



Eating disorder and sports engagement in individuals playing sports

Transtorno alimentar e engajamento em esportes em indivíduos que praticam esportes

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Abstract

The main purpose of study is to investigate the relationship between the level of sports engagement, eating disorder tendency. A total of 524 individuals, a mean age of 24±8.00 in study. The data of the study were collected using the personal information form, the scale of engagement to sport, the orthorexia-11 scale. In the analysis of the data, the Independent Sample T-Test was used to compare the paired groups to determine the differences between the groups, One-Way Anova was used to compare the groups of three or more. In determining the effect size of the differences, Cohen d values for T-Test and eta² values for ANOVA were calculated. Pearson Correlation test was used to determine the relationship between eating disorder tendency, sports engagement levels. Participants' sports engagement scores; while it did not differ according to gender ($p>0.05$), it differed branch, level of sports, diet and year of sports ($p<0.05$). Orthorexic (eating disorder) tendencies of the participants; while it did not differ gender and level of doing sports ($p>0.05$), it differed branch, dieting status and year of doing sports ($p<0.05$). It was determined that the sport, history, diet and training frequency were effective on adherence levels, orthorexic tendency, high level of sport adherence increased orthorexic tendency. Considering that people's physical appearance concerns are high, their desire to have a fit appearance due to environmental effects, this is thought to be

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effective in increasing the level of engagement to sports, orthorexic tendency.

Keywords: Addiction. Nutrition. Exercise. Performance. Body Image. Eating Disorder.

Resumo

O principal objetivo do estudo é investigar a relação entre o nível de engajamento esportivo e a tendência a transtornos alimentares. Um total de 524 indivíduos, idade média de $24 \pm 8,00$ em estudo. Os dados do estudo foram coletados usando o formulário de informações pessoais, a escala de engajamento no esporte, a escala de ortorexia-11. Na análise dos dados, o Independent Sample T-Test foi usado para comparar os grupos pareados para determinar as diferenças entre os grupos, One-Way Anova foi usado para comparar os grupos de três ou mais. Na determinação do tamanho do efeito das diferenças, os valores de Cohen d para T-Test e os valores η^2 para ANOVA foram calculados. O teste de correlação de Pearson foi usado para determinar a relação entre a tendência ao transtorno alimentar e os níveis de engajamento esportivo. Pontuações de engajamento esportivo dos participantes; enquanto não diferiu quanto ao gênero ($p > 0,05$), diferiu ramo, nível de prática esportiva, dieta e ano de prática esportiva ($p < 0,05$). Tendências ortoréxicas (transtorno alimentar) dos participantes; enquanto não diferiu gênero e nível de prática esportiva ($p > 0,05$), diferiu ramo, regime alimentar e ano de prática esportiva ($p < 0,05$). Foi determinado que o esporte, história, dieta e frequência de treinamento foram eficazes nos níveis de adesão, tendência ortoréxica, alto nível de adesão ao esporte aumentou a tendência ortoréxica. Considerando que as preocupações com a aparência física das pessoas são altas, seu desejo de ter uma aparência em forma devido aos efeitos ambientais, acredita-se que isso seja eficaz para aumentar o nível de envolvimento com esportes, tendência ortoréxica.

Palavras-chave: Vício. Nutrição. Exercício. Performance. Imagem Corporal. Transtorno Alimentar.

Introduction

The physical structure of an athlete is a means of performing and achieving success. In addition to exercises and training, body weight and body composition are the main determinants of performance in many sports disciplines, so the nutrition of the athlete is related to body functions and development (1,2).

The level of physical fitness required by the sport requires athletes to cope with many demands and expectations in terms of nutrition (3,4,5). In addition, in some sports disciplines, weight and weight classifications can create a special pressure on athletes regarding their eating behaviors and body weights and play an important role for success (2,6,7). Body dissatisfaction occurs when there is a mismatch between the individual's own body image and the body he or she perceives as ideal. This dissatisfaction brings with it the urge for weakness, irregular eating habits and clinical eating disorders. De Bruin et al (1) by distinguishing between the 'sportive' body and the 'social' body of the athlete, suggested that an athlete may be satisfied with his body shape and figure in the social environment, but may not be satisfied with his body in the sports environment.

