º from shoulders, grip strength of the dominant hand was measured in rested state. Measurements were performed on the dominant hand only, and the best value after two trials was considered as the grip strength (21).

Posture Evaluation

Posture analysis of patient was performed using the analysis application called PSM (The PostureScreen Mobile®) which was tested for validity in previous studies with positive results (10,11,13,26). PSM application performs the analysis by making angular calculations and marking the anatomical reference points on the photos of the posture variables on sagittal-coronal plane in anterior and lateral (right) directions taken using the camera of an iPad® tablet with the upper body naked and in neutral position. The male case named S.K. had a loss of balance during standing static posture position since multiple right tibia bones were fractured before. Therefore, his photos were taken while he was standing using a walking stick. Afterwards, PMS application performed an analysis of posture variables. Moreover, this application can also guide the user on how to digitalize the specified anatomical reference points. These reference points are as follows on the anterior side; right and left pupils, middle point between the nose and upper lip, top point of right and left acromioclavicular (AC) joint, right and thoracal (T8) over sternum (episternal notch), right and left anterior superior iliac spine (ASIS), and the middle point of right and left ankle joints. A total of five anatomical reference points were marked for lateral posture analysis; tragus of ear, cervicothoracic area on the middle line of shoulder, greater trochanter, tibiofemoral joint and middle line of lateral malleolus. Then the PSM application performed the calculation and analysis of 8 different body segments by using proprietary algorithms (Figure 1). These segments are forward tilt of head (Anterior/Lateral -AL), position of head (A-L), tilt and position of shoulder (A-L), position of ribcage (left-right), position of pelvis (left-right) and pelvic tilt (left-right). Application also calculated the load on the head (lb and kg).

RESULTS

Table 2. Height, Weight, Age, BMI

Height (cm)	Weight (kg)	Age (years)	*BMI (kg/m²)
2.51	158	37	25.1

*Body Masss Index

Table 3. Measurement of Length of Upper Extremities (cm)

Arm (Right)	Arm (Left)	Forearm (Right)	Forearm (Left)	Hand (Right)	Hand (Left)	Arm Span
121	121	47	47	28,5	28,5	2,72

Table 4. Measurement of Length of Lower Extremities (cm)

Real Lower Extremity (Right)	Real Lower Extremity (Left)	Functional lower extremity (Right)	Functional lower extremity (Left)	Thigh (Right)	Thigh (Left)	Leg (Right)	Leg (Left)	Foot (Right)	Foot (Left)
13.4	13.8	14.2	14.9	59	62	59	63	35.5	36.5

Table 5. Skinfold Thickness (mm)

Chest	Subscapular	Axilla	Triceps	Abdominal	Suprailiac	Thigh
15	14	17	13	24	9	18

Table 6. Diameter Measurements (cm)

Shoulder	Biacromial	Elbow	Wrist	Biiliac	Bitrochanteric	Knee	Ankle
50.8	31.7	40	34	36.6	40.3	48	60

Table 7. Upper and Lower Extremity Perimeter Measurements (cm)

Head	Neck	Shoulder	Arm	Forearm	Wrist	Chest	Abd.	Hip	Thigh	Knee	Leg	Ankle
68	46	141	37	36	27	126	127	133	55	48	30	29

Abd: Abdominal

Table 8. Chest Depth (cm) and Hand Grip Strength Measurements (kg)

Chest Depth	Handgrip Strength
22.1	65.3

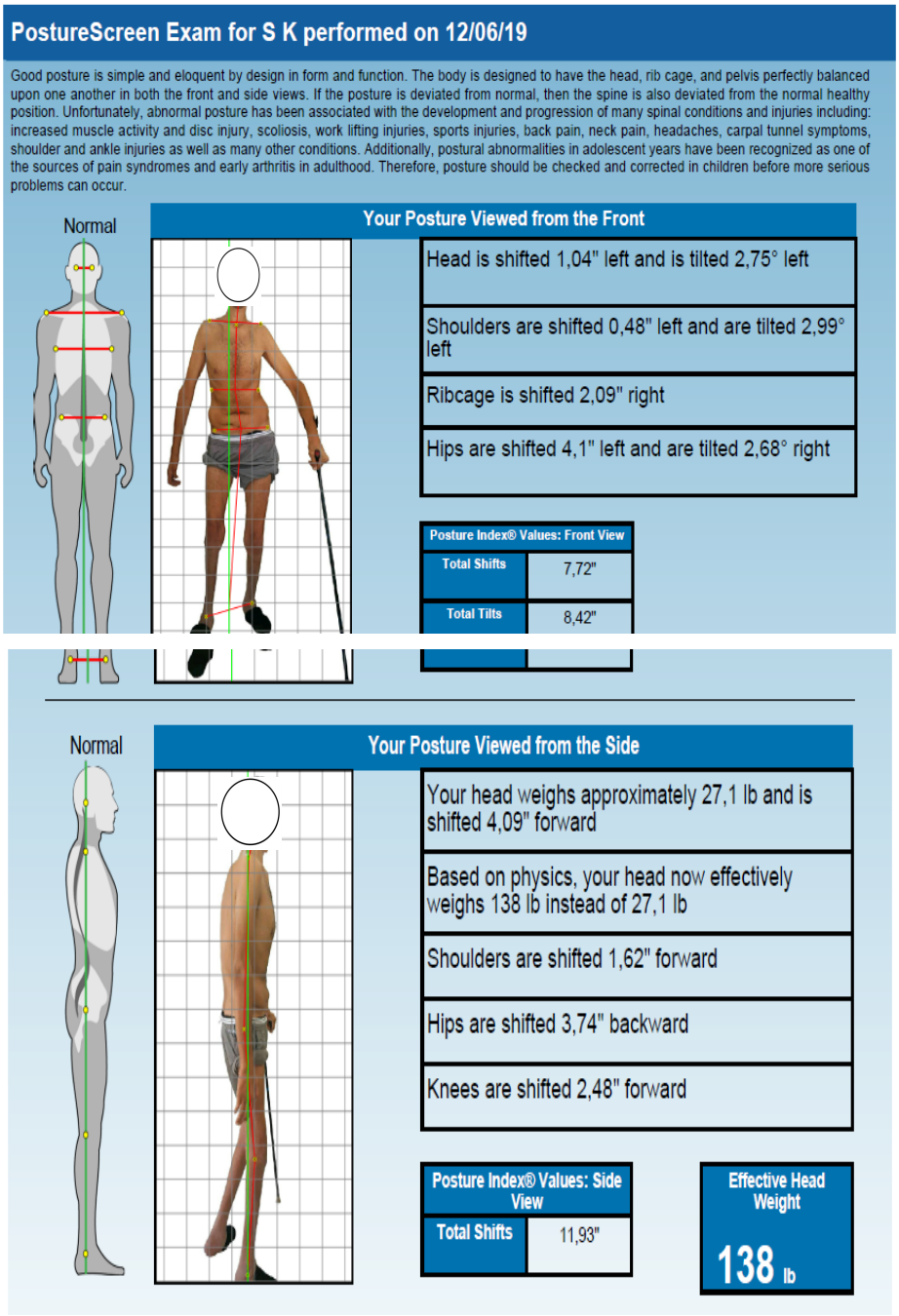

Figure 1. Posture Evaluation

DISCUSSION

Starting from the ancient ages, acromegalic and gigantic individuals with extraordinary anthropometric sizes have been the subject of many mythological stories (4). The male case in this study named S.K, has an anthropometric and morphologic structure that is over the normal human sizes (Table 2-8). It is also seen that he suffers from tibial shortness due to two right tibia fractures (right 59 cm and left 63 cm. Table 4). Gigantism occurs when open epiphyseal growth plates allow for linear growth due to secretion of excessive GH in childhood whereas acromegaly is a condition that occurs in adulthood (6). Growth and development are affected primarily by gens, hormones, nutritional sources, environmental and cultural interaction as well as combination of other factors (6). As an important element of growth and development, development of skeletal system is mainly controlled by the growth hormone that is produced in pituitary gland (24). Anomalies such as tumor malformation, hyperplasia or traumatic destruction affect the pituitary gland, and therefore

growth hormone may cause hyperpituitarism (22). According to the literature review, some of the people that were entitled as the tallest person in the world, whether gigantic or not, are as follows: Robert Wadlow (The Alton Giant) took a part in the book of "Guinness" records as the tallest person of all times after his death with a height of 8 feet 11 inches (2.72 cm) and weight of 272 kg. (6). Joseph Edouard Beaupre was born in 1881 in Saskatchewan, Canada, and died in 1904 at the age of 23 as a pituitary tumor related gigantic person with a height of 252.9 cm and a weight of 170 kg. (14). Leonid Stepanovych Stadnyk (1969-2004) put his stamp in history with a height of 2.57 cm resulting from a tumor in his pituitary gland (15). Väinö Myllyrinne (1909–1963) is known to have had a height of 2.24 cm and a weight of 141 kg. (16). It is also known that there are people recorded as the tallest in the book of "Guinness" records who are still alive today. They may be listed as follows: Brahim Takioullah, born in 1982 in Morocco, is 2.46 cm tall and has the diagnosis of acromegaly (16). Born in 1987 in Iran, Morteza Mehrzad Selakjani is known as the second tallest living person in the world with a height of 2.47 cm resulting from acromegaly (16). Born in 1983, Dharmendra Pratap Singh has officially been recorded as the tallest living person in India (16). Zhang Juncai was born in 1966 in the People's Republic of China, and is among the tallest living people in the world with a height of 2.42 cm. (16). Born in 1988, Asadulla Khan has also attracted attention in India with a height of 2.41 cm. (16). Born in 1975 in Pakistan, Naseer Soomro is 2.38 cm tall. (16) Chinese athlete Sun Mingming was born in 1983 and is entitled as the tallest basketball player in the world (16).

As a result, the fact that anthropometric, morphometric and posture structures of the male case called S.K were not evaluated extensively before led to the need to perform the required researches and reveal data. The studied case was diagnosed with gigantism due to secretion of growth hormone above normal levels caused by a tumor in pituitary gland. The increase in his length continued with the increased age, and could not be stopped until a certain age. Therefore, it was seen that he had quite higher sizes as compared to the anthropometric and morphometric structure of a healthy individual resulting with a posture disorder.

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The Relationship Between Young Amateur Footballers' Ego States and Accordance Levels Based on Their Positions In The Team and Their Performance: Samsun Province Sample

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Abstract

The aim of this study was to investigate the relationship between ego states based on Transactional Analysis (TA) and accordance levels based on team positions of footballers playing in elite U-19 young amateur league in Samsun province and their performance. The sample of the study consisted of 183 amateur football players playing in the league. For this purpose, TA Ego Status Scale, Personal Information Form and Performance Evaluation Scale were used as data collection instruments. One-way ANOVA and Tukey HSD test were used to examine the differences among the total scores of the players' ego states (Critical Parent, Nurturing Parent, Adult, Natural/Free Child and Adapted Child) for the various variables (the football players' positions on pitch, their performance etc). In addition to this, the correlation between the ego status (observed) of football players and ego status of their positions (expected) was estimated by using Pearson correlation coefficient. The results showed that the correlation between amateur team players' ego status based on transactional analysis and their positions in the team were only positively correlated with the adult ego status; however no statistically significant relationship was found between performance of football players and their ego status. In conclusion, unlike the results of studies showing that athletes' personality traits and psychological skills affect their sporting performance, this result of this study are in parallel with the results of studies which showed no a important correlation between athletes' personality traits and their sporting performance. For this reason, it is necessary to do more studies that different research methods and scales should be used on different sample groups in teams and individual sports based on TA Ego States.

Keywords: Transactional Analysis, Ego Status, Personality, Positions in Football, Performance

INTRODUCTION

Football is undoubtedly the world's most popular sport. This game, which attracts the attention of millions of people in stadiums and in front of TV screens, has gained a huge economic structure and this has given football a privilege amongst other sports branches. The footballers who are the most important actors of this game have

always been the ones having the highest values in this economic structure and making up the significant income and expense component of the football clubs. The day-to-day technological, economic, social and educational methods of

football have increased its attractiveness and created an environment in which the winner gains more and the loser loses more. For this reason, in order to achieve sportive success and make it stable, clubs have become competing with each other to have the best technical staff and the footballers.

İn-game performances of football players are very important due to the center of success in football is in the pitch. Together with the apposite training methods, good management of psychological processes of the players (10,36) and their personality traits (18) should be considered as parts of a whole to achieve the utmost performance to succeed.In other words, sportive performance in football does not only involve physical, technical or tactical performance, it also shows an integrity of the cases like imagining, utmost performance under pressure, commitment, coping with stress, competition anxiety, goal setting, attention, concentration and personality traits (4,14,30,32).

Although personality traits are regarded as important components for success in sports, there are studies that remark the fact that each position in team sports requires different personality traits (4, 14). Personality is important in terms of the work that the individual deals with. There are many studies on the fact that the harmony between the work and the personality of the individual contributes positively to performance (2, 20,35,43). “When person-position matching is provided, the individual adapts more easily to his occupation and environment and contributes more to his workplace. He takes a bright view of his work and gets proud of it, he focuses his energy on improving himself so that he can be more successful in creating a difference in the field which is one of the most necessary features these days” (15). For this reason, in the recruitment process, a number of personality tests are applied in many areas to determine whether the individual is suitable for the position or not (15,35).

When the relationship between personality and football player position is taken into consideration in this respect, many clubs pay particular attention to the personality traits of the players in addition to their technical and tactical skillsin the transfer process. Because sportive capability and personality are the two effective means throughout the individual's sports life.

There is no doubt that there is an interaction between sport and personality. (32). In addition, there are many researches in literature about the fact that different sports branches are in parallel with different personality traits (4). It is reasonable to consider that recognizing the personality of the athlete and finding suitable methods for his personality which could force him to perfrom the utmost performance is an effective factor in achieving sportive success. Especially the variable player profiles and game positions in football is a matter that draws particular attention to it amongst other sports.

In sports psychology, there are very limited studies on the players' psychological skills and the personality characteristics required for their in-team positions (4, 19). The findings in researches about different sports branches related to in-team positions and personality traits or psychological characteristics of the players differ from each other (3,13,19,21,23,28,30,31,34, 39,40). Therefore, lack of studies in this field and the uncertainty of the findings (4,14,30) causes controversy about whether personality is related to in-team positions or not.

In order to analyze the personality traits of the team players and individual players, various scales were used based on different theoretical bases. The most commonly used scales are “Eysenck Personality Inventory” and “Five Factor Personality Model” which are clearly evident in the literature (4). Especially the Five Factor Personality Model has become the most widely accepted model in recent years. (12). This method is based on the assumption that people can understand themselves and express their personalities verbally. The Five-Factor Personality model uses the elements of the "language" (adjectives) to classify the personality, and in the international platform there are many examples of classifying personality through adjectives (33).

As a result of the literature review, it has been observed that also the Transactional Analysis theory has been used to determine the personality characteristics of individuals (3,37). In some studies it has been stated that this theory is in line with the Five Factor Personality Model and there is a a mutual correlation between the

two models (24,44). However, in sports psychology, there are very limited studies in determining the personality characteristics (ego status) of the individuals based on transactional analysis (3,37). It has also been found that there is only one study in the literature which examines the relationship between the personality characteristics of the team players based on transactional analysis (ego status) and their in-team positions (3).

Transactional Analysis Theory (TA), also known as Eric Berne's Operational Analysis Approach developed in the early 1950s, is one of the widely accepted approaches to explaining the personality traits of the individual. In many areas such as personality, development, interpersonal relations and psychotherapy, TA Theory provides a clear viewpoint of understanding and expressing the thoughts, feelings and behaviors of the people (1). TA, as a personality theory, using the ego states model, helps us understand the psychological status of the people and recognize how they exhibit their functionalities and personalities behaviorally (41). The ego states model in TA includes two separate models, structural and functional. The structural model is related to the content of ego states, and the functional model is related to the process of this content. While structural model shows the personality as Parental, Adult and Child ego states, the functional model shows it as Protective Parent, Critical Parent, Adult, Natural Child, and Approved Child ego-states (1).

Kayalar (27), clarifies that TA provides important clues about ego states behavioral diagnostics and building effective teams within the TA transaction organization and management science. He states that the use of TA can provide the effectiveness while building teams. At this point, TA-based ego states provide an overview for the researchers about whether there is a relationship between the performance of the football players and the accordance of their personality characterstics with the personality traits that are required for different in-game positions in the team.

For this reason, the purpose of this study is to investigate the Samsun U-19 Elite League young amateur football players' ego states based on transactional analysis and the relationship between their performance and the accordance level of their in team positions.

For this purpose, the following research questions were sought;

Is there any significant relationship between ego states according to the players' level of education?

Is there any significant relationship between the ego status of the footballers (observed) and the position ego status (expected)?

Is there any difference between the ego status of the footballers with regards to the end season performance evaluations?

Is there any difference between the ego status of the teams with regards to the season-end league rankings?

Is there any difference between the ego status of the footballers with regards to the position in which they mainly play in the team?

MATERIAL AND METHOD

Research Design

In the study, descriptive relational screening model which is one of the quantitative research methods was used in order to understand the differences between the ego states of the players, and comprehend the accordance between the ego states (observed) and the ego states (expected) related to their in-team positions. Relational screening model aims to determine the presence or degree of the covariance between two or more variables (26).

Population and Sample of the Research

The population of the research consists of the football players in the 2018-2018 season U-19 Elite amateur category. The sample of the research consists of a total of 183 football players playing in the teams at Samsun U-19 Elite Amateur Category (Atakum Belediyespor, Kadıköyspor, Yolspor, İlkadım Belediye Yab-pa Spor, Çarşambaspor, 19 Mayıs Belediyespor, Ladik Belediyespor, Samsun Belediyespor, Atakentspor, Gaziosmanpaşa Pınarspor, Karasamsunspor, Telekomspor).

A total of 183 football players participated in the present study are shown in Table 1.

Table 1. Demographic characteristics of the football players and their distribution according to teams and positions

Characteristics		n	%
Age	16 year	44	24.0
	17 year	91	49.7
	18 year	45	24.6
	19 year	3	1.64
Education	Middle School	4	2.18
	High school	172	94.0
	University	7	3.82
Teams	Atakum Belediyespor	15	8.20
	Kadıköyspor	15	8.20
	Yolspor	19	10.4
	İlkadım BLD. Yap-pa	22	12.0
	19 Mayıs Belediyespor	16	8.74
	Çarşambaspor	11	6.01
	Atakentspor	12	6.56
	Samsun Belediyespor	16	8.74
	Ladikspor	13	7.10
	Telekomspor	18	9.84
	Karasamsunspor	11	6.01
	G. Pınarspor	15	8.20
Positions	Goalkeepers	18	9.84
	Fullbacks	28	15.3
	Stoppers	28	15.3
	Wweepers	10	5.46
	Midfielders	44	24.0
	Wingers	38	20.8
	Forwards	17	9.29

Data Instrument

In order to determine the ego states and in-game ideal ego states of the young players the "Ego States Scale" developed by Arı (7) was applied. A "Personal Information Form" was used to obtain information about their demographic and football characteristics, and also a "Performance Rating Scale was implemented by their coaches to evaluate the performances of the players from the beginning of the season to the end of the season.

Data Collection

This study was approved by the Social and Human Sciences Ethics Committee of the Ondokuz Mayis University with dated 26.11.2019 and decision numbered 2018/314. Before data were collected, the trainers and players the Samsun U-19 elite amateur league category were firstly informed about the study. Secondly, the coaches were delivered the "Ego States Scale" an hour before the training and were asked to mark each of the required (ideal) personality characteristics with regards to the in-game positions (goalkeeper, fullback, stopper, sweeper, midfielder, winger, forward). The coaches were then given the "Performance Rating Scale" and asked to fill in it with the information about the players and evaluate their seasonal performances. 20 minutes before the training, the players were asked to fill in the "Personal Information Form" and then the "Ego Status Scale". The application process was carried out in an environment in which none of the participants was affected by another.

Statistical Analysis

Data were analyzed using the Statistical Package of Social Sciences version 21 (IBM SPSS Statistics; Armonk, NY, USA) software. Firstly, normality assumption was examined using the Shapiro-Wilk method ($P>0.05$). Secondly, one-way ANOVA and Tukey HSD multiple comprasion test were used to determine the differences between the total scores about the players' ego states (Critical Parental, Protective Parental, Adult, Natural Child and Approved Child) with regards to the players' performances, team leaguge rankings and the in-team positions of the players. Finally, Pearson correlation coefficients were calculated to examine the relationship between the ego status of the players (observed) and the in-team position ego status (expected) of the players. The findings were expressed as number (n), mean and standard deviation. The level of statistical significance was accepted as $p<0.05$.

RESULTS

In this present study, it was found that there was a statistically significant difference only between the Adult Ego States of the players in Samsun U-19 Elite young amateur league in the season 2018-2019 with regards to their levels of education (Table 2). Adult ego states of high school and university graduates were found to be higher than the ego states of middle school graduates ($P=0,009$). On the other hand, there was no significant difference between the ego states with regards to their ages and levels of income.

Table 2. Adult Ego States According to the Players' Level of Education

Level of Education	n	Means	Std. Deviation	P-value
Middle School	4	0.1921b	0.0199	
High School	172	0.2147a	0.0146	0.009
University	7	0.2177a	0.0132	

Table 3 shows the correlation about the accordance between the ego states of the players (observed) and their in-game position ego states (expected).

Table 3. The accordance between the ego states (observed) and the in-game position ego states of the players.

			Expected (Coach)				
			CP	PP	A	AC	NC
Observed (Footballer)	CP	r	-0.051	0.054	-0.091	0.050	0.029
		P-value	0.492	0.469	0.223	0.501	0.698
	PP	r	0.030	-0.016	0.098	-0.020	-0.062
		P-value	0.686	0.828	0.188	0.792	0.406
	A	r	0.029	0.069	0.166*	-0.021	-0.150*
		P-value	0.696	0.351	**0.025**	0.782	0.043
	AC	r	-0.025	-0.023	0.049	-0.048	0.061
		P-value	0.740	0.755	0.512	0.522	0.409
	NC	r	0.053	-0.090	-0.088	-0.006	0.049
		P-value	0.474	0.227	0.239	0.932	0.509

(CP: Critical Parental Ego State, PP: Protective Parental Ego State, A: Adult Ego State, AC: Approved Child Ego State, NC: Natural Child Ego State)

This paper showed that there were no significant correlations between observed and expected ego states (the footballer's own ego state and in-game position ego states of the players evaluated by their coaches, respectively) except for Adult Ego State (r=0.166; P=0.025,) (Table 3). Also, it was determined that no statistically significant difference was found between the Critical Parental (P=0.700), Protective parent (P=0.865), Adult (P=0.305), Approved child (P=0.495) and Natural Child Ego States (P=0.814) of the players with regards to their performances.

No statistically significant difference was found between the Adult (P=0.100), Critical Parental (P=0.404), Protective parent (P=0.153), Approved Child (P=0.364) and Natural Child (P=0.361) Ego States with regards to the end of season league rankings. Although there is no statistical significance between the end-of-season league rankings and ego states, Adult ego states has been found to be the closest to the level of significance (P=0,100). It was found that the champion and the team came in second in the U-19 amateur league (Atakum Belediyespor – the champion, Kadıköyspor- second place) had the highest adult ego state scores when compared to all the other teams. Also, Atakum Belediyespor had a higher adult ego states score than Kadıköyspor did (Table 4).

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Table 4. The Adult Ego States with regards to the end of season league rankings

		Teams	n	Mean	Std. Deviation	p-values
End of Season League Ranking	1.	Atakum Belediyespor	15	0.2182	0.0129	0.100
	2.	Kadıköyspor	15	0.2176	0.0163	
	3.	Yolspor	19	0.2147	0.0125	
	4.	İlkadım BLD. Yap-pa	22	0.2165	0.0104	
	5.	19 Mayıs Belediyespor	16	0.2146	0.0078	
	6.	Çarşambaspor	11	0.2147	0.0132	
	7.	Atakentspor	12	0.2155	0.0172	
	8.	Samsun Belediyespor	16	0.2140	0.0173	
	9.	Ladikspor	13	0.2089	0.0176	
	10.	Telekomspor	18	0.2101	0.0177	
	11.	Karasamsunspor	11	0.2003	0.0216	
	12.	G. Pınarspor	15	0.2109	0.0117	

Table 5 showed the descriptive statistics about the Critical Parental, Adult and Natural Child Ego States of the voluntary U-19 Elite young amateur league players with regards to their in-team positions.

It was found that there were significant statistical differences in the Critical Parental, Adult and Natural Child Ego States of the players with regards to their in-game positions in which they mainly play (p<0,05; Tablo 5). A high level of statistical significance was found especially in Adult Ego States (p<0,001). It was seen that while the goalkeepers and fullbacks had the highest average scores in terms of Critical Parental Ego States, the midfielders, wingers and forwards got the lowest average scores (p=0,006). However, in respect to the Adult Ego States, the midfielders got the highest scores while the goalkeepers had the lowest scores (p<0,001). Finally, the midfielders and forwards got the highest average scores with regards to the Natural Child ego states when compared to all of the other players, and the fullbacks got the lowest scores (p=0,017). According to these findings, it can be said that the goalkeepers and fullbacks mainly had an egogram of Critical Parental (CP) Ego States while the stoppers, sweepers, midfielders, wingers and forwards mainly had an egogram of Adult (A) Ego States.

Table 5. Ego States statistics of the players with regards to their in-team positions

Footballers' positions in the club	n	Mean	Std. Deviation	p-values
Critical parent ego state				
Goalkeeper	18	0.2135a	0.0319	
Fullback	28	0.2130a	0.0331	
Stopper	28	0.2030ab	0.0369	
Sweeper	10	0.2076ab	0.0464	<0.001
Midfielder	44	0.1878b	0.0336	
Winger	38	0.1899b	0.0360	
Forward	17	0.1843b	0.0271	
Adult ego state				
Goalkeeper	18	0.1991c	0.0133	
Fullback	28	0.2098b	0.0153	
Stopper	28	0.2178ab	0.0162	
Sweeper	10	0.2102b	0.0165	<0.001
Midfielder	44	0.2201a	0.0115	
Winger	38	0.2164ab	0.0135	
Forward	17	0.1893	0.0224	
Natural child ego state				
Goalkeeper	18	0.1985a	0.0238	
Fullback	28	0,1794c	0,0230	
Stopper	28	0,1817bc	0,0256	
Sweeper	10	0,1963ab	0,0244	0.017
Midfielder	44	0,1937abc	0,0258	
Winger	38	0,1940abc	0,0189	
Forward	17	0,1982a	0,0257	

[a,b,c]Means in the same column not sharing common letters are significantly different according to Tukey test

DISCUSSION AND CONCLUSION

The results of the present study show that the players who were high school graduates or university students had rather higher Adult Ego states than the middle school graduates (Table 2). The result with respect to Ego states is in agreement with Akın (3) except for Adult Ego states. Akın (3) found that no statistically significant difference between the ego states and education levels of the professional football players. On the other hand, Gülşen (22) examined the relationship between the educational backgrounds and the problem solving skills of football players playing in different leagues, and found out that the players who were high school graduates and university students had much better problem solving skill levels than the middle school graduates. According to the study the Adult Ego states of the students increased as their levels of education increased while Critical Parental Ego states increased as the levels of education decreased.

The results of the present study show that the accordance between the ego states (observed) of the players and their in-team position ego states (expected) had a positive correlation with regards to only Adult Ego states (P=0.025; Table 3). However, when the relationship between this correlation and

the performances of the players and teams was taken into consideration, it was noticed that there were no statistically significant correlations between the performances and the accordance of the observed and expected adult ego states. This result was inconsistent with Akın's study (3) on professional football players. Akın (3) determined a statistically significant relationship between the expected ego states and the observed ego states (Protective Parental and Adult ego states), and found out that this accordance had a positive effect on the performances players. It was stated that on condition that there was accordance between the in-team position of the players and their ego states, their performances got better. On the other hand, they presented poor performance when there was no accordance between the in-team position of the players and their ego states, their performances (3). The fact that the present study did not show similarity to the study carried out by Akın (3) can be explained by the sample group in this research.The results can be identified with the fact that the participant players were either 19 years old 19 (n=3) or under 19 (n=180) playing in U-19 category in Samsun province. On the other hand, the participants in Akın's study were players all from Turkish professional leagues (Super League and 1st League) 72.8 % of which were 20 years old or over 20.

Although the accordance of Adult Edo states in the expected and observed ego states has no relation with the players' performances, this accordance has an important place in the Transactional Analysis (TA) theory (7). The development and use of a pure (with strong boundaries and not messed with other ego states) Adult can support the removal of all emotional problems in Adult control that Berne mentioned from time to time (42). It evaluates the possibilities of dealing with the outside world by processing the data and it is important for the individual to maintain his existence (11). The lack of appropriate personality and psychological characteristics or any deterioration in these can be regarded among the most important reasons that affect the success and failure of athletes in their sportive life (4,5,32). In the literature we see that the sportive perfomance is especially associated with the athlete's levels of "responsibility/self-discipline / balance/emotional balance" (neurotic) (5,32). Here, the Five Great Personality Factors (the Great Five), which include these two psychological features, are of great importance. As the Great Five is the most widely accepted personality trait structure that adopts the basic characteristics theory, it makes this situation much clearer in the minds. (4,5,32). The parallelism of the Five Great Personality Factors with TA Ego States is of particular importance within the research findings. In short, Winter and Udomsak (45) compared the ego states and five factor personality dimensions using the adjective checklist (ACL: Adjective Check List). In the light of that study, it was found that there was mutual correlation between Parental Ego-Responsibility and Compatibility; Adult Ego - Emotional Balance (the opposite pole of the neurotic dimension); Child Ego - Openness and Extroversion; Approved Child - Compatibility – Neuroticity According to the findings, the Adult Ego states both turned to be significant within the in-team positions of the players and showed a positive correlation between the expected and observed ego states (P=0.025; Table 3), and thus, it can be considered that it will contribute positively to the performances of the players in the future it is not meaningful for now. The relation of sportive performance with "responsibility/self-discipline / balance/emotional balance" (neurotic) (32) indicates that it is associated with Adult and Parent Ego states (45). Adul Ego relates to "balance / emotional balance (neurotic)", shows individuals' emotional instability and refers to their aspects of anxiety, hostility, depression, self-consciousness, impulsivity and fragility while Parental Ego represents "responsibility / self-discipline".

According to the research findings, the highest level of significance between the position of the players (goalkeeper, fullback, stopper, sweeper, midfielder, winger and forward) and Adult Ego states was seen in the midfielders while the lowest level of significance was carried by the goalkeepers and the fullbacks (Table 5). Although there was no statistical significance difference between the ego states and the performances ($p<0.05$), it was seen that the players with an Adult Ego states egogram were closer to the level of significance. Although the findings are not a significant indicator for this study, they can be seen as valuable for future studies. It is likely to see in the literature that players with Edut Ego egogram may have sporting performance differences when compared to other players (9,32,45).

It was found that the midfielder position had the highest average score when compared to the other positions in the Adult ego states (P=0.001; Table 5), which has the highest level of significance between in-team positions and ego states. The

midfielders organize and direct the footbal game and establish the connection between the attackers and the defenders. They are primarily responsible for the game controlling. For this reason, they should provide good interaction with other players should have good coordination skills.They are responsible for the changes in the rhythm of the game, slowing it down or accelerating it. The midfielders should be creative, confident, self-controlled and balanced, controlled and energetic, challenging, diligent and they should haveleadership characteristics, sophisticated game intelligence, complex technical and combination skills, limited aggressive structure, strong motivating power, dense and continuous concentration ability, developed environmental and directional attention, ability to think quickly and accurately, tactical in-game skills, strong analyizing ability (6,8,16,22,29). All these features, which have a positive effect on the performances of the players, can be ensured with the coherence of the all other ego states which undergo adult ego control and selectivity. It is because a personality with a weighted adult ego status can respond to events and situations with a suitable attribution and show the most convenient behavior and attitude (7). However, the fact that there is no statistical significance between the adult ego status and performance does not confirm that the ego states expressing the aspects of the personality have a meaningful relationship with sporting performance. In other words, it does not support the idea that personality has a positive effect on sportive performance (3,4,5,32).

There was no statistically significant difference between the end-season league performances of the teams and their ego states ($p>0,05$). However, the first two teams in the league Atakum BLD. (the champion) and Kadıköyspor (the second) which had the right to participate directly in the championship had a higher average score than the other football teams in the league and it was also seen that Atakum BLD. (the champion) had a higher Adult Ego states score than Kadıköyspor (the second) ($P=0,100$; Table 4). Although this may indicate a positive relationship between success and Adult ego status, it is quite difficult to say that there is a relationship between the success rating of the league and adult ego states when we consider all the teams in the league. Team performance is multidimensional and it is assumed that different personality traits cause different performance results (17). For this reason, it is natural that there may not be any relationship between league performances and ego states of the teams. Team performance can be achieved through the development of psychological processes such as in-team social cohesion, social integrity, emotional balance and extroversiton (4) At the same time, Van Vianen and De Dreu (44) found that a high level of responsibility and suitability in the team could be associated with a higher level of engagement in the mission. However, the relationship between personality and team performance relates to the relationship between team success and a series of moderate variables such as the kind of the task, confidence in the team, team stability, and interdependence levels of technical management. An introverted and emotionally unstable individual can disrupt the team and adversely affect the performance of the others (17). At this point, Transactional Analysis (TA) can be seen as very important. TA is not only a personality theory but also a communication theory that examines the interpersonal relationship (41).

