INTERNATIONAL JOURNAL of IJSETS SPORT, EXERCISE & TRAINING SCIENCES

e-ISSN 2149-8229 **Volume** 11, **Issue** 1, 67–75, (2025) ***Research Article***

https://dergipark.org.tr/tr/pub/useeabd

Examination of Exercise Addiction and Orthorexia Nervosa Symptoms of Individuals Engaged in Physical Exercise

Mustafa TURHAN[1], Egemen ERMİŞ[2]

Abstract

Aim: The present study aimed to examine exercise addiction levels and orthorexia nervosa symptoms of individuals who engage in regular physical exercise in terms of various variables.

Method: A total of 350 individuals between the ages of 16 and 50 who exercised regularly in Samsun province participated in the present study. "Personal Information Form", "Exercise Addiction Scale" and "ORTO-11 Scale" were used as data collection tools. Normality test of independent sample t-test, ANOVA and Scheffe multiple comparison tests were conducted to analyze the results found in the study.

Results: A statistically significant difference was found among male participants and female participants in terms of Postponement of Individual Social Needs and Conflict, Tolerance Development and Passion and Exercise Addiction Scale scores ($p<0.05$). Participants who were not satisfied with their physical appearance had higher ORTO-11 scores. Participants who had 1-3 training sessions a week had higher ORTO-11 scores than participants who had 4-7 and 8 and higher training sessions a week, while participants who had 4-7 and 8 and higher training sessions a week had higher Excessive Focus and Emotion Change, Postponement of Individual Social Needs and Conflict, Tolerance Development and Passion and Exercise Addiction Scale scores than participants who had 1-3 training sessions a week ($p<0.05$).

Conclusion: A negative correlation was found between orthorexia nervosa and exercise addiction. It was concluded that the individuals who were engaged in regular physical exercise had low orthorexia nervosa levels and high exercise addiction levels.

Key words: *Eating Disorder, Exercise Addiction, Healthy Eating, Healthy Life, Orthorexia Nervosa.*

Submission Date : 30.12.2024 **Acceptance Date** : 26.03.2025 **Online Publication Date** : 27.03.2025
https://doi.org/10.18826/useeabd.1609794

INTRODUCTION

The importance of a balanced diet and regular exercise for a healthy life is frequently highlighted by health experts. A healthy balanced diet accompanied by regular exercise is essential in maintaining physical and mental health and well-being and the most important criteria for a healthy lifestyle are exercise and nutrition (Rudolph, 2018). Today, making efforts for a healthy diet continues to increase its effectiveness among individuals. In parallel with this, positive aspects of being in a regular exercise plan are known to improve and maintain the elements of physical fitness in the lives of individuals and this situation leads individuals to participate in regular and varied physical activities. However, habits related to healthy eating, duration, intensity and frequency of exercise participation may cause some negative consequences if they affect an individual's life planning more than necessary. Exerting too much effort to eat healthily can become an obsession and the desire to exercise can become addictive (Chen, 2016).

The benefits of physical exercise on health are well-known (Malm et al., 2019). Regular physical exercise in adults has been shown to be related to lower risk of various cancers, lower risk of cardiovascular and all-cause mortality, reduced risk of weight gain, better cognitive function, improved quality of life, and improved sleep (Powell et al., 2019). However, if regular exercise for physical and psychological health goes beyond its purpose and the duration of exercise continues to increase day by day, individuals may lose control (Yeltepe, 2005). Exercise addiction (EA) is a dysfunctional behaviour characterised by exaggerated training and loss of control over exercise behavior (Szabo & Demetrovics, 2022). Individuals who are unable to give up exercise are prone to behaviours such as not being able to spare time for their relatives and close environment, isolating themselves from social activities and adapting their lifestyle according to their exercise plan (Adams & Kirkby, 2002). The word exercise is often recognised as a useful concept because of its positive effects. The word addiction, on the other hand, generally connotes all situations that are negative. Previously, addiction was categorised into two: the use of alcohol and the use of drugs. However, it is now referred to in many other classifications,

[1] Ondokuz Mayıs University, Institute of Graduate Studies, Turkey, egemenermis55@gmail.com
[2] **Corresponding Author:** Ondokuz Mayıs University, Faculty of Sport Sciences, Department of Coaching, Turkey, egemen.ermis@omu.edu.tr

such as sexual behaviour, playing chance games, excessive exercise and computer or video games (Terry et al., 2004).