Therefore, for athletes competing in sports with specific weight class requirements (e.g. boxing, judo, wrestling), the pressure on body weight is likely to increase. These athletes are more critical of their sportive bodies than their social ones, and they have stricter sportive body ideals. Studies report that athletes from weight-focused sports have higher rates of eating disorder symptoms than athletes from sports that do not have body weight or body shape requirements (8,9).

In non-weight-oriented sports, it is claimed that the eating habits of the athletes are shaped by the pressure of the trainer in order to achieve an ideal physical attractiveness associated with optimal sports performance, to achieve sportive success or to maximize athletic performance (1,9,10,11,12,13,14,15,16). In studies conducted with athletes in these sports branches, Smolak et al (17) reported a higher prevalence of eating disorders in elite athletes compared to those who do recreational sports. A number of studies have shown no difference in body dissatisfaction or disordered eating symptoms between athletes and non-athletes (12,18,19).

Eating disorders seen in athletes lead to behaviors related to long-term hunger, skipping meals, restricted eating, overeating, vomiting, use of weight loss drugs, use of laxatives and diuretics, and excessive exercise. All these actions negatively affect health, interpersonal relationships, mental health, nutrition, academic success, work efficiency, quality of life and social relationships. In line with this information, it is important to investigate the risk of eating disorders, which may adversely affect the performance of the athletes, in order to determine whether the athletes are at risk and not to experience poor performance.

In this context, the risks of Orthorexia Nervosa of individuals who do sports will be examined in our study. Orthorexia nervosa; It is a pathological obsession defined as a healthy eating obsession, and nutritional deficiencies can result in irreversible damage to health (20).

In the literature, it has been observed that the focus is on the pathology of eating disorders in sample groups that include adult athletes or adolescents (13,15,21,22,23). In this study, unlike the existing studies, examining the relationship between the sports engagement levels of the athletes and the tendency of eating disorders makes our study unique.

When we look at the results of the studies in the literature in general, it is thought that adolescent athletes may not have a tendency to show eating disorder pathology, but female athletes and athletes competing in certain sports disciplines have a higher

The main purpose of this study is to investigate the relationship between the level of sports engagement and eating disorder tendency in the sample of Turkish athletes. In addition, our study aimed to examine the level of engagement to sports and symptoms of eating disorders in terms of gender, BMI (body mass index), sports branch, year of doing sports, level of sportsmanship, number of training and dieting status. In this direction, our research; It will include athletes between the ages of 18-35, who have been active for at least 2 years, and who do not have any health problems, who agree to voluntarily fill out the questionnaire.

Methodology

2.1 Model of the Research

In the study, the survey model, one of the quantitative research methods used in the field of social sciences, was used and a survey study was conducted as a data collection technique.

In the study, the eating disorder tendencies of athletes with different levels of engagement to sports will be revealed and it will be determined whether demographic characteristics such as gender, BMI, sports branch, level of sportsmanship, number of training and dieting affect the level of sports engagement and eating disorder. The framework of this conceptual model is shown in Figure 1.

The study was approved by the Recep Tayyip Erdogan University Social and Human Sciences Ethics Committee (number: 2022/172, Date: 15/09/2022).

2.2 Study Group

A total of 546 people, who were determined by the random sampling method based on voluntariness, completed the survey form applied in the research online. Of these, 22 were excluded because they did not meet one of the following criteria: Be between 18 and 35 years old, Participating in regular activities for at least 2 years, Not having any health problems, To provide voluntary participation.

As a result of the examinations, a total of 524 individuals with an average age of 24 ± 18.00 and a mean BMI of 23.47 ± 3.24 , who train an average of 4 ± 1.80 per week, participated in our study.