Kayalar (27), in his study which examines the effect of Transactional Analysis on creating an effective team, states that TA provides ego states behavioral diagnosis and the types of Transactions provide important clues. Thus, he mentions that the application of TA in creating teams increases the effectiveness of the teams. However, as there is no meaningful relationship between the player/team performances and their ego states, it becomes difficult to be interpreted in terms of TA which is both a personality and interpersonal communication theory.

In consequence, in contrast to research which remark the fact that the personality traits and psychological skills of the players have an effect on sporting performance, this study turned out to be in parallel with the studies that could not find any a important relationship between personality traits and psychological skills of the players and their sporting performance.

Limitations and Recommendations

The sample of the study has composed of U-19 elite players of amateur teams in Samsun. In this respect, future studies on this theoretical framework with the players who play in the infrastructure of professional teams can give different results in terms of the relationship between the performances of the position-ego states of football players.

In order to obtain data on how the positions within team relate to the ego status of the players only the Ego Status Scale developed by Arı has used. There are different scales in determining the ego

status of the individual (s) in the literature. In this respect, the use of different scales in the literature may give different results in terms of the relationship between the performances of the position-ego states of football players.

Various research methods are used to determine the personality traits or psychological skills of athletes. The studies examining the relationship between the positions played by footballers and their personality traits or psychological variables has seen to be based on quantitative methods. The use of qualitative research or integrated / mixed research methods using both quantitative and qualitative research patterns may provide different findings and perspectives in terms of determining the ego status of football players.

It has considered that the validity of the findings obtained from the application of personality tests to athletes that are not designed for sports-specific subjects is limited. Also the ego status scale used in this study is not designed for athletes or football players. The development of data collection tools designed specifically for the athlete or the football player and which have been validity and reliability can give different results in terms of how the position-ego status relations is related to the performances of the players.

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Notational Analysis Of Wheelchair Women's Badminton Matches In The International Badminton Tournament

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Abstract

Badminton, which can be played in all age groups for competition and recreation in the world, is the fastest racket sport and has taken its place in international tournaments. In this study, it was aimed to examine the competition performance of wheelchair women Badminton players participating in international competitions. The national team badminton in 19 wheelchair categories with disabilities from 17 countries participating in the 4th International Enes Cup Badminton Tournament with an average age of 36.66 ± 4.88, average height 1.68 ± 0.04, body weight average 59 ± 6.44 athlete (Russia, Japan, Thailand, France, Spain, Malaysia and Turkey) participated on a voluntary basis, Analysis studies were carried out on 7 single women's competitions. As a result of the study, it was determined that the most common type of shots in 1527 strokes performed by wheelchair single female badminton athletes was Clear and the least used stroke was Drive. ($p<0.05$). It was determined that the most striking region was the back and middle region among the 1519 hit areas performed by the athletes, while the game winning region was the front region with the highest number of 14.94% and the middle region with at least 4.17%. The game-losing hit zone, which is the game-hit hit zone, from 174 athletes performed by the athletes was analyzed as 174 hit-zone, and the game-losing hit zone was analyzed ($P <0.05$). It was determined that the game losing region was the frontal and at least the middle region with 74 of the most. It was determined that the athletes made a maximum of 36.82% back line error and at least 9.95% a side line error. As a result of the research, it was concluded that the athletes preferred the Clear stroke, the reason for this was the control of the game in wheelchair badminton players, the time saving in the chair control among rallies, and therefore the ethics of preference clear technique, which is a guaranteed hit.

Keywords: Wheelchair Badminton, Game Control, Match Performance.

INTRODUCTION

It has been stated that the sport, which plays an active role in every stage of human life in our age, plays an important role for good personality and mental health as well as healthy physical and psychological development, as well as regular physical activities (10,11,22). Badminton is among the most popular and fastest racket sports in the world that can be easily played in all age groups (21, 26, 24). Badminton has become a fast-paced and competitive sport, played enthusiastically by

millions of people worldwide. Today, Badminton is an Olympic sports branch (4), organized in national and international associations to which 180 nations belong (15) and as of 2016, more than 100 million licensed athletes worldwide. Badminton sport, whose main country is England, has been played according to fixed rules since 1872, after British colonists recognized this decline game in India (15). For the first time, it started with a very small number of athletes in England's Stoke Mandevilla Center in 1995, primarily for the rehabilitation of war veterans who were disabled after the Second World War. Nowadays, participation is rapidly increasing in terms of both athletes and countries (23). Performance analysis (PA) refers to the process of recording and analyzing athletes' performance during training and competition, focusing on providing objective data that inform and support the coaching process (12). Statistical sports competitor analysis methods are successfully used by professional sports franchises in many countries. (16). The main goal of sports coaches and athletes is constantly looking for new analysis methods in training practices in order to win as many competitions as possible and competitive advantage (13,20). Competition analysis is very useful in terms of providing usable data to sports science, coaches and athletes in terms of the performance and effects of the athlete (27).

The aim of this research is to evaluate the variety of strokes, stroke frequencies, number-winning, number-losing strokes, match performance, match times, rest times, sets between strokes and scored regions of international wheelchair national badminton players.

MATERIAL METHOD

Badminton national team with 17 disabilities from 17 countries, with an average age of 36.66 ± 4.88, height average 1.68 ± 0.04, body weight average 59 ± 6.44 participating in the International 4th Enes Cup Badminton Tournament. the tournament was attended by athletes (6 Russia, 5 in Japan, four in Thailand, one in France, one in Spain, one in Malaysia and one Turkey) 6 handicapped wheelchair national badminton athletes have shown a willingness to study and 7 were carried out analyzes on a single women' competition. Demographic (age, height and weight) of the athletes participating in the research were examined with a personal information form.

The competitions are placed in the back areas of the court with the help of two cameras, all the competitions are recorded and the total number of strokes of the athletes (Clear, Drive, Smaç, Drop, Lift, Block, as well as Forehand, Backhand as a service shot) and the total stroke type and Total match areas, numerical distribution of game-winning strokes and game-losing strokes, game-winning and game-losing and hit regions were analyzed with notational method over the records by watching 7 match videos.

Statistical Analysis

The data obtained at the end of the study were evaluated using Statistical Package for Social Science (SPSS) 22.00 statistics program. One-Way Anova analysis was used for the general average of the data obtained from the competitions ($p > 0.05$).

RESULTS

Table 1. Descriptive Statistics on the Wheelchair Badminton Players Participating in the Research.

Variables	N	Number of Matches	Mean	SD
Age	6	7	36.66	4.88
Height	6	7	1.68	0.04
Weight	6	7	59	6.44

When Table 1 is examined, the average age of the badminton athletes with physical disabilities participating in the study was 36.66 ± 4.88 years, the average height was 1.68 ± 0.04 meters, and the body weight averages were 59 ± 6.44 kg.

Table 2. Numerical Distribution of Total Hit and Number of Athletes.

Stroke Types	Number	Percentage (%)
Clear	509	33.33
Lift (Lob)	238	15.59
Drop	224	14.67
Forehand Service	211	13.82
Block	161	10.54
Backhand Service	133	8.71
Smash	35	2.29
Drive	16	1.05
Total	1527	100.00

When Table 2 is examined, the most frequent strokes performed in 1527 strokes performed by wheelchair single female badminton athletes are 33.33% (509 pieces), the most clear and the least strokes type is 1.05% (16 pieces) determined.

Table 3. Numerical Distribution of Total Strike Zones of Athletes.

Hit Zones	Number	Percentage (%)
Back	805	53.00
Front	522	34.36
Middle	192	12.64
Total	1519	100.0

When Table 3 is analyzed, it was determined that the most frequent hitting region in the 1519 hitting region performed by wheelchair single female badminton athletes was the back region with 53.00% (805 pieces) and the middle region with 12.64% (192 pieces).

Table 4. The Ratio of Athletes' Game Winning Strike Zones to Total Hit Zones.

Stroke Types	Game Winner Hit Zones (A)	Total Hit Zone (B)	Percentage of A / B (%)
Front	78	522	14.94
Back	88	805	10.93
Middle	8	192	4.17
Total	174	1519	11.45

When Table 4 is analyzed, it is determined that the game-winning region is the front region with the highest number of 78 (14.94%) and the middle region with the least 8 (4.17%). The hit zone, which won the game from the 1519 hit zone performed by the athletes, was analyzed as a total of 174 hit zones (11.45%).

Table 5. The Ratio of Athletes' Losing Strike Zones to Total Hit Zones.

Stroke Types	Game Winner Hit Zones (A)	Total Hit Zone (B)	Percentage of A / B (%)
Front	74	522	14.18
Back	82	805	10.19
Middle	14	192	7.29
Total	170	1519	11.19

When Table 5 is examined, it was determined that the game losing region is the most 74 (14.18) and the front and at least 14 (7.29%) middle regions. Losing the game from the 1519 hit zone, performed by the athletes, was analyzed as 170 hit zone (11.19%).

Table 6. Numerical Distribution of the Errors Athletes Make in the Match.

Types of Errors	Number of Errors	Percent (%)
Backline Error	74	36.82
File Error	39	19.40
Frontline Error	36	17.91
Service Error	32	15.92
Sideline Error	20	9.95
Total	201	100.00

When Table 6. is examined, it was determined that a total of 201 errors were made. It was determined that most of the athletes made 74 (36.82%) back line errors and at least 20 (9.95%) sideline errors.

Table 7. 22 Average of the Minimum and Maximum Rally Times of the Match.

	Total	Mean
Rally Time	27 min. 35 sec.	5 sec. 5 sp-sec.
Minimum Rally Time	5 sec. 11 sp-sec.	1 sec.
Maximum Rally Time	99 sec. 42 sp-sec.	19 sec. 9 sp-sec.

min: minute, sec: second, sp-sec: split-second

When Table 7 is analyzed, the average rally time of 7 matches is 5 seconds and the average minimum rally time is 1 second and the average maximum rally time is 19 seconds and 9 seconds.

DISCUSSION AND CONCLUSION

In the last thirty years, while many institutions have been implementing a structured analysis process to gain a competitive advantage, it has been stated that sports performance analyzes started to be applied mostly in the early 2000s (7). Competition analyzes are important tools that collect information about the actions performed, contribute to the evaluation of this information and to organize training programs, and determine the changes in the performance of the players individually (5,9). The main purpose of this study is to analyze the match performance and stroke variety of international wheelchair women badminton players by region. In many studies, sufficient analysis studies regarding wheelchair badminton athletes have not been found. The average age of the physically disabled badminton athletes participating in the study was 36.66 ± 4.88 years, their average height was 1.68 ± 0.04 meters and their body weight averages were 59 ± 6.44 kg (Table 1). When other studies are examined, it can be assumed that the average age is high, because of the absence of a certain age category, participation of athletes of all ages and accidents at an advanced age (19, 18).

Among the 1527 strokes performed by wheelchair single female badminton athletes, it was determined that the most used shot type was 33.33% (509 pieces), and the least shot type was 1.05% (16 pieces). In the studies conducted with badminton players without physical disabilities, the lift type of 221% of the most preferred strokes of athletes in the total of 2071 strokes made by athletes in single female under 15 years of badminton competitions (27) is the lift, smash, respectively, of the first three strokes most preferred by female athletes. and clear hit, and male athletes have been reported to have net drop, lift and drive hit (17). Considering the preferred stroke types, it can be stated that other strokes that men and women generally prefer lift strokes show due to gender factor. The fact that wheelchair badminton players do not prefer the lift stroke is primarily because the strokes made on the front line are risky, but the clear shot on the front area of the field is a more guaranteed and controlled stroke. In the study conducted by Ming et al (2008), it was seen that the most preferred stroke was Clear and paralleled with the research conducted.

It was determined that the most frequent hitting region in the 1519 hitting zone performed by wheelchair single female badminton athletes was the back region with 53.00% and the middle region with 12.64% (Table 3). In different studies, it has been reported that in single-woman competitions under the age of 15, the beats are mostly performed from the front area of the court, 41.28% and from the back and middle court areas respectively (27). The reason for the different results of the research was thought to be due to the high rate of Clear playing of the athletes with disabilities and the impact of the chair equipment used by them.

It was determined that the game-winning region was the frontal region with 14.94% and at least the middle region with 4.17% (Table 4). The hit zone, which won the game from the 1519 hit zone performed by the athletes, was analyzed as 174 hit zone (11.45%) in total. In other different studies, it was reported that a total of 385 strokes in game play were performed in front of the net and 85 strokes at different levels were 22.0%, 230 strokes in the middle area were 59.8%, and 70.2% strokes in the back area, and the scoring strokes were mostly from the middle area, front court and Finally, it was determined that it was being made from the back court (17). In the wheelchair badmintoists, since a similar analysis was not available in the literature, no parallelism or opposite opinion was revealed with the research conducted.

In the study, it was determined that the game losing region was the front region with 14.18% at most and the middle region with at least 7.29%. A total of 170 hit zones that lost the game from the 1519 hit zone performed by the athletes were analyzed as 11.19%. In other studies, it has been reported that the ratio of the error occurrence regions to the total number of false strokes in the game-losing hits is the highest occurrence at the front region with 51.7% (27). In another study conducted on similar age groups, it can be said that the strokes made with simple errors mostly occur in the file (front) region (14) and are in parallel with the findings of the research.

It can be said that the athletes made a maximum of 36.82% back line error and at least 9.95% a side line, a total of 201 line errors (Table 6), and the number of errors was high due to the excessive use of the Clear stroke technique. In a different study conducted on 17-year-old national badminton players, it was analyzed that the area with the most mistakes was the frontal court (8,87 ± 1,34) region (8). It has been reported that the error occurrence areas of the strokes performed by athletes in single women under the age of 15 were the most common with 169 errors (51.7%) (27). However, since badminton playing in a wheelchair is not included in the front court area of athletes, there is no similarity with these studies in this sense.

Considering the different studies on rally times, 20 single men without disabilities found that the average rally time was 9 seconds in the Beijing Olympics and 10.4 seconds in the London Olympics. In addition, in another study conducted with athletes without disabilities, the average rally time of 20 single boys matches was reported to be 9 seconds in Sets 1 and 2 (Abian et al 2013) and is in line with the research conducted (Table 7). In the study conducted in the 2015 World Championship, the average rally time was found to be 10.033 for men and 12.061 seconds for women (25) and different results were obtained with the research conducted (Table 7). From this point of view, it is thought that the current studies are not on individuals with disabilities, causing the difference in the average rally time.

It can be said that the results to be revealed through the trainers and analysts who attended

more analysis training in the pre-season period will be effective in directing the athletes and also minimizing the error rate. When the results of the research are evaluated, it is recommended to diversify the research in terms of how the training programs organized by Badminton teams are reflected in the competition and their effects.

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Can Mindful Eating Help Us When We Struggle With Eating? Mindful Eating Replaces Diets.

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Abstract

Eating and weight related disorders are spreading widely all over the world. Individuals and health professionals are seeking effective and lifelong treatments for them. The purpose of this review was to summarize researches and evaluate the effectiveness of mindfulness and mindful eating on obesity, disordered eating and eating disorders. Practicing mindful eating has being used for emotional eating, binge eating, food cravings, and weight management. Past reviews interpreting the association between being mindful eating strategies and eating behaviors or attitudes may be showing us that mindful eating is the best way to deal with eating issues. Mindfulness and mindful eating related approaches can be used as a part of the treatment plans of obesity, disordered eatings and eating disorders due to the fact that these therapies are being worked as effectively practical.

Key words: mindful eating, mindfulness, obesity, eating disorders, disordered eating.

INTRODUCTION

Mindfulness and eating

In the last 30 years, mindfulness has become popular and effective in treatment plans of stress and eating issues (13,17,26). Mindfulness has been described as 'bringing a certain quality of attention to moment by moment experience (23). The description of mindfulness, has been expressed as 'increasing awareness and responding skillfully to mental processes that contribute to emotional distress and maladaptive behaviour' (7). In a similar study, it was defined as 'a psychological stable of cognitive skills that allows to bring complete attention to the present and experience on moment-to-moment basis in a nonjudgmental and nonreactive manner' (9). It seems to be hard to define mindfulness and also mindful eating just by a sentence, so in this review it will be tried to express by some researches.

Mindfulness is a process that includes awareness of both the internal processes and the environmental factors that come from the outside; being mentally, emotionally and physically exactly in that moment (4,6,7). Mindfulness is binge at the moment, it is not just living in present moment. So being mindful requires attention and sense everything nonjudgementally. Mindfulness associated with health issues (23,24) and especially stress reduction (7). Although mindfulness is associated with many health conditions, now that we know it is related to eating too. It has been shown that in individuals who have high

mindfulness state and self-love, the decrease in body weight is higher. There is a strong relationship between negative automatic thoughts and body weight gain (29). It was later advocated that it would be beneficial to develop mindfulness and self-love in order to help body weight loss in the research related to mindfulness and body weight management which is the continuation of the same research (30,31). They found that mindfulness affected body weight loss independently, and that weight loss and self-love were positively related. In the continuation of the study, they found a strong negative relationship between negative automatic thoughts and body weight loss. In the intervention part of the research, mindfulness and self-love trainings have been given and it was observed that mindful eating is increased at the end of the research (30). Subsequently, in a similar study, the effect of mindfulness based eating training on impulsivity and body weight management was observed. When we look at the pre- and post-evaluations, it was shown that body weight and body mass index (BMI) were decreased (42). In another randomized controlled study, after the mindfulness training, body weight and mindfulness state of the participants were associated. At the end of the trainings, it was observed that BMI was decreased and physical activity status is increased in the intervention group. In addition, the sub-factors of the scales applied were examined and external eating and emotional eating and binge eating symptoms were decreased (43).

In a randomized controlled trial, researchers provided mindfulness training focusing on changing eating behaviors to one group by giving exercise guidance aimed at increasing diet and daily physical activity, with a mild energy restriction, and provided training for stress management with cognitive behavioral techniques. When the results of the study were examined, the emotional eating states of the group who received awareness training decreased statistically significantly compared to the other group (34).

Mindfulness by itself, has effects on managing internal and external factors such as portion control (3,4,9), preventing emotional eating (6,7,9) stopping overeating (12,21) within the scope of mindful eating, so it plays an important role in weight management. In a study, it was aimed to change the eating behavior with mindfulness based stress training and after awareness training, a significant decrease was found in emotional eating and uncontrolled eating states, which are the sub-factors of the scales (29). In previous studies, it was emphasized that the relationship between disinhibition, which is dependent on external factors and emotional eating, is strong in obese individuals (1,4,11).

Mindful eating

Mindfulness has been adapted to define eating behaviors, as a result the name and definition of mindful eating have been created (20). With the understanding of the importance of mindful eating, a measurable tool has been developed (16) and adopted to Turkish (26). Mindful eating means to stop, think and act by being aware of what you eat and eating consciously, not eating as a reflex (5). Mindful eating is defined, for the first time in Turkish in a study, 'With realizing how and why eating behavior occurs rather than what is eaten; internalizing physical hunger-satiety clues and being aware of the effect of emotions and thoughts; without being affected by environmental factors and being focused on the food that will be consumed at the present moment without judging the food choices' (26).

Mindful eating can be useful to make healthier and more satisfying choices by being aware of the food consumed without being affected by the individual's body weight or nutritional status. It is related to intiutive eating but contains outer wisdom too. Satisfying the individual and feeding the body of the individual in the process in which all senses should be used is an important part of mindful eating. The individual should also be aware of what type of hunger is present and accordingly determine when to start and when to stop eating through internal processes (6,16). Mindful eating has the potential to reduce automatic and inattentive reactions. With mindfulness, emotional eating, that caused by emotional triggers, will lose its effect on unnecessary food consumption will decrease (6,7). Automatic eating can be inevitable in such cases. In those who experience mindful eating, the effectiveness of the automatic eating can be impaired (deautomized) and their response to craving improves, so body weight management will be provided (5,36). Mindful eating has also nutritional knowledge and external issues. Knowing nutrients, foods, healthy choices and the participants that have high scores on mindful eating named as 'mindful eaters'. Being a 'natural mindful eater' is a key to have anything but eating problems (6).

Mindful eating with obesity, disordered eating and eating disorders

Eating, nutrition and weight related problems have been increasing nationally and globally. Eating behavior outcomes are changing to binge eating, emotional eating, external eating, and dietary intake. And when individuals can not do anything about them, they feel hopeless so apply any other options like overexercising, using laxatives or diuretics or fasting (10,18). Eating has become a complex issue for people in last years. Now treatment plans are including different types of therapies rather than conventional ones. Because now that there are so many changes in daily life (social media, online games etc.), we should have best solutions for patients.

In a study on body weight management in women, mindful eating training about food consumption outside the home was given. Considering the training content, trainings were provided within the scope of a broad mindful eating in the form of nutritional contents related to body weight management during food consumption outside, individualized strategies to reduce food intake while outside home and mindful eating practices. When we look at the exercises in detail, trying to make the eating experience enjoyable by drawing attention to the size, smell and texture of the food, and in relaxation exercises were applied by focusing on the emotions and thoughts that trigger hunger, taste, stomach satiety and eating. As a result, body weight and energy intake were decreased significantly in the intervention group compared to previous consumptions. It was also found that body weight management is important when consuming food outside (43). In a randomized controlled study, the effect of mindful eating training with type 2 diabetes was observed. While there was no difference in body weight management in mindful eating educated group, it was found that energy intake and sugar consumption decreased significantly compared to the other group (35).

Overeating has been divided into emotional overeating (such as anxiety) and external overeating (the image / smell of food). In a study the researchers evaluated the relationship between disinhibition and overeating and being slightly obese within the framework of emotional and external overeating (44). Experiential avoidance exists in both emotional and external eating behaviors. Mindful eating reduces food craving (1) and plays an active role in maintaining body weight management (15). In a previously mentioned study, randomized controlled mindfulness intervention was applied to reduce the effect of stress-induced eating on abdominal fat gain. It has been observed that there is a relationship between consuming meals mindfully (by the mindfulness trainings) and body weight loss (24).

In a study examining the relationship between obesity and emotional eating, the relationship between emotional eating, overeating, and the restrictive factor and overweight group was found to be strong. In the same study, emotional eating was found to be effective in the relationship between overeating and overweight (12). In a review researchers suggested mindful eating should be added in weight management treatment programs especially for obese individuals (13). Even if there are some studies that have modest improvements about weight loss, programs' long-term effect was effective weight management. Similarly, in 2019 a review about mindful eating and the relationship between diets and obesity, reviewers concluded that studies were focused on weight loss but the most important issue is being in a strategy that not based on energy restriction or restricted diets, so we can use mindful eating approaches (17).

Impulsive eating, which is similar to automatic eating, also leads to rapid food consumption and can make body weight management become difficult. Regaining after body weight loss and the relationship between impulsive eating and disinhibition are also found to be strong (15,25). Especially an impulsive individual may have difficulties to pay attention, so it may be resulted being unable to postpone satisfaction (31). It was proved that mindfulness trainings that target hedonic eating will be more effective than energy restriction with the implementation of obese individuals (34). Considering the preliminary study results, mindful eating interventions have been shown to be a powerful tool in reducing body weight, emotional and automatic eating. In short-term studies, it was stated that trainings given through mindfulness are effective in body weight management and this can be provided permanance by making these studies long-term (12,24,31,36). On the other hand, a study showed that mindfulness training is effective in making healthy food choices, but it does not affect portion control (32). It was pointed out that mindful eating trainings are

effective on daily energy intake, permanent body weight loss and glycemic control. At the end of the research, although the practices about mindfulness did not provide a reliable result in reducing energy intake, it was proved that it is a reliable tool in preventing overeating and thus preventing body weight gain. As a limitation of the study, it was shown that long-term results were not evaluated (35).

Binge eating disorder (BED) (2) treatment plan need a team and it has been used mindfulness-based interventions in recent years (19). Especially since 2008, mindful eating has also gained popularity (1,5,41). With these BED treatment plans, weight, glycemic control, cravings, emotional eating and external eating can be managed. Mindful eating interventions are also frequently used in binge eating disorders and help reduce emotional and automatic eating. It was claimed that cognitive distortions indirectly affect symptoms of binge eating and BMI, so cognitive distortions are the main process that needs to be improved (42).

Bulimia nervosa's (BN) (2) treatment plan should include psychotherapy and nutrition educations. In last years in addition to this plan, mindfulness-based interventions and mindful eating trainings have been used (8,27). Mindfulness-based eating awareness training (MB-EAT) improves emotional eating, good food choices, following hunger and satiety clues in best ways (28). The researches are growing and becoming better for treatment of eating disorders (11,38,39). Because individuals with binge eating and bulimia nervosa can not spend the energy that they intake, the result is simple: weight gain. Consuming large amounts of food will last with adiposity. That is why nutrition plan should be included to the treatment plan but not diets (10). With the plan when there is an intervention about mindful eating, it will end with less emotional and external eating because individuals become aware of their hunger and satiety clues, gain mindful eating skills (37). In a randomized controlled trial, group trainings (introduction to self-regulation, mindful eating exercises, binge triggers, types of hunger, taste and satisfaction tips, fulness, forgiveness, inner voice / wisdom, evaluation) and follow-up among overweight and obese groups with binge eating disorders (practices, observations, body weight management) were applied. In the evaluations made after the trainings, it was stated that 95% of the individuals who had a binge eating in overweight and obese group are no longer meet the diagnostic criteria of binge eating disorder. Mindful eating training was found to have a high impact on binge eating episodes and body weight loss (28).

Anorexia nervosa (AN) is a hard to handle psychiatric disorder. It can be deadly risky for health and the end can be mortal (2). Anorexia's treatment should be careful and intentive. Sometimes plan should be inpatient. In this plan there should be a dietitian beacuse patients need to learn 'accurate' knowledge of nutrition adn eating attitudes. Nowadays mindfulness and mindful eating programs are being used by researchers (14). In a study that was conducted 10-week mindful eating program with AN patients and found significant decreases in eating disorder symptoms at the end (22). Similarly in a research, it is found that first focused intervention to meal or snack is not working, when individuals used a mindful eating strategy as focuing on their five senses, hunger and satiety clues, it is significantly successful (33). They pointed out that mindful eating is an effective therapy for individuals with AN. Then in another study researchers used orange labeling for mindful eating practice as recording thoughts when participants were eating an orange and there was a successful result for the treatment (40).

CONCLUSION

Recent years 'being at the moment' as mindfulness has become important. Mindful eating is getting popular because it dominated by the view that the results of gaining mindful eating skills rather than traditional dietary treatments, in which the energy-reduced diet program is prepared and nutritional trainings are supported, are more effective. It should be added to the eating disorders treatment program beacuse even if treatments are successful, individuals may regain weight after months or years. Dietary-oriented interventions is not a permanent solution in body weight loss, and more permanent solutions can be achieved by directing behavioral interventions to healthy eating habits by gaining mindful eating skills about eating, nutrition and satiety. Mindful eating has effects on body weight management and eating attitudes, behaviors. In the proposed treatment system of disordered eating and eating disorders; psychiatrist, psychotherapist and dietitian can work together for the purpose of providing mindful eating skills with healthy, lifelong, sustainable eating behaviors and weight management can be achieved.

Suggestions

Nutrition consultances, trainings, educations and diets can be useful for weight management and eating problems in a short time like for a month, a year or 5 years. Besides theoretical therapy, there should be a plan that works lifelong. That is why minfulness and mindful eating approaches will be useful for eating and weight management treatments.

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Association of Anthropometric Profile to speed and agility performance in male soccer players

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Abstract

The purpose of this study was to examine the relationship between anthropometric, sprint and agility performance in soccer players. Descriptive cross-sectional study was employed on purposely selected 25 soccer players from Sidama Coffee and Hawassa City soccer clubs in southern part of Ethiopian premier league male soccer players. To serve these purpose basic anthropometric parameters (Body mass, height, body mass index), girth anthropometric (upper arm, waist, thigh and calf circumference) were measured. Performance measures of 30 meter speed test and Illinois agility tests also were measured on each subject. The obtained quantitative data was analyzed by one-way analysis of variance (ANOVA) to examine the difference in performance between playing position and Pearson correlation ($p<0.05$, 0.01) was used to see the relationship between all measured variable with the help of SPSS version 20.00 software. The result of the study revealed that strikers were the heaviest and tallest in contrasts with defenders and midfielders. They also had the larger upper arm, waist, thigh and calf circumference. There was significant differences of waist circumstance between playing position in score of $F = 4.555$, $P < 0.05$ (0.022). Body mass was correlated in body mass index ($r=.676$; $p<0.05$) in midfielder and ($r=.947$; $p<0.05$) in striker playing position. Arm circumference correlated with waist ($r=.642$; $p<0.01$) and thigh circumference ($r=.840$; $p<0.01$) in midfield positional players. Arm circumference correlated with thigh circumference ($r=.911$; $p<0.05$) in striker position. 30m speed correlated with only arm circumference ($r=-.666$; $p<0.05$) in midfielder position. Based on the result of the study researchers concluded that arm circumference was significantly correlated with waist and thigh circumference in midfield positional players. Similarly in striker position arm circumference was significantly correlated with thigh circumference. But there are no significant correlation with positional differences in speed performance with both basic and girth anthropometric variable except arm circumference in midfielder position. Agility was negatively correlated with all measured anthropometric variable in all playing position and statically no significant difference were observed. The obtained results can serve as normative anthropometric values for regular sport medical examinations of footballers in Ethiopia country

Key words: Girth anthropometric, speed performance, agility performance

INTRODUCTION

Soccer is an intermittent, high-intensity sport requiring a broad range of physical abilities in order to achieve competitive success (28). The game comprises activities like sprint and jumps in attack and defense. It also requires aerobic capacity as the game lasts one and half hour, sometimes even longer than the official time. These short and long lasting activities were performed over the entire game (31). To succeed in a team sport, soccer players need the optimal combination of technical, tactical, physical characteristics (like somatotype) and mental motivation (4). Besides fitness and the technical skills of the footballers, anthropometric indicators and body composition play an important role in successful performance (2). Morphological characteristics successfully discriminate soccer players by competitive level and field position (24). This evidence suggests that specific physiological demands and anthropometrical prerequisites exist for different playing positions and result in the selection of young players based on superior physiological performances and anthropometrical

advantage (13). There are many practical implications of studying anthropometry among sports participants. For soccer managers, coaches, and physiotherapists, an understanding of the optimal anthropometric characteristics of players can help to develop squad members to their full potential. Additionally, physiological testing is of great importance for monitoring fitness, strength, agility, and skill, and should be examined according to the different positional roles within the team (27). Indeed, it has been reported that there are anthropometric predispositions for positional roles within soccer; with taller players being the most suitable for central defensive positions, goalkeeping, and central attack (23).

Specific playing position may have unique physical and physiological requirements. Attackers appear to be the fastest players in the team. The greatest overall distances appear to be covered by midfield players who act as links between defense and attack. Defenders perform more backward movement than attackers (33). Sprint, acceleration, and agility are among the most important performance variables in youth soccer (12). High-speed actions are known to impact soccer performance and can be categorized into actions requiring maximal speed, acceleration or agility (19). Agility is one of the main determinants of performance in soccer. It can be successfully developed if the training is based on the changes of direction, which are done quickly and easily. By working on agility and improving the balance and coordination, soccer players will be able to move faster and change directions more quickly while maintaining control (27). Assessment of agility is easy to administer and could be performed in conjunction with sprint tests throughout the season following periods of specific sprint training (30].

Correlations of anthropometric characteristics and speed and agility performance of soccer player in different playing position remained less reported, especially in Ethiopian context. Therefore, this study attempts to fill the gap in the literature to gain more insight regarding anthropometric, speed and agility performance among some selected southern part of Ethiopian premier league male soccer payers according to different playing positions.

The purpose of the present study is to analyze the anthropometrical related to speed and agility performance in male soccer players in some selected southern part of Ethiopian premier league male soccer players, and to determine how closely these emulate previous findings.

Material and Methods

Participants:

The research was conducted on a sample of twenty five male soccer players purposely selected who play in the top clubs Southern part of Ethiopian premier league male soccer club players (N=13, Hawassa City and N=12, Sidama Coffee) to participate in this study. The sample included players aged between 20-27 years. The selection criteria included: (1) they have been members of the club and best players from (defender, midfielder, and striker) position. (2) all players participated in at least 75% training sessions per week. (3) the physicians of the outpatient hospitals evaluated the physical performance of all participants, and sport injury rates and incidence were recorded. The study was conducted in the final stage of the season, but the players were still in a competitive phase.