Orthorexia nervosa (ON) as a concept first began to appear in the late 1990s. Orthorexia nervosa is defined as a fixation on eating healthy food with the aim of achieving healthiness (and/or avoiding illness) by Bratman & Knight (2000). It is characterized by a strict avoidance of food which are impure or unhealthy by the individual (Strahler et al., 2018). The most common words used to describe orthorexia nervosa are obsession, fixation, and preoccupation (Cena et al., 2019). These words suggest excessive attention to food, which takes over one's cognition and leads to behaviour sustaining this fixation. Individuals with orthorexia nervosa prioritize all-natural, additive free food. If they consume something they perceive as unhealthy, they experience anxiety (Farchakh et al., 2019). Individuals with orthorexia nervosa think about food and drink at all times of the day and spend most of the day constantly thinking and preoccupying themselves with healthy eating. Orthorexia nervosa can be clearly indicated when this obsessive behaviour affects the individual's life negatively (Cartwright, 2004). Orthorectic individuals apply very strict principles to themselves in terms of nutrition by feeling themselves to be in a constant diet plan. As a result of these behavioural attitudes, they may experience significant health problems. It has been found that individuals with orthorexia nervosa have higher behaviors related to general eating pathological problems such as stress, depression, and life satisfaction compared to individuals without orthorexia nervosa (Strahler et al., 2018). It has been found that orthorexia nervosa is related to symptoms and concerns characteristics of eating disorders (McComb & Mills, 2019; Brytek-Matera et al., 2020; Mitrofanova, 2020). One of the groups with the highest risk of orthorexia nervosa is individuals who are engaged in sports (Brytek-Matera, 2012). Since they know the importance of physical fitness for individuals who are engaged in sports, they pay attention to their nutrition to have sufficient physical fitness. The fact that they are very sensitive to nutrition planning leads these individuals to investigate the ingredients in foods, to examine the nutrient content labels on the packages of the foods taken, and to try to calculate the calories of the foods. For this reason, people who engage in sports or regular physical exercise usually have a high level of desire to follow a diet or to be in a diet program (Üstündağ, 2020).

It is widely accepted that intense physical exercises are typically related to eating disorders, while the relationship between orthorexia nervosa (ON) and excessive physical exercise is still a subject of debate (Yao et al., 2023). In addition, the research in literature on factors related to orthorexia nervosa is still insufficient and there are few studies examining the variables of exercise addiction and orthorexia nervosa together (Rudolph, 2018). Therefore, the present study aims to fill this gap in the literature by addressing these two important issues together and determining the exercise addiction levels of individuals who engage in regular physical exercise in terms of their sociodemographic characteristics and determining the prevalence of orthorexia nervosa.

METHOD

Research model

Since the study was conducted to reveal the status of individuals in different age groups at a certain point in time, the present study was modelled as a cross-sectional study. In cross-sectional studies, participants' opinions regarding a topic or event, or their features such as interests, skills, abilities and attitudes are determined while data measurement is performed at once and sample sizes are larger compared to other types of studies (Karasar, 2018).

Participants

A total of 350 individuals, 170 females and 180 males, between the ages of 16 and 50, who regularly exercised in Samsun province, participated voluntarily in the study. As demographic characteristics, gender, disability status, weekly exercise time, educational status and satisfaction with physical appearance were evaluated. The sample was determined through a simple random sampling method. There are various practical rules in the literature for determining the sample size. In this study, the recommendation that the sample size in scale studies should be at least 5 times of each scale item (Tavşancıl, 2014) was taken into consideration. The scale forms used in the study consist of 28 items in

total. For this reason, the minimum number of participants required to participate in the study was determined as 140.