2.3 Data Collection Process

The data of the study were collected using the "Personal Information Form", "Scale of Attachment to Sports" and "Orthorexia-11 Scale". The survey form was sent to the participants via Google Doc online survey between 2021-2022. After explanatory information about the importance and purpose of the research was given to the athletes, the data were returned within two weeks only from the athletes who participated voluntarily.

2.4 Data Collection Tools

2.4.1 *Personal Information Form*

This form was prepared by the researchers, and within the scope of the purpose of the research, it also consists of questions about independent variables such as gender, age, height, weight, sport branch, level of athlete and number of training. The variables used in this study were determined by reference to previous studies (3,9,24,25,26).

2.4.2 *Sport Engagement Scale (SES)*

The scale form consisting of 12 items and 3 sub-dimensions developed by Schaufeli and Bakker (27) was adapted into Turkish by Kayhan et al (28) and its validity-reliability study was carried out. The Turkish version of the scale was composed of 10 items by removing

items with low factor loads. The Cronbach Alpha coefficient of the 11-item SES was determined as 0.91. While the sub-dimensions of the scale consist of; Absorption, Vigor
the questions in the scale are answered as a 7-point likert (1=Never”,..., “7=Always). A minimum of 10 and a maximum of 70 points can be obtained from the scale. High scores from the scale indicate a high level of engagement to sports, while low scores indicate a low level of engagement to sports. With SES, participants' engagement to sports can be evaluated not only on the total score, but also on the sub-dimensions. In our study, evaluation was made on the total score. The Cronbach's Alpha Coefficient of the answers given by the individuals participating in the study we have done to SES was determined as 0.886.

2.4.3 Orthorexia-11 Scala (ORTO-11)

The 15-question scale form developed by Donini et al (29) was adapted into Turkish by Arusoğlu et al (20) and its validity-reliability study was carried out. In the Turkish version of the scale, only items with a factor load of 0.50 and above were selected and the scale form was composed of 11 items. The Cronbach Alpha coefficient of the 11-item ORTO-11 scale form was determined as 0.62. While the sub-dimensions of the scale consist of the dimensions of;emotion (includes concerns and feelings about healthy eating),behavior (includes behaviors related to food choice), and cognition (includes nutritional cognitions)

the questions in the scale are answered in the form of a 4-point likert (always, often, sometimes and never) with the expression of the present tense. While the answers that are the distinguishing criteria for orthorexia are evaluated as "1" and the answers showing a tendency to normal eating behavior are evaluated as "4" points, a minimum of 15 points and a maximum of 60 points can be obtained in total. In the study of Arusoğlu et al., those who scored ≤ 40 on the ORTO-11 scale were considered orthorexic, and those who scored >40 were considered normal. With the ORTO-11 scale, the eating disorder tendencies of the participants can be evaluated according to the total score as well as sub-dimensions. Due to the low internal consistency coefficients for the sub-dimensions, the total score was evaluated in our study. The Cronbach's Alpha Coefficient of the answers given by the individuals participating in our study to the ORTO-11 scale was determined as 0.709.

2.5 Data Analysis

Statistical analyzes were performed using IBM SPSS 26.0 and JASP 16.2 statistical software programs. The results were evaluated at $p < 0.05$ significance level. In order to determine the differences between the groups; while the Independent Sample T-Test was used to examine the tendency of eating disorders and the level of adherence to sports in terms of gender, level of athletes, sport branch and status of dieting, the One-Way Anova test was used for the variable of years of doing sports. Tukey test was used as Post hoc analysis to determine which groups caused the difference after the Anova test. To determine the effect size of the differences, Cohen d values were calculated for t-test and η^2 values were calculated for ANOVA. In addition, Pearson Correlation test was used to determine whether there is a relationship between eating disorder tendency and sports engagement levels.