Research design. Descriptive cross sectional research design study was implemented. The study was undertaken in compliance with the Arba Minch University Medical School and approved by Arba Minch University Ethical Committee (No, RCP/1234/09 and date 2/23/2018). The soccer players gave written informed consent after having been explained the procedures, benefits and possible risks of participation in the study. All tests have been performed during the period of 1st may 2018 during a final competitive season, over a three-month period (March, April and May). During the study, the soccer players were engaged in their designed training programme that consisted of 7–8 training sessions per week and a weekly match.

Procedures

Anthropometric Measures

Anthropometric measures included three types of measurements: basic (body mass, standing height, body mass index), Girths (upper arm, waist, thigh and calf circumference). Each subject was measured in accordance with the standard methods of kinanthropometry (25). Height and body mass were measured using calibrated digital stadiometer and weighing machine, body mass was measured to the nearest 0.1 kilogram and height was measured to the nearest of 0.001 meter. Body mass index is calculated using body mass index formula, i.e. weight (kg) divided by height (m2). All data were

collected by the author who had experienced in taking body circumference.

30 Meter Dash Test

Before the start trials, standard warming up exercise was given for 15 minutes. Selected participants have knowledge and experience with various test protocol. In order to keep the test accurate and worthwhile, all tests have been performed during the period of 1st may 2018 under condition of temperature(15ºC to 25ºC) in the same moment of day at 10h am after getting balanced meal.

The test involved running a single maximum sprint over 30 meters, with the time recorded. Start from a stationary position, with one foot in front of the other. The front foot must be behind the starting line. This starting position should hold for 2 seconds prior to starting, and no rocking movement allowed. The tester should encouraged to continue running hard through the finish line. There were two trials in total, and a 3-minute recovery allowed between each trial. The best (fastest) 30m sprint time selected for analysis. The timing starts from the first movement and then the timing system triggered, and finishes when the chest crosses the finish line and/or the finishing timing gate triggered. The time was recorded using standardize stopwatch. All methods and procedures in accordance with 30-meter dash test standard made by Davis B, (10)

Illinois's Agility Test

The athlete started on standing start at the starting cone. The athlete started on a "ready-set-go" countdown. The researcher started the watch when he says goes. The athlete then must sprint as fast as possible around all the cones without knocking them down. The stopwatch stopped when the athlete crossed the finish line. Test each athlete 2 times and rest fully in between each repetition. Agility measured by using the stopwatch and the best times of three successful trials (to the nearest 0.1 second) were recorded in accordance with Illinois's Agility test standard made by McKenzie, B (22).

Statistical Analysis

The data was carried out using Statistical Package for Social Sciences (SPSS) version 20.0 for IBM. One-way analysis of variance (ANOVA) was undertaken to evaluate the differences in the basic and girth anthropometric with performance (speed and agility) measures based on playing positions. Statistical significance was set at $p<0.05$. Pairwise comparisons were made using the Bonferroni test. (When F ratios were significant, If the result was significant, Tukey HSD post hoc analysis was carried out to determine specific substantial differences among the groups. A probability level of 0.05 or less was taken to indicate statistical significance). Descriptive statistics are mean ± standard deviations. The relationships between anthropometric variables related to speed and agility variable according to their playing position were determined using Pearson product moment correlation coefficient. The following corresponding criteria were used for interpreting the magnitude of the correlation between measures was high when $r >0.70$, moderate when $r <0.50$-0.70, low when $r<0.30$- 0.50 and very low when $r<0.30$.

Results

Descriptive statistics (mean, ± standard deviation) in some selected Anthropometric parameters with speed and agility performance variables of participants grouped by in to three playing position summarized in table 1. In table 1, shows the mean values and standard deviations of male football players of different playing positions i.e. defenders, midfielders and attackers with regard to the some selected basic anthropometric (height, body mass and body mass index) and girth anthropometric (waist, upper arm, thigh and calf circumference) and performance variables of speed and agility. When comparing with age midfielders are younger than their counterparts; defender and stickers. The mean value of all measured basic anthropometry variable (height, Body mass, Body mass index) and girth anthropometric (waist, arm, thigh and calf circumference) of sticker had greater mean value than their counterparts; defender and midfielders. While comparing the mean of speed revealed that all positional players had almost the same performance. But, strikers had shown better agility than their counterparts; defender and midfielders. It is also observed that midfielder had little bit better in agility than defenders.

As illustrated in table 2, the ANOVA revealed that there were no significant differences of basic anthropometric variables(height, body mass and body mass index) between playing position. Similarly there is no significant difference girth anthropometric (waist, upper arm, thigh and calf circumference) between playing position except waist circumference in score of F = 4.555, sign= P< 0.05(0.022)

Table 3, shows height was moderately correlated with body mass(r=.568) in the midfielder position and (r=.682) in strikers position. Height also moderately correlated with agility(r=.646) in midfield position. Body mass was significantly correlated in body mass index(r=.676) in midfielder and (r=.947) in striker playing position. Height did not show any significant correlation to speed and agility performance in all playing position. Similarly there was no significant correlation between speed and agility in all playing position.

Correlations between some selected girth anthropometric variables with speed and agility performances are presented in Table 4. Arm circumference was significantly correlated with waist (r=.642; p<0.05) and arm circumference significantly correlated with thigh circumference (r=.840; p<0.01) in midfield positional players. Similarly in striker position arm circumference was highly correlated with thigh circumference (r=.911, P<005). Speed was significantly negative correlated with arm circumference(r=-.666; P<0.05) in mid fielder position. But speed was negatively correlated in majority measured girth anthropometric variable in midfielder and striker playing position. Similarly agility also negatively correlated with all measured girth anthropometric and speed performance variable in all playing position. However in defensive position agility was moderately correlated with calf circumference.

Table 1. Descriptive statistics of anthropometric profile, speed and agility performance in three playing position

Variables	DF			MD			SK			Total		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Age(years)	9	23.555	3.844	10	22.300	3.093	6	24.333	5.785	25	23.240	4.023
Height (cm)	9	176.277	4.309	10	173.060	4.599	6	178.161	3.828	25	175.442	4.653
Body mass (kg)	9	68.300	6.064	10	66.680	4.449	6	74.650	8.609	25	69.176	6.745
BMI	9	21.672	1.783	10	22.279	1.530	6	23.483	2.172	25	22.350	1.848
WC	9	79.888	2.666	10	80.300	2.626	6	84.000	3.162	25	81.040	3.155
AC	9	30.555	2.297	10	30.100	1.100	6	31.666	1.966	25	30.640	1.845
TC	9	57.444	3.844	10	57.000	2.403	6	59.833	3.868	25	57.840	3.399
CC	9	38.888	1.166	10	38.800	1.686	6	41.166	3.868	25	39.400	2.380
Speed (30m)	9	4.346	.094	10	4.338	.186	6	4.325	.242	25	4.338	.168
Illinois agility	9	16.326	.489	10	16.260	.419	6	15.911	.535	25	16.200	.483

DF-defender, MD-midfielder, SK-striker, BMI-body mass index, WC-waist circumference, AC-arm circumference, TC- thigh circumference, CC-calf circumference, SD-standard deviation, N-number of respondents

Table 2. ANOVA results obtained from three playing position of selected Ethiopian soccer players

Variables		Sum of Squares	Df	Mean Square	F	Sig.
Age(years)	Between Groups	16.904	2	8.452	.500	.613
	Within Groups	371.656	22	16.893		
	Total	388.560	24			
Height (cm)	Between Groups	107.400	2	53.700	2.865	.078
	Within Groups	412.293	22	18.741		
	Total	519.693	24			
Body mass (kg)	Between Groups	248.995	2	124.497	3.249	.058
	Within Groups	843.011	22	38.319		
	Total	1092.006	24			
BMI	Between Groups	11.886	2	5.943	1.865	.179
	Within Groups	70.110	22	3.187		
	Total	81.997	24			
WC	Between Groups	69.971	2	34.986	4.555	**.022**
	Within Groups	168.989	22	7.681		
	Total	238.960	24			
AC	Between Groups	9.304	2	4.652	1.413	.265
	Within Groups	72.456	22	3.293		
	Total	81.760	24			
TC	Between Groups	32.304	2	16.152	1.450	.256
	Within Groups	245.056	22	11.139		
	Total	277.360	24			
CC	Between Groups	24.678	2	12.339	2.438	.111
	Within Groups	111.322	22	5.060		
	Total	136.000	24			
Speed (30m)	Between Groups	.002	2	.001	.027	.973
	Within Groups	.677	22	.031		
	Total	.679	24			
Illinois agility	Between Groups	.679	2	.340	1.514	.242
	Within Groups	4.934	22	.224		
	Total	5.614	24			

AC-Arm Circumference, WC-Waist Circumference, TC-Thigh circumference, CC- Calf circumference

Table 3 Correlations[a,c,e] matrix between basic anthropometric variable with speed and agility between different playing position

Variables		Playing Position														
		DF(N=9)					MD(N=10)					SK(N=6)				
		Ht	BM	BMI	Speed	agility	Ht	BM	BMI	speed	agility	Ht	BM	BMI	speed	agility
Ht	Pearson Correlation	1	.568	-.207	.455	.646	1	.389	-.415	-.409	.307	1	.682	.412	-.700	.182
	Sig. (2-tailed)		.111	.592	.218	.060		.266	.234	.240	.388		.135	.417	.121	.730
BM	Pearson Correlation	.568	1	.600	.525	.136	.389	1	.676*	-.579	-.108	.682	1	.947**	-.392	-.106
	Sig. (2-tailed)	.111		.088	.146	.726	.266		.032	.080	.767	.135		.004	.442	.842
BMI	Pearson Correlation	-.207	.600	1	.250	-.324	-.415	.676*	1	-.247	-.353	.412	.947**	1	-.173	-.204
	Sig. (2-tailed)	.592	.088		.517	.395	.234	.032		.491	.317	.417	.004		.744	.699
Speed	Pearson Correlation	.455	.525	.250	1	.307	-.409	-.579	-.247	1	-.027	-.700	-.392	-.173	1	.468
	Sig. (2-tailed)	.218	.146	.517		.422	.240	.080	.491		.940	.121	.442	.744		.350
Agility	Pearson Correlation	.646	.136	-.324	.307	1	.307	-.108	-.353	-.027	1	.182	-.106	-.204	.468	1
	Sig. (2-tailed)	.060	.726	.395	.422		.388	.767	.317	.940		.730	.842	.699	.350	

*. Correlation is significant at the 0.05 level (2-tailed). Ht-Height, BM-Body mass, BMI-Body mass index, DF- Defender, MD-Midfielders, SK-Striker

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4. Correlations[a,d,e] matrix between anthropometric with speed and agility according to different playing position

Variables		Playing Position																	
		DF(N=9)						MD(N=10)						SK(N=6)					
		AC	WC	TC	CC	Speed	Agility	AC	WC	TC	CC	Speed	agility	AC	WC	TC	CC	Speed	agility
AC	Pearson Correlation	1	.297	.535	.399	.322	-.357	1	.642*	.840**	.251	-.666*	-.258	1	.418	.911*	.167	-.369	-.290
	Sig. (2-tailed)		.438	.138	.287	.398	.345		.045	.002	.483	.036	.472		.409	.011	.753	.471	.578
WC	Pearson Correlation	.297	1	.542	.558	.233	.144	.642*	1	.528	.492	-.491	-.071	.418	1	.687	-.458	-.193	-.120
	Sig. (2-tailed)	.438		.132	.118	.547	.711	.045		.117	.149	.149	.846	.409		.132	.361	.714	.820
TC	Pearson Correlation	.535	.542	1	.263	.036	-.108	.840**	.528	1	.192	-.424	-.483	.911*	.687	1	-.185	-.344	-.133
	Sig. (2-tailed)	.138	.132		.494	.927	.782	.002	.117		.595	.222	.158	.011	.132		.726	.504	.802
CC	Pearson Correlation	.399	.558	.263	1	.634	.553	.251	.492	.192	1	-.182	-.489	.167	-.458	-.185	1	.436	-.149
	Sig. (2-tailed)	.287	.118	.494		.067	.122	.483	.149	.595		.615	.152	.753	.361	.726		.387	.779
Speed	Pearson Correlation	.322	.233	.036	.634	1	.307	-.666*	-.491	-.424	-.182	1	-.027	-.369	-.193	-.344	.436	1	.468
	Sig. (2-tailed)	.398	.547	.927	.067		.422	.036	.149	.222	.615		.940	.471	.714	.504	.387		.350
Agility	Pearson Correlation	-.357	.144	-.108	.553	.307	1	-.258	-.071	-.483	-.489	-.027	1	-.290	-.120	-.133	-.149	.468	1
	Sig. (2-tailed)	.345	.711	.782	.122	.422		.472	.846	.158	.152	.940		.578	.820	.802	.779	.350	

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

AC-Arm Circumference, WC-Waist Circumference, TC-Thigh circumference, CC-Calf circumference DF-Defender, MD-midfielders, SK-Striker

DISCUSSION

In the present study the participants (N=25) were grouped into three different playing positional groups: defense, midfield and striker position. The finding of the present study revealed that striker had greater mean value of basic anthropometric measurements (body mass, height and body mass index) than their counterparts; defender and midfielders. But statically no significant differences were observed. This is in line with the previous report of Kemal Goral (18) in terms of height, body mass and body mass index values, no difference were detected between positions. The comparison of our result with professional and / or top football players in Europe, the Middle East and South America have an approximate body height varying from 176.0 – 183.0 cm, and body weight generally less than 80 kg (within the span of 65.6 – 78.7 kg), and BMI index varying between 23.00 – 24.45 kg/m2 (6). Some former researches also establish that the height can have an impact on the game position of the football player in the team, so the higher players are mostly placed as goalkeepers and in the defense, where the height is advantage (5). But the more studies revealed that defenders are taller and heavier than other positional players Carlos Lago et al., (7, 8). In another literature, the analysis of body composition and fat mass showed that strikers were leaner than midfielders, defenders, and goalkeepers Gil SM, (14).

The mean value of girth anthropometric (waist, arm, thigh and calf circumference) also statistically no significance differences were observed according to positional difference in the current study. Reports regarding certain anthropometric parameters (diameters, circumferences and skinfolds) in adult footballers are rare in the literature. Macedonian national league club footballers showed similar result in arm, thigh and calf circumference in related to the present study Jasmina Pluncevic-Gl et al., (17). The comparison of our results with the data of F. Javier Nu et al., (11) regarding anthropometric parameters of senior national Serie A Italia soccer players had lower waist (76.6+2.4 cm), lower thigh (53.9+1.5 cm) circumferences than our footballers at the relative age up to 29. The relative of fat free mass circumference value in the lower limbs, trunk, and upper limbs in soccer players, are very important to execute the loco motor activities, jumps, kicks and flight that the game demands. Considering the fact that lower extremity and the middle part of the body of soccer players are more affected than their upper extremity in their training programs in addition to the type of power training in soccer players, bone density and muscle sizes increase more in these locations. Nonetheless, we postulate that anthropometry contributes to success in specific playing positions at a senior level. For example, taller and heavier players are more suitable to be goalkeepers and defenders and shorter and lighter players are more suitable to be midfielder (32).

Speed and agility are integral aspects of almost every defensive and offensive maneuver performed by soccer players in practices and games (26). Speed in the soccer depends on prediction of game, reaction, reaction time choice and movements (29). The results of this study shows no significant difference was found in 30-m sprint times in different playing position. The strikers were faster than defenders and midfielders. These results are similar to those provided by Carlos Lago et al., (7). In another study, Gil, S.M., et al., (15) it was found that forwards were the fastest group and goalkeepers are the slowest.

Agility training is an important part of any soccer player's regimen because it replicates the various motions players will experience during the run of play. Soccer is a game full of direction and speed changes with and without the ball, and agility training helps players become more agile and improves coordination (20). However, the result showed strikers had shown little better agility than their counterparts; defender and midfielders. It is also observed that midfielder had little bit better in agility than defenders but statically no significant differences were observed. The greater values of Illinois agility result found in strikers compared with defenders, and midfielders are consistent with those of previous studies Alliance K et al., (1). The reason strikers were agile could be due to the fact that they always run and turn at high intensity Clark JR (9). However, our results did not conform to the study of Kemal Goral, (18) which has shown that the Illinois agility test was significantly lower in the midfielders compared with strikers.

In the present study we did not find any significant correlation between the playing position and speed performance with basic anthropometric variables. This finding is supported by Arjan Hyka et al (3); however another study Wong PL, (30) found a significant correlation between of weight and height with speed. Body mass is the most

significant predictor of 30 m sprint time. Indeed, a negative parallelism found in our study between body weight and sprint time in different playing position is in agreement with the results of Malina et al. (21) who found that body mass is the most significant predictor of 30 m sprint time. Speed was negatively correlated in majority measured girth anthropometric variable in midfielder and striker playing position. But it was significantly negative correlated with arm circumference in midfielder position. Similarly agility was negatively correlated with all measured girth anthropometric variable in all playing position except in calf circumference in midfield position. Agility is a key requirement of optimal performance in many sports and one of the most discriminating factors among soccer players (16). The present study agility was no significantly correlated with all basic anthropometric variables in all playing position except high correction in height in defensive players. To measure and report the agility performances of players at regular intervals can provide significant benefits in the process of training to improve the performance levels of athletes playing in different positions.

The data in the present study carry considerable practical applications for coaches and soccer player. Anthropometric variables and performance variable like speed and agility studied can be used as a predictor of performance in national club soccer players. It should be useful in future investigation on player selection, talent identification, and training program development. Future longitudinal studies should be carried out in all soccer players throughout the country with various anthropometric and performance parameters.

CONCLUSION

The result of the study shows striker players taller and heavier and performed better speed agility performance than other positional players. This may attributed to nature of position. The speed and agility performance related to height and body mass was insignificant within the groups. Similarly speed and agility performance was negatively in low correlated in majority of anthropometric variables.

Measurements of anthropometric profile and know its correlation with speed and agility performance can serve as normative anthropometric values for regular sport medical examinations of footballers in our country. These results could also be used as a template for the purpose of comparison of anthropometric and functional features between adult footballers of similar level from different countries. Because soccer players different playing positions have different anthropometric characteristics and speed and agility performance variables, and could help coaches to select players for the professional level according with the playing position. It should be also useful too talent identification and training program development in soccer players.

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The Investigation Of The Effect Of Static And Dynamic Core Training On Performance On Football Players

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Abstract

This study was carried out to investigate the effect of static and dynamic core training on the performance of football players. In this study, static and dynamically applied core exercises were evaluated in terms of speed and agility in football players, and then their effects on anaerobic power tests, core stabilization tests and body composition were compared. While 10 of the 30 football players participating in the study were practicing dynamic core exercises and 10 of them were practicing static core exercises 2 days a week for about 9 weeks and 30 minutes a day, 10 athletes continued their football training with the other group athletes as control groups. The effects of the exercises, performed at the end of 9 weeks on performance, body composition, and core stabilization tests were compared in the pre and post-test in order ($p<0.05$). There is no significant difference in the height, body weight, body mass index parameters of 30 subjects (10 control, 10 static core, 10 dynamic core) belonging to the 3 groups participating in the study. Significant differences were found at waist level and hip circumference at the level of $p<0.05$ in comparisons between the first and last measurements of all anthropometric measurements. While there was a significant increase in the duration of leg lift, push-up, plank, shuttle, and isometric tests, a decrease was observed in the plank, shuttle and isometric test times in the control group. In the pre and post-test comparisons, 30 m speed, long jump, vertical jump, agility 550 and arrowhead agility tests showed a significant difference at $p<0.05$ level. It can be said that core studies should be included in training aimed at increasing performance in the football branch.

Keywords: Football, Core, Performance, Static Training, Dynamic Training.

INTRODUCTION

In recent studies, it has been observed that the interest in core exercises has increased considerably and the relationship between core training-body composition, trunk stabilization, athletic performance and disability has begun to be studied (23). In recent studies, it has been observed that the interest in core exercises has increased considerably and the relationship between core training-body composition, trunk stabilization, athletic performance, and disability has begun to be studied (23). However, the relationship between core stabilization and performance is a highly controversial issue (34). While many studies reveal that the relationship between core training and athletic performance is low (34), it can be said that the core training has many limiting factors affecting the results of many studies due to its structure (not working isolated, activating in many basic training structures and adapting). (26). Core exercises consist of movements that increase the flexibility and strength of the body. It also increases muscle

endurance and cardiovascular fitness levels. They develop psychomotor skills and coordination, such as balance (3).

The word Core is a word derived from English, which is used to mean seed. It is the midpoint of the body, where the center of gravity of the human body, which is meant to be expressed in the core, in sports sciences (16). According to Behm et al. (4), when defined anatomically, the core is the muscle that provides the body's stability in connection with the skeletal system of the trunk area (rib cage, spine, pelvis, shoulder belt), soft tissues (cartilage and connective tissues). Core stability is a feature that positively affects sports performance. Tong et al. (30) examined the relationship between respiratory muscles and core muscles in high-intensity runs and stated that fatigue in core muscles as a result of insufficient respiratory muscles negatively affects the running performance. Core stability helps the person to stay in balance and maintain this condition.

A correct posture and a strong core structure are very important for balance ability (25). Majewski-Schrage et al. (15) state that core stability has overcome the physical health approach over time, becoming a part of health and physical performance issues with different approaches, and according to them, this situation is now related to physical fitness, rehabilitation programs, back-spine problems, and performance. In weight lifting training, the athlete changes his stability status, that is, if he intends to create a more unstable situation, the core muscles will perform more actively to maintain the technique of the movement (12). In many sports, force components that will disturb the balance of the body appear during a movement with arms and legs. Torque and momentum resulting from the movement of arms and legs when a tennis ball or a soccer ball is hit will force the body to move in the opposite direction with the arms and legs. In order to produce the desired level of force from the arms and legs and to continue the movement in the same direction, the core muscles must balance the spine (33).

This study is about which types of movement structure (static-dynamic) that increased trunk stabilization with core training will be more beneficial and how this effect will reflect on performance. Within the core training plan to be applied by coaches, the study is important in terms of which types of contractions should be used and reveal the effect of core exercises.

MATERIAL AND METHOD

Participants

The aim of the study is to investigate the effect of 9-week static and dynamic core training of football on some performance parameters. 30 students between the ages of 12 and 14 at the Yunus Emre Secondary School within the borders of İpekyolu district of Van province participated in the study on a voluntary basis. The dynamic (n: 10) and static (n: 10) groups were selected from the students who played in the school team in the previous year. The control group consists of only 10 students playing football. In addition to football training 2 days a week, only a dynamic core training program was applied to a group of 10 people for 2 days, and a static core training program was applied to another group of 10 people, and the dynamic and static core training program was applied to two different groups within the same days. The ethical committee report of our study was taken with the decision of the ethical committee number 27 Selçuk University, Faculty of Sport Sciences, non-interventional clinical research.

Working Groups and Training Program

Dynamic study group: The dynamic exercise group consisting of 10 subjects repeated 6 exercises (Balance Ball with Pocket Knife, Reverse Crunch, Russian Return, Shuttle, Leg Lift, and Back extension) for 9 weeks, and the level of difficulty increased gradually. The scope of exercise was determined by the number of repetitions and sets. The increase in the number of repetitions was provided to differentiate the muscle groups involved in the movement and to include the auxiliary weights in the movement. The number of sets is determined as 2 in all movements. The rest time between sets was determined as 1 minute. The number of repetitions of the exercises started between 10-15 repetitions and advanced to the level of 20-25 repetitions at the end of the 9th week.

Static study group: The static study group consisting of 10 subjects repeated 6 exercises (Side Plank, Shoulder Bridge, Plank, Static Crunch, Leg Lift, Back extension) 2 times a week, whose difficulty level gradually increased for 9 weeks. The scope of exercise was determined as the duration of the movement. The increase in loading was achieved by increasing the duration of the movement and

differentiating the muscle groups included in the movement. The set numbers of all movements are determined as 2. The rest time between sets is 1 minute. In the first week, depending on the exercises, the movement time started from 20-35 seconds and was advanced to 30-60 seconds at the end of the 9th week

Control group: The control group which consists of 10 subjects, continued football training in which other group athletes also participated. They did not participate in any other training.

Measurements and Tests Applied in the Study

Height, weight, body mass index measurements: The lengths of the subjects were measured using a Holtain brand stadiometer with an accuracy of ± 1mm. This measurement was measured when the person was in an anatomical posture, his heels were combined, his head was in the frontal plane, and the overhead table was positioned at the vertex point, and then the values were recorded as cm '(26). Weight measurements of the subjects were made with a weighing scale of ± 100 g. Body mass indexes (BMIs) were obtained by dividing the weight in kilograms by the square of the neck in meters.

Waist-hip circumference and waist/hip ratio measurements: Waist Circumference: After the normal expiration of the subject between 2 - 2.5 cm above the navel hole and the thinnest point around the waist, it was measured with an anthropometric tape and recorded in centimeters (11). Hip Circumference: It was measured from the maximum posterior hip-width point with an anthropometric tape over the gluteal fold and it was recorded in centimeters (11). Waist-Hip Ratio: It is the figure obtained by dividing the waist circumference to the hip circumference (all measurements are in centimeters), which gives information about the distribution of body weight (visceral fat). It plays an important role in the determination of obesity and health risk factors. (35).

Leg lift test: Subjects were asked to raise their legs 5-10 cm up and keep them straight, with their back areas lying in contact with the mat. Hands were kept under the body between the back and hip during movement, and the load on the muscles of the abdominal region was increased. The test was terminated if the subjects touched their legs on the ground. The measurement was applied by means of a stopwatch and the scores obtained were recorded in seconds (22).

Push-up test: In a push-up position, a push-up is completed with the hands at shoulder level, the chest touching the mat and the elbows returning to the flat position (10). The number of repetitions achieved by the subjects by providing the correct posture without resting was recorded as the maximum push-up score.

Plank test: Plank test protocol consists of 8 steps and is applied against time. The total duration of the protocol is 3 minutes. After the first step is started, if the athlete fails to stay in the appropriate plank position (touching of the hand or foot on the ground, etc.) then the test score is recorded as the test score of the subject. If the subject successfully completes all 8 steps, the exact duration of the test is recorded as an athlete score (31).

Sit-up test: The abdominal resistance of the subjects was evaluated by performing a 1-minute sit-up test. Subjects were placed on the mat with their knees bent at about 90 degrees, with their hands tied to the back of the head, and each contact was counted as one point, and the correctly applied repetitions within 1 minute were recorded as the maximum number of sit-up (10).

Back isometric endurance test: For this test, the athlete was laid in a prone position, hanging from the bed. The athlete was fixed from the legs at the level of the gastrocnemius muscle and was asked to hold the body part parallel to the ground against the gravity with the hands clenched in the chest. When the posture is impaired or when the athlete cannot complete the experiment due to pain, the duration of the test is stopped and the score is recorded in seconds (18).

30m speed: The speed capabilities of the subjects were evaluated with 30 meters short running tests. Athletes repeated the test twice and their best grades were included in the evaluation. The 30-meter sprint test was determined in seconds when the athletes were standing at a distance of 1 meter from the photocell and completed the distance at a maximum speed, at a distance of 30m. Measurements were made on grass ground with soccer shoes (27).

Long jump by standing: When his feet are bilaterally behind the starting line, his hands are moved as desired, the athlete is asked to jump horizontally and fix it at the point where it falls,

without losing its balance and falling. The athlete has been given three attempts. The best jump distance was accepted as the test score in centimeters (24).

Vertical jump: It was applied to determine the explosive forces of athletes. The highest distance from which the subject can reach upwards at the shoulder width is determined as the starting 0 point. The difference between the longest distance extends at the point where it is located without taking a step and the 0 point is recorded in cm as the jump distance value. (24).

Arrowhead agility: The Arrowhead test starts one meter behind the starting point and continues with a return to point D or C, located 5 meters to the right and left after passing 10 m from the photocell. This process involves returning from point B, which is 5 meters further from the starting point of point A, and stopping the photocell by crossing the starting point for the second time. Each athlete repeated the test three times, and the measurements were planned on the grass ground, allowing the athletes to recover (9).

505 agility test: As soon as the athlete exits one meter behind the starting point and passes through the starting point, the photocell time begins, after returning the distance of 10 meters from the direction he desires (on the right foot or on the left foot), he passes the second photocell at a distance of 5 meters and stops the time. The subject was given three attempts and the lowest time was recorded as the most successful score. The experiment was carried out on the grass ground with soccer shoes (24).

Data Analysis

Statistical analysis of the footballers' findings was made in the IBM SPSS 25 package program. Descriptive information for all footballers and groups is tabulated. The first and posttest distributions of the groups were examined, and normality of distributions and homogeneity of variances were determined by Mauchly 'Sphericity Test and Levene test. Analyzes between the groups, within the group and the effect of training, were made with multiple measures analysis of variance (MANOVA) in repeated measurements. Bonferroni Test was continued in Post Hoc comparisons in meaningful relationships, and the degree of significance was accepted as 0.05.

FINDINGS

Table 1. Descriptive information about groups and comparison of height, weight, and body mass index between groups

Group		Mean ± SD	Maximum	Minimum	Comparison between groups	
Control n=10	Height (m)	1.57±0.98	1.74	1.38		
	Weight (kg)	47.20±11.13	69.00	33.00		
	BMI (kg/m2)	18.79±3.55	27.38	15.26		
Static core n=10	Height (m)	1.58±0.04	1.68	1.51		
	Weight (kg)	47.60±10.30	68.00	35.00		
	BMI (kg/m2)	19.02±3.76	26.25	14.40		
Dynamic core n=10	Height (m)	1.59±0.09	1.71	1.45		
	Weight (kg)	42.70±7.77	52.00	33.00		
	BMI (kg/m2)	16.75±1.23	18.18	14.76	x-square	P
Total n=30	Height (m)	1.58±0.08	1.74	1.38	0.109	0.389
	Weight (kg)	45.83±9.76	69.00	33.00	1.062	0.561
	BMI (kg/m2)	18.19±3.14	27.38	14.40	2.110	0.438

BMI: Body Mass Index. SD: Standart Devition

Descriptive values of the subjects are indicated in the table. The average height, body weight and body mass index of 30 subjects (10 control, 10 static core, 10 dynamic core) belonging to 3 groups participating in the study were respectively1.58 ± 0.08; 45.85 ± 9.76; 18.19 ± is 3,14't. For all descriptive variables, there is no significant difference between the groups before the training period.

Table 2. Comparison of the first and last anthropometric test changes of the groups

	Group	N	Pre-test	Post-test	In-Group Change (%)	Test* Group F	P
Antropometric Measurements							
Weight (kg)	Control	10	47.20±11.13	49.80±9.3	-2.6 (-5.50)*	0.754	0.480
	Static Core	10	47.60±10.30	50.30±10.57	-2.7 (-5.67)*		
	Dynamic Core	10	42.70±7.77	44.40±7.51	-1.7 (-3.98)*		
BMI (kg/m2)	Control	10	18.79±3.55	19.53±2.47	-0.74 (-3.93)*	0.686	0.512
	Static Core	10	19.02±3.76	19.47±3.79	-0.45 (-2.36)*		
	Dynamic Core	10	16.75±1.23	16.94±1.08	-0.19 (-1.13)*		
Waist (cm)	Control	10	72.40±8.8	74.50±7.15	-2.1 (-2.90)*	12.440*	0.000
	Static Core	10	70.90±10.92	70.40±12.48	0.50 (0.70)*		
	Dynamic Core	10	66.60±4.27	64.60±3.74	2.00 (3.00)*		
Hip (cm)	Control	10	83.70±7.86	85.40±6.53	-1.70 (-2.03)*	3.677*	0.039
	Static Core	10	83.20±7.75	83.00±8.96	0.20 (0.24)*		
	Dynamic Core	10	79.60±6.02	78.10±4.55	1.50 (1.88)*		
Waist/Hip Ratio	Control	10	0.863±0.03	0.872±0.03	-0.009 (-1.04)*	1.272	0.297
	Static Core	10	0.849±0.06	0.844±0.06	0.005 (0.58)*		
	Dynamic Core	10	0.839±0.05	0.827±0.02	0.012 (1.43)*		

BMI: Body Mass Index

In the table, first and last test measurements of anthropometric measurements such as body weight, body mass index, waist circumference, hip circumference, and waist-hip ratio are compared in terms of inter-group, intra-group, and group * test interaction. Significant differences were found at waist level and hip circumference at the level of $p < 0.05$ in comparisons between the first and last measurements of all anthropometric measurements. In intra group comparisons, a significant difference was found at $p < 0.05$ level in all measurements. While test * group interaction is observed in waist and hip circumference tests, this interaction results from the intra-group development of static core and dynamic core groups. In other anthropometric variables, test * group interaction is not observed.