Data collection tools

Personal Information Form: This form was prepared by the researchers and included information about the participants' age, gender, weekly duration of exercise, educational status, gym membership status and satisfaction with physical appearance.

Exercise Addiction Scale (EAS): "Exercise Addiction Scale (EAS)" developed by Demir, Hazar and Cicioğlu was used as a data collection tool to determine the exercise addiction levels of individuals (Demir et al., 2018). "Exercise Addiction Scale" consists of 17 items and 3 sub-dimensions. Items 1, 2, 3, 4, 5, 6, 7 of the scale, which was created in a 5-point Likert-type format, measure the sub-dimension of Excessive Focus and Emotion Change (EFEC); items 8, 9, 10, 11, 12, 13 measure the sub-dimension of Postponement of Individual-Social Needs and Conflict (PISNC), and items 14, 15, 16, 17 measure the sub-dimension of Tolerance Development and Passion (TDP) (Demir, 2018). The scale is scored as '1=Strongly Disagree', '2=Partially Disagree', '3=Moderately Agree', '4=Agree', '5=Strongly Agree'. Score ranges are evaluated as '1-17 normal group, 18-34 low risk group, 35-51 risk group, 52-69 addicted group, 70-85 highly addicted group'.

ORTO-11: In the present study, ORTO-11 test, which was developed to determine obsession with healthy eating in individuals, was used to calculate the orthorexia nervosa risk. The ORTO-11 scale was first prepared as ORTO-15 in 2005 by Donini et al., (2004) and adapted by Arusoğlu et al., 2008. The items in the scale can be answered in a 4-point format. Respondents are asked to tick one of the options 'always', 'often', 'sometimes' and 'never'. Each item is graded as 1, 2, 3 and 4 points. The items examine the obsessive behaviours of individuals in selecting, purchasing, preparing and consuming foods that they themselves consider healthy. As the scores of the respondents increase, their tendency towards orthorexia decreases. The cut-off value used to evaluate the Orthorexia-11 Questionnaire in the present study was determined by utilizing the method adopted by Arusoğlu et al.

Data analysis

When ordinal data such as Likert scales are used in survey data, normality tests (Shapiro-Wilk, Kolmogorov-Smirnov, etc.) often do not yield normal distribution results. The main reason for this is that the Likert scale produces values that are discreet and in a limited range (e.g. 1-5) rather than a continuous variable. Such data may not conform to a perfectly normal distribution by nature. In this case, looking at Kurtosis and Skewness values is a much more practical and meaningful approach. A Kurtosis value between ±1.0 is considered excellent for most psychometric purposes, but a value between ±2.0 is in many cases also acceptable, depending on the application (George & Mallery, 2012). Skewness is the measure of the symmetry of a distribution; in most instances the comparison is made to a normal distribution. A positively skewed distribution has relatively few large values and tails off to the right, and a negatively skewed distribution has relatively few small values and tails off to the left. Skewness values falling outside the range of -1 to +1 indicate a substantially skewed distribution (Hair et al., 2013). In this context, in the present study, the Kurtosis and Skewness values of all survey questions and the total scores obtained from them were found within the ranges specified by the reference sources and the data found were normally distributed. In the analysis, the independent samples t-test was used for two group comparisons and analysis of variance (ANOVA) test was used for more than two group comparisons. The Scheffe post-hoc test was used to determine the groups with differences in multiple comparisons (since the group sample numbers were different). Pearson Correlation analysis was also conducted to examine the correlation between orthorexia nervosa and exercise addiction. The findings were expressed as arithmetic mean and standard deviation, and the significance level was taken as 0.05. All calculations were made with SPSS 21 package program. When the factor structures for both scales were analyzed, Cronbach Alpha values were found as follows: 0.912 for Excessive Focus and Emotion Change factor, 0.882 for Postponement of Individual-Social Needs and Conflict factor, 0.854 for Tolerance Development and Passion factor and 0.949 for Exercise Addiction Total Score. Cronbach Alpha value was found as 0.858 for ORTO-11 scale.