2.5.1 Research Hypotheses

- ✓ H₁: There is a significant relationship between the level of engagement to sports and eating disorder.
- ✓ H₁: Gender, sports branch, year of doing sports, level of sportsmanship and dieting status make a difference on the sports engagement status of the athletes.
- ✓ H₁: Gender, sport branch, year of sport, level of sportsmanship and dieting status make a difference on the eating disorder tendencies of the athletes.
- ✓ H₁: There is a significant relationship between BMI and number of training variables, sports engagement level and eating disorder.

Results

Variables	Group	n	%
Gender	Male	346	66.00
	Woman	178	34.00
Sport Branch	Individual Sports	356	67.90
	Team Sports	168	32.10
Sports Year	2-3 years	128	24.40
	4-6 years	112	21.40
	7-9 years	88	16.80
	10 years and above	196	37.40
Athlete Level	Amateur	362	69.10
	Professional	162	30.90
Dieting	Yes	152	29.00
	No	372	71.00

Table 1: Distribution of the participants regarding their demographic information.

Source: The Author

In Table 1, it was seen that 66% of the participants were male and 34% were female. It was observed that 67.90% of the individuals did individual sports and 32.10% did team sports. It was observed that 37.40% of the individuals had 10 years and over, 16.80% had 7-9 years, 21.40% had 4-6 years, 24.40% had a history of 2-3 years. It was seen that 69.10% of the people were amateurs and 30.90% were professionals. It was seen that 71% of the people did not diet, and 39% of them were on a diet.

Variables	Group	N	Mean	Sd	df	t	p	Cohen D
Gender	Male	346	61.41	8.44	522	-0.243	0.808	--
	Woman	178	61.60	8.26				
Sport Branch	Individual Sports	356	61.92	7.40	522	1.771	0.037*	0.155
	Team Sports	168	60.54	10.09				
Athlete Level	Amateur	362	60.49	8.95	522	-4.087	0.000*	0.409
	Professional	162	63.68	6.41				
Dieting	Yes	152	62.91	7.12	522	2.513	0.012*	0.252
	No	372	60.89	8.78				
Variable	Group	N	Mean	Sd	df	F	p	Eta ²
Sports Year	2-3 years	128	58.91	9.65	3,520	6.669	0.000*	0.037
	4-6 years	112	63.05	6.40				
	7-9 years	88	60.92	7.36				
	10 years and above	196	62.51	8.54				

Table 2: Total score levels of engagement to sports in terms of variables

P<0.05, n: number of people, sd: standard deviation, df: degrees of freedom, 1: 2-3 years, 2: 4-6 years, 3: 7-9 years, 4: 10 years and above

Source: The Author

In Table 2, T-Test was applied for two independent groups at a=0.05 significance level to determine whether there was a significant difference in the total score of engagement to sports in terms of gender, sport branch, level of doing sports and dieting status of the participants. In the test results; There was no significant difference in the total score in terms of gender (p>0.05). There was a significant difference in the total score in terms of sports branch ($t_{(522)} = 1.771$; p=0.037). It was observed that the mean of the individuals who did individual sports (61.92±7.40) was significantly higher than the mean of those who did team sports (60.54±10.09).

A significant difference was found in the total score in terms of athlete level ($t_{(522)} = -4.087$; p=0.000). It was seen that the averages of those who do sports professionally (63.68±6.41), are significantly higher than the averages of those who do sports as amateurs (60.49±8.95). There was a significant difference in the total score in terms of dieting ($t_{(522)} = 2.513$; p=0.012). It was observed that the mean of dieters (62.91±7.12), was significantly higher than the mean of non-dietists (60.89±8.78).

In order to determine whether there is a significant difference in the total score of engagement to sports in terms of the years of doing sports of the participants in Table 2, the One-Way Anova test at $\alpha = 0.05$ significance level was applied. In the test results, a significant difference was found in the total score in terms of years of doing sports ($F_{3,520} = 6.669$; $p = 0.000$). It was observed that the average of those who exercised for 2-3 years (58.91 ± 9.65), was significantly lower than the average of those who participated in exercise for 4-6 years and over 10 years.