Table 3. Comparison of the first and last core test changes of the groups

	Group	N	Pre-test	Post-test	In-Group Change (%)	Test* Group F	P
Core Measurements							
Leg lifting (sec)	Control	10	67.60±32.85	67.40b±30.54	0.20 (0.29)*	10.797*	0.000
	Static Core	10	72.40±16.26	74.00b±18.44	-1.60 (-2.20)*		
	Dynamic Core	10	91.10±28.12	96.70a±27.68	-5.60 (-6.14)*		
Push-up	Control	10	6.20±3.32	6.40b±2.71	-.020 (-3.22)*	11.304*	0.000
	Static Core	10	13.50±4.27	15.20b±5.09	-1.70 (-12.59)*		
	Dynamic Core	10	16.90±5.50	23.00a±4.66	-6.10 (-36.09)*		
Plank (sec)	Control	10	58.00±19.48	57.90b±19.89	0.10 (0.17)*	6.937*	0.004
	Static Core	10	59.50±16.91	63.30b±19.32	-3.80 (-6.38)*		
	Dynamic Core	10	65.50±22.05	71.90a±21.32	-6.40 (-9.77)*		
Shuttle	Control	10	26.40±4.32	25.50b±5.81	0.90 (3.40)*	27.000*	0.000
	Static Core	10	17.50±2.54	20.00b±4.96	-2.50 (-14.28)*		
	Dynamic Core	10	31.00±4.18	36.70a±4.27	-5.70 (-18.38)*		
Back isometric (sec)	Control	10	91.00±16.11	89.60b±16.58	1.40 (1.53)*	10.178*	0.001
	Static Core	10	118.80±38.40	121.40b±39.32	-2.60 (-2.18)*		
	Dynamic Core	10	113.20±36.21	129.30a±37.59	-16.10 (-14.22)*		

Intergroup comparisons: a>b *p<0.05

In the table, the measurement results showing the core performances of the groups are compared in terms of intergroup, intragroup and group * test relationships. Leg lift time shows a significant increase in dynamic and static groups, while a decrease is observed in the control group. While dynamic and static test groups significantly extended test times in push-ups, plank, sit-up, and isometric tests, a decrease in plank, shuttle and isometric test times were observed in the control group. Improvement was observed in the push-up test period of the control group. A significant difference was found at the p <0.05 level in all in-group comparisons. In all core tests, the dynamic group is statistically higher than the static and control groups. While test * group interaction is observed in all core tests, this interaction results from the intra-group development of dynamic and static test groups.

Table 4. Comparison of the changes in the first and last performance measurements of the groups

	Group	N	Pre-test	Post-test	In-Group Change (%)	Test* Group F	P
Dynamic Field Measurements							
30 m. (sec)	Control	10	5.86±0.49	5.93c±0.47	-0.07 (-1.19)*	10.397*	0.000
	Static Core	10	5.75±0.47	5.72b±0.52	0.03 (0.52)*		
	Dynamic Core	10	5.96±0.49	5.84a±0.48	0.12 (2.01)*		
Long Jump (cm)	Control	10	167.30±18.36	168.00c±16.22	0.70 (0.41)*	6.099*	0.007
	Static Core	10	169.40±20.16	173.00b±21.05	3.60 (2.12)*		
	Dynamic Core	10	177.40±16.43	184.10a±17.68	6.70 (3.77)*		
Vertical Jump Height (cm)	Control	10	32.10±5.25	33.30b±4.87	1.20 (3.73)*	0.089	0.915
	Static Core	10	26.90±3.57	27.80b±3.76	0.90 (3.34)*		
	Dynamic Core	10	34.30±7.13	35.70a±5.75	1.40 (4.08)*		
550 Agility (sec)	Control	10	4.91±0.17	4.99c±0.17	-0.08 (-1.62)*	9.029*	0.001
	Static Core	10	4.72±0.23	4.67b±0.34	0.05 (1.05)*		
	Dynamic Core	10	4.57±0.12	4.44a±0.12	0.13 (2.84)*		
Arrowhead Agility (sec)	Control	10	11.01±0.17	11.12c±0.11	-0.11 (-0.99)*	16.980*	0.000
	Static Core	10	10.74±0.50	10.69b±0.56	0.05 (0.46)*		
	Dynamic Core	10	10.46±0.37	10.29a±0.37	0.17 (1.62)*		

Intergroup comparisons: a>b *p<0.05

In the table, the measurement results showing the dynamic area measurements of the groups are compared in terms of inter-group, intra-group, and group * test relationships. In the in-group first and last test comparisons, 30 m speed, long jump, vertical jump, agility 550, and arrowhead agility tests showed a significant difference at p <0.05 level. In all 30 m speed, long jump, vertical jump, and agility tests, while dynamic and static test groups significantly extended the test times, a significant decrease was observed in the 30 m speed and agility test times in the control group. However, in all dynamic field tests, the dynamic group increased the test time more than the static and control group. An increase is observed in the long jump and vertical jump test times of the control group. While test * group interaction is observed in all dynamic field tests, this interaction results from the intra-group development of dynamic and static test groups.

DISCUSSION AND CONCLUSION

Today, the application areas of core exercise have increased. Fitness exercises such as pilates, yoga, tai-chi mostly work based on core force principles. The examinations conducted examine the effect of core force on different purposes for increasing performance, preventing disability and treatment (1).

The average height, body weight and body mass index of 30 subjects (10 control, 10 static core, 10 dynamic core) belonging to 3 groups participating in the study were respectively; 1.58 ± 0.08, 45.85 ± 9.76; 18.19 ± is 3,14't. For all descriptive variables, there is no significant difference between the groups before the training period.

Significant differences were found at waist level and hip circumference at the level of p <0.05 in

comparisons between the first and last measurements of all anthropometric measurements. In intragroup comparisons, a significant difference was found at the p <0.05 level in all measurements. While test * group interaction is observed in waist and hip circumference tests, this interaction results from the intra-group development of static core and dynamic core groups.

Leg lift time shows a significant increase in dynamic and static groups, while a decrease is observed in the control group. While dynamic and static test groups significantly extended test times in push-ups, plank, sit-up, and isometric tests, a decrease in plank, sit-up and isometric test times were observed in the control group. Improvement was observed in the push-up test period of the control group. A significant difference was found at p <0.05 level in all in-group comparisons. In all core tests, the dynamic group is statistically higher than the static and control groups. While test * group interaction is observed in all core tests, this interaction is due to the intra-group development of dynamic and static test groups.

In the table, the measurement results showing the dynamic area measurements of the groups are compared in terms of inter-group, intra-group, and group * test relationships. In the in-group first and last test comparisons, 30 m speed, long jump, vertical jump, agility 550, and arrowhead agility tests showed a significant difference at p <0.05 level. While dynamic and static test groups significantly extended the test times in all 30 m speed, long jump, vertical jump and agility tests, a significant decrease was observed in the 30 m speed and agility test times in the control group. However, in all dynamic field tests, the dynamic group increased the test time more than the static and control group. An increase is observed in the long jump and vertical jump test times of the control group. While test * group interaction is observed in all dynamic field tests, this interaction results from the intra-group development of dynamic and static test groups.

10 different moderate-intensity dynamic core stabilization exercises applied before physical education lessons provided significant improvement in all of the back extension, plank, right-left plank, dynamic sit-up, static it-up test scores (2). In the study consisting of 10 experimental and 10 control groups, 50 m swimming time showed 2% improvement in elite swimmers with 12-week core training. In addition, in the prone bridge and asymmetric arm pull-down tests, moderate and high level improvement was demonstrated compared to the control group. At the same time, peak EMG activity increased with maximal voluntary contractions (32). In another study similar to this study, both dynamic and static study groups who were training on unstable surface increased their scores in core tests (plank, double foot lift, back extension) (22). Oliver and Di Brezzo (21) expressed the development of the 1-minute sit-up test as a result of balance exercises with and without the stepper board.

The effects of two different types of 8-week core training method (static-dynamic) on core stabilization and Stork balance test were examined. In all core stabilization tests performed before and after the exercise (except the Static group in the plank test), the exercise groups increased the test times statistically, while the control group did not change (28). For example, according to Noyes et al. (20) after 6 weeks / 3 days of 90-120 minutes of flexibility, quickness, speed, strength, and endurance exercises applied to 34 adolescent female volleyball players, it was seen that there was a significant increase in the lower extremity ranking, abdominal strength, maximal aerobic power and vertical jumps of the athletes (20). Mills et al. (17) investigated the effect of progressive trunk stabilization on performance in a 10-week lumbopelvic stabilization training involving 30 female basketball and volleyball athletes aged 18-23. Although the agility, vertical jump, and balance test scores of the experimental group developed, there was no relationship between the improvement in lumbopelvic stabilization and performance improvement (17).

In Lephart et al. (14) study, golfers who have received eight weeks of golf training have seen that they increase the abdominal-hip strength, trunk rotational strength and hip abduction strength with balance training, and this is in line with the literature. A positive improvement was observed in parameters such as sport-specific shooting distance, stroke rate, and ball speed. In the study of Myer et al. (19) in young volleyball players, 10-week neuromuscular trunk and hip exercise increased with standing hip abduction force (19). Cressey et al. (7) determined improvements in both groups in the repeated jump, deep jump, 40-10 yard sprint and t-agility tests in their studies where they mixed the performance effect of the weight study performed on a stable and unstable surface. In sprint tests, they

concluded that the exercises performed in an unstable environment cause higher development (7).

As a result of the body stabilization program applied to ballet and modern dance students, statistically significant differences were found in vertical jump performance, dynamic balance and proprioception values for the dominant and non-dominant sides (13). In the study, in the vertical jump test applied for the dominant and non-dominant side lower extremities, a significant increase was observed in the dancers after the training. It has been explained by the fact that the increase in the performance of the leap is strengthening the trunk muscles in the trunk stabilization training, as well as the proximal stabilization and the better the explosive force in the distal (13). In the study of 12 football players playing in the Norwegian 1st League, the 8-week core stabilization exercises (sling exercises) applied twice a week improved the athlete's stroke rate (3,5%) and static balance scores more than the control group (29). In a study conducted with an experimental group of 43 people, 10 * 3 weeks old swissball core exercises increased isokinetic trunk extension and flexion strength (2). In a study in which 20 female athletes aged between 18-23 participated, it was found that after 10 weeks of lumbopelvic stabilization training, the lower extremity muscle strength of the training group was higher than the control group and group undergoing general muscle strength training (17). As a result of pilates exercises performed by young women without training, Cowley et al (6) did not see a difference of 1 RM increase between the group practicing resistance using the pilates ball and the group working on a stable flat bench. There was a significant improvement in the abdominal strength test in both groups (6). As a result of the 8-week core training in handball player, no change was observed in body compositions, while statistically positive results were found in vertical jump, flexibility, right and left paw strength and balance parameters (8).

As a result; Static and dynamic core training applied to football players is thought to contribute to the improvement of performance. In terms of performance, it is observed that in many sports branches, coaches include core exercises in their training programs. In this regard, it may be beneficial for core exercises to be included in football training due to the positive effects on protective and functional capacity, or for strength training to increase the stimulation and use of core muscle.

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Determination Of Physical Activity Levels Of Men And Women In The 20- 30 Age Range: The Case Of Batman Province

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Abstract

The aim of this study is to determine the Physical Activity Levels of Men and Women between the ages of 20-30. The universe of the study included men and women living in the province of Batman; The sample included the voluntary men and women aged 20-30 who were living in the province of Batman. There are a total of 1524 people, 762 men and 762 women. A questionnaire consisting of two parts as socio-demographic characteristics and international physical activity questionnaire. SPSS package program is used in the calculation of the obtained filtering. In the 1524 computers for the study, 732 of them are between the ages of 20-25 and 792 of them are between 26-30 years of age. According to the findings of our study, both women and men had high levels of physical activity. There was a significant difference at the level of $p < 0.001$ between the physical activity levels of women and men. In addition, although there was no statistical relationship between age and physical activity level, it was determined that the physical activity level decreased as the age progressed. As a result, it can be said that the level of physical activity decreases in both women and men as the age progresses.

Keywords: Physical Activity, Nutrition, Exercise, Age.

INTRODUCTION

All of the body movements done by consuming energy are called physical activities (4). Physical activity is an internationally used term. Movements created using muscles and joints in daily life cause increasing heart and respiratory rate and fatigue at different levels depending on the increase in energy consumption during their formations (2). Regular practicing of physical activity is called exercise (3).

Exercises are body movements practiced repetitively and regularly. Regular physical activity, in other words, exercise plays an essential role in socializing, getting rid of undesired bad habits and healthy growth and development in adolescence period (11). The term MET, which is the abbreviation of metabolic threshold, is used to express amount of oxygen consumed during physical activity. It refers to approximately 3.5 ml oxygen consumed per minute per kilogram while one MET of rest (30).

Physical activity, one of the current research topics, is defined as volitional acts, resulting in increased energy consumption and produced by skeletal muscles (25). Considering the health protective aspect of physical activity, it should also

be remembered that psychological health and well-being are as important as physical health. On the other hand, a physically active lifestyle is of particular concern to the physical fitness of the individual. Individual's work, mode of transportation, walking, climbing stairs, leisure activities, nutritional status, climate and weather conditions affect the level of physical fitness of the individual (19).

On one-hand, moderate and high levels of physical activity provides decreasing the risk of coronary heart disease, diabetes, obesity and hypertension, blood pressure in people with hypertension, stress and related diseases and reduction in fatigue and pain complaints. On the other hand they provide increasing bone density accordingly protection against osteoporosis, increasing self-confidence, psychological well-being and strengthen immune system (7). It is also known that physical activity increases self-confidence, improves the spirit of success, social communication, solidarity and gentlemenship and helps to reduce the mental fatigue and tension (7).

Alongside technological developments in our era, new living conditions lead people to an inactive and stationary life. When considered from the review of the World Health Organization (WHO) in 2002, sedentary life, in other words, stagnant life causes 1.8 million people to die every year worldwide. Inactivity affects approximately 11-16% of breast and colon cancer, diabetes diseases and 23% of heart diseases in the world. There are four basic areas where people can be physically active in a day. These are work places, transportation, household chores and recreational activities (2).

It is possible to say that there are also cultural influences on practicing physical activities, even though they are not emphasized. As a matter of fact, especially because of their gender roles and social acceptance, individuals tend to focus on physical activities that they are not interested in or stay away from the activities they are interested in. This issue emerges as some sport branches are ascribed to women and some other sport branches are assumed to men. In other words, social approaches between individuals constitute specific gender identities for many sport branches. This can cause individuals to get away from sports because of the reason that they cannot do the sports activities they want (30).

In the study that we prepared about physical activity that is so important in social and individual terms, the physical activity levels of men and women living in the province of Batman were examined. The measurements not only have importance in terms of reflecting the general physical activity level of the province of Batman, but also in that regard of reflecting the difference between the sexes in physical activities.

The aim of this study is to determine the physical activity levels of individuals between the ages 20-30, living in Batman.

MATERIAL AND METHOD

In total 1524 individuals, 762 men and 762 women were included in the study on a voluntary basis. The selection of these individuals included in the research was made by random method. In other words, individuals being in the determined age range but having different education, occupation, marital status etc. were conducted a questionnaire. In this way, the study is pursued a goal to reflect the overall picture more accurately. In the study, a questionnaire form consisting of two parts, one of them is socio-demographic characteristics and the other is international physical activity survey (IPAQ), was conducted. The application time of the questionnaires took approximately 5-10 minutes. From the collected data, the time spent on participants' sitting, walking, moderate intensive activities and intensive activities were found and recorded. The ethical committee report of our study was taken with the decision of the ethical committee number 28 Selçuk University, Faculty of Sport Sciences, non-interventional clinical research.

The total activity score of each participant was calculated by considering the total duration of other activities, but by excluding the total score of sitting time. Residence time was calculated separately from the total activity score. Metabolic equivalent, oxygen consumption coefficients (MET)-minute (min)/week (wk.) score were calculated from the time obtained in evaluating the activities. While collecting the data, it was taken as a criterion that all activities were performed for at least 10 minutes at a time (17). In calculating these activities, standard MET values were used to calculate the total score of all activities for each individual besides the durations. These are as follows: (21).

Walking = 3.3 MET, moderate intensive physical activity = 4.0 MET, intensive physical activity = 8.0 MET, sitting = 1 MET. Using these standard values,

daily and weekly physical activity level was calculated as follows:

For example: for the walking MET-min/wk. score of a person walking 4 days and 40 minutes; Walking MET-min/wk. = 3.3 x walking minutes x the number of walking days was calculated as: 3.3 x 40 x 4 = 528 MET-min/wk. Medium intensity MET-min/wk. was calculated as: 4.0 x medium intensity activity minutes x medium intensity activity days. Severe intensity MET- min/wk. was calculated as 8.0 x severe intensity activity minutes x severe intensity activity days. Total amount of activity was calculated as: (total MET-min/wk.) = (walking + medium intensity + severe intensity) the number of MET-min/wks. (21).

The sitting question used in IPAQ has a hand as a determinant. It is not used as a part of scoring physical activity. There is little data on sedentary (sitting) behaviours and there is no accepted threshold value shown as a categorical level (20). In IPAQ questionnaire, three levels of physical activity are categorically determined when classifying populations. There are as follows: inactive (non-active-category 1), minimally active (low activity level-category 2) and very active (high physical activity increasing well-being, category 3). The criteria for these levels were established by calculating the continuous scorecard values obtained above (21).

The total energy spent during the calculation of IPAQ questionnaire sections was calculated according to the data of IPAQ score protocol (short-forms). Physical activity levels were classified as < 600 MET -min/wk. physically non-active, 600-3000 MET –min/wk. minimally active, > 3000 MET – min/wk. very active (beneficial for health (29). Data analysis of the questionnaire was done in SPSS 23 package program. Frequency and percentage values of socio-demographic characteristics were taken. In addition, independent T test was used in binary comparisons and one-way analysis of variance ANOVA was used to compare more than two groups. To calculate the differences resulting from ANOVA, the Tukey HSD test was used. Moreover, correlation analysis was used to determine whether the obtained data are related to each other.

FINDING AND RESULTS

The values of the ages of the individuals participating in the study over the percentile are as follows:

11,7% - 20 years old,

10% - 21 years old,

5,6% - 22 years old,

9,6% - 23 years old,

11% - 24 years old,

9,1% - 25 years old,

8,7% - 26 years old,

8% - 27 years old,

7,9% - 28 years old,

8,5% - 29 years old, and

9,8% - 30 years old

Fifteen point six percent of the individuals participating in the research are low income, 77, 9% are middle income and 6, 5% are high-income individuals. In addition 32, 6% of individuals smoke while 67, 4% of them are non-smokers.

Table 1. Distribution of individuals participating in the research according to their proximity to sports fields

Proximity to Sports Fields	F	%
Yes	741	48.6
No	783	51.4
Total	1524	100

According to the table 1, while there are places where 48, 6% of the individuals participating in the research can perform physical activities near the settlements they live, 51, 4% of the individuals have no opportunity to do their physical activities because of not being such places near to their settlement areas.

Table 2. Distribution of individuals participating in the research according to their diet

Nutrition Styles	f	%
Home cooking	1226	80.4
Prepared foods	298	19.6
Total	1524	100

According to table 2, while 80, 4% of the individuals participating in the study are fed with homemade meals, 19, 6% of them generally prefer ready-to-eat foods.

Table 3. Relationship between MET values and variables

MET Values	R	P
Gender- Physical Activity Level (MET)	-.195	.000
Age- Physical Activity Level (MET)	-.033	.205
Marital status- Physical Activity Level (MET)	-.056	.029
Education- Physical Activity Level (MET)	.033	.202
Income- Physical Activity Level (MET)	.073	.005
Disease-Physical Activity Level (MET)	-.002	.927
Smoking-Physical Activity Level (MET)	-.083	.001
Sports- Physical Activity Level (MET)	-.107	.000
Nutrition- Physical Activity Level (MET)	.053	.040
Value- Physical Activity Level (MET)	.557	.000

According to table 3, there was no significant relationship between age, education level, disease variables and MET values (p>0, 05). As a result of correlation analysis, it was found that there were different correlation levels as follows: a very negatively weak correlation between MET values and gender (r=-0,195 p<0,05), marital status (r=-0,056, p<0,05), smoking (r=-0,083,p<0,05), sports (r=-0,107 <0,05), a very positively weak correlation between income (r=0,073 p<0,05) and nutrition (r=0,053 p<0,05) and positively moderate relationship between met and values(r=0,557 p<0,05).

Table 4. Comparison of the level of physical activity according to gender

Group	N	M	SD	Level of physical activity	T	P
Men	762	3335.88	2407.93	High	6.826	0.00
Women	762	2500.89	2367.00	High		

According to the independent T test, the physical activity level of both men and women was determined to be high in metrics. A statistically significant difference was found between male and female subjects at the p<0,001 level according to the physical activity value.

Table 5. Comparison of age and physical activity level

Group	N	M	SD	Level of physical activity	F	P
21-22	180	3858.26	2503.62	High	1.853	0.174
22-24	552	4083.18	1844.65	High		
25-28	513	3604.44	1600.34	High		
29-31	279	3317.23	1476.23	High		

The distribution of the 1524 participants by age is given in the table above. As a result of the one-way analysis of variance ANOVA, no statistically significant difference was detected according to the ages of participants. However, the physical activity level of all participants was found to be high.

Table 6. Comparison of average of age and physical activity level

Group	N	M	SD	Level of physical activity	t	p
20-25	732	3006.24	2267.03	High	2.124	0.034
26-31	792	2837.18	1678.43	High		

According to the table 6, 732 of the 1524 individuals participating in the study are in the 20-25 age range and the other 792 are in the 26-31 age range. Both of groups' physical activity levels were high. As a result of the T test, it was determined that the physical activity levels of the participants between the ages of 20-25

and 26-31 were different from each other. A statistically significant difference was found at p<0,05 level by age groups**.**

Table 7. Comparison of educational status and physical activity level

Group	N	M	SD	Level of physical activity	F	p	Tukey HSD
Primary	122	2101.46	1678.51	Low	7.165	0.000	Primary-Secondary*** Primary-University** Primary-Master*** Secondary-University*
Secondary	183	3393.41	2364.02	High			
University	1123	2880.18	2473.79	High			
Master	96	3517.84	2416.19	High			

According to the table, a significant difference was found at p<0,001 level between groups. According to the Tukey HSD test results carried out to determine which group causes the difference, the differences between them are as follows:

The difference between primary and high school is at p<0,001 level.

The difference between primary and university is at p<0,01 level.

The difference between primary and postgraduate is at p<0,001 level.

The difference between high school and university is at p<0,05 level.

Table 8. Comparison of income status and physical activity level

Group	N	M	SD	Level of physical activity	F	p	Tukey HSD
Low	238	2644.55	2163.61	High	5.231	0.005	Low-High** Modarate-High*
Modarate	1187	2918.18	2446.66	High			
High	99	3579.23	2617.75	High			

Two hundred-eight of the 1524 respondents who participate in the research are low income, 1187 are middle income and 99 are high income. As a result of one-way analysis of variance of ANOVA, a statistically significant difference was detected between groups at p<0,01 level. According to the Tukey HSD test results carried out to determine the groups, causing this difference, it was found that there are differences of p<0,01 level between low-high and medium-high of p<0,05 level.

Table 9. Comparison of smoking status and physical activity level

Group	N	M	SD	Level of Physical Activity	t	P
Smoking	497	2142.20	2414.31	High	2.513	0.012
Non-Smoking	1027	2810.08	2420.99	High		

Four hundred and ninety-seven of the 1524 respondents in the study smoke but 1027 of them do not. Regardless of the smoking status of the participants, level of smoking status was determined high. According to the independent T test, a statistically significant difference was found between groups at p<0,05 level.

Table 10.Comparison of doing sports and physical activity level

Group	N	M	SD	Level of Physical Activity	t	p
Athletes	741	3161.97	2495.22	High	3.835	0.000
Non-sports	783	2687.88	2330.92	High		

According to the table 10, 741 of 1524 people participating in the study perform sports but 783 of them do not. Participants who do sports and do not are high in both groups. As a result of the T test, it was found that physical activity levels of the participants who did sports or not. According to results of the independent T test, a statistically significant difference at high level was found at p<0,001 level.

Table 11. Comparison of nutritional status and physical activity level

Group	N	M	SD	Level of physical activity	t	p
Home cooking	1226	2902.94	2446.27	Hepa aktif	-0.505	0.614
Prepared foods	298	2981.93	2327.90	Hepa aktif		

According to the table 1226 of 1524, individuals participating in the study prefer eating homemade food but 295 of them are fed ready-made food products. Physical activity levels of participants who eat at home or consume ready products were found at high level. According to the independent T test, there was no statistically difference between the groups.

DISCUSSION AND CONCLUSION

According to the data obtained, 732 of the 1524 people participating in the study are between 20-25 years old and 792 of them are between 26-30 years old. Physical activity levels of both groups were found at high level. As a result of T test, a significant difference was found between the physical activity levels of the participants in the specified age range at p<0,05 level.

According to the data obtained, 238 of the 1524 respondents who participate in the research are low income, 1187 are middle income and 99 are high income. Regardless of the income of all participants, the income level was found high. As a result of ANOVA test, it is concluded that the physical activity levels do not differ according to income status of participants (p = 0. 061>0, 05).

In the study conducted by Öztürk (20) to investigate the physical activity levels of university students, the prevalence of students' inactivity was found to be 14, 8 percent.

In this context, it is concluded that only 17, 7% of students have a physical activity level that can benefit health. The physical activity levels of male students participating in the study have statistically more positive and significant results than female ones. Findings about the physical activity levels of men and women show parallelism with our study.

In their research, Sallis et al. (24) stated that girls' participation in physical education lessons was less than that of boys'. In their research about physical activity levels of on university students conducted by Ocucu et al. (18) it was stated 36% of the students were at a sufficient level, 43% were at a low level and 21% were not physically active.

When we look at the physical activity levels of female and male individuals in the study conducted by Şanlı and Güzel (26) it is seen that 17,1 percent are not physically active, 63,9 percent are low in physical activity and 19,0 percent are sufficient to protect their health. In addition, it is seen that 17, 6% of women are not active physically. This rate is determined 16, 4% in male participants. It is seen that 17, 6% women have sufficient physical activity and 20, 9% men have sufficient physical activity (26).

Hopping et al. (12) examined the relationship between elevated physical activity level and obesity in adults in arctic Canada. In the study, while BMI women were obese, men were equally normal and obese. Male and female participants under the age of 50, who are in the category of high physical activity, stated that they had high physical activities. Participants over the age of 50 stated that they did their physical activities on moderate and high levels. Although most of the participants reported their physical activities as medium or high, they were found overweight and obese. This shows that women are not able to perform their physical activities sufficiently and this situation causes obesity with age. It shows parallelism with the majority of our study.

In the study conducted by Demirgüç et al (6) on women it was found that women working and performing physical activities were superior to housewives in terms of endurance, strength and agility.

In the study conducted by Polat (22) to determine the physical activity level of cops who participated in the research were seen that 58,44% of them were involved in low level in terms of physical activity level. In addition, while 32,47% of cops were found to perform their physical activities in moderate level, 9, 09% of them were determined to perform their physical activities in high level.

In this conducted study, while there was a significant relationship between variables such as age, occupational service year, body mass index and physical activity, on the other hand no significant relationship was found between education level and physical activity level. The results obtained are similar to the results that we achieved in our study.

In a report that examined five studies evaluating the level of physical activity in adults, it was shown that the level of physical activity of 51 percent of university students was insufficient (16). Burke et al. (5) showed that only 10% of individuals have sufficient physical activity levels in a study they conducted in 594 university students studying in the department of kinesiology in Canada.

Leslie et al. (15) found that 47 percent of female students and 32 percent of male students are not physically active in a study with 2729 university students in Australia. Haase et al. (10) showed that men are physically more active in their study with university students in 23 different countries. However, Von Bothmer et al. (28) found no significant difference between physical activity habits of boys and girls in their studies evaluation physical activity level, health habits and motivation among 479 university students in Sweden.

American Health Ministry's 2010 goal is to determine the amount of moderate to severe and severe physical activity in different groups and create areas and activities that will enable people to be physically active (13).

It is aimed to investigate socio-economic factors in spreading sports and sports activities. It was found from the results of the questionnaire that the sports branches they were interested in had changes in the event that the participants had better economic status (14). Fogelman et al. (9) examined the relationship between the intensity and type of physical activity with socio-economic and health factors and found that men had a higher sports index than women. In a study, although there was not much difference between education level, marital status and physical activity level, it was determined that the monthly income was higher and the rate of doing physical activity was higher among the women who have an occupation and work (8).

In his study on adults, Akova (1) found the rates of low, moderate and high levels of physical activity of women and men respectively: (41,4% and 29,4%), (46% and 50,6%), (12,6% and 20%). In a different study, it was determined that university students have 40,55% passive, 43,73% low active and 17,30% active physical activity levels (17).

In the study conducted by Sahebi (23), the average physical activity level of female students was 2630,43 MET-min/wk. and that of male students was 3273,18 MET-min/wk. In the study conducted by Topsaç and Bilgin (27), when the monthly income and physical activity levels of the students with disabilities were examined, they reached the conclusion that as the monthly income levels increase, their participation in physical activity also increases. This reveals the impact of the social environment and economy on physical activity. This shows parallelism with results of our study.

As a result of the interpretation of the obtained findings, it is seen that there is a significant difference in physical activity levels in the province of Batman regarding male and female gender. The difference can be defined that men do more physical activity and women do less physical activity than men. On the basis of this difference in physical activity between male and female sex, it is possible to base cultural, economic, social and similar factors.

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Performance Development Of Wrestlers In Sport Education Centre

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Abstract

The aim of this study is to determine the changes in the physical and motoric characteristics of wrestlers in wrestling education Centers in the first year. The average age of the wrestling training center wrestlers was 12.05 years in the first measurement and the last measurement was 13.05 years. There was a significant change in age and height of wrestlers in one year period ($p < 0.001$). The change in body weights was found to be insignificant ($p > 0.05$). The changes in squat jump, long jump, hand grip strength, flexibility, shuttle pull, 30 meter speed, aerobic and anaerobic power values of the wrestlers were significant in one year period ($p < 0.05$ and $p < 0.001$). There was no significant difference in throwing health ball in one year period ($p > 0.05$). In the present study, the differences between the average max V02, 30 meter sprint, number of shuttles in 30 seconds and sit and reach flexibility values of wrestlers within a year were found to be statistically significant ($p<0.05$ and $p<0.001$). Conclusion: Motor performance parameters of speed, abdominal strength, flexibility, anaerobic strength and aerobic endurance values of the wrestlers increased during the one year period. There was no significant increase in shoulder - arm throw strength. Particular attention should be given to arm traction movements, in addition to pushing from arms and shoulder area exercises during wrestlers' training.

Key words: Wrestling, Education, Development

INTRODUCTION

Wrestling is a sports branch which requires the existence of various functional characteristics together. In wrestling, muscular strength, speed reaction time, agility, nerve and muscle coordination, static dynamic balance, high anaerobic capacity, and optimal high aerobic capacity are important factors that play a role in performance. Various scientific studies have reported that the most used energy system in wrestling is ATP-CP and lactic acid system. The aim and content of wrestling training is to develop these characteristics (5, 16). In wrestling, athletes have to make very quick movements in short periods of time. In addition to aerobic strength, anaerobic strength is also important. In addition, success depends on body strength to a great extent in wrestling. Strength is very important especially in defense and also in offense while practicing techniques or resisting techniques and making counter moves. In wrestling, flexibility is a very important factor for success. Flexibility enables the wrestler to move to a great extent and creates positive effect in practicing the techniques. Speed and reaction speed are important factors influencing the wrestlers' success. During competition, a wrestler performs attacks, defence,

and counterattacks and has to perform these attacks in a quick way (2, 7, 23). With the increase in international competition, recognising both their own and their opponents' body compositions in terms of endurance, strength and condition has become a must for success in Turkish athletes. The success of the athlete depends on the development of strength, speed, flexibility and jump technique performance (14). Physical fitness; Many parameters affect age, height, body weight, aerobic and anaerobic power, body component, flexibility, resting heart rate and blood pressure (12,17).Structural and motoric characteristics of wrestlers are the most important determinants of performance. In order to be able to realize performance development in wrestling in the most effective way, suitable training programs are needed in addition to children's being suitable for universal structural model determined for wrestling. In Turkish wrestling, wrestling training centres have a significant place in reaching success. Factors which are effective in determining the concept of talent in sport can be listed as status of health, anthropometric characteristics, motoric characteristics, techno motoric characteristics, ability to learn, being ready for efficiency, emotional characteristics, cognitive characteristics and social factors (13,14). Eurofit tests applied to children of different age groups can be about determining general health and diet conditions, assessing exercise habits and providing data about children's anatomic and functional characteristics (6, 8). The success of wrestlers is determined according to athletes' physical characteristics, style and motivation, position during competition and the ability of moving and deciding in the most correct way. Determination and development of the characteristics of wrestlers for success can be possible only through scientific tests and studies. Determination of physical and physiological characteristics and monitoring the development of these characteristics is an important factor for success in wrestling (2). Physical characteristics and motor performance parameters vary by age and gender. Families and coaches can make successful planning if they know the differences in the physical characteristics and motor performances of children according to age and gender (16). Even the colours used in the field of sports have different effects on athletes (23).