RESULTS

Table 1. Descriptive results

Variables	Groups	n	%
Gender	Male	180	51.43
	Female	170	48.57
Being Satisfied with Physical Appearance	Yes	182	52.00
	No	168	48.00
Educational Status	Secondary	48	13.71
	Associate	68	19.43
	Under/Post graduate	234	66.86
Weekly Training Sessions	1-3	174	49.71
	4-7	109	31.14
	>8	67	19.14
Total		350	100

Among the participants, 180 are male and 170 are female, indicating an almost equal gender distribution. While 52% are satisfied with their physical appearance, 48% stated that they are not. Most of the participants (66.9%) have an undergraduate or postgraduate education. Those with a secondary education make up 13.7%, while associate degree holders account for 19.4%. Most participants (49.7%) train 1-3 days per week, while 31.1% train 4-7 days, and 19.1% train 8 or more days per week.

Table 2. ORTO-11 scores and Exercise Addiction and sub-dimension scores of the participants in terms of gender

Variables	Gender	n	Mean	d.f.	t	p
ORTO-11	Male	180	27.74	4.82	-.088	.930
	Female	170	27.78	4.44		
Excessive Focus and Emotion Change	Male	180	23.89	7.29	.731	.465
	Female	170	23.36	6.19		
Postponement of Individual-Social Needs and Conflict	Male	180	15.85	5.41	3.999	0.001*
	Female	170	13.62	5.01		
Tolerance Development and Passion	Male	180	11.53	4.33	3.970	0.001*
	Female	170	9.78	3.90		
Exercise Addiction Total Score	Male	180	51.28	15.56	2.919	0.004*
	Female	170	46.76	13.18		

**p<0.05*

As can be seen in Table 2, a statistically significant difference was found in "Postponement of Individual-Social Needs and Conflict", "Tolerance Development and Passion" sub-dimensions and total score of "Exercise Addiction Scale" (*p<0.05*). Male participants were found to have higher scores than female participants.

Table 3. Comparison of ORTO-11 scores and Exercise Addiction and sub-dimension scores of the participants in terms of the state of being satisfied with physical appearance

Variables	Satisfaction with physical appearance	n	Mean	d.f.	t	p
ORTO11	Yes	182	26.31	4.69	-6.449	0.001*
	No	168	29.33	4.02		
Excessive Focus and Emotion Change	Yes	182	24.19	7.08	1.599	0.111
	No	168	23.04	6.39		
Postponement of Individual-Social Needs and Conflict	Yes	182	15.32	5.51	2.050	0.041*
	No	168	14.16	5.07		
Tolerance Development and Passion	Yes	182	11.38	4.46	3.291	0.001*
	No	168	9.92	3.79		
Exercise Addiction Total Score	Yes	182	50.90	15.32	2.437	0.015*
	No	168	47.12	13.58		

**p<0.05*

In Table 3, statistically significant differences can be seen in "ORTO-11", "Postponement of Individual-Social Needs and Conflict", "Tolerance Development and Passion" and "Exercise Addiction" scores in terms of the state of being satisfied with physical appearance (p<0.05). Participants who were satisfied with their physical appearance got higher scores.

Tablo 4. Comparison of ORTO-11 scores and Exercise Addiction and sub-dimension scores of the participants in terms of educational status

Variables	Educational Status	n	Mean	d.f.	F	p	Scheffe
ORTO11	Secondary	48	28.17	4.64	.842	.432	-
	Associate	68	28.25	5.05			
	Undergraduate/postgraduate	234	27.53	4.51			
Excessive Focus and Emotion Change	Secondary[1]	48	21.60	7.44	10.807	0.001*	3>1-2
	Associate[2]	68	21.12	7.74			
	Undergraduate/postgraduate[3]	234	24.79	6.03			
Postponement of Individual-Social Needs and Conflict	Secondary[1]	48	14.04	5.69	3.842	.022*	3>2
	Associate[2]	68	13.43	5.55			
	Undergraduate/postgraduate[3]	234	15.30	5.12			
Tolerance Development and Passion	Secondary	48	10.67	4.89	2.251	.107	-
	Associate	68	9.74	4.07			
	Undergraduate/postgraduate	234	10.96	4.08			
Exercise Addiction Total Score	Secondary[1]	48	46.31	16.49	6.887	.001*	3>1-2
	Associate[2]	68	44.28	15.96			
	Undergraduate/postgraduate[3]	234	51.05	13.39			

**p<0.05*

In Table 4, a statistically significant difference can be seen in "Excessive Focus and Emotion Change", "Postponement of Individual-Social Needs and Conflict" and "Exercise Addiction total" scores, with undergraduate and postgraduates having higher scores.