When the effect sizes were examined, it was determined that the sports branch, the level of doing sports and the status of dieting had a high effect on the level of engagement to sports, while the year of doing sports had a low effect.

Variable	Group	N	Mean	Sd	df	t	p	Cohen D
Gender	Male	346	25.77	5.14	522	-0.112	0.911	--
	Woman	178	25.82	4.71				
Sport Branch	Individual Sports	356	26.12	5.22	522	2.259	0.024*	0.217
	Team Sports	168	25.07	4.41				
Athlete Level	Amateur	362	25.77	5.07	522	-0.125	0.900	--
	Professional	162	25.83	4.83				
Dieting	Yes	152	23.07	4.62	522	-8.493	0.000*	0.820
	No	372	26.90	4.71				
Variable	Group	N	Mean	Sd	df	F	p	Eta ²
Sports Year	2-3 years	128	24.95	5.11	3,520	3.983	0.008*	0.022
	4-6 years	112	26.46	5.01				
	7-9 years	88	26.98	5.11				
	10 years and above	196	25.41	4.74				

Table 3: Eating disorder total score levels in terms of variables

$P < 0.05$, n: number of people, sd: standard deviation, df: degrees of freedom, 1: 2-3 years, 2: 4-6 years, 3: 7-9 years, 4: 10 years and above

Source: The Author

In Table 3, T-Test was applied for two independent groups at $\alpha = 0.05$ significance level to determine whether there was a significant difference in the total score of eating disorders in terms of gender, sport branch, level of sports and dieting status of the participants. In the test results;

There was no significant difference in the total score in terms of gender ($p > 0.05$).

A significant difference was found in the total score in terms of sports branch ($t_{(522)} = 2.259$; $p = 0.024$). It was seen that the mean of the individuals who did individual sports (26.12 ± 5.22) was significantly higher than the mean of those who did team sports (25.07 ± 4.41).

There was no significant difference in total score in terms of athlete level ($p > 0.05$).

There was a significant difference in the total score in terms of dieting ($t_{(522)} = -8.493$; $p=0.000$). The mean of non-diet (26.90 ± 4.71) was found to be significantly higher than the mean of dieters (23.07 ± 4.62).

In Table 3, the One-Way Anova test at $\alpha = 0.05$ significance level was used to determine whether there was a significant difference in the total score of eating disorders in terms of the participants' years of doing sports. In the test results, a significant difference was found in the total score in terms of years of doing sports ($F_{3,520} = 3.983$; $p=0.005$). It was observed that the mean of those who exercised for 2-3 years (24.95 ± 5.11) was significantly lower than the mean of those who participated in the exercise for 7-9 years.

When the effect sizes were examined, it was determined that sports and dieting had a high effect on eating disorders, and the year of doing sports had a low effect.

Variable	Coefficient	Sports Engagement Total Score	Eating Disorder Total Score
BMI	r	-0.046	-.107*
	p	0.292	0.014
	N	524	524
Number of Trainings/ Weekly	r	.272**	-.128**
	p	0.000	0.003
	N	524	524

Table 4: The relationship between BMI, number of training sessions, sports engagement and eating disorder scores

Source: The Author

In Table 4, the Pearson correlation test was applied to determine whether there was a significant relationship between the number of training variables of the participants and the scores of sports engagement and eating disorder. In the test results;

There was a high negative correlation between BMI and eating disorder ($r=-0,107$; $p=0,014$).

It was observed that there was a high level of positive correlation between the number of training sessions and sports engagement scores ($r=0.272$; $p=0.000$), while a high level of negative correlation was found between the eating disorder scores ($r= -0.128$; $p=0.003$).