The aim of this study is to find out the changes during the first year in physical and motoric characteristics of wrestlers admitted to wrestling training centres.

METHOD:

Participants: A total of 39 wrestlers between the ages of 12 and 13 who were having regular training in the provinces of Samsun and Sivas participated in the study. Participation occurred on a voluntary basis. The first measurement of the wrestlers was taken within the first week they came to wrestling training centres. The second measurement was taken a year later.

Training program of wrestlers in wrestling training center: Between May and June, plays and basic techniques in wrestling were taught. Between July and August, basic techniques, skills and condition moves were taught. Between October and November, basic techniques, tactics and endurance moves were taught. In December and January, basic techniques, tactics and endurance moves were continued. In February, March and April, matches for techniques, tactics and competitions were made. There were trainings for five days a week (A training of 550 hours a week). Loading intensity was kept between 50-60%. Trainings included 20 minutes of gymnastic based warm-up, 40 minutes of basic-technique work out and 10 minutes of stretching.

Measurements: Grip force: Hand dynamometer was adjusted to the hand measurements of wrestlers. The wrestlers extended their arms straight without bending their elbows. The dynamometer was tightened with the arm on the side with an angle of 10-15 degrees from the shoulder. The best performance was taken after two trials with both hands (11).

Squat Jump: A full jump was performed with the knees of the wrestlers 90 degrees bent in squat position and the hands on the waist (1).

Anaerobic Power: Vertical jump distance was used to find out anaerobic power. The formula is as below.

$P = \sqrt{4.9} \times Weight \times \sqrt{D}$ P= Anaerobic Power (kgm/sec) D=Vertical jump distance (m)

$\sqrt{4.9}$= Standard time

Standing long jump: Behind a marked line, the wrestlers stood with their feet open shoulder wide and jumped forward. Both hands were taken backwards before jump. With the forward movement of the arms, a jump was made as forward

as possible and to the farthest distance. The best of the two trials was taken (18,21).

Throwing health ball: Health ball is 2 kg. The wrestlers threw the ball by opening their knees at shoulder width just behind the starting line. The health ball was grabbed with both hands and taken to the back of the head. After bending the trunk slightly backwards, the arms were thrown forward and the wrestlers tried to throw the ball at the farthest point from the head. The better of the two trials was recorded (21).

30 sec. shuttle: It was performed while the wrestlers were lying on their backs with their knees bent 90 degrees, hands on the back of the head and the soles touching the ground to make the highest number of repetitions in 30 seconds. The highest number of repetition was recorded (17,21).

30 m. Sprint: The start and finish lines of the ground were determined on a straight line to cover 30 meters. Photocell was placed to the start and finish line (21). The wrestlers started when they were ready and they tried to pass the finish line in shortest time possible. The best degree was recorded after two trials (1,17).

20 Meters Shuttle run test and VO2 max.: The wrestlers ran 20 meters round. Administration of the test: It starts with the speed of a slow run (8 km/h) and the wrestler starts to run with the sound of the first signal. He should approach the line until the

sound of the second signal. When he hears the second signal, he goes back to the start and this running speed continues with signals increasing at 0,5 km/h each minute. When the wrestlers hear the signal, they adjust their tempo to be on the other side of the court with the second signal. The initial speed increases gradually. If the wrestler misses a signal sound and reaches the second one, the test continues. The test ends if the wrestler misses two signals in a row. Maximal VO2 value was calculated in ml/ kg/min, indirectly based on the shuttle run test and from the assessment table (22).

Statistical analyses: SPSS 23.0 program was used to analyse the data. Normality was examined with Kolmogorov-Smirnov test. It was found that the data obtained were distributed normally. Independent samples t test was used to compare the differences in average. Significance level was taken as $p<0,05$.

RESULTS

Average values of the wrestlers' physical and motoric characteristics, standard deviations and comparison results are presented respectively in the tables below.

Table 1. Changes in anthropometric characteristics of wrestlers

Variables	Measurement	n	Average	St deviation	t-test
Age (Years)	First measurement	39	12,05	1,23	-3,57**
	Last measurement	39	13,05	1,23	
Height (cm)	First measurement	39	151,13	10,08	-2,38*
	Last measurement	39	156,49	11,04	
Weight (kg)	First measurement	39	45,53	12,41	-1,88
	Last measurement	39	50,94	13,04	

** p<0.001

Ages are 12.05 years at the first measurement and 13.05 years at the last measurement. Height were determined as 151.13 cm in the first measurement and 156.49 cm in the last measurement. Body weights were 45.53 kg at the first measurement and 50.94 kg at the last measurement.

Table 2. Changes in some motoric characteristics of wrestlers according to years

Variables	Measurement	Average	St deviation	t-test
Squat jump (cm)	First measurement	25,51	6,41	-2,16*
	Last measurement	30,20	5,38	
Vertical jump	First measurement	26,13	7,41	-2,29*
	Last measurement	32,45	7,54	
Long jump (cm)	First measurement	161,31	20,28	-3,23**
	Last measurement	176,77	21,92	
Right hand grip strength (kg)	First measurement	21,77	7,67	-3,39**
	Last measurement	28,24	9,12	
Left hand grip strength (kg)	First measurement	21,82	7,55	-3,45**
	Last measurement	28,31	8,97	
Health bal throwing (cm)	First measurement	517,44	150,81	-1,82
	Last measurement	580,52	156,11	
Sit-reach flexibility (cm)	First measurement	18,52	4,77	4,36**
	Last measurement	24,92	4,94	
30 seconds shuttle (n)	First measurement	21,71	4,27	-3,94**
	Last measurement	25,79	4,85	
VO_2 max (ml/kg/min)	First measurement	47,74	2,74	-4,61**
	Last measurement	49,53	2,60	
30 metre sprint (sec)	First measurement	5,27	0,36	10,58**
	Last measurement	4,82	0,43	
Anaerobic power (kg.m/sec)	First measurement	51,37	17,62	-3,24*
	Last measurement	63,76	19,68	

** $p<0.001$

While Squat jump was 25.51 cm in the first measurement, it increased to 30.20 cm in the last measurement. The vertical jump, on the other hand, increased from 26.13 cm in the first measurement to 32.45 cm in the last measurement. While the long jump was 161.31 cm in the first measurement, it increased to 176.77 cm in the last measurement. While hand grip forces were around 21 kg in both hands in the first measurement, it increased to 28 kg in the last measurement. While the Sit-reach flexibility value was 18.52 cm in the first measurement, it increased to 24.92 cm in the last measurement. While the 30-meter sprint value was 5.27 seconds in the first measurement, it increased to 4.82 seconds in the last measurement.

DISCUSSION

When the body profiles of the wrestlers in athlete training centres were examined, average squat jump was found as 24.18 cm in 12-year-old wrestlers and as 29.21 cm in 15-year-old wrestlers (23). Average age of the wrestlers in wrestling training centre was found as 12.05 years in the first measurement and as 13.05 years in the last measurement. While average height was found as 151.13 cm in the first measurement, it was found as 156.49 cm in the last measurement; average weight was found as 45.53 kg in the first measurement and as 50.94 kg in the last measurement. The changes in ages and heights of wrestlers within a period of one year were found to be significant ($p<0.001$), while the changes in weights were found to be insignificant ($p>0.05$). The fact that there was no significant increase in weight can be because they were in the period of starting to lose weight.

Squat jump value was found as 27.55 cm in 14-year-old wrestlers (4) and as 29.26 cm in 15-year-old wrestlers (5). In the present study, average squat jump value was found as 25.51 cm in the first measurement and as 30.20 cm in the last measurement.

When the body profiles of wrestlers in wrestling training centres were examined, average active jump (vertical jump) was found as 25.87 cm in 12-year-old wrestlers and as 31.27 cm in 15-year-old wrestlers (23). In the present study, average vertical jump value was found as 26.13 cm in the first measurement and as 32.45 cm in the last measurement.

When the body profiles of wrestlers in athlete training centres were examined, long jump value was found as 167.51 cm in 12-year-old wrestlers and as 198.90 cm in 15-year-old wrestlers Tekelioğlu et al. (23). Aslan et al., (2) found the average standing long jump value as 184.2 cm in the first measurement and as 182.7 cm in the last measurement within a period of one year. Average standing long jump value was found as 181.94 cm in 14-year-old wrestlers (4) and as 197.95 cm in 15-

year-old wrestlers Bayraktar et al.,(5). In the present study, the average standing long jump value was 161.31 cm in the first measurement and 176.77 cm in the last measurement. The changes in squat jump and long jump values of wrestlers within a year were found to be significant ($p<0.05$ and $p<0.001$). The significant difference between the first and last test values of the wrestlers in squat and jump tests can be due to the trainings they undergo in addition to the fact that they had grown up.

Average hand grip strength of wrestlers in athlete training centres was found as 23.33 kg in right hand and as 22.60 kg in left hand in 12-year-old wrestlers and as 37,04 kg in right hand and as 36.24 kg in left hand in 15 -year-old wrestlers (23). In their study, Aslan et al., (2013) found average hand grip strength as 26.1 kg in the first measurement and as 34.8 kg in the last measurement in wrestlers between the ages of 13 and 15. In one study, Bayraktar et al.,(5) found hand grip strength as 32.65-32.47 kg in right and left hand, respectively in 14-year-old wrestlers. In another study, Bayraktar et al.,(5) found hand grip strength as 37.98-37.58 kg, respectively in 15-year-old wrestlers. In the present study, while the average hand grip value was found as 21.77 kg for the right hand in the first measurement, it was 28.24 kg in the last measurement and it was found as 21,82 kg for the left hand in the first measurement and as 28.31 kg in the last measurement. The difference between the first and last test hand grip values of the wrestlers within one year was found to be significant.

In athlete training centres, average health ball throwing value was found as 465 meters in 12-year-old wrestlers, while it was found as 703 meters in 15-year-old wrestlers (23). Aslan et al. (2013) found average health ball throwing value in 13-15-year old wrestlers as 554 cm in the first measurement and as 612 cm in the last measurement. In a study, Bayraktar et al. (5) found average health ball throwing distance as 729 cm in 15-year-old wrestlers. In the present study, first measurement for average health ball throwing was found as 517.44 cm and last measurement was found as 580.52 cm. No significant difference was found between first and last measurement average health ball throwing values within a year ($p>0.05$). The result that the change in health ball throwing was insignificant can be due to the fact that trainings are in the form of pulling most of the time. It can be recommended to include pushing and hand grip workouts in addition to pulling workouts.

In one study, Bayraktar et al. (4) found average max V02 value as 48.87 ml/kg/min in 14-year-old wrestlers, while in another study Bayraktar et al. (5) found average max V02 value as 51.19 ml/kg/min and anaerobic strength value as 73,63 kgm/sec in 15-year-old wrestlers. In the present study, average max V02 value of the wrestlers was found as 47.74 ml/kg/min in the first measurement and as 49.53 ml/kg/min in the last measurement. In their study, Aslan et al. found average anaerobic power value as 71.5 kgm/sec in the first measurement and as 79.5 kgm/sec in the last measurement in 13-15-year-old wrestlers. In the present study, anaerobic power values were found as 51.37 kgm/sec in the first measurement and as 63.76 kgm/sec in the last measurement.

In their study, Aslan et al. (2) found average 30 meter sprint value as 4.98 sec in the first measurement and as 4.97 sec in the last measurement in 13-15-year-old wrestlers. 30 meter sprint value was found as 4.94 sec in 14-year-old wrestlers (4) and as 4.76 sec in 15-year-old wrestlers (5). In the present study, while the average 30 meter sprint value was found as 6.07 sec in the first measurement, it was found as 5.11 sec in the last measurement.

When the body profiles of wrestlers in athlete training centres were examined, it was found that the average number of 30 seconds shuttles was 27.81 in 12-year-old wrestlers, while it was 32,25 in 15-year-old wrestlers (23). In their study, Aslan et al., (2) found the number of 30 seconds shuttles as 23.9 in the first measurement and as 27.4 in the last measurement within the period of a year. In one study, Bayraktar et al.,(5) found the average number of shuttles in 30 seconds as 31.98. In the present study, while the average number of 30 seconds shuttles was 21.71 in the first measurement, it was found as 25.79 in the last measurement.

In their study, Gül et al. (10) stated that there was a significant difference in sit and reach flexibility test in terms of years. In their study, while İmamoğlu et al. (13) found the average sit and reach test value as 17.90 cm in 41 kg wrestlers, they found it as 22.06 cm in 37 kg wrestlers. While Özal (20) found the average flexibility measurement in 1999-2000 academic year wrestling training centre exam as 15.63 cm in children who passed the exam, they found it as 11.49 cm in children who failed the exam. Bağcı (3) found the average flexibility performance in 12-14-year old wrestlers as 20.85 cm in the first

measurement, they found it as 24.35 cm in the last measurement. In the present study, while sit and reach flexibility value was found as 18.52 in the first measurement, this value was found to increase to 24.92 cm in the last measurement. The flexibility values in our study were found to be different from the values in other studies. The reason for this can be anthropometric differences, age and weight differences and measurement differences between wrestlers.

In their study, Aslan et al. (2) found that hand grip strength, health ball throwing distance, 30 seconds shuttle, anaerobic power and 0 meter sprint values improved significantly in 13-15-year old wrestlers. On the contrary, they found that there was no significant improvement in vertical jump, standing long jump and 30 meter sprint values. While Cicioğlu et al. (7) found improvement in 30 second shuttle and flexibility of 15-17-year old wrestlers within a season, they stated that there was no improvement in terms of aerobic endurance and 20 meter sprint values. Gökdemir et al. (9) found significant improvement in hand grip strength and anaerobic power. Ziyagil et al. (25) found significant improvement in hand grip strength and flexibility values, while they did not find any improvement in aerobic endurance. In the present study, the differences between the average max V02, 30 meter sprint, number of shuttles in 30 seconds and sit and reach flexibility values of wrestlers within a year were found to be statistically significant ($p<0.05$ and $p<0.001$).

Conclusion: Among the motor performance parameters of the wrestlers, increases were found in sprint, abdominal strength, flexibility, anaerobic strength and aerobic endurance values within a year. No significant increase was found in shoulder-arm strength. Emphasis should be placed in pushing from the arm and shoulder area workouts in addition to arm pulling movements of wrestlers in their trainings.

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Investigation Of The Relationship Between Arm Skin Thickness And Circumference Measurement And Hand Grip Strength Of Children Attending With Badminton Sport

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Abstract

Purpose: The aim of this study is to investigate the relationship between the thickness of the arm, circumference measurement and the hand grip of the 10-12 age children badminton athletes. Materials and Methods: 72 badminton athletes with a mean age of 11.8 ± 0.1 were included in the study voluntarily. Physical characteristics of children; height (kg), body weight (kg), body mass index (kg/m²), body circumference measurements (cm), (forearm, mid-arm and mid-upper arm) and skinfold (mm), (triceps, subscapula, biceps, suprailiac skin thickness) values were measured. Results: Data were analyzed by SPSS 23.0 package program. The Shapiro-Wilk test was used to determine whether the distribution of numerical variables was uniformly distributed. Pearson Correlation test was applied to determine whether there is a correlation between the parameters. Statistical significance level was accepted as $p < 0.05$. In the evaluation, a statistically significant difference was found between the right hand grip strength and subscapula skin thickness, ($r=0.25$), mid-arm circumference, ($r=0.27$), measurement and left hand grip strength with subscapula skin thickness, ($r=0.3$), forearm circumference, ($r=0.24$), mid-arm circumference, ($r=0.35$) and mid-upper arm circumference, ($r=0.34$), ($p < 0.05$). Conclusion: It can be said that arm skin thickness and arm circumferential measurements are effective in the hand grip strength parameters of sports such as badminton.

Keywords: Badminton, skin thickness, circumference measurements, hand grip strength

INTRODUCTION

Badminton is a sport game based on quickness, speed, strength, skill, coordination and immediate decision, played by two or two people, aiming to drop a ball made of goose feather or plastic with a lightweight hand-held racket to the opponent's court. It is a game and sport in which everyone can easily learn and play with pleasure and pleasure of all ages, play and play in any environment where there is no strong wind when it can be used for recreation and fitness purposes (2). As in every sports branch, badminton athletes want to have a fast, strong, durable and perfect technique in return for heavy training, devoted and bored work. Therefore, the physical physiological and biomotoric properties of the athlete must be appropriate for the sport in which he will apply. If these elements are present, success can be achieved by organizing them well (9).

Muscle strength is the ability of the person to elicit the strength or torque that the muscle generates in a given unit of time. (5, 11). Strength and physical properties are closely linked. Considering that the top-level athletes in badminton

can reach up to 320 km/h in smash, it is an indication that the strength and explosive strength parameter is important for an effective hit (5). In addition to being the health criterion of physical and physiological factors such as skin thickness, body circumference measurements, which are important in achieving success, it is accepted as an important element of sporting performance (7, 8). At the same time, bad physical properties against gravity during trainings and competitions in badminton have difficulties for the athlete (9). In this context, it is known that body weight is a determining factor in terms of performance.

In this context; The aim of this study is to investigate the relationship between arm skin thickness, circumference measurement and environmental strength and grip strength of children who are engaged in badminton sport in children aged 10-12 years, since it is necessary to know which physical and / or physiological properties affect the other and to improve the performance of the athlete.

MATERIALS AND METHODS

72 badminton athletes with a mean age of 11.8±0.1 participated in the study voluntarily. Volunteers were informed about the purpose and content of the study and the best and healthiest measurements were obtained and a form was obtained from the families of the participants to confirm their participation in the study. Participants do not have any health or disability problems.

MEASUREMENT METHODS

Height measurement: Height measurements degree of precision is made to height meter of 0.01 m.

Measurement of body weight (kg) and body mass index: Participants' body weight (kg), body mass index (kg/m²) were determined by Inbody 270 Professional Body Analyzer.

Hand grip strength measurement: Hand grip strength measurement is performed by T.K.K. 5401 model dynamometer manufactured by TAKEI brand. The athletes were asked to squeeze the dynamometer in their hands with all their forces without bending the arm and touching the body while standing. The test was performed twice and the best result was recorded.

Skinfold thickness measurement:

Subcutaneous fat measurements of the athletes participating in the study, 0.2mm precision HOLTAIN brand skinfold caliper was made on the right side of the body. For this study; biceps, triceps, sup-scapula, suprailiac skinfold were measured.

Circumference measurements: Measurements were taken with the athlete standing upright and the center of gravity balanced on both legs. Tape measure was used in these measurements.

Data analysis was performed using SPSS 23.0 package program. Shapiro-Wilk test was used to determine the distribution of numerical variables. Pearson correlation test was used to determine whether there was a correlation between the parameters

RESULTS

Table 1. Age, height, body weight and body mass index values

Parameters	Group	Mean±SD
Age	Badminton (n:72)	11.7±0.11
Body Height (cm)	Badminton (n:72)	150.4±1.09
Body Weight (kg)	Badminton (n:72)	42.3±1.27
Body Mass Index (kg/m²)	Badminton (n:72)	18.5±0.39

When Table 1 was examined, the mean age of children playing badminton the ages of 10-12 was 11.7±0.11, height was 150.4±1.09 cm, body weight was 42.3±1.27 kg and body mass index was 18.5 ± 0.39 kg / m².

Table 2. The relationship between skin thickness and right hand grip strength of circumference measurement parameters

Parameters	Mean±SD	Right Hand Grip Strength (kg) Mean±SD	r	*p*
Triceps skin thickness (mm)	13.9±0.49	19.7±0.39	0.16	*0.19*
Subscapula skin thickness (mm)	9.39±0.46		0.25	*0.04**
Biceps skin thickness (mm)	8.53±0.39		0.04	*0.76*
Forearm circumference (cm)	19.1±0.18		0.18	*0.14*
Mid-arm circumference (cm)	21.5±0.23		0.27	*0.02**
Mid-upper arm circumference (cm)	22±0.01		0.21	*0.08*

*p<0.05

Table 2 examined, subscapula skin thickness (mm), (r=0.25) and Mid-arm circumference (r=0.27) with the right hand grip strength (kg) parameter was found to have a statistically significant positive correlation between 95% confidence interval, triceps skin There was no statistically significant difference in thickness (mm), biceps skin thickness (mm), forearm circumference (cm) and mid-upper arm circumference (cm) (p>0.05).

Table 3. The relationship between skin thickness and left hand grip strength of circumference measurement parameters

Parameters	Mean±SD	Left Hand Grip Strength (kg) Mean±SD	r	*p*
Triceps skin thickness (mm)	13.9±0.49	18.7±0.43	0.14	*0.25*
Subscapula skin thickness (mm)	9.39±0.46		0.3	*0.01**
Biceps skin thickness (mm)	8.53±0.39		0.13	*0.27*
Forearm circumference (cm)	19.1±0.18		0.24	*0.04**
Mid-arm circumference (cm)	21.5±0.23		0.35	*0.00**
Mid-upper arm circumference (cm)	22±0.01		0.34	*0.00**

*p<0.05

Table 3 examined, Subscapula skin thickness (cm), (r=0.3), forearm circumference (cm), (r=0.24), mid-arm circumference (cm), (r=0.35) and Mid-upper arm circumference (cm), (r=0.34) Left hand grip strength (kg) parameter was found to have a statistically significant positive relationship in 95% confidence interval (p<0.05) but triceps skin thickness (cm) and biceps skin thickness (cm) values were not statistically significant difference (p>0.05).

DISCUSSION

In this study, the relationship between grip strength and arm skin thickness and circumference measurement of 72 badminton children aged between 10-12 years were investigated. In the evaluation, a statistically significant difference was found between right hand grip strength and subscapula skin thickness, mid-arm circumference measurement and left hand grip strength and subscapula skin thickness, forearm circumference, mid-arm circumference measurement, mid-upper circumference measurement (p<0.05). Right hand grip strength parameter with triceps skin thickness, biceps skin thickness, forearm circumference and mid-upper perimeter values and hand grip strength parameter with triceps skin thickness and biceps skin thickness values were not statistically significant (p>0.05).

When the physical properties of the children between the ages of 10-12 were examined, the height values were found to be 150.4 ± 1.09 cm. Body weight values were found to be 42.3 ± 1.27 kg. BKI values were 18.5 ± 0.39 kg /m². According to the researches, 323 children 13 years old in Sweden have a mean BMI of 19.9 ± 3.6 kg / m2 (14). Selçuk (20), found BMI values as 19.68 ± 2.98 kg / m² in the 11-13 age group male swimming group. Kutlay et al. (10), found the BMI value of 13 elite female athletes with an average age of 11 as 15.85 ± 2.11 kg / m². Karaca (8) found that the mean height of the children who are engaged in badminton sports between the ages of 12-14 was 156.7 ± 37.5 cm and the mean body weight was 42.3 ± 12.9 kg. Saeed Abdulrahman (18), the average age of children who do sports 10-12 years 11 ± 0.82 years, average height, 144.6 ± 7.94 cm, body weight average, 43.1 ± 7.90 kg, the average BMI, 20.4 ± 3.45 determined that. When our study and other studies were compared, it was found that they showed similar values due to their development in the same age group and dealing with badminton athletes. While Revan et al. (17), did

not find a statistically significant difference between Turkish male badminton players (10,9%) and foreign country badminton players (11,2%) in terms of body fat percentages, the body fat percentages of both groups were between normal values. Comparing the body type of men and women who do not do sports with athletes, it is stated that athletes have larger mesomorphic and endomorphic components, while their endomorphic components are lower (6)

When the physiological characteristics of the children aged 10-12 years were examined, the subscapula skin thickness was found to be 9.39 ± 0.46 mm, triceps skin thickness was 13.9 ± 0.49 mm, and biceps skin thickness was 8.53 ± 0.39 mm. circumference measurements; the forearm was 19.1 ± 0.18 cm, the mid-arm circumference was 21.5 ± 0.23 cm, and the mid-upper arm circumference was 22 ± 0.01 cm.

Karaca (8); skin fold thickness, biceps 5.8 ± 2.9 mm, triceps 7.45 ± 3.72 mm, subscapula 7.55 ± 2.78 mm, suprailiac 7.18 ± 3.67 mm, hand grip strength was found to be 24.5 ± 4.13 kg. These findings are thought to be in line with our study because our study group is a badminton athletes. According to Lieshout, body fat percentages of badminton players said that they should be in the range of 10–15% in men and 15-20% in women. At the same time, Senel et al. (21), determined 6.9%, Lieshout and Lombard (12,13), 9.6% in body elite badminton players. In line with these studies, although body size is not the main determinant of success in badminton, individuals' skinfold thickness can affect strength and therefore performance.

When the motoric features of the children between the ages of 10 and 12 were examined, the right and left hand grip strength parameters were found to be 19.7 ± 0.39 kg and 18.7 ± 0.43 kg, respectively.

Pekel, 11–13 years of children's right / left hand grip strength is 20.8 ± 6.5 / 19.9 ± 5.8 kg, stated that (15). Saygın and Öztürk also found that the right and left grip strength were 19.09 ± 4.96 kg and 17.07 ± 4.91 kg, respectively (19). Çetin et al. found the right and left hand grip strength parameters of children between 10 and 12 years of age as 25 ± 0.6 kg and 23.9 ± 0.62 kg, respectively (4). Sobush and Fehring evaluated the arm grip strength of 111 participants as right and left, and looked at the relationship between body fat percentages. They showed that the relationship between body fat percentage and grip strength was significant (22).

As a result, there is a significant relationship between body fat mass and strength (7). Because of this relationship, it can be said that arm skin thickness and arm circumference measurements are effective on grip strength parameter in sports requiring arm strength such as badminton. For the reliability of the study, it is possible to reproduce the study samples in which the relationship between skinfold thickness, body circumference and strength is examined in another age group or in various sports branches.

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Examination of Exercise Addiction Levels of University Students

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Abstract

Study was conducted to examine the addiction levels of university students. The research group consists of 343 male and 277 female totally 620 students in the academic year of 2019-2020 in Bingöl University School of Physical Education and Sports (Pesa), Faculty of Arts and Sciences and Vocational Schools. "Exercise Addiction Scale" was used to obtain data for the purpose of the research. The students participating in the study were asked personal information questions regarding their demographic characteristics. The study was carried out in SPSS 22 statistical package program and the degree of significance was taken as 0.05. Independent Sample T (Independent Sample) and Mann Whitney-U test in dual comparisons, One-Way Variance Analysis (One Way Anova) in multiple comparisons and Kruskal Wallis Analysis in non-normally distributed data, and correlation (Pearson) test to determine the relationship between variables. According to the answers given by the students who participated in the study, there was a significant difference between the groups in terms of gender, faculty, time spent on social media and academic grade point average. According to the results of the correlation analysis, a low level of meaningful relation was found between the time spent on social media and exercise addiction levels of the students.

Key Words: Exercise, Addiction, University Students

INTRODUCTION

Exercises are physical activities performed out planned and programmed and aimed at maintaining or improving physical fitness (17). In another definition, exercise; planned, structured, voluntary and regular activities that are repeated to achieve, develop or maintain physical condition, to develop or maintain one or more aspects of physical fitness (10, 12, 21). Regular physical activity plays an important role in maintaining health and preventing diseases. However, excessive exercise has the potential to adversely affect physical and psychological health (3).

Although it is universally accepted as a healthy habit, it is accepted that exercise behavior has the potential to turn into an obsessive and harmful behavior on people (16).

The reason for this may be that individuals' desire to appear physically better, if they are working in a business area with high stress intensity, the desire to vanish the stress and fatigue of the day, if they have any mental and nervous diseases or if they exhibit behaviors that tend to violence, it can be said to be caused by the desire to get rid of it.

According to Eysenck, addiction (7) is a notion that expresses the individual's susceptibility to some types of behavior that may have unusual and harmful consequences. These types of behavior can be alcohol and drug use, as well as sex, sports, travel or work. Exercise addiction; is defined as the exercise routine being out of control of the individual, increasing the duration, frequency and intensity of the exercise continuously to ensure the desired effect from the exercise, not exercising for

family and friends, not exercising instead of participating in social activities and rearranging the individual's life within the framework of exercise habits (1, 25). Researchers negatively addicted exercise addiction; when an individual who is over-exercising cannot exercise, experiences problems such as anxiety, depression, irritability, insomnia (11) and positive addiction; They evaluate the individual in two different forms as over-exercising (8) to deal with the difficulties encountered in his/her life. In recent years, studies on the function of the brain and the brain have been found to cause many addictions to chemical addiction. Therefore, it is seperated into two groups as addiction, substance addiction and process addiction. Until recently, process dependence, which is the second main area of addiction, also known as behavior or activity addiction, has not attracted much attention. Although process dependencies are parallel to substance addiction, they do not include substance use. In order to understand process dependence, it is important to understand that addicted behavior or activity is used as a substance against mental pain as substance does in substance addiction (23). It is determined that exercise addiction is associated with factors such as physiological factors, exercise type, gender and year of participation in the exercise (11, 2).

The aim of this research we have done is to examine the addiction levels of university students and to determine the effects of these addiction levels on the social and cultural characteristics of students and to associate them with the previous studies in the literature.

MATERIAL - METHOD

The study group of this research, which was performed out to examine the addiction levels of university students, consists of 620 students, 343 male and 277 female study at Bingöl University School of Physical Education and Sports (Besyo), Faculty of Arts and Sciences and Vocational Schools during the 2019-2020 academic year. In our research, “survey method” was used as a data collection tool. The volunteers participating in the study were informed before completing the questionnaires given to them and their consent was obtained by getting their approvals. In order to carry out this research, the ethical committee decision numbered 30 of 26.02.2020 was taken by the Ethics Committee of the Faculty of Sport Sciences of the Faculty of Sport Sciences, Non-Interventional. The survey consists of 2 sections and 22 questions in total. In the first part, there are 5 statements about demographic variables. In the second part, consisted of 17 statements the "Exercise Addiction Scale" developed by Tekkurşun-Demir et al. (19) was used in the research.

The data gathered through the Exercise Addiction Scale were analyzed via the statistical package program SPSS.22 program and the results were interpreted. Descriptive statistics including arithmetic mean, standard deviation, frequency and percentage distributions are presented in order to gain insight into demographic information and other group questions. Correlation (Pearson) test was applied to determine the relationship between playing time and exercise addiction levels on the daily digital platform. In order to determine the relation between exercise dependency general and exercise dependence sub-dimensions with some demographic variables, the normality of distributions (Kolmogorov-Smirnov) and then Skewness and Kurtosis tests were examined in the first place. In the research, individuals' "normal" expression scores change according to the Z value varies between -3 and +3, while "extreme values" are scores and the Z value is outside the range of -3 and +3. Yet, according to Shao (15), the normal distribution of the data to be used in the study depends on the values of skewness and kurtosis between ± 3. Independent Sample T (Independent Sample T) and Unidirectional Variance Analysis (OneWayAnova) tests were applied for the variables with normal distribution according to the test results, and Mann Whitney-U and Kruskal Wallis Test was applied for the variables that did not show normal distribution. If there is a difference between the variables, Tukey HSD and Dunnet T3 tests were used according to the homogeneity results from the Post-Hoc tests to determine which group or groups originated from this difference. The results were evaluated at 95% confidence interval and significance level at $p < 0.05$.

FINDINGS

This is the section where the statistical results of the study will be explained. Statistical analysis based on the demographic characteristics of the people participating in the research will be included.

Table 1. Distributions of the Students Depending on Demographical Variances

	Demographical Variances	N	%
Gender	Male	343	55.3
	Female	277	44.7
Faculty	Physical Education and Sports Academy (PESA)	247	39.8
	Faculty of Science and Letters	154	24.8
	Vocational High Schools	219	35.3
Time Spent On The Social Media	1 hour and less	302	48.7
	2-3 hours	197	31.8
	4-5 hours	80	12.9
	6 hours and over	41	6.6
Grade Average	40-54	38	6.1
	55-74	320	51.6
	75-90	245	39.5
	91 and over	17	2.7
Total		620	100

When Table 1 is examined, 55.3% of the students participating in the study are male and 44.7% are female. As a result of examining the types of faculties / schools where the students study, 39.8% of the students study in PESA (Physical Education and Sports Academy), 24.8% in the Faculty of Science and Arts, 35.3% in Vocational Schools. As a result of examination of the time spent by the students on social media, 48.7% of them were 1 hour or less daily, 31.8% of them were 2-3 hours, 12.9% of them were 4-5 hours and finally 6.6% of them were social hours. It was determined that he had. Lastly, it was determined that 6.1% of students have averages between 40-54, 51.6% of them between 55-74, 39.5% between 75-90, and 2.7% of 91 and over.