Table 5. Comparison of ORTO-11 scores and Exercise Addiction and sub-dimension scores of the participants in terms of number of weekly training sessions

Variables	Number of weekly training sessions	n	Mean	d.f.	F	p	Scheffe
ORTO-11	1-3[1]	174	29.09	4.46	17.342	0.001*	1>2-3
	4-7[2]	109	26.93	4.19			
	≥8[3]	67	25.66	4.71			
Excessive Focus and Emotion Change	1-3[1]	174	21.41	6.52	24.073	0.001*	2>3>1
	4-7[2]	109	26.75	5.51			
	≥8[3]	67	24.34	7.21			
Postponement of Individual-Social Needs and Conflict	1-3[1]	174	13.25	5.22	15.067	0.001*	2-3>1
	4-7[2]	109	16.29	4.59			
	≥8[3]	67	16.21	5.69			
Tolerance Development and Passion	1-3[1]	174	9.01	3.96	32.138	0.001*	2-3>1
	4-7[2]	109	12.31	3.47			
	≥8[3]	67	12.37	4.28			
Exercise Addiction Total Score	1-3[1]	174	43.68	13.76	28.041	0.001*	2-3>1
	4-7[2]	109	55.36	12.04			
	≥8[3]	67	52.93	15.42			

**p<0.05*

Table 5 shows statistically significant differences in ORTO-11 scores and all sub-dimensions and overall score of "Exercise Addiction Scale" in terms of the number of weekly training sessions ($p<0.05$). It was found that participants who had 1-3 training sessions a week had the lowest scores in all sub-dimensions and overall score of "Exercise Addiction Scale" and the highest score in ORTO-11 scale.

Table 6. Correlation coefficient values between ORTO-11 and Exercise Addiction subscales and total scale

Variable	ExcessiveFocus	IndividualSoc	Tolerance	EASTotal
ORTO-11	-.255*	-.237*	-.284*	-.286*

**p<0.05; Pearson Correlation analysis*

When the results in Table 6 are analysed, a weak negative correlation can be seen between ORTO-11 scores and Exercise Addiction subscales and total scale (**p<0.05*). While ORTO-11 scores increase, exercise addiction scores decrease.

DISCUSSION

The present study, which was conducted to examine the exercise addiction levels and orthorexia nervosa symptoms of individuals who regularly engaged in physical exercise in terms of various variables,

revealed that as orthorexia nervosa tendency of individuals increase, their exercise addiction scores also tend to increase.

When the ORTO-11 scale was analysed in terms of the gender variable, no statistically significant difference was found. McInerney & Ernst (2011) reached the same conclusion in their study with individuals aged 16-40 years. There are also other studies which reported that there is no significant relationship between ORTO-11 score and gender (Brytek et al., 2015; Almedia et al., 2018; Erduğan et al., 2024). Therefore, when the literature was reviewed, it was found that the data obtained from other studies supported the present study.

In the present study, when PISNC, TDP and EAS scores were examined in terms of the gender variable, it was found that male participants had higher scores than female participants. Similar to the results of the present study, Tekkurşun-Demir & Türkeli (2018) found a significant difference in favor of men in the sub-dimensions of PISNC and TDP. In a systematic review by Dumitru et al., (2018) exercise dependence levels were higher in men than in women in 25 of the 27 studies they examined. Zmijewski & Howard (2013) also found that male participants had higher PISNC, TDP and EAS scores than female participants. However, there are also studies in which women had higher scores or in which no significant difference was found (Demirel & Cicioğlu, 2020; Batu & Aydın, 2020). The differences in the results may be due to the differences in the demographic characteristics of the participants in studies.