Variable	Coefficient	Eating Disorder Total Score
Sports Engagement Total Score	Pearson R	-.320**
	p	0.000
	N	524

Table 5: Relationship levels between sports engagement and eating disorder behavior

Source: The Author

In Table 5, the Pearson correlation test was applied to determine whether there was a significant relationship between the participants' sports engagement and eating disorder

tendencies. In the test results, it was determined that there was a high level of negative correlation between sports engagement and eating disorder ($r = -0.320$; $p=0.000$).

Discussion

Participants' sports engagement scores; It was determined that it did not differ according to gender, but differed according to sports branch, level of sports, diet and year of sports (Table 2). Individuals, professionals, dieters, and those with more sports backgrounds were found to be more committed to sports. It is thought that the fact that the time spent by men and women for sports is not very different because the study is limited to people who have been doing regular activities for at least 2 years does not make a difference on their level of engagement. The resulting differences; It is thought that those who do sports individually feel more belonging because they take the responsibility on their own, those who go on a diet depend on exercise to keep themselves in shape, and those who have a long history of sports and those who do sports professionally have a past connection to the activity. On the scores of engagement to sports, Fawyer et al (30) obtained similar results according to gender, Can and Kızılet (31) according to participation time in sports, Sivrikaya and Biricik (32) according to sports branch, and Cox (33) according to athlete level.

Orthorexic (eating disorder) tendencies of the participants; It was determined that it did not differ according to gender and level of doing sports, but differed according to sports branch, diet and year of sports (Table 3). It was observed that those who did team sports, dieters and those with less sports background had higher orthorexic tendencies. The resulting differences; It is thought that those who do team sports do not receive support for nutrition, those who do diets are more obsessed with nutrition, and those who have less sports history are more obsessed with nutrition in order to be more fit. On the eating disorder scores, Scott et al (34) and Thiemann et al (35) obtained similar results according to sports branch, McDonald et al (36) according to athletic year, and Mossley (37) according to dieting status.

It was determined that the level of engagement of the participants increased as the number of training increased, while the level of eating disorder (decrease in eating disorder scores means higher orthorexic tendency) decreased. In addition, as BMI increased, orthorexic tendency was found to increase (Table 4). Considering that individuals like to do sports and they do sports to be in shape, it is possible that this will cause them to train more and this will increase their engagement to sports. In addition, it is thought that those who have more training are obsessed with nutrition in order to maintain their form. Costa et al (38) and McDonald et

al (36) reported that exercise frequency had an effect on engagement. Fidan et al (39) similarly reported that as the body mass index increased, orthorexic symptoms increased.

It was determined that as the participants' level of engagement to sports increased, their orthorexic tendencies also increased (Table 5). It is thought that the increase in their engagement to sports with the aim of obtaining an ideal physical attractiveness as a result of optimal sports performance affects their eating behavior. Similarly, in most of the studies conducted, it is stated that the prevalence of eating disorders is found in individuals who do sports (1,9,12, 13,14,15,36,40,41).

Conclusion

As a result, it was determined that the level of engagement and orthorexic tendency differed according to the variables, and these differences were caused by the sport branch, sport history, number of training and diet. In addition, it was determined that the high level of engagement to sports increased the orthorexic tendency. When people's physical appearance concerns are high, especially their desire to look fit due to environmental effects, this may be a factor in increasing the level of engagement to sports and orthorexic tendency. The positive effect of having a fit body on performance can also cause deterioration in eating behavior by keeping the athletes under pressure. This can lead to an obsession with nutrition and can lead to nutrient deficiencies, developmental problems and chronic diseases. Contrary to the removal of the theme that excessive sports are harmful to health, it should be concluded that it would be more correct not to normalize excessive training, food restriction and excessive weight loss in sports environments by seeing it as a problematic behavior. In this direction, obsessive eating behaviors can be prevented with a proper training plan and awareness about nutrition.

Considering the results of our study, the variables that affect orthorexic tendency should be determined well and appropriate approaches should be taken by taking them under control. In this context; It is recommended that individuals at risk receive support, Since studies on orthorexia nervosa are limited, it is suggested that more research should be done, Studies can be conducted with different sample groups on eating disorders.

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