Table 2. Comparison of exercise addiction sub dimensions and general exercise addiction levels of students depending on gender variance

		Gender	N	X	S.s	T	p
Exercise Addiction Sub Dimensions	Over Focus and Emotion Change	Male	343	24,46	6,144	4,252	.000***
		Female	277	22,23	6,801		
	Procrastination of Individual-Social Needs and Conflict	Male	343	16,17	5,756	4,408	.000***
		Female	277	14,10	5,842		
	Tolerance Development and Passion	Male	343	12,25	4,104	6,395	.000***
		Female	277	10,00	4,526		
Exercise Addiction General		Male	343	46,87	12,040	5,776	.000***
		Female	277	40,94	13,220		
Total			620				

p<0.001***

When Table 2 is examined, a significant difference was found between the groups in the exercise addiction sub-dimensions and general exercise addicition levels according to the gender variable of the students participating in the study (p <0.05).

Table 3. Comparison of exercise addiction sub dimensions and general exercise addiction levels of students depending on faculty/vocational school variance

		Faculty/Vocational School	N	X	S.s	f	p	
Exercise Addiction Sub Dimensions	Over Focus and Emotion Change	[a]Pesa	247	25.46	5.350	36.446	.000***	a > c b > c
		[b]Faculty of Science and Letters	154	24.24	6.305			
		[c]Vocational Schools	219	20.67	6.948			
	Procrastination of Individual-Social Needs and Conflict	[a]Pesa	247	16.27	5.005	26.555	.000***	a > c b > c
		[b]Faculty of Science and Letters	154	16.77	6.570			
		[c]Vocational Schools	219	13.02	5.642			
	Tolerance Development and Passion	[a]Pesa	247	12.62	3.702	36.288	.000***	a > c b > c
		[b]Faculty of Science and Letters	154	11.72	4.521			
		[c]Vocational Schools	219	9.36	4.494			
Exercise Addiction General		[a]Pesa	247	48.31	9.913	46.517	.000***	a > c b > c
		[b]Faculty of Science and Letters	154	46.54	13.151			
		[c]Vocational Schools	219	37.97	13.383			
Total			620					

p<0.001***

When Table 3 is analyzed, there was a significant difference found between the groups in terms of exercise addiction sub-dimensions and general exercise addiction levels according to the faculty / college variable in which the students participated in the study (p <0.05). According to the Post-Hoc test results to determine between which groups the difference is, it has been determined that the difference in both the general levels of exercise addiction and the sub-dimensions of exercise addiction is between students studying in vocational schools and students studying in faculty of science and letters and PESA.

Table 4. Comparison of exercise addiction sub dimensions and general exercise addiction levels of students depending on the time spent on the social media

		Digital Game Playing Time	N	X	S.s	Sd	X^2	p	
Exercise Addiction Sub Dimension	Over Focus and Emotion Change	[a]1 hour and less	302	23.49	6.209	3	2.108	.550	
		[b]2-3 hours	197	23.19	6.560				
		[c]4-5 hours	80	24.43	6.863				
		[d]6 hours and over	41	22.75	8.024				
	Procrastination of Individual-Social Needs and Conflict	[a]1 hour and less	302	14.01	5.135	3	22.479	.000***	d,c,b> a
		[b]2-3 hours	197	16.29	6.211				
		[c]4-5 hours	80	16.48	6.320				
		[d]6 hours and over	41	16.87	6.786				
	Tolerance Development and Passion	[a]1 hour and less	302	10.67	4.295	3	11.251	.010*	c > a b > a
		[b]2-3 hours	197	11.85	4.432				
		[c]4-5 hours	80	11.86	4.339				
		[d]6 hours and over	41	11.39	5.224				
Exercise Addiction General		[a]1 hour and less	302	42.68	11.904	3	10.451	.015*	c>a
		[b]2-3 hours	197	45.48	13.467				
		[c]4-5 hours	80	46.46	13.258				
		[d]6 hours and over	41	45.14	15.536				
Total			620						

p<0.001*** p<0.05*

When Table 4 is analyzed, there was a significant difference found among the groups in the sub-dimensions of exercise dependence according to the time period variable of the students participating in the study, and the postponement of individual-social needs, and conflict development, tolerance development and passion sub-dimensions and overall exercise addiction levels (p <0.05). According to the results of the Mann Whitney-U test performed to determine which groups the difference is, both in the general levels of exercise addiction and in the sub-dimensions of exercise addiction, the difference of individual-social needs and development of conflict with tolerance and passion, it was determined that students that spend daily 1 hour and less than one hour on social media and students that spend much more time on social media.

Table 5. Comparison of exercise addiction sub dimensions and general exercise addiction levels of students

depending on grade average variance									
		Grade Average	N	X	S.s	Sd	X^2	p	
Exercise Addiction Sub Dimensions	Over Focus and Emotion Change	[a]40-54	38	21.55	7.500	3	8.790	.032*	d>a
		[b]55-74	320	23.38	6.053				
		[c]75-90	245	23.65	6.907				
		[d]91 and over	17	26.58	6.699				
	Procrastination of Individual-Social Needs and Conflict	[a]40-54	38	16.05	5.798	3	11.210	.011*	d > b d > c
		[b]55-74	320	15.02	5.666				
		[c]75-90	245	15.10	6.061				
		[d]91 and over	17	19.82	5.886				
	Tolerance Development and Passion	[a]40-54	38	11.78	4.598	3	4.727	.193	
		[b]55-74	320	11.04	4.213				
		[c]75-90	245	11.30	4.676				
		[d]91 and over	17	13.17	4.461				
Exercise Addiction General		[a]40-54	38	43.97	13.833	3	7.870	.049*	d > b
		[b]55-74	320	43.73	12.148				
		[c]75-90	245	44.31	13.639				
		[d]91 and over	17	52.52	12.268				
Total			620						
p<0.05*									

When Table 5 is examined, according to the grade average variable of the students who participated in the study, there was a meaningful difference between the groups in the sub-dimensions of exercise addiction and emotional change, procrastinating of individual-social needs, and conflict sub-dimensions and overall exercise addiction levels ($p < 0.05$). According to the results of the Mann Whitney-U test realized to determine which groups the difference is, both in the general levels of exercise addiction and in the sub-dimensions of exercise addiction, the average of the difference is with an average of 91 and above and ones that have lower averages in terms of delaying individual-social needs and conflict dimensions.

Table 6. Correlation analysis that reflects the relationship between students' digital game play time and exercise addiction levels

			Exercise Addiction
Time spent on the social media	R	1	.099*
	P	-	.014
	N	620	
p<0.05*			

When Table 6 is analyzed, there was a positive but low level meaningful relationship determined between the time spent on social media and exercise addiction levels of the students who participated in the study ($p<0.05$).

DISCUSSION AND RESULT

The study was done to examine the addiction levels of university students. The research group consists of 343 male and 277 female in total in the academic year of 2019-2020 in Bingöl University Physical Education and Sports Academy (PESA), Faculty of Arts and Sciences and Vocational Schools. In this section, similar studies will be discussed with the study. When the literature is examined, when the studies conducted with gender are examined, there are studies indicating that females have higher levels of exercise addiction than males in the studies performed on Athletes (9, 13). While these studies support our study; There are studies that do not find any significant difference in exercise addiction level (4, 5, 6, 14, 20, 22, 24). The reason for the difference between male participants and female participants is that the number of athletes in gyms and fitness centers is more than the female participants and as a result, it can be said that it may lead to the time allocated to males is higher than the time allocated to females.

According to the faculty / college variable where the students participating in the study studied, there was a significant difference between the groups in exercise addiction sub-dimensions and overall exercise addiction levels. When the literature was analyzed, there were no studies found comparing exercise addiction depending on faculties. However, there are studies related to regular sports in the literature. In the study of Tekkurşun Demir and Türkeli, it was specified that

the level of exercise addiction of the participants differed according to the regular sports. In this context, it was found that the average scores of those who do regular sports in the sub-dimensions of "over-focus and emotional change", "procrastinating individual-social needs and conflict", "development of tolerance and passion" and "trust" are meaningfully higher than those who do not do regular sports (18). As the reason for the high school addiction of students study in physical education, it can be said that the lessons learned in the departments are related to the exercise and the students' desire to look fit by virtue of their departments.

When the body of the literature was analyzed, there was no study researching the academic averages of students and exercise addiction. We can say that academic success and exercise have increased at the same rate. We can also say that exercise and sports contribute positively to human life and students' academic achievement.

When the body of the literature is analyzed, there was no study found examining the time spent on social media and exercise addiction. Looking at the results of the study in general, significant differences were identified. It has been monitored that, as exercise addictions increase, social media levels increase throughout the study. In this case, we can say that the students' desire to publish their work during the exercise via social media or the exercise time may be extended in order to share more on social media.

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The Effect Of Sports On The Attention Levels Of Primary School Students

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Abstract

The aim of this study was to investigate the effect of sports on the attention levels of primary school students. Participants were 150 female and 170 male Primary education students aged 12-14 years. Student's t-test was used for paired categorical comparisons between the groups. While there was a statistically significant difference between girls and boys in terms of psychomotor speed, selective attention level and special learning difficulty values ($p < 0,05$), no statistically significant difference was found for concentration performance and total item error percentages ($p > 0, 05$). While there was no statistically significant difference between the psychomotor speed scores of both boys and girls in the comparison between sport group and non-sport group ($p > 0.05$), there was a statistically significant difference in the level of selective attention, learning disability, concentration performance and total item error percentage ($p < 0.05$ and $p < 0.001$).
Conclusion: It was determined that the attention levels of primary school students doing sports were better than those who were not doing sports. In the study, girls' psycho-motor speed scores and selective attention level scores were higher than boys' scores. Special learning disability scores were higher in boys than girls. It is recommended that all students in primary schools be involved in sporting activities to raise their attention levels.

Key words: Sport, D2 Attention test, Student

INTRODUCTION

Attention is the selection and extraction of any of the sensory stimuli among others according to specific targets. Attention is directed and structured in terms of the needs of the body (16, 30). Memory or attention indicates the process of perceiving, organizing, storing and recalling and using the stimuli when they are needed (5). Attention includes willingness in people and changes according to environmental conditions and topics of interest (26). It is stated that 5% of the people in the world experience attention disorder (31). However, it has been stated that attention deficit affects about 4% to 6% of school children in general (25). Attention is important in many activities related with learning. There are many differences between the learning levels of a student who has a good level of attention and a student who is careless or who has a low level of attention (7). Attention requires continuity especially for adequate performance appropriate for age. Sustained attention is being selective and the ability to act and continue when focusing is appropriate and necessary (21). Students' mental and physical performance is affected by many factors. For example, the success of the athlete is influenced by the development of strength, speed, flexibility and leap motor performance (20). Physical

fitness of students; age, height, body weight, strength, body component, flexibility, heart rate and blood pressure are affected by many factors (24). Again, a good body posture or posture development is required in the performance development of students (37). Sports has a positive effect on physical and mental development of students. It is stated that children who do sport regularly have higher levels of focus, discipline and concentration when compared with their peers (22). It is stated that a training including movement has a positive effect on the development of attention and memory (4).

In individuals with attention deficit, behaviours such as having difficulty in performing the tasks they take over, moving on to another task before finishing one, pretending to be listening to what is being said and immediate distractions with external stimuli are observed (17). It is imperative to know which basic skills should be paid attention to in order to make sufficient or appropriate activities, how to direct attention to another goal when necessary and how to pay attention to this goal (28). In the field of sports, performance is related to physical and motoric abilities in addition to cognitive and perceptual skills (9). The capacity to control thought mechanisms and pay attention to related issue is important for effective performance in sport. As a result of losing the capacity to pay attention with distractions in attention and blur of mind, an athlete's not being able to show the required performance shows the value of selective attention and sustained attention (1). It is necessary for an athlete to have a good capacity to pay attention to a specific issue in order to show top performance (12).

The aim of this study is to compare the attention levels of primary education students who are doing sports and those who are not doing sports.

METHOD

Participants: The participants are 150 female and 170 male primary education students aged between 12 and 14. While some of the students are participating in sport activities for three days a week, others are not participating in any sport actively.

Data Collection Tools

In addition to personal information form, "D2 Test of Attention" was used.

D2 Test of Attention: D2 Test of Attention, which was adapted by Toker (33) was thought as appropriate for 11-14 age group. In D2 Test of Attention, there are 14 lines with 47 characters on each line. On each line, there are 16 different characters consisting of the letters "p" and "d". There are marks above or below these letters (one, two, three or four marks, some of which are above the letters and some of which are below the letters). During the test, the test taker has to scan and cross out the characters "d" with two marks. The test taker is given 20 seconds for each line. In the assessment of the test, total number of items crossed out (psychomotor speed), the number of characters not crossed out and ignored (level of selective attention), total number of characters crossed out incorrectly (special learning difficulty) and total item-error scores are taken into consideration. Psychomotor speed: It is the number of crossed out items or the total number of characters crossed out. It is the numerical value of the performance for all related or unrelated characters crossed-out. It shows the highness level of psychomotor speed. Level of selective attention: It is the number of characters which are not crossed out and ignored. The higher number of these indicates that the level of attention is low and the quality of performance is inadequate. Special learning difficulty: It is the total number of characters crossed-out incorrectly. Higher number of these indicates special learning difficulty, having difficulty in obeying instructions, carelessness and deficiency in differentiating what one sees. Total item-error: It is the subtraction of error scores from the total number of characters crossed out. Total item-error is also expressed as total performance score. Concentration performance: It is found by subtracting the number of characters crossed out incorrectly from the number of characters crossed out correctly. It can be considered as the best index for performance accuracy and speed coordination (10, 12, 36).

Data Analysis

SPSS 23.00 package program was used in data analysis. Kolmogov- Smirnov and Shapiro-Wilk normality distribution of the variables was conducted. T-test was conducted for paired categorical comparisons between groups.

RESULTS

Table 1. Comparison of test results according to genders

	Gender	n	Average	St. deviation	t-test	p
Psychomotor speed	Female	150	433.76	86.36	2.97	0.032*
	Male	170	408.59	92.32		
Level of selective attention	Female	150	43.95	39.75	2.55	0.041*
	Male	170	35.15	35.20		
Special learning difficulty	Female	150	18.32	16.22	-2.92	0.036*
	Male	170	23.54	21.48		
Concentration performance	Female	150	117.59	40.27	1.43	0.12
	Male	170	111.25	43.86		
Total item error percentage	Female	150	85.64	25.34	1.25	0.15
	Male	170	85.71	27.26		

*p<0.05

The psychomotor speed score is 433.76 in women and 408.59 in men. Concentration performance is 117.59 in women and 111.25 in men. While there is a significant difference in psychomotor speed scores according to gender (p <0.05), there is no significant difference between concentration scores (p> 0.05).

Table 2. Comparison of D2 Test of Attention between sport and non-sport group in terms of gender

Gender	Variables	**Sport group**		**Non-sport group**			
		Average	St.dev.	Average	St.dev.	**t-test**	**p**
Female	Psychomotor speed	438.03	75.00	430.00	90.03	1.97	0.23
	Level of selective attention	33.12	25.87	56.22	42.51	5.12	0.001**
	Special learning difficulty	16.22	16.41	20.70	16.10	2.42	0.036*
	Concentration performance	127.93	30.53	105.86	40.52	5.18	0.001**
	Total item error percentage	88.73	24.15	82.11	25.30	2.56	0.028*
Male	Psychomotor speed	420.93	80.90	397.48	90.20	1.95	0.36
	Level of selective attention	30.20	24.23	39.62	41.12	2.15	0.042*
	Special learning difficulty	21.10	18.12	25.75	20.30	2.32	0.039*
	Concentration performance	123.39	30.26	100.30	40.90	5.44	0.001**
	Total item error percentage	87.12	22.80	83.55	22.51	2.10	0.044*

*p<0.05 and **p<0.001

While the psychomotor speed score in women is 438.03 points in sports, it is 430.00 points in non-sports. Concentration score is 127.93 points for those who do sports and 105.86 points for those who do not do sports. In men, the psychomotor speed score is 420.93 points in women who do sports, while it is 397.48 points in those who do not do sports. The concentration score is 123.39 points for those who do sports and 100.30 points for those who do not do sports. While there is no significant difference between the psychomotor speed scores of those who do sports and do not do sports in both women and men, there is a statistically significant difference between concentration scores (p <0.001).

DISCUSSION

In some of the studies conducted on children in Turkey, no gender differences have been reported in terms of attention (6,23,35). In a study, Renk (32) reported no significant difference between genders in terms of concentration performance and attention deficiency problem percentage. Özcan (29) found that there were no statistically significant differences between students' general attention percentage scores and that general attention percentages of female and male students were similar. Bektaş (10) found that girls had better total performance (psychomotor speed), level of selective attention and concentration performance than boys. In some of the studies conducted on attention, it is stated that girls have better attention gathering skills than boys (10,11, 33). In this study, while there were statistically significant differences between girls and boys in terms of psychomotor speed, level of selective attention and special learning difficulty values (p<0,05), no statistically significant difference was found in terms of concentration performance and total item error percentage values (p>0,05). In the study, girls were found to have higher psychomotor speed scores and level of selective attention scores than boys. On the other hand, boys were found to have higher special learning difficulty scores than girls. No difference was found between boys and girls in terms of concentration performance. Different results in studies can be

resulting from the differences in student groups in addition to different factors (age, degree of being active, etc.). In the present study, boys were found to have higher special learning difficulty. In other words, girls were found to have better attention gathering skills than boys.

Yaycı (36) found that the total number of crossed-out items, the number of errors subtracted from total number of crossed-out items and concentration performance of the group defined as active were significantly higher than those of the group defined as passive. In a study conducted by Kartal et al. (22), children who were engaged in the sport of fencing were found to have better attention levels than children who were not engaged in the sport of fencing. In a study by Göktepe et al.(15), children who were engaged in the sport of skiing were found to have better attention levels than children who were not engaged in the sport of skiing. Asan (8) stated that table tennis exercises had a positive effect on attention characteristics of children. Akandere et al.(3) found that the experimental group in which educational games were applied for 8-week had better attention values than the control group. Adsız (2) found that primary education students who were doing sports had 83% times higher attention than those who were not doing sports. Altun et al. (6) found a significant difference between the attention levels of children in favour of the experimental group and found that intelligence games were effective in developing level of attention. People hold attitudes and beliefs that influence how they experience, express, and respond to emotions (18). In their study, İbiş and Aktuğ (19) found that children who were doing sports had better attention than children who were not doing sports. Tunç et al. (34) found an increase in the post-test attention levels of children who played golf for 8 weeks when compared with pre-test levels. Atakurt et al. (5) stated that orienteering training had positive effects on attention. Akcınlı (4) stated that movement training had positive effects on attention and memory development in 8-year-old children. In one study, it was found that with specific music accompanied rhythmic movements, social behaviour problems and hyperactivity levels of children who had attention deficit and hyperactivity disorder decreased and consequently their concentration and attention ability increased (27). It has been reported that physical activity increases flow of blood to the brain (14). When we look at the chronic effects of sportive activities which develop heart and veins, it is emphasized that activities have positive effects on attention and behaviours (13). In this study, while the psycho-motor speed of girls who did sports, in other words their total number of crossed out characters, was 438.03; this number was found as 430.00 in the group which did not do sports. While concentration performance of the girls who did sports was found as 127.93; it was found as 105.86 in the group which did not do sports. While the psycho-motor speed of boys who did sports, in other words their total number of crossed out characters, was 42.93; this number was found as 397.48 in the group which did not do sports. While concentration performance of the boys who did sports was found as 123.39; it was found as 100.30 in the group which did not do sports. In the comparison of groups in terms of the state of doing sports, while no statistically significant difference was found between the psychomotor speed scores of both girls and boys ($p>0,05$), statistically significant difference was found between their selective attention levels, learning difficulty, concentration performance and total item error percentage ($p<0,05$ and $p<0,001$). While the concentration performance and selective attention levels of children who did sports increased, their special learning difficulty decreased.

Conclusion: It was found that the attention levels of primary school students who were doing sports and those who were not doing sports were better in favour of those who were doing sports. In the study, girls' psycho-motor speed scores and selective attention level scores were higher than boys' scores. Special learning disability scores were higher in boys than girls. It is recommended that all students in primary schools should be involved in sporting activities to raise their attention levels. Exercises to correct attention disorders can be recommended to primary school children. Attention-enhancing activities for the branches can be made for children actively involved in sports.

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Effect Of The Level Of Participation In Sportive Activities On Trust In Teachers And Identification Level With School

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Abstract

The study was performed out to examine the effect of high school students' level of participation in sports activities on teacher confidence and identification with school. The research group consists of a total of 302 students, 211 males and 91 females studying in different types of high schools in Şanlıurfa during the 2018-2019 academic years. In order to gain data for the purpose of the study, "Identification with School Scale" and "Teacher Trust Scale" were used. The students participating in the study were asked personal information questions regarding their demographic characteristics. Skewness and kurtosis tests were examined to test the normality of data distribution. The study was carried out in SPSS 22 statistical package program and the degree of significance was taken as 0.05. Independent Sample T (Independent Sample) test was used in binary comparisons, One-Way Variance Analysis (OneWayAnova) was used in multiple comparisons, and the correlation (Pearson) test was used to determine the relationship between variables. According to the responses given by the students who participated in the study, there was a significant difference between the groups in terms of facility adequacy in the school, the efficiency of the sports activities and the type of school, for the level of the students' confidence in the teacher and their identification with the school, but there was a significant difference between the groups in terms of their identification with the students. According to the results of the correlation analysis, a positive correlation was found between the students' confidence levels and their identification with the school. Finally, according to the regression results obtained, it was determined that the adequacy of the club activities and facilities in the school had a positive effect on the students' identification with the school and their confidence in the teacher.

Key Words: Trust, Identification, Sports, Facility Sufficiency

INTRODUCTION

Sports helps to create and sustain many social values that are of great importance. Sports can achieve this function in many ways. The fact that there is an area where people can express themselves in the concept of sports helps them develop psycho-socially, at least by supporting such activities and taking part in a socialization process (18). Schools are the place where the majority of the changes in the behavior of the individual are realized (9). Because schools are the places where students spend most of their time outside their homes. Students' attitudes towards school affect many features of students. When the literature is surveyed, these attitudes are; on their successes (2, 5,7, 22, 23, 25), in school absenteeism (2, 24) on their satisfaction with the school (2); It has a crucial effect on interest and desire for learning (8, 22,23), and also in attending school activities (24). Schools can have an impact on students positively or negatively, both for the development of a healthy mind and for academic success. Student-school engagement is mentioned in many researches about the interaction and relationship of these institutions, which have the power to affect students' lives in this way (13, 14, 19, 29). The supportive nature of the bonds developed with teachers in the school environment, students seeing education as a valuable investment

and making efforts to reach their goals will increase their probability of acting in a system of norms and values that are shared jointly by the society. The connection with teachers and school will act in a way to prevent deviant behavior by reinforcing avoidance of unwanted behavior (35). Considering the findings of the research conducted on this subject, it is understood that disciplinary problems such as absenteeism in schools, especially dropping out of high schools, being a member of gangs or forming student gangs are mostly seen in students who do not have a sense of belonging (21). It is possible to say that such problems will be less common in students who feel belonging to the school. Again according to Ma (21), the structure of the school, teachers' approaches and behaviors and peer interaction are important in developing a sense of belonging to students. There are items such as pride with the school, feeling valued, talking with teachers comfortably, making school, making friends as favorite place (20).

Trust is one of the important factors that we encounter in order to realize the goals and objectives effectively and efficiently not only in the relations between social life and people but also within the organization and the institution.

According to King, schools with trusting relationships, problems in teaching and learning in schools where there is no trust, and obstacles encountered, low morale, unmotivated staff, poor management, student discipline problems, union complaints, inadequate parental involvement, and an unpleasant general atmosphere. They do not have most problems like (17). Enhancing an atmosphere of trust provides important benefits for schools. Improved effectiveness, communication, organizational citizenship and student success are some of these benefits (33). In many research conducted until now, the reasons such as the students' not being able to identify with the school have been stated as cultural expectations, previous school achievements, structural and regulatory environment of the school, stereotype threat, poverty and peer pressure (12, 13, 26, 32, 37).

The greatest factors in students' trust in teachers and identification with the school; we can say that school friends, teachers, school facilities, cultural activities in schools and sports competitions. In this conducted study; it was aimed to examine the effect of sport on the level of trust and teacher identification with the teacher.

MATERIAL - METHOD

The study group of this research, which was performed out to examine the effect of high school students' participation levels in sports activities on their identification with the school and their trust in their teachers, constitutes totally 302 students, 211 males and 91 females studying in different types of high schools in the city of Şanlıurfa in the 2018-2019 academic year. In our research, survey method was used as a data collection tool. The volunteers participating in the study were informed before completing the questionnaires given to them and their consent was obtained by getting their approvals. In order to carry out this research, the ethical committee decision numbered 28 of 26.02.2020 was taken by the Ethics Committee of the Faculty of Sport Sciences of the Faculty of Sport Sciences, Non-Interventional. The survey consists of 3 sections and 31 questions. In the first part, there are 8 expressions related to demographic variables. In the second part, the "Identification with School Scale" adapted to Turkish by Ozer and Dundar (27), developed by Voelkl (37), which consists of 10 expressions, developed by Adams and Forsyth (1), consisting of 13 expressions in the third and last section. The "Scale for Trust in Teacher", which was adapted to Turkish by Ozer and Tul (28) was used in the research.

Data collected through scales of Identification with School and Trust in Teacher SPSS statistical package program. The data was analyzed with 22 program and the results were interpreted. Descriptive statistics including arithmetic mean, standard deviation, frequency and percentage distributions are presented in order to gain insight into demographic information and other group questions. Correlation (Pearson) test was used to determine the relationship between students' identification with school and teacher confidence levels. Skewness and Kurtosis tests were examined in the first place in order to determine the relationship between school identification and teacher trust dimensions with some demographic variables. In the research, "normal" expression scores of individuals' Z value varies between -3 and +3, while "extreme values" are scores whose Z value is outside the range of -3 and +3. However, according to Shao (31), the normal distribution of the data to be used in the study depends on the values of Skewness and Kurtosis between ± 3. Independent Sample T (Independent Sample T) and One Way Variance Analysis (One Way Anova) tests

were applied according to the test results. If there is a difference between the variables, Tukey HSD and Dunnet T3 tests were used according to the homogeneity results from the Post-Hoc tests to determine which group or groups originated from this difference. In addition, regression analysis was used to test the relationships between the variables in a holistic way. The results were evaluated at 95% confidence interval and significance was at p <0.05 level.

FINDINGS

This is the section where the statistical results of the study will be explained. Statistical analysis based on the demographic characteristics of the people participating in the research will be encapsulated.

Table 1. Distributions of Students According to Demographical Variances

	DemographicalVariances	N	%
School Type	Anatolian High School	87	28.8
	Vocational/Technical High School	64	21.2
	Sports High School	71	23.5
	Imam Hatip Anatolian High School	80	26.5
Do you do sports?	Yes	215	71.2
	No	87	28.8
Are the facility opportunities in your school sufficient?	Yes	63	20.9
	No	239	79.1
Are the club opportunities in your school sufficient?	Yes	44	14.6
	No	258	85.4
Total		302	100

When Table 1 is analyzed, it is determined that 71.2% of the students participating in the study do sports and 28.8% do not do sports. As a result of examining the adequacy of facility facilities in schools, it was determined that 79.1% of students considered the facilities in their schools insufficient, and 20.9% of them considered the facilities in their schools sufficient. Alike, as a result of examining the adequacy of the club activities in schools; 85.4% of the students did not find the club activities in their schools sufficient, and 14.6% of them considered the club activities in their schools sufficient.

Table 2. Comparison of identification with school and trust in teacher levels of students depending on "Do you do sports?" variance

		Do you do sports?	N	X	S.s	t	p
Identification With School Sub Dimensions	Belonging	Yes	215	14.81	4.060	2.395	.017*
		No	87	13.62	3.551		
	Dignification	Yes	215	16.00	3.461	1.429	.154
		No	87	15.41	2.776		
Identification with School General		Yes	215	30.82	6.406	2.302	.022*
		No	87	29.03	5.325		
Trust in Teacher General		Yes	215	38.84	10.659	.427	.670
		No	87	38.26	10.604		
Total			302				

p<0.05*

When Table 2 is examined, according to the responses given by the students participating in the study to the question of "Do you do sports?", there is a significant difference between the groups in favor of those who do sports in sub-dimensions of general identification with school (p <0.05).

Table 3. Comparison of identification with school and trust in teacher levels of students depending on "Whether the facility opportunities at your school are sufficient?" variance

		Are the facility opportunities at your school sufficient?	N	X	S.s	t	p
Identification with School Sub Dimensions	Belonging	Yes	63	16.00	3.667	3.518	.001**
		No	239	14.06	3.932		
	Dignification	Yes	63	16.26	2.886	1.174	.241
		No	239	15.72	3.379		
Identification with School General		Yes	63	32.26	5.298	2.876	.004**
		No	239	29.79	6.275		
Trust in Teacher General		Yes	63	44.25	8.515	4.855	.000***
		No	239	37.20	10.657		
Total			302				

p<0.01** p<0.001***

When Table 3 is examined, according to the answers given by the students participating in the study to the question of "Whether the facility opportunities at your school are sufficient?", there was a significant difference found between the groups in terms of belonging to the general school identification level and the sub-dimensions of identification with the school and general trust in teacher levels (p <0.05).

Table 4. Comparison of identification with school and trust in teacher levels of students depending on "Are the club activities at your school sufficient?" variance

		Are the club activities at your school sufficient?	N	X	S.s	t	p
Identification with School Sub Dimensions	Belonging	Yes	44	16.50	3.114	4.476	.000***
		No	258	14.12	3.980		
	Dignification	Yes	44	16.34	2.701	1.099	.272
		No	258	15.75	3.371		
Identification with School General		Yes	44	32.84	4.969	3.513	.001**
		No	258	29.87	6.246		
Trust in Teacher General		Yes	44	46.06	7.777	5.203	.000***
		No	258	37.41	10.547		
Total			302				

p<0.01** p<0.001***

When Table 4 is analyzed, according to the answers given by the students participating in the study to the question of "Whether the club activities in your school are sufficient?", there was a significant difference found between the groups in terms of belonging to the general school identification level and belonging to the school identification sub-dimensions and general trust in teacher (p <0.05).

Table 5. Comparison of identification with school and trust in teacher levels of students depending on school type variance

		School Type	N	X	S.s	f	p	
Identification with School Sub Dimensions	Belonging	[a]Anatolian High School	87	13.86	3.654	12.837	.000***	c>a,b,d b> d
		[b]Vocational/Technical High School	64	14.78	3.872			
		[c]Sports High School	71	16.60	4.015			
		[d]İmamHatipAnatolianHigh School	80	12.98	3.451			
	Dignification	[a]Anatolian High School	87	15.94	3.058	2.225	.085	
		[b]Vocational/Technical High School	64	16.04	3.025			
		[c]Sports High School	71	16.38	3.961			
		[d]İmamHatip Anatolian High School	80	15.07	2.971			
Identification with School General		[a]Anatolian High School	87	29.80	5.491	9.032	.000***	c>a,d b> d
		[b]Vocational/Technical High School	64	30.82	5.832			
		[c]Sports High School	71	32.98	7.053			
		[d]İmamHatip Anatolian High School	80	28.06	5.335			
Trust in Teacher General		[a]Anatolian High School	87	37.40	10.381	6.363	.000***	c> d b> d
		[b]Vocational/Technical High School	64	41.67	10.030			
		[c]Sports High School	71	41.23	11.231			
		[d]İmamHatip Anatolian High School	80	35.38	9.758			
Total			302					

p<0.001***

When Table 5. is examined, according to the answers given by the students to the question of school type, there was a meaningful difference found between the groups in terms of belonging to the general school and the dimensions of belonging to the school identification sub-dimensions and general trust in teacher (p <0.05).

Table 6. Correlation analysis that reflects the relationship between identification with school and trust in teacher levels of student

			Trust in teacher
Identification with School	r	1	.588
	p	-	.000***
	n	302	

p<0.001***

When Table 6 was examined, there was a positive meaningful relationship determined between the identification levels of the students participating in the study and their trust in teacher.

Table 7. Regression analysis that reflects the relationship between facility sufficiency at school club activities and trust in teacher levels of students

		Variances	Beta (ß)	S. Error	*t*	*F*	*p*	R^2
Independent Variance	Facility Sufficiency	FAC»TT	-,270	1,452	-4,855	23,570	.000***	.07
Dependent Variance	Trust in Teacher							
		Variances	Beta (ß)	S. Error	*t*	*F*	*p*	R^2
Independent Variance	Club Activities	CA»TT	-,288	1,663	-5,203	27,071	.000***	.08
Dependent Variance	Trust in Teacher							
p<0.001***								

In the Table 7, when the results of regression analysis considered; it was conducted to determine the effect of the students 'facility adequacy and teacher confidence levels at each other, it was found that the sufficient number of facilities in the school affects (R2 = .07) the teachers' confidence levels at a low but positive level (p <0.001). Similarly, when we consider another result, in the results of the regression analysis which was conducted to determine the effects of the students' club activities and teacher trust levels at each other; it was found that the sufficient number of club activities at the school affects (R2 = .08) the trust in teacher levels of the students at a low but positive level (p<0.001).