In terms of the state of being satisfied with physical appearance, it was found that the individuals who were not satisfied with their physical appearance in the present study had higher ORTO- 11 scores. Previous studies have found that dissatisfaction with one's body is related with disrupted eating behavior in university students (Bundros et al., 2016). In a study conducted by Altıntaş et al., (2007) it was found that participants who were dissatisfied with their physical appearance showed more orthorexia nervosa symptoms. The reason for this may be that individuals may never be satisfied with their own physical appearance if they are obsessed with healthy eating, and perhaps they may have turned this into an obsession. However, PISNC, TDP, and EAS scores of individuals who were satisfied with their physical appearance in the present study were statistically significantly higher. Tatlıses (2016) also found a significant difference in PISNC, TDP and EAS scores of individuals who were satisfied with their physical appearance, which supported the findings of the present study. There are also studies in literature which show that orthorexic individuals do not have body dissatisfaction because the main goals of orthorexic individuals are not to lose weight but to eat healthily (Bratman & Knight, 2000). Another study conducted on young adults reported that body image was not a predictor for orthorexic tendency (Topçu & Arıcak, 2019). When the results are compared, it can be said that when individuals who exercise regularly bring this to the degree of addiction, a significant difference in these scores is normal, but it is possible to say that these participants are candidates to becoming addicted to exercise.

In the present study, it was found that participants with undergraduate degrees had higher EFEC and EAS scores than the participants who had associate and secondary education degrees. In terms of PISNC sub-dimension, it was found that participants who had undergraduate and post-graduate degrees had higher scores than the participants who had associate degrees. It was found that the participants with undergraduate and post-graduate degrees had the highest scores in all the subdimensions of exercise addiction scale. In terms of ORTO-11 scores, it was found that the participants with undergraduate and post-graduate degrees had the lowest scores, which means that they had the lowest tendency for being orthorexic. In their study, Arusoğlu et al. (2018) found that post-graduate education group had higher score on ORTO-11. Donini et al., (2014) found a significant difference in orthorexia nervosa levels of individuals who had low levels of education.

It was found that ORTO-11 scores of individuals who had 1-3 training sessions a week were higher than the scores of individuals who had 4-7 sessions and those who had 8 and more sessions a week. Therefore, the first hypothesis of this study that regular physical exercise would have a positive effect on orthorexia nervosa levels of individuals was confirmed. In a study conducted by Polat (2015), while the highest level of orthorexia nervosa was found in participants who exercised once a week, the lowest level of orthorexia nervosa was found in the group who exercised twice a week. While the results support the results of the present study, this study was conducted only on gym members. In Erduğan et al.'s (2024) study, it was found that orthorexic tendency increased as the number of days individuals exercised

increased. In the present study, the participants who had 4-7 or 8 and more training session a week had higher PISNC, TDP, EAS scores than the participants who had 1-3 training sessions a week. Thus, the second hypothesis of the present study that individuals who have regular physical exercise would have high exercise addiction levels was also confirmed. Participants' trying to escape from daily work and facing socialisation problems may be the reasons for extending the exercise duration. In Erduğan et al.'s (2024) study, it was found that the levels of exercise addiction among participants significantly increased with increase in frequency of weekly workouts. Sicilia et al., (2017) stated that exercise intensity significantly predicted exercise addiction. Üstündağ (2020) also examined exercise addiction and orthorexia nervosa symptoms in participants who exercised in gyms. According to the results, it was concluded that whether the participants exercised or not had no effect on their ORTO-11 scores. In another study on 150 participants who exercised regularly, Orhan et al., (2019) reported that weekly exercise duration and exercise addiction were not correlated. On the contrary, Roncero et al., revealed a significant relation between scores for Orthorexia-11 Questionnaire and doing regular physical exercise (Roncero et al. 2017). Different results found in different studies may be due to the different levels of information the participants had about training and the different samples of studies.

A weak negative correlation was found between ORTO-11 and Exercise addiction scores. While ORTO-11 scores increased, exercise addiction scores decreased. Similarly, Erduğan et al., (2024) also found a low negative correlation between orthorexia nervosa and exercise addiction. Zmijewski & Howard (2013) investigated the status of exercise addiction and orthorexia nervosa symptoms in a study of 375 male and female participants who exercised regularly and found a positive correlation between the two groups. Yıldırım et al., (2017) also found that these two variables were correlated. When the literature is reviewed, the results of the present study and similar studies show that as the participants' behaviours towards nutritional obsession increase, their level of addiction on exercise also tends to increase.

CONCLUSION

According to the results of the present study, which was conducted to examine the relationship between orthorexia nervosa and exercise addiction in individuals who exercise regularly, it can be concluded that individuals who engage in regular physical exercise have low levels of orthorexia nervosa symptoms and high levels of exercise addiction. Therefore, decreasing exercise addiction levels can vary depending on the level of orthorexia nervosa.

Etical Approval and Permission Information

Ethics Committee: Ondokuz Mayıs University, Social Sciences Research Ethics Committee
Protocol/Number: 2022-110

REFERENCES

Adams, J., & Kirkby, R. J. (2002). Excessive exercise as an addiction: A review. *Addiction Research & Theory, 10*(5), 415-437.

Altıntaş, A., Aşçı, F. H., & Özenir, B. T. (2007). Benlik sunumunun cinsiyete ve egzersiz davranışı parametrelerine göre incelenmesi. *Spor Bilimleri Dergisi, 18*(2), 91-99.

Almeida, C., Vieira Borba, V., & Santos, L. (2018). Orthorexia nervosa in a sample of Portuguese fitness participants. *Eating and Weight Disorders, 23*(4), 443–451.

Arusoğlu, G., Kabakçı, E., Köksal, G., & Merdol, T. K. (2008). Ortoreksiya Nervoza ve Orto-11'in Türkçeye uyarlama çalışması. *Türk Psikiyatri Dergisi, 19*(3), 283-291.

Batu, B., & Aydın, A. D. (2020). Elit yüzme sporcularının egzersiz bağımlılığı düzeylerinin incelenmesi. *Gaziantep Üniversitesi Spor Bilimleri Dergisi, 5*(4), 399–412.

Bratman, S., & Knight, D. (2000). *Health food junkies: overcoming the obsession with healthful eating.* Broadway Books, p.1-242.

Brytek-Matera, A. (2012). The relationship between body image disturbance and coping with stress in patients suffering from anorexia nervosa. *Polish Psychological Bulletin, 43*(4), 253-260.

Brytek-Matera, A., Donini, L. M., Krupa, M., Poggiogalle, E., & Hay, P. (2015). Orthorexia nervosa and self-attitudinal aspects of body image in female and male university students. *Journal of Eating Disorders, 3*(1), 2.

Brytek-Matera, A., Onieva-Zafra, M.D., Parra-Fernández, M.L., Staniszewska, A., Modrzejewska, J. & Fernández-Martínez, E. (2020). Evaluation of orthorexia nervosa and symptomatology associated with eating disorders among European university students: A multicentre cross-sectional study. *Nutrients, 12*, (12), 3716.

Bundros, J., Clifford, D., Silliman, K., & Neymas Morris, M. (2016). Prevalence of orthorexia nervosa among college students based on Bratman's test and associated tendencies. *Appetite,* 101, 86-94.

Cartwright, M. M. (2004). Eating disorder emergencies: understanding the medical complexities of the hospitalized eating disordered patient. *Critical Care Nursing Clinics, 16*(4), 515-530.

Cena, H., Barthels, F., Cuzzolaro, M., Bratman, S., Brytek-Matera, A., Dunn, T., & Donini, L. M. (2019). Definition and diagnostic criteria for orthorexia nervosa: A narrative review of the literature. *Eating and Weight Disorders Studies on Anorexia, Bulimia and Obesity, 24*, 209–246.