Table 8. Regression analysis that reflects the effect between facility sufficiency and club activities and identification with school levels of students

		Variances	Beta (ß)	S. Error	*t*	*F*	*p*	R^2
Independent Variance	Facility Sufficiency	FAC»IWS	-,164	,862	-2,876	8,271	.000***	.02
Dependent Variance	Identification with School							
		Variance	Beta (ß)	S. Error	*t*	*F*	*p*	R^2
Independent Variance	Club Activities	CA»IWS	-,170	,992	-2,990	8,939	.000***	.02
Dependent Variance	Identification with school							
p<0.001***								

When Table 8 is analyzed and considered, in the results of the regression analysis; it was done to determine the effect of the students' facility adequacy and school identification levels to each other, it was found that the number of facilities at the school has a low but positive effect (R2 = .07) on students' identification with the school (p <0.001). Similarly, when we look at another result, in the results of the regression analysis performed to determine the effect of the students' club activities and their level of identification with the school on each other, it was found that the sufficient number of club activities in the school affects (R2=.08) the students' identification level with school at a low but positive level (p <0.001).

DISCUSSION AND RESULT

In this part, it will be tried to explain the results of this study conducted in order to examine the level of identification with the school and confidence in the teacher according to the level of high school students' participation in sports activities and the results of other studies in the literature.

According to the answers given by the students who participated in the research to the question of "Do you do sports?" there was a significant difference found between the groups in favor of those who do sports. In the studies conducted, many positive features such as academic achievement, motivation, self-efficacy perception, participation in the school, positive interpersonal relationships, satisfaction with the school, feeling happy in the school, and looking positive in the future are affirmative; Many negative characteristics such as dropout, anxiety, bullying, alienation to school, depression, sadness, jealousy and loneliness have been found to be negatively related (30). In order to gain these positive and negative behaviors on students, we can say that it is possible to have students do sports and thus increase the identification of students with the school.

According to the answers given to the question of whether the facility opportunities of the students participating in the research, which are the other variables of our study, are sufficient, there is a significant difference between the levels of belonging to the general school and the dimensions of belonging to the school and the levels of belonging to the general teacher and the level of general trust in teacher, According to the answers, there was a significant difference between the groups in terms of the level of identification with the general school and the dimensions of belonging to the sub-dimensions of identification with the school, and the levels of general trust in teacher. When these two variables are examined, we can say that there are sufficient facilities in schools and that club activities in schools are sufficient, that students' identification with school and their trust in teachers will increase.

In another result of our study, according to the answers given by the students who participated in the study to the question of school type, a significant difference was found between the groups in terms of belonging to the general school and the dimensions of belonging to the sub-dimensions of identifying with the school and the level of trust in the general teacher. When we consider the results of our study, we can say that sports high school students are identified with school and their trust in teachers is higher than other schools. When the literature is examined in the body of literature; Dundar (11) found some differences between schools in his study of middle school students' level of identification with the school and their perceptions of trust in teachers. Gedik (15) reached out to a result that Anatolian high school students became more alienated from school than general high school and vocational high school students. It is possible to say that this result is similar to the result obtained from this research. It is because the opposite of the concept of alienation to school is identification with school (11). When the studies on school commitment were examined in the literature, a significant difference was found between academic success and school commitment (3, 16, 21). Some research findings (4, 6, 10, 34, 36), which are related to the reasons for the students to prefer Imam-Hatip high schools, have the majority of students enrolled in these schools and they have a view of Imam-Hatip high schools. Their angles are positive. It can be thought that this situation may have positive effects on students' sense of belonging to the school (11). Based on this situation, we can say that students in sports high schools prefer education in sports high schools and even take a talent exam to win their schools. In addition to this, we can say that students studying in sports high school usually stay in boarding schools and training in schools outside their classes is another effect. Again, we can explain the reason why the students in sports high schools have high trust in teacher, it is because of their teachers are not only the teachers but also the coaches of them.

As it can be seen in the 6th table of our study, a positive and significant relationship was determined between the students' level of identification with the school and their level of trust in the teacher. When the correlation coefficients in the study of Dundar (11) about; secondary school students' level of identification with the school and their perceptions of trust in the teacher are examined, it is seen that there is a positive and high level relationship between trust with the teacher and school identification. When the t-test results related to the significance of the regression coefficients are examined, it is seen that the teacher confidence variable is a significant predictor of identification with school. The result of this conducted study is in the quality of supporting of our study.

Consequently, the fact that students have a trust and good communication manner with their teachers can emerge not only in class settings but also in social and cultural sharing. Furthermore, it is surely the priority of all educators that students adopt educational institutions and spend time in a useful and meaningful way in educational institutions as much as possible. It is thought that conducting various activities in the social and cultural sense through clubs, organizing activities that will benefit the students to socialize, may cause students to connect to more schools and to spend more time in their schools. It can be said that this can increase students' success levels and impact teachers' job satisfaction significantly.

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Self-Handicapping and Self-Esteem Levels of Taekwondo Referees

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Abstract

This study investigated the self-handicapping and self-esteem levels of taekwondo referees. The population was consisted of 437 Taekwondo referees which serve as official referees in the Turkish Taekwondo Federation and the study group was consisted of 82 active referees (female=36, male=46). Data were collected by inviting the referees to take part in the study during the Turkish Taekwondo Championships held in different cities. All the necessary written permissions including the ethics approval and permission from the central referee committee were obtained. Hitit University Ethics Committee approved the study. The volunteers were asked to give written consent. Statistical analyses were held by using independent samples t test, one-way ANOVA, Tukey HSD as post-hoc and Pearson's r. The level of significance was predetermined as .05 for all statistical analyses. To collect data, self-esteem scale by Rosenberg and self-handicapping scale by Rhodewalt were used. The scales' Turkish adaptations were done by Tukuş and Akin, respectively. Statistical analyses revealed that taekwondo referees' self-handicapping scores were high and self-esteem scores were moderate. The referees' self-handicapping scores were not significantly different by any variable. A significant difference in self-esteem scores by the place of residence was observed. It is concluded that additional researches should be done to set out the reasons for the high self-handicapping scores of taekwondo referees.

Keywords: Competition, sports, self-respect

INTRODUCTION

In today's modern world, as almost every aspect of human life, sports have become more specialized and this specialization that initialized by Japanese martial arts Judo, Kendo and Karate was followed by Korea's Muay Thai, China's Wushu and Korea's Taekwondo. However, among these specialized sports, Taekwondo has become the most popular martial art in the world (3) and today it has a world federation with 209 member countries (51). Taekwondo, a very popular and well-known sport in the world, is also popular in Turkey and according to the data abtained from the Ministry of Youth and Sports, Taekwondo is the sport that has the third-largest number of (85,404 licensed) athletes following football and chess (45).

As in every sport, the main goal in Taekwondo is to win the competition by fair-play and be successful. For a fair competition, a fair referee is essential, and in Taekwondo the referee is the authority that rules the competition by following the regulations set and determines the winner of the competition (50).

As the most powerful official in the competition, the referee must be self-confident, consistent, determined, calm under pressure and fully motivatied (47). Athletes, coaches, spectators, and federation officers expect the referee to be fair

and unbiased, and along with these, the referee should make decisions without errors. These high expectations increase the load in referees' shoulders.

The concept of self-handicapping can be explained as a strategy of voluntarily creating reasons for failure in order to protect self-esteem to stay away from the consequences of a potential failure, and individuals who feel a potential failure may tend to create situations that lead them to fail (12, 32). This strategy allows the person to internalize success and externalize failure (1) because the person himself/herself creates potential situations that may be the reason for his/her failure, but if (s)he is successful, (s)he will think that (s)he does not need to strive to be successful; if (s)he fails, the artificially-created reason will help him/her to reach a conclusion that the success was impossible due to the reason that can not be controlled by him/her and by doing so, (s)he will protect self-esteem in both cases (4, 10).

Self-esteem can be defined as the subjective assessment of the emotions that the individual feels (17). Self-esteem can also be expressed as all of the person's positive evaluations towards himself/herself, and high self-esteem includes the individual's view about himself/herself as valuable (2). Self-esteem that has various components is influenced by some factors such as feeling valuable, being successful, having social acceptance, and accepting himself/herself as is (38).

The concept of self-esteem is often associated with the concept of self-handicapping, but the direction of the relationship of these concepts is not clear. Some studies have found that these concepts have positive correlations (11, 16, 39), and individuals with high self-esteem has a tendency to use self-handicapping strategies (33).

Literature search revealed that the number of studies on referees' self-handicapping and self-esteem levels is limited and there is no study on Taekwondo referees' self-handicapping or self-esteem levels. As far as our knowledge, the current research is the very first one to examine the self-esteem and self-handicapping levels of Taekwondo referees. Because of its uniqueness, the current study is considered to be important for contributing to the literature. Tthis study was designed and executed to assess active Turkish Taekwondo referees' self-handicapping and self-esteem levels.

MATERIAL & METHOD

At the time of the study, 437 referees who were registered at the Taekwondo Federation and completed their visa procedures were the population and the sample (n=82) chosen from the population had the power to represent the population (for q=.5; d=.1; t=1.96, calculated n=79) (52). Participants who were referees during Taekwondo Championships in Turkey, were invited to take part in the study.

Volunteers were asked to sign the written consent form and no volunteers were included in the study unless the consent was signed. Ethics Committee approval was obtained from Hitit University Ethics Committee (2019-135) prior to the study and written permission was obtained from Taekwondo Central Referee Committee.

Rosenberg's (41) 10-item self-esteem scale and Rhodewalt's (40) 25-item self-handicapping scale were used as data collection tools. Turkish adaptation along with the validity and reliability study for the self-esteem scale was conducted by Tukuş (44). Self-handicapping scale was adapted into Turkish by Akin (5).

Correlation coefficients between the items in the self-handicapping scale were found between .69 and .98. Exploratory factor analysis results revealed that the 25-item scale explained 32% of the total variance and the items were pooled in one dimension. It was found that factor loads of the scale ranged between .34 and .69, and item total correlation scores ranged between .30 and .63. The results of the confirmatory factor analysis suggested that the one-dimensional model fit well (RMSEA=.037, NFI=.98, CFI=.99, IFI =.99, RFI=.97, GFI=.97, AGFI=.94). Internal consistency reliability coefficient of self-handicapping scale is .90 and test-retest reliability coefficient is .94 (4). The score to be obtained from the self-handicapping scale varies between 0 and 125 and its median value is around 60 (40).

Internal consistency of the self-esteem scale was analyzed and positive, negative and total Cronbach Alpha values were found to be .875, .853, and .897, respectively (44). The lower and upper limits of the self-esteem scores are 10 and 40. High scores indicate that the self-esteem is high and low scores indicate that the person has low self-esteem (41).

Data analysis were done by using SPSS 22.0 (IBM, USA; Licensed to Hitit University) commercial software. The average and standard deviation (SD) values were shown in the text as Mean±SD.

To select appropriate statistical methods, the data were first analyzed whether the distributions of the data met the normality assumption. Shapiro-Wilk (S-W) test and Q-Q Plot graph were used to assess normality. Parametric tests were used since it was seen from the Q-Q Plot and S-W results (p>.05) that the data fit the normal distribution.

Differences between two independent groups were analyzed by independent samples t test and multiple group comparisons were conducted by using one-way ANOVA. Tukey HSD was used as the post-hoc test since it was observed that the variances were equal. Pearson's r was used to examine the relationship and direction between the variables. In all statistical analyses p was set at .05.

RESULTS

In this study, 82 referees who were active referees in Turkish Taekwondo Federation participated voluntarily. Forty-six of the participants were men (age:35.61±9.16 years) and 36 were women (age: 29.19±7.40 years). Table 1 depicts the descriptive statistics of the participants. More than 34% (n=28) of the participants were married and the others (n=54; 65.8%) were single.

Table 1. Frequency and percentages of the variables.

Variable		*f*	%*
Sex	Male	46	56.1
	Female	36	43.9
Marital status	Married	28	34.2
	Single	54	65.8
Level of education	High school	25	30.5
	Associate	16	19.5
	Bachelor's	37	45.1
	MS's or PhD	4	4.9
Profession	Official	30	36.6
	Worker	9	11.0
	Retiree	3	3.7
	Self employed	16	19.5
	Student	15	18.3
	Unemployed	9	11.0
Level of monthly income	Below 2020 TL	25	30.5
	2020-3500 TL	18	22.0
	3501-5000 TL	30	36.6
	5001-7000 TL	9	11.0
Place of residence	Town	24	29.3
	Province	31	37.8
	Metropolis	27	32.9
Level of proficiency in English	None	18	22.0
	Elementary	10	12.2
	Intermediate	35	42.7
	Upper intermediate	12	14.6
	Advanced	7	8.5
Referee category	Candidate	31	37.8
	Regional	25	30.5
	National	22	26.8
	International	4	4.9
Experience (yrs)	Less than 1	25	30.5
	1-3	14	17.1
	4-6	3	36.6
	7-9	33	40.2
	10 and over	7	8.5

** Notice that subgroup totals may differ from 100 since the calculated figures were rounded to the nearest decimal.*

About 70% of the participants had bachelor's degree; 30% of the participants did not have regular income and the rate of referees who did not speak English was 22%. Only 4 (4.9%) of the referees participated in the study were international referees. The number of national referees was 22 (26.8%) and the number of regional referees was 25 (30.5%). When the years of experience was inspected, it was seen that approximately half (47.6%) of the participants had 3 years or less and the rest (52.4%) had 4 years or more experience.

Table 2. Descriptives of self-handicapping and self-esteem scale scores

	Self-esteem scale score	Self-handicapping scale score
n	82	82
Mean	24.96	73.82
Median	25.0	74.0
Standard deviation (*SD*)	2.91	8.58
Minimum	18.0	56.0
Maximum	32.0	89.0

Table 2 shows the descriptive statistics of the subjects' self-esteem and self-handicapping scores. Self-esteem scores of the subjects ranged between 18 and 32 (24.96±2.91) and the median value was 25 which was very close to the average. The examination of self-handicapping scores revealed that the scores were varied between 56 and 89 (73.82±8.58) and the median value was 74.

Table 3. Analysing the scale scores by independent samples *t* test.

Scale	Category	*n*	Mean	*SD*	*t*	*df*	*p*
Self-esteem scale	Male	46	25.07	2.64	0.356	80	.72
	Female	36	24.83	3.26			
	Married	28	25.57	8.60	1.369	80	.18
	Single	54	24.65	8.64			
Self-handicapping scale	Male	46	73.24	8.78	-0.584	80	.56
	Female	36	74.44	8.39			
	Married	28	73.36	8.60	-0.348	80	.73
	Single	54	74.06	8.64			

Gender and marital status variables did not significantly affect the scores received from the scales (p>.05) (Table 3). In Table 4, the results of the one-way ANOVA test were summarized. According to the table, it was found that the place of residence variable had a statistically significant effect on self-esteem scores (p<.01) but other variables did not have any significant effects. The scores obtained from the self-handicapping scale were not affected by any variable (p>.05).

Table 4. Multiple group comparisons by *ANOVA*.

		Self-esteem scale					Self-handicapping scale			
		df	Sum of squares	Mean square	*F*	*p*	Sum of squares	Mean square	*F*	*p*
Level of education	*BG*	3	5.34	1.781	0.204	.89	188.54	62.845	0.850	.47
	WG	78	681.55	8.738			5769.72	73.971		
	Total	81	686.89				5958.26			
Referee category	*BG*	3	37.20	12.399	1.489	.22	378.92	126.307	1.766	.16
	WG	78	649.69	8.329			5579.34	71.530		
	Total	81	686.89				5958.26			
Experience (yrs)	*BG*	4	33.42	8.356	0.985	.42	667.44	166.859	2.428	.05
	WG	77	653.47	8.487			5290.82	68.712		
	Total	81	686.89				5958.26			
Profession	*BG*	5	7.50	1.499	0.168	.97	399.61	79.921	1.093	.37
	WG	76	679.39	8.939			5558.65	73.140		
	Total	81	686.89				5958.26			
Level of monthly income	*BG*	3	20.82	6.939	0.813	.49	124.94	41.647	0.557	.65
	WG	78	666.07	8.539			5833.32	74.786		
	Total	81	686.89				5958.26			
Place of residence	*BG*	2	77.06	38.527	4.991	.01*	65.80	21.934	0.290	.83
	WG	79	609.83	7.719			5892.46	75.544		
	Total	81	686.89				5958.26			
Proficiency in English	*BG*	4	35.35	8.837	1.044	.39	227.34	56.834	0.764	.55
	WG	77	651.54	8.462			5730.92	74.428		
	Total	81	686.89				5958.26			

** p<.01; BG: between groups; WG: within groups*

Tukey HSD was used as the post-hoc test to determine which pairs caused the significant difference by the place of residence on self-esteem scale scores. The results revealed that the difference was between the town and the province [F(2)=4.991; p=.01]. Self-esteem score obtained by the subjects living in the town was 26.25±2.57 while the score of the subjects living in the province was 23.87±2.47 (Table 5).

Table 5. *Post-hoc* test (Tukey *HSD*) results for the Place of Residence variable.

Place of residence		Mean±*SD*		Mean difference	*SE*	*p*
Town	Province	26.25±2.57	23.87±2.47	2.37903	0.75542	.01*
	Metropolis	26.25±2.57	25.07±3.25	1.17593	0.77945	.29
Province	Metropolis	23.87±2.47	25.07±3.25	-1.20311	0.73138	.23

** p<.01; SE: standard error*

Pearson's correlation coefficient was used to examine the level of correlation between self-esteem and self-handicapping scores. As a result, a negative, weak but statistically significant relationship was found between the scores obtained from the scales (r=.25; p=.02) (Table 6).

Table 6. Correlation between self-esteem and self-handicapping scores.

		Self-handicapping score
Self-esteem score	Pearson's *r*	-,25
	p	,02*
	n	82

** p<.05*

DISCUSSION

One of the critical components of a sporting event is the decisions of the referee, who has the superior power over the competition (14). In Taekwondo, the winner is determined according to the decisions of the referee. So, the level of stress of the competition affects the performance of the referee, and if the referee feels himself/herself under intense stress, (s)he can use self-handicapping strategies to protect his/her self-esteem (39). When self-handicapping and self-esteem levels of Taekwondo referees participated in the current study were assessed, a negative and weak, but statistically significant relationship between Taekwondo referees' self-handicapping and self-esteem scores was found. As the self-esteem scores of Taekwondo referees decrease, self-handicapping points increase, vice versa.

Literature review revealed that the number of papers that studied referees' self-handicapping and self-esteem levels found to be limited. Most of the researchess were carried out to dealt with athletes self-handicapping (18, 19, 26, 35) and self-esteem (21, 22, 34, 36). Only four studies examining the self-handicapping levels of the referees were found but only one of them included self-esteem and that study was done by the participation of badminton referees (30). It was seen that the other studies were conducted on football referees (27), wave surf referees (29), and curling referees (28). As far as our knowledge, the current study is the first study on Taekwondo referees' self-handicapping and self-esteem levels.

Taekwondo referees' self-handicapping mean score was calculated as 73.82±8.58 (median=74). In a study, football referees' self-handicapping scores were found to be 50.39±12.61 and the median was 51 (27). Wave surf referees' self-handicapping scores were 41.84±13.22 and the median was 38 (29). Curling referees' self-handicapping scores were found to be 46.6±11.45 and the median value was 48 (28). Badminton referees' self-handicapping scores were 45.48±13.5 and the median was 45 (30). When compared to the mean self-handicapping values from the other studies, Taekwondo referees' self-handicapping scores were relatively higher. It was thought that Taekwondo differed from the other sports by its category as being a combat sport and that may be the reason for the difference. As the athletes move very fast in combat sports and the number of the techniques performed per unit time is high when compared to the non-combat sports, the concentration and effort levels of the referees during the competition may be higher than the referees in other sports. Therefore, the referees may use self-handicapping strategies more to protect their self-esteem in case of a potenial error. The median value of self-handicapping scale scores was reported

earlier to be around 60 (40). The median value of the Taekwondo referees' self-handicapping scores (median=74) was over the value reported by Rhodewalt (40). It can be said that both mean and median self-handicapping scores of Taekwondo referees are higher than the referees in other sports reported by the previous studies.

Taekwondo referees' self-handicapping and self-esteem scores were examined by gender, marital status, level of education, referee category, years of experience, profession, level of monthly income and level of proficiency in English. No statistically significant differences were observed between those groups. Self-handicapping scores did not differ by the place of residence but there was a difference in self-esteem scores. It was found that self-esteem scores of the participants who lived in towns was higher than the scores of those who lived in cities. In contrast, badminton referees' self-esteem scores were found not to be affected by the place of residence (30). It was thought that the reason of the difference found in the current research should be studied in the future researches.

Self-esteem is the person's attitude towards himself and this attitude can be realized either positively or negatively (41). In the studies self-esteem was examined, some reported that gender had no effect on self-esteem scores (15, 48) while some claimed that gender had an effect on self-esteem scores (23). The results of the current study revealed that Taekwondo referees' self-esteem scores did not differ significantly by gender. Although there is no agreement on whether gender had an effect on self-esteem scores, the reason of the difference found in the current study was that the subjects took part in different studies may have different social values.

Studies examining the relationship between self-esteem and self-handicapping were found in literature but these studies were generally conducted on teachers, students and academic staff (7, 13, 15, 17, 37, 43, 49). Ferradas et al. (17), in which self-esteem and self-handicapping levels of higher education students were examined, reported that self-handicapping levels were increased as the self-esteem levels were decreased. Results of the current study revealed that there was a negative and significant relationship between Taekwondo referees' self-esteem and self-handicapping scores. These results are in line with the literature.

It was found that level of education or monthly income of the subjects did not affect self-esteem and self-handicapping scores of the Taekwondo referees. Previous studies reported that there was a positive correlation between self-esteem scores and level of education (6, 42). Self-esteem was known as the basic reaction of human beings (8) and there are two dimensions of self-esteem as self-efficacy and self-respect which have interaction with each other (9). The results obtained from the current study were not consistent with the information in the literature. It was thought that the reason may have been due to the Taekwondo referees' relatively high self-esteem scores that was caused by the referees' high self-efficacy and self-respect feelings.

The place of residence variable was found to have a statistically significant effect on the Taekwondo referees' self-esteem scores. It was observed that self-esteem scores of the subjects who lived in town were higher than their counterparts who lived in provinces. The reason to this may be that the subjects living in the provinces have a different life style and social environment than the subjects live in towns, but more research is needed to better understand this situation.

It was previously reported that perfectionist individuals had a low level of satisfaction with their performance (32) and felt higher levels of stress (31). Because perfectionist individuals have higher fear of failure (20), these individuals may have a higher tendency to use self-handicapping strategies (25). Self-handicapping levels of Taekwondo referees were found to be above the average values mentioned in the literature. In Taekwondo, which is a combat sport, athletes move so fast that scores can be obtained by applying combined technical hits and counter attacks in a very short time. These fast movements force the referees to be very careful and focused during the competition. One of the reasons that Taekwondo referees' self-handicapping scores were found to be above mean values may be caused by the inability to maintain the attention and focus required.

Erroneous decisions can be made during the fight of the athletes, or an athlete may be rewarded points by mistake. Referees who are aware of this situation may tend to use self-handicapping strategies to protect their self-esteem. On the other hand, high self-handicapping scores may also be due to Taekwondo referees having a perfectionistic personality. It is also known that people may use

self-handicapping strategies to protect self-esteem and to manipulate perceptions of individuals about themselves (24, 46). Therefore, it is concluded that further studies are needed in order to reveal the reasons of self-handicapping of Taekwondo referees.

According to the results of the current study, Taekwondo referees' self-handicapping scores were high and self-esteem scores were moderate. The self-handicapping scores of the referees differed by none of the variables measured. It was found that there was a significant difference in self-esteem scores only by place of residence.

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The Relationship Between Cognitive Flexibility and The Meaning of Life: A Research on The Students of The Faculty of Sport Sciences

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Abstract

Aim: The aim of this study is to investigate the relationship between cognitive flexibility and meaning of life levels of students studying in the faculty of sports sciences. Method: The research was conducted on 2018-2019 SUBU Faculty of Sport Sciences students using relational screening model. A total of 152 students, 44 females and 108 males, selected by simple sampling, participated in the research. As a data collection tool, "Cognitive Flexibility Scale" developed by Bilgin (2009a), "Meaning of Life Scale" developed by Steger, Frazier, Oishi and Kaler (2006) and translated by Demirdag and Kalafat (2015) and "Personal Information Form" were used. Parametric tests were applied to the data showing normal distribution. Data were analyzed using descriptive statistics, independent groups t-test and Pearson correlation analysis. Findings: The students' cognitive flexibility and meaning of life subscale scores did not differ significantly according to gender and sporting status (p> .05). There was no significant relationship between cognitive flexibility scores and age of students (p> .05). There was a positive correlation between age and existing meaning (p <.05), but there was no significant relationship between age and meaning (p> .05). Conclusion: While there was a positive correlation between cognitive flexibility scores and existing meaning (p <.05), there was no significant relationship between cognitive flexibility scores and wanted meaning (p> .05).

Keywords: Cognitive flexibility, meaning of life, student

INTRODUCTION

Cognitive approaches have shown that cognitions affect emotions. In this context, it is possible to say that the way of thinking away from cognitive flexibility causes negative emotions and causes these emotions to be experienced more intensely (15). Hence, when we consider this explanation, an individual who has a low level of cognitive flexibility may experience negative emotions intensely and this can cause negative thoughts about the meaning of life. Deffenbacher (11) states that when cognitive structures are based on flexible and personal preferences, threat, frustration and even less anger are felt even in the case of a challenge. On the other hand, when the cognitive structures are strict and far from flexible,

anger is felt more intensely, and behaviors are more likely to be more aggressive. This explains the relationship between cognitive flexibility and the meaning of life.

Beck (3), one of the founders of cognitive theory, stated that cognitive theory's approach to psychological disorders developed because of depression. According to him, individuals who are depressed deal with themselves, their environment and the future from a strict and negative point of view. According to the cognitive model, dysfunctional thoughts are at the root of psychological disorders and affect these behaviors (cited: 9). In this context, if the individual's thought structure is far from flexible, then dysfunctional cognitive structures such as intermediate beliefs, basic beliefs, automatic thoughts and schemas occur (4). In this case, the cognitive structures that occur can determine the meaning that an individual puts on life.

Frankl evaluates the concept of meaning of life in a subjective dimension and according to him, the meaning of life is different for each individual (17). As a matter of fact, life means the responsibility to find the right solutions to the problems and to carry out the duties that exist continuously for each individual. The meaning of life varies from person to person for these tasks and reasons. In this context, it is impossible to define the meaning of life in general terms (17). There are many different views on the meaning of life in the literature. Klinger (21) listed the characteristics of personal development, interpersonal relationships, success and leaving traces in life as the basis of the meaning of life (cited: 24). According to another view, the meaning of life serves some functions in human life. The meanings, first of these functions, provide a reason for human to live and thus actions are guided by meaning. This provides the control function for events in life. Finally, the meanings help the self-value to form. Thus, when people find meaning in their lives, emotional problems are solved and life gets more meaningful (10).

Considering the healing and positive effects of sport in psychology and mental states, it can be said that there is a relationship between sport and cognitive flexibility and meaning of life. Technological developments have enabled people to acquire new fields of activity that will make their lives meaningful. In this context, Adler (1) stated that an individual who wants to carry out an activity in accordance with the meaning of life and spends all his perseverance and effort for this cause will be in good physical and mental condition for his activity. As can be understood, the meaning of life is related to the goals set and whether these goals are realized or not. In this case, it is possible to talk about sports. Because there are goals that require continuity in sports. In other words, in order to be successful in competitions in a sports branch, continuous training is required. The athlete makes the same preparation for each contest. In this case, there is a new goal expected for each competition. Achieving this goal can enable the individual to have a positive view of the meaning of life. Likewise, when cognitive flexibility and sport relationship is examined, cognitive flexibility requires making new strategic decisions for each situation encountered. In this case, the athlete responding to each position in a competition by developing new strategies explains the relationship between sports and cognitive flexibility.

It is thought that there is a relationship between cognitive flexibility and meaning of life in terms of the meaning an individual derives from his/her life and the way s/he evaluates events. Because the way and individual evaluates the situation in the face of a problem may make that individual look at life more positively and moderately. From this point of view, cognitive flexibility means that the individual is aware of the options and appropriate alternatives for solution in the face of the problem or event and feels competent in being flexible against these problems (22). In other words, the decision made by the individual in the face of a problem by minimizing the negative aspect of the event may affect the process of making sense of an individual's life. Because the meaning of life is a motivational goal-oriented broad concept that includes cognitive components and emotional components (14, 25).

The aim of this study, based on the explanations made in the light of literature, is to investigate the relationship between cognitive flexibility and the meaning of life of students studying in the Faculty of Sports Sciences.

METHOD

Research Model

This research was carried out using "the relational screening model". The relational screening model is "a research model aiming to determine the

existence and/or degree of joint change between two and more variables" (20).

Population and Sample of the Research

The population of the research consists of students of Sakarya University of Applied Sciences, Faculty of Sport Sciences. The sample of the study consisted of 152 sport sciences students (44 female and 108 male) who were selected from the population with convenience sampling method. Convenience sampling is "the fastest and cheapest way to obtain data" (19).

Data Collection

The data of this research was obtained from the personal information form and measurement tools applied to the students studying in the Faculty of Sports Sciences of Sakarya University of Applied Sciences in March and April of the spring semester of 2018-2019 academic year. While collecting the data, the curriculum was followed in order not to hinder the students' lessons and the data was collected in a way that did not prevent the course flow by informing the responsible instructor of each course in advance. While collecting the data, the principle of voluntary participation of students was taken into consideration.

Data Collection Tools

In the research, "Personal Information Form", "Cognitive Flexibility Scale" and "Meaning of Life scale" were used as measurement instruments.

Personal information form

"Personal Information Form" was prepared in order to determine the demographic information of sports science students. In the personal information form, it is aimed to reach information such as age, gender, sports status of the students.

Cognitive Flexibility Scale

"Cognitive Flexibility" scale, which was used in the research, was developed by Bilgin (6). The scale consists of 19 items. The scale items consist of adjective pairs (for example, "I can, I cannot", I am successful, I am unsuccessful"). The scores obtained from the scale vary between 19-95. The increase in the scores obtained from the scale shows that the individual approaches the cognitive flexibility more. In the reliability studies conducted on the scale, the Cronbach's alpha coefficient for the whole scale was found to be .92 (6). As a result of the current research, the Cronbach's alpha coefficient of the measurement tool was found to be .92.

Meaning of Life Scale

The "Meaning of Life" scale used in the study was developed by Steger Frazier, Oishi and Kaler (28) and the Turkish adaptation was made by Demirdag and Kalafat (13). 9 items consisted of positive items (items 1, 2, 3, 4, 5, 6, 7, 8 and 10), and 1 item consisted of negative item (item 9). The scale consists of two sub-dimensions: the existing meaning in life (1, 4, 5, 6 and 9) and the search for meaning in life (2, 3, 7, 8 and 10). The score that can be obtained varies between 7 and 70. The highest score obtained from the scale indicates that the individual has a high level of meaning of life. After adapting the scale to Turkish, Cronbach's alpha coefficient was found to be .81 for the existing meaning in life sub-dimension and .85 for the search for meaning in life sub-dimension. As a result of the current research, the Cronbach's alpha coefficient was found to be .69 for the existing meaning in life sub-dimension of the measurement tool and the Cronbach's alpha coefficient was .83 for the search for meaning in life sub-dimension.

Data Analysis

Within the scope of the research, the raw data collected from the students were checked one by one in order to prevent possible errors and to be made ready for analysis, and the questionnaires that gave incomplete, incorrect and inconsistent answers were excluded from the analysis. It was subjected to normality test before deciding the analysis to be applied to the data. In the normality test, skewness and kurtosis values of the data were examined. As a result of the statistical process, it was found that the data were in the range of -2…. + 2. It can be stated that these values are suitable for normal distribution (18). Parametric tests were preferred because the data showed normal distribution. Descriptive statistics, independent groups t-test, one-way analysis of variance and Pearson correlation analysis were used to evaluate the data in general. Significance level was taken as .05. The data were analyzed by SPSS package program.

FINDINGS

Table 1. Percentage and frequency distributions related to demographic characteristics of the students

Gender	n	%
Female	44	28,9
Male	108	71,1
Sporting status	n	%
Doing sports	117	77,0
Not doing sports	35	23,0

Table 1 shows the distribution of demographic characteristics of students participating in the research. 44 (28.9%) of the students were female; 108 (71.1%) were male. When the sports status of the students was examined, 117 (77.0%) of them were doing sports; 35 (23.0%) of the students were not doing sports.

Table 2. The comparison results of the cognitive flexibility scores of the students who participated in the research according to gender

	Gender	n	$\overline{X}$	ss	sd	t	p
Cognitive Flexibility	Female	44	76,90	15,59	150	-,53	,59
	Male	108	78,18	12,24			

Table 2 shows the results of the independent groups t-test used to compare the cognitive flexibility scores of the students according to gender. The results of the analysis show that the cognitive flexibility scores of the students do not differ according to gender (p> .05).

Table 3. The comparison results of the cognitive flexibility scores of students participating in the research according to their sporting status

	Sporting status	n	$\overline{X}$	ss	sd	t	p
Cognitive Flexibility	Yes	117	78,80	12,90	150	1,68	,09
	No	35	74,51	14,09			

Table 3 shows the results of independent groups t-test used to compare the cognitive flexibility scores of the students according to their sporting status. The results of the analysis show that the cognitive flexibility scores of the students did not differ according to their sporting status (p> .05).

Table 4. The comparison results of the meaning of life sub-dimension scores of the students participating in the research according to gender

	Gender	n	$\overline{X}$	ss	sd	t	p
The existing meaning in life	Female	44	27,41	4,36	150	,70	,48
	Male	108	26,78	5,30			
The search for meaning in life	Female	44	26,57	6,04	150	,15	,87
	Male	108	26,40	5,95			

Table 4 shows the results of independent groups t-test used to compare the meaning of life sub-dimension scores of students according to gender. The results of the analysis show that students' meaning of life sub-dimension scores did not differ according to gender (p> .05).

Table 5. The comparison results of the meaning of life sub-dimension scores of the students participating in the research according to their sporting status

	Sporting status	n	$\overline{X}$	ss	sd	t	p
The existing meaning in life	Yes	117	27,03	5,13	150	,32	,74
	No	35	26,71	4,77			
The search for meaning in life	Yes	117	26,66	5,78	150	,79	,42
	No	35	25,74	6,55			

Table 5 shows the independent groups t-test results used to compare the meaning of life sub-dimension scores of students according to their sporting status. The results of the analysis show that students' meaning of life sub-dimension scores did not differ according to their sporting status (p> .05).

Table 6. The results of the relationship between age and cognitive flexibility and meaning of life sub-dimension scores of students

		Cognitive flexibility	The existing meaning in life	The search for meaning in life
Age	r	-,029	,195	-,088
	p	,722	,016*	,279

Table 6 shows the Pearson correlation analysis showing the relationship results between students' age and cognitive flexibility and meaning of life sub-dimension scores. The results of the analysis show that there is a statistically significant relationship between students' ages and the existing meaning in life (r = .195; p <.05). On the other hand, no statistically significant relationship was found between age and cognitive flexibility (r = -. 029; p> .05) and the search for meaning in life (r = -. 088; p> .05).

Table 7. The results of the relationship between cognitive flexibility scores and meaning of life sub-dimension scores of the students participating in the research

		The existing meaning in life	The search for meaning in life
Cognitive flexibility	r	,295	,127
	p	,000**	,120

Table 7 gives the Pearson correlation analysis showing the relationship between the students' cognitive flexibility scores and meaning of life sub-dimension scores. The results of the analysis showed that there was a statistically significant relationship between the cognitive flexibility scores of students and the existing meaning in life (r = .295; p <.01). On the other hand, there was no statistically significant relationship between cognitive flexibility and the search for meaning in life (r = .127; p> .05).

DISCUSSION AND CONCLUSION

The aim of this study was to investigate the relationship between cognitive flexibility and the meaning of life of students studying in faculty sports sciences.

With the result of the analysis of gender variable in the study, it was found that cognitive flexibility scores did not show significant differences according to gender (p> .05). Related to the result, looking at Bilgin's (7) definition of cognitive flexibility, it was stated that cognitive flexibility was a feature acquired through interpersonal relationships and this feature was mostly influenced by age, experience and parental attitudes. From this point of view, in terms of the results achieved, cognitive flexibility, regardless of gender, is a feature that we gain through our experiences and the ideas, cognitive schemes, beliefs and thoughts we gain as a result of these experiences. Therefore, when the basis of these features is considered as the experiences and the emergence of new ideas against these experiences, it can be said that this situation is not related to the gender factor. Parallel to the results obtained from the researches in the literature, Diril (15) concluded that there was no significant relationship between gender and cognitive flexibility in his study with high school students. In another study conducted on university students, it was concluded that cognitive flexibility did not differ according to gender variable (35). In another finding, differently, Öz (23) concluded that there was no significant difference in cognitive flexibility according to gender.

With the result of the analysis of sporting status variable, it was found that there was no significant difference in cognitive flexibility scores according to sporting status (p> .05). As a reason

for this situation, Canas el at. (8) states that cognitive flexibility is the ability to regulate information processing strategies to meet new and unexpected situations around them. In other words, cognitive flexibility is related to learning processes and gained through experience. In this context, considering that cognitive flexibility develops over time, doing sports takes a short period of time in daily life and the situations encountered while doing sports may be limited. This may not be enough to gain cognitive flexibility. Scanning the literature, there are a limited number of studies examining the relationship between cognitive flexibility and sports. In contrast to the results, Yavuz (33) examined the resilience and cognitive flexibility levels of physically disabled athletes and found that cognitive flexibility levels of disabled individuals who are national athletes were higher than other athletes. The effect of sport on cognitive development was emphasized.

With the result of the analysis examining the meaning of life sub-dimensions according to gender variable, it was concluded that the meaning of life sub-dimension scores of students did not differ according to gender (p> .05). As a reason for this situation, Frankl (17) touched on situations such as protected images, religion, sense of humor, future expectation, goal, expectation from life, leaving a mark on life and living the nature and culture in order to give meaning to life. From this point of view, the idea that the individual has formed about the meaning of life can occur as a result of the above-mentioned situations regardless of gender. In their study, related to the results, Demir and Murat (12) concluded that there was no significant difference between the gender variable and the meaning of life. In another study, Steger and Kashdan (29) concluded that there was no significant difference between the gender variable and the meaning of life. Unlike the results, Taş (30) found that there was no significant difference in terms of the existing meaning in life according to the gender variable, whereas men sought more meaning in terms of the search for meaning in life than women. In another study, Bektaş (5) found that the mean score of women was significantly higher in the existing meaning in life sub-dimension, a sub-dimension of meaning of life, compared to men.

With the result of the analysis where the meaning of life sub-dimensions were examined according to the sports status, it was concluded that the meaning of life sub-dimension scores of students did not differ according to the sports status (p> .05). Klinger (21), at the source of the meaning of life, mentioned concepts such as success, personal development, altruism, hedonism, creativity, religiousness, social relations. In this context, it can be considered that doing sports is not enough to add meaning to life. On the other hand, the achievements of professional athletes bring to their personal development, country and society can still make the individual's life meaningful. After scanning the literature, no studies related to the meaning of life and sports were found. Looking at similar studies, Doğan and Moralı (16) found that there was no significant difference between the sports status variable and the life and job satisfaction levels of the instructors. In another study, Toros et al. (31) concluded that there was no significant difference between task and ego-oriented goals and life satisfaction of mountaineers.

As a result of the analysis conducted to determine the relationship between cognitive flexibility and meaning of life according to the age variable, it was found that there was a statistically significant relationship between students' ages and the existing meaning in life (p <.05). On the other hand, no statistically significant relationship was found between age and cognitive flexibility and the search for meaning in life (p> .05). The reason why there is a meaningful relationship between age and the existing meaning in life is supported by Erikson's explanation. Because Erikson stated that the meanings acquired during an individual's life did not remain constant and that these acquired meanings changed in parallel with age. In other words, an individual has an existing meaning in life at the end of every age. This may lead to changes in life values with the advancement of age, changes in purpose and meaning (32). On the other hand, when we look at

the reason why there is no significant relationship between age and cognitive flexibility and the search for meaning in life, it is seen that cognitive flexibility is a concept that directs the individual to produce solutions in the face of negative events or situations. In other words, it can be thought that the events encountered in life are at the basis of gaining cognitive flexibility. Asıcı and Ikiz (2) found that the level of cognitive flexibility did not differ according to age, and related to the result, an individual's satisfaction with the life was primarily linked with meeting their biological and psychological needs. As the reason why there is no relationship between age and the search for meaning in life, individuals get an existing meaning in life at the end of an age, but rather it can be thought that there are factors such as proving oneself to the society, realizing themselves and being loved by the society. Related to the results, Söylemez (27) found that there was no significant difference in meaning of life according to age variable.

With the result of the analysis conducted to determine the relationship between cognitive flexibility and meaning of life, it was concluded that there was a significant relationship between cognitive flexibility and the existing meaning in life, whereas there was no significant difference between cognitive flexibility and the search for meaning in life. Related to the results, the reason why there is a significant relationship between cognitive flexibility and the existing meaning in life can be explained with meaning of life having a positive relationship with positive emotions and a negative relationship with negative emotions (26). When the studies in the literature were scanned, no study on the relationship between cognitive flexibility and meaning of life was found. When similar studies are examined, Yelpaze and Yakar (34) concluded that cognitive flexibility is a significant predictor of life satisfaction. The reason why there is no significant relationship between cognitive flexibility and the search for meaning in life can be explained by the fact that the way of evaluating the events has no effect on the meaning that the individuals try to find in their life.

Ultimately, it was concluded that cognitive flexibility and meaning of life scores students studying in the faculty of sport sciences did not differ according to age, gender and sporting status. A significant positive relation was found between the student's cognitive flexibility scores and the existing meaning in life. On the other hand, there was no significant relationship between cognitive flexibility scores and the search for meaning in life. Planning of studies involving larger sample groups and professional athletes may be extremely important for the reliability of the results obtained. In addition, the findings can be supported by experimental studies.

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Monitoring Hydration Status of Elite Judo Athletes During a Competition Day

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Abstract

Dehydration is defined as deficit in total body water and has been suggested to have adverse effects on athletic performance as well as health. Despite ongoing efforts to inform the athletes, especially weight-classified athletes present higher level of dehydration. As judo is a weight-classified sport and athletes are exposed to rapid weight loss methods, hydration status of judo athletes should be monitored for athletes' health and implications for future precautions. Thus, the aim of this study was to monitor hydration status of elite judo athletes during a competition day. Eighteen (13 males, 5 females) elite judo athletes voluntarily participated in this study. Following body composition measurements, USG and urine color measurements were carried out before and after the competition in order to determine their hydration status. Athletes' pre-match USG value was 1,021 while it was found 1,019 after competitions. As for urine color, it was 5,17 before competitions and 4,87 after competition. According to these results elite judo athletes presented higher level of dehydration during a competition day despite ad libitum fluid intake. Judo athletes and coaches should be informed about adverse effects of dehydration and individual water intake prescriptions for these athletes can be advised. Further research is also advised to confirm that dehydration negatively affects judo specific performance.

Keywords: hyphohydration, combat sports, judo, dehydration

INTRODUCTION

Judo is an Olympic combat sport where high level of aerobic and anaerobic fitness, muscular endurance, strength and agility are of great importance for successful judo performance. Judo is a weight classified sport and athletes compete according to their ages and weight categories. Judo athletes apply rapid weight loss methods to make weight just a few days before the competition and even hours before the official weigh-in time (13). Both increased sweating and fluid restriction are used by judo athletes during rapid weight loss period (13). Refraining from fluid intake as well as being exposed to increased sweating lead to dehydration.

Enough water intake is of great importance for water induced functions such as transportation of food and waste products, regulation of body temperature, maintenance of blood pressure via regulating blood volume, maintenance of acid-base

balance and supporting cardiovascular functions (4). It has been obviously proven that even moderate level of dehydration increases physiological strain, with leading to lower energy availability (5), impairment in thermoregulation (8, 14), alterations in plasma and intracellular electrolyte levels (3, 9). Furthermore, dehydration of 5% of body mass or greater has been indicated to have effects on blood composition up to following seven days (11, 12). Progressive weight loss over five days has been reported to decrease total body water, blood volume, extracellular water and plasma volume (16).

There is evidence to suggest that dehydrated judo athletes are not adequately rehydrating before their competitions (6, 19). According to urine specific gravity (USG) and measure of body mass 15 h before the competition and 2 h before the competition, athletes gained 2.04% of their body mass and 54.8% of the athletes were significantly dehydrated (Usg>1.021) 2 h before the competition. Another supporting finding of this situation is that judo athletes were as dehydrated as wrestlers despite 15 h recovery period between weigh-in and match in contrast to wrestlers (19). Although there are some studies about hydration status of judo athletes (6, 13, 18) there is limited study investigating hydration status of judo athletes during a competition day. Thus the aim of this study was to monitor hydration status of elite judo athletes during a competition day.

MATERIAL AND METHOD

Experimental Approach to the Problem

As a result of abovementioned information, there is a need of information about hydration status of elite judo athletes during competition day where they present their highest level of performance. As adverse effects of dehydration have been obviously presented by the literature, it is very important that athletes compete under euhydrated condition for performance but more importantly for their health.

Subjects

Thirteen males (age=21,5±3, weight=70,3±10,1, height=1,71±0,08, BMI=23,6±1,5) and 5 females (age=21,2±1, weight=76,4±23,2, height=1,74±0,12, BMI=24,6±4,2) elite judo athletes voluntarily participated in this study. The criteria to participate in the study included competing at international tournament for the last two years and not going through menstrual period for female participants. All the subjects were informed about the nature of the study and they gave written informed consent.

Data collection

Data collection was carried out during European Universities Games in 2018 and Grand Prix Antalya in 2019. On arrival to the competition hall, subjects were instructed to urinate into a plastic cup for urine specific gravity (USG) and urine color measurement. Body composition was determined for only descriptive purposes. After weighing the subjects their stature was determined with a stadiometer (Seca, 213, Hamburg, Germany) to the closest 1 cm. Hydration status of the athletes were assessed via USG and urine color which are generally accepted markers of hydration status in the field (17). The analysis for USG was carried out with a digital refractometer (ATAGO, PAL-10S, Tokyo, Japan). Hydration status of the participants were classified according to the suggestion of National Athletic Trainers' Association Position Statement (15) (≤1.020 g/mL euhydrated, ≥1.020 g/mL dehydrated). The same measurement for USG and urine color was repeated after the subjects completed their competitions. Urine color was graded from 1 to 8 (1).

Statistical Analysis

All data was given mean and standard deviation. The data normality was verified with Shapiro-Wilk test. The Paired Sample t test was used to compare USG values and urine colors. According to their USG values athletes were classified either euhydrated or dehydrated and percentages were given for pre and post-match conditions. SPSS 20 was used for the analysis and p value was set at $p<0,05$.

RESULTS

USG and urine color changes are presented in table 1. No statistically significant difference was found between measurements.

Table 1. Changes in USG and Urine Color

Variable	Pre-match	Post-match	t	p
USG	1,021±0,007	1,019±0,004	0,964	0,349
Urine color	5,17±1,79	4,83±1,04	0,766	0,454

Despite no significant difference found between the measurements, according to USG and urine color most of the athletes were found dehydrated (66,6%) and they completed the competition day in dehydrated condition (55,5%). Percentages of

euhydrated and dehydrated athletes can be found in Figure 1.

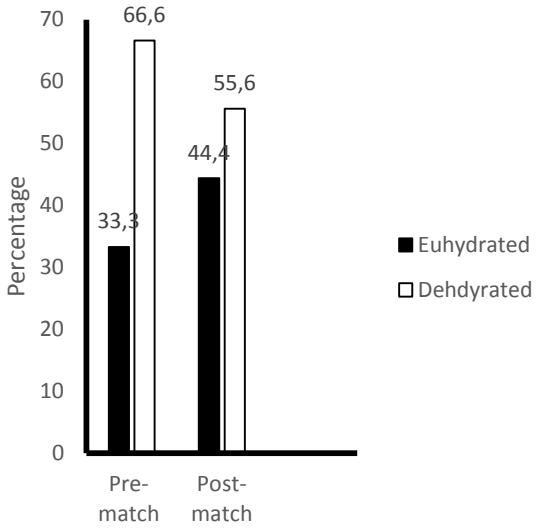

Figure 1. Percentages of athletes according to their hydration status

DISCUSSION

The main findings of this study included: 1) athletes started the competitions in dehydrated state (USG≥1,020 g/mL), 2) they also completed the competition day in dehydrated condition, 3) before the competitions athletes' urine color was higher than 5 which indicates significant dehydration, 4) athletes' urine color or USG did not decrease in contrast to expectations.

Maintaining hydration status is of great importance for performance. Dehydration adversely affects performance due to elevation in heart rate, decrease in stroke volume, rapidly increase in body temperature and perception of exertion and leading to fatigue, dizziness, low blood volume and suboptimal performance (4, 14, 15).

According to suggestions by NATA (15), six of the athletes were euhydrated while 12 of the athletes presented significant dehydration before the competitions. Petterson and Berg (10) investigated the effect of weigh in time on hydration status of combat sport athletes and indicated a mean USG value of 1,029 for all athletes before competition while it was 1,027 and 1,031 for evening weighed athletes and morning weighed athletes, respectively. As weigh-in time was changed in 2013 (7), now athletes have more time to rehydrate between the official weigh-in and competitions. However, our findings stated that almost 15 h recovery was not enough for judo athletes to rehydrate following weigh-in given that some authors indicated that most of the judo athletes resort to rapid weight loss methods (2). Moreover, the findings of Ceylan at al. (19) supported ours as they compared hydration status and acute weight gain of wrestlers and judo athletes and stated that judo athletes presented high level of dehydration in the match morning despite 15 h of rehydration period. Riviera-Brown and Felix Davila (13) monitored changes in hydration status of adolescent judo athletes during training in the heat and in accordance with our findings they stated that most of the athletes started and finished a training session with a significant level of dehydration and experienced symptoms of dehydration despite availability of water during training. Another study by Gürses et al. (6) investigated acute weight gain and dehydration in judo athletes and highlighted that judo athletes could not compensate the gap of dehydration between official weigh-in and match time which was approximately 15 hours. They stated that athletes competed under dehydrated condition. In the current study, after the competitions, 8 of the athletes were euhydrated whilst ten of the athletes were dehydrated. It can be concluded that athletes did not consume enough water to minimize the dehydration.

CONCLUSIONS

In the current study athletes presented higher level of dehydration during a competition day. This study had some limitations; weight loss of the athletes was not determined on the weigh-in day, hydration status was not monitored on the weigh-in day to compare the changes with competition day. Another limitation was that we did not monitor fluid intake of the athletes which surely affects the changes in hydration status. Therefore, it can be suggested that fluid intake, body mass changes and hydration status on the weigh-in day should be thought for further studies as well as including and comparing different age groups and genders. Coaches and athletes should pay high attention to keep hydration values between normally accepted ranges and hydration status check can be included in the competitions before weigh-in to preserve health of weight-classified athletes. Further research is warranted to clarify whether dehydration directly and negatively affects judo specific performance.

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Investigation Of University Students' Overall Quality Of College Life And Their Satisfaction With This Life Terms Of Their Genders And Departments

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Abstract

The current study was conducted to investigate university students' life quality and life satisfaction in the campus. The study was designed in the survey model. The population of the study is comprised of the students attending the Physical Education and Sports School, Faculty of Economics and Administrative Sciences, Faculty of Health Sciences and Faculty of Education in the central campus of Burdur Mehmet Akif Ersoy University. The sample consists of 400 students selected from among the population through random sampling. The data were collected through the questionnaire method. As the questionnaire, "The University Life Quality Scale" adapted to Turkish by (13) was used. From this scale, the overall life quality and overall life satisfaction dimensions were taken. The Cronbach's Alpha reliability coefficient was calculated to be 0.85 for the overall life quality dimension and 0.83 for the overall life satisfaction dimension. The questionnaire was administered to the students through face-to-face method. A total of 400 students (212 females and 188 males) responded to the questionnaire. In order to analyze the collected data, percentages (%) were calculated and Independent Samples T Test and Kruskal-Wallis Test, Bivariate Correlation were used. In the determination of the differences between the variables, 0.05 was taken as the confidence interval. The obtained findings have revealed that the students' overall life quality and life satisfaction in the campus mean scores are low, that while their mean scores do not vary significantly by gender, their overall life quality mean scores vary significantly depending on the faculty they attend ($p<0,05$). As a result, it can be said that the participating students' overall life quality and life satisfaction in the campus mean scores are low.

Keywords: University, Quality of life, Life satisfaction, Student

INTRODUCTION

The concept of quality is the feature of a person, object or life which indicates the quality of this person, object or life and can measure and evaluate its distinctive superiority on other things (4). The concept of quality of life, on the other hand, is defined as "the way people perceive their situation within the whole of their culture and value judgments in connection with their goals, expectations, standards and interests" (40). In another definition, the World Health Organization defines it as "one's perception of his/her own life in a culture and value system according to his/her own goals, expectations, standards and interests." The

important point here is that the standards that are the basis for achieving the targets of a quality life are not imposed from the outside, that they are determined by the person himself/herself (5, 33).

Quality of life refers to measurable, physical (spatial) and social components of the environment and the way they are perceived (34). Quality of life is seen as an emerging and developing concept with the development of modern life and the modernization of societies. The focus of the studies looking at the quality of life is the human-human relationship and the environment-human relationship where the daily life continues (16).

The science of sociology evaluates the quality of life in terms of living standards, life style, and relations between social classes in general within the framework of "social indicators" approach (29).

Quality of life has a complex structure that is affected by the physical, social, psychological and personal beliefs of individuals and the environment they live in (19). It is a multi-faceted concept that reflects the subjective assessment of the satisfaction taken from the environment in which the person lives and interacts with other individuals (17). "Quality of life is individuals' perceptions of their own lives within the culture and values system they live in" (6). "Life satisfaction" is the emotional reaction or attitude of the person to his/her life at work, leisure and in other time frames (15).

Life satisfaction is a process in which an individual evaluates the quality of his/her life in general in line with the criteria he/she chooses (8). In this sense, life satisfaction is a judgment that each individual achieves by comparing the standards he/she sets for himself with the conditions he/she is in. Therefore, life satisfaction is determined as a result of not taking the generally accepted criteria of quality of life, but the criteria that individuals prefer for themselves (20, 21). Thus, life satisfaction stands out as a subjective judgment in which the quality of life is evaluated as a whole (26).

Recently, students' life quality has become an important subject and concept in higher education research (2). Quality of college life, which is a sub-dimension of general life quality, expresses the feeling of satisfaction that students experience throughout their student life (30). Quality of college life in this connection can be defined as conscious and positive experiences arising from the sense of control on the emergence of situations such as subjective well-being, happiness, having fun and life satisfaction experienced by students throughout their university life.

Among the factors that affect students' quality of life, issues such as the services provided in the university environment and their functioning, standards of the academic program, quality and management of student services, and social relations come to the fore (2). Quality of college life is seen as a concept that includes emotional and cognitive dimensions (9). The concept of quality of college life manifests itself as the positive and negative levels of satisfaction and emotional balance experienced by students in their university life including academic, administrative, social, cultural and economic services (35).

Seen from this perspective, quality of college life refers to the extent to which the needs of students throughout their university life are met and the experiences that lead to positive emotionality (14). While positive emotionality gives rise to emotions such as willingness and enthusiasm, vigilance, interest, determination, excitement, strength, pride, attention, negative emotionality induces emotions such as anxiety, fear, sadness, depression, tension, shyness, quilt and aggression (22, 10).

Students' life satisfaction refers to the subjective assessment of their experiences of life satisfaction and education, and the various outcomes they achieve. This assessment continues to take shape because of the repetitive experiences of students throughout their university life (11). Students' life satisfaction depends on the extent to which the university they attend responds to their priorities (3). In this sense, strengthening students' life satisfaction should be seen as an important goal of the university administration (7).

Conditions of the social and physical environment in which people life, their expectations, the extent to which they have achieved their expectations and how much they are influenced by internal and external factors affect their life quality and life satisfaction. Life quality and life satisfaction levels positively or negatively affect individuals physically, mentally, socially and psychologically. Individuals who are good in terms of life quality and life satisfaction form a happy and successful community; communities form a nation.

The high life quality and life satisfaction levels of young individuals who will form the future of a society are important for their good upbringing. The

life quality and life satisfaction levels of university students who come from different parts of the country and different backgrounds to study in higher education for a certain period of time will affect their physical, social, psychological and academic success.

In this regard, the current study was conducted to investigate university students' life quality and life satisfaction in the university environment. The findings of the current study are believed to contribute to the training of healthy, happy and qualified individuals in the society by revealing university students' life quality and life satisfaction in the university environment and how they change depending on some variables.

MATERIALS AND METHOD

The current study was conducted to determine university students' life quality and life satisfaction in the university environment.

The current study employed the survey model. The population of the current study are the students attending the Physical Education and Sports School, Faculty of Economics and Administrative Sciences, Faculty of Health Sciences and Faculty of Education in the central campus of Burdur Mehmet Akif Ersoy University. The sample consists of 400 students selected from among the population through random sampling.

The data were collected through the questionnaire method. As the questionnaire, "The University Life Quality Scale" adapted to Turkish by (13) was used. From this scale, the overall life quality and overall life satisfaction dimensions were taken. The Cronbach's Alpha reliability coefficient was calculated to be 0.85 for the overall life quality dimension and 0.83 for the overall life satisfaction dimension.

The questionnaire was administered to the students through face-to-face method. A total of 400 students (212 females and 188 males) responded to the questionnaire. The questionnaire data were transferred to the computer environment in the appropriate statistical program for statistical processing. In order to analyze the collected data, percentages (%) were calculated and Independent Samples T Test and Kruskal-Wallis Test, Bivariate Correlation were used. In the determination of the differences between the variables, 0.05 was taken as the confidence interval.

FINDINGS

Table 1. Distribution of the Participants' Demographic Features

Variables		N. (Distribution)	% (Distribution)
Gender	Female	212	53.0
	Male	188	47.0
	Total	400	100.0
Department Attended	Physical Education and Sports School	100	25.0
	Faculty of Economics and Administrative Sciences	100	25.0
	Faculty of Health Sciences	100	25.0
	Faculty of Education	100	25.0
	Total	400	100.0
Grade Level	1st year	84	21.0
	2nd year	62	15.5
	3rd year	144	36.0
	4th year	110	27.5
	Total	400	100.0

In Table 1, the demographic features of the participants are presented. As can be seen, 53% of the participants are females and 47% of them are males; 25% are from the Physical Education and Sports School, 25% are from the Faculty of Economics and Administrative Sciences, 25% are from the Faculty of Health Sciences, and 25% are from the Faculty of Education; 36% of them are 3rd year students, 27.5% are 4th year students, 21% are 1st year students and 15.5% are 2nd year students.

Table 2. Results of the Independent Samples T Test Conducted to Determine whether the Students' Overall Life Quality and Life Satisfaction Mean Scores Vary depending on Gender

Variables		N	$\bar{X}$	S	df	t	p
Overall life quality	Female	212	2.8858	0.97747	398	0.505	0.614
	Male	188	2.9372	1.05774			
Overall life satisfaction	Female	212	2.7991	0.86435	398	0.262	0.793
	Male	188	2.7755	0.92963			
P<0.05*							

As can be seen in Table 2, the participating students' overall life quality mean scores do not vary significantly depending on the gender variable [t(398)=0.505,p=0.614] (p>0.05). The overall life quality mean scores found for the male and female students are as follows: males ($\bar{X}$=2.9372), females ($\bar{X}$=2.8858).

Moreover, the participating students' overall life satisfaction mean scores were also found to be not varying significantly depending on the gender variable [t(398)= 0.262,p=0.793] (p>0.05). The overall life satisfaction mean scores found for the male and female students are as follows: males ($\bar{X}$=2.7755), females ($\bar{X}$=2.7991).

Table 3. Results of the Kruskal Wallis Test Conducted to Determine whether the Students' Overall Life Quality and Life Satisfaction Mean Scores Vary depending on Grade Level

Variables		N	Mean Rank	sd	X^2	p
Overall life quality	Physical Education and Sports School	100	168,10	3	17.665	0.001*
	Faculty of Economics and Administrative Sciences	100	236,27			
	Faculty of Health Sciences	100	196,78			
	Faculty of Education	100	200,86			
	Total	400				
Overall life satisfaction	Physical Education and Sports School	100	194,88	3	4.174	0.243
	Faculty of Economics and Administrative Sciences	100	197,15			
	Faculty of Health Sciences	100	189,62			
	Faculty of Education	100	220,35			
	Total	400				
P<0.05*						

As can be seen in Table 3, the participating students' overall life quality mean scores vary significantly depending on grade level [X2=(sd=3, n=400)= 17.665,p=0.001] (p<0.05).

On the other hand, the participating students' overall life satisfaction mean scores were found to be not varying significantly depending on grade level [X2=(sd=3, n=400)= 4.174, p=0.243] (p>0.05).

Table 4. Distribution of the Correlations between the Participants' Overall Life Quality and Life Satisfaction

Variables		Overall life quality	Overall life satisfaction
Overall life quality	Pearson Correlation	1	0.546(**)
	Sig. (2-tailed)		,000
	N	400	400
Overall life satisfaction	Pearson Correlation	0.546(**)	1
	Sig. (2-tailed)	,000	
	N	400	400

** Correlation is significant at the 0.01 level (2-tailed).

As can be seen in Table 4, there is a significant, high and positive correlation between the students' overall life quality and overall life satisfaction (r=0.546, p<0.01).

DISCUSSION AND RESULTS

A total of 400 university students participated in the current study conducted to determine the quality of college life and satisfaction with this life. The demographic features of the students have revealed that 53% of the participants are females and 47% of them are males; 25% are from the Physical Education and Sports School, 25% are from the Faculty of Economics and Administrative Sciences, 25% are from the Faculty of Health Sciences, and 25% are from the Faculty of Education; 36% of them are 3rd year students, 27.5% are 4th year students, 21% are 1st year students and 15.5% are 2nd year students (Table 1).

The participating students' overall life quality mean scores were found to be not varying significantly depending on the gender variable [t(398)=0.505,p=0.614] (p>0.05). The overall life quality mean scores found for the male and female students are as follows: males ($\bar{X}$=2.9372), females ($\bar{X}$=2.8858). These values show that the overall life quality of the students is medium. Moreover, the participating students' overall life satisfaction mean scores were also found to be not varying significantly depending on the gender variable [t(398)= 0.262,p=0.793] (p>0.05). The overall life satisfaction mean scores found for the male and female students are as follows: males ($\bar{X}$=2.7755), females ($\bar{X}$=2.7991). These values show that the students are undecided about their overall life satisfaction (Table 2).

The participating students' overall life quality mean scores were found to be varying significantly depending on grade level [X2=(sd=3, n=400)= 17.665,p=0.001] (p<0.05). This shows that the students' overall life quality varies depending on the department they attend. When the mean rank calculated for the responses given by the participants was examined, it was found to be 236.27 for the Faculty of Economics and Administrative Sciences, 200.86 for the Faculty of Education, 196.78 for the Faculty of Health Sciences and 168.10 for the Physical Education and Sports School. These values show that while the students from the Faculty of Economics and Administrative Sciences are moderately content with their life quality, the students' life quality scores are low in general.

On the other hand, the participating students' overall life satisfaction mean scores were found to be not varying significantly depending on the department they attend [X2=(sd=3, n=400)= 4.174,p=0.243] (p>0.05). When the mean rank calculated for the responses given by the participants was examined, it was found to be 220.35 for the Faculty of Education, 197.15 for the Faculty of Economics and Administrative Sciences, 194.88 for the Physical Education and Sports School and 189.62 for the Faculty of Health Sciences. These values show that the majority of the participants are undecided about their life satisfaction. Thus, it can be said that the overall life satisfaction scores of the participants are low.

A significant, high and positive correlation was found between the participants' overall life quality and life satisfaction (r=0.546, p<0.01). Thus, it seems that with increasing life quality, life satisfaction also increases. This finding concurs with the findings reported in many studies in the literature (18, 32, 35, 36, 31, 39, 1).

The existing research has revealed that students' life quality and life satisfaction vary depending on many factors such as positive relationships they establish with their friends and families (7, 27), good physical and mental health (37), quality of sleep (24), housing conditions (28) and having financial resources to meet their needs

(25, 38) while negative experiences associated with these factors decrease their life satisfaction (12).

As a result, it can be said that though some small differences based on gender and grade level occur, in general the students' life quality and life satisfaction scores are low, that they are not content with the quality of their college life and life satisfaction, that there is a significant correlation between overall life quality and life satisfaction and that their life quality and life satisfaction perceptions tend to change in the same direction. In light of the findings of the current study, the following suggestions can be made:

- Various environments should be prepared for students to get engaged in activities to develop themselves in their free time in the university.
- More social living areas such as canteens, cafeterias, cinemas should be provided for students.
- Students should be provided with the opportunities for accommodation and transportation suitable for their financial situation.
- Factors that negatively affect the expectations of students from the future should be investigated in depth and measures should be taken to make them more optimistic about the future.
- Factors that cause loneliness of students experiencing high levels of loneliness should be examined and educational activities should be organized for these students to enhance their communication skills and social skills.
- The quality of the services offered to students in schools should be increased and they should be student-centred, and qualified consultancy services should be offered to students.
- Psychological Counselling and Guidance units should be established for students at universities.
- The problems that reduce the quality of life and life satisfaction of students should be identified and eliminated.

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