Chen, W.J. (2016). Frequent exercise: A healthy habit or a behavioral addiction? *Chronic Diseases and Translational Medicine, 2*(04), 235-240.

Demir, G. T., Hazar, Z., & Cicioğlu, H. İ. (2018). Egzersiz bağımlılığı ölçeği (EAS): Geçerlik ve güvenirlik çalışması. *Kastamonu Eğitim Dergisi, 26*(3), 865-874.

Demirel, H. G., & Cicioğlu, H. İ. (2020). Üst düzey sporcuların egzersiz bağımlılık düzeylerinin incelenmesi. *Gaziantep Üniversitesi Spor Bilimleri Dergisi, 5*(3), 242–254.

Donini, L. M., Marsili, D., Graziani, M. P., Imbriale, M., & Cannella, C. (2004). Orthorexia nervosa: a preliminary study with a proposal for diagnosis and an attempt to measure the dimension of the phenomenon. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 9*(2), 151-157.

Dumitru, D. C., Dumitru, T., & Maher, A. J. (2018). A systematic review of exercise addiction: Examining gender differences. *Journal of Physical Education and Sport, 18*(3), 1738–1747.

Erduğan, F., Sülün, F., Uzun, E. A., & Özdemir, D. (2024). Exploring the interplay between orthorexia nervosa and exercise addiction in the pursuit of optimal well-being. *Research in Sports Science, 14*(2), 64-72.

Farchakh, Y., Hallit, S., & Soufia, M. (2019). Association between orthorexia nervosa, eating attitudes and anxiety among medical students in Lebanese universities: Results of a cross-sectional study. *Eating and Weight Disorders, 24*(4), 683–691.

George, D., & Mallery, M. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference*, 17.0 update (10a ed.). Pearson.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2013). *Multivariate Data Analysis.* Pearson Education Limited.

Karasar, N. (2018). *Bilimsel Araştırma Yöntemleri: Kavramlar, İlkeler ve Teknikler* (32.Baskı). Nobel Yayın Dağıtım.

Malm, C., Jakobsson, J., & Isaksson, A. (2019). Physical activity and sports – real health benefits: A review with insight into the public health of Sweden. *Sports, 7*(5), 127.

McComb, S.E. & Mills, J.S. (2019). Orthorexia nervosa: A review of psychosocial risk factors. *Appetite*, 140, 50-75.

Mitrofanova, E. (2020). *From a Healthy Diet to Pathology: Exploring the Complexity of Orthorexia Nervosa*. Ph.D. Thesis. Kingston University, UK.

Orhan, S., Yücel, A. S., Sadeq, B. J., & Orhan, E. (2019). Investigation of the exercise dependence of athletes doing kickboxing, taekwondo, and Muay Thai. *Sports (Basel, Switzerland), 7*(2), 52.

Polat, C., & Şimşek, K. Y. (2015). Spor merkezlerindeki bireylerin egzersiz bağımlılığı düzeylerinin incelenmesi: Eskişehir İli Örneği. *Akademik Sosyal Araştırmalar Dergisi, 3*(15), 354-369.

Powell, K. E., King, A. C., Buchner, D. M., Campbell, W. W., DiPietro, L., Erickson, K. I., . . . Whitt-Glover, M. C. (2019). The scientific foundation for the physical activity. *Journal of Physical Activity and Health, 16*, 1–11.

Roncero, M., Barrada, J. R., & Perpiñá, C. (2017). Measuring orthorexia nervosa: Psychometric limitations of the ORTO-15. *The Spanish Journal of Psychology, 20*:E41.

Rudolph, S. (2018). The connection between exercise addiction and orthorexia nervosa in German fitness sports. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 23*(5), 581-586.

Sicilia, Á., Alcaraz-Ibáñez, M., Lirola, M. J., & Burgueño, R. (2017). Influence of goal contents on exercise addiction: Analysing the mediating effect of passion for exercise. *Journal of Human Kinetics, 59*, 143–153.

Strahler, J., Hermann, A., Walter, B., & Stark, R. (2018). Orthorexia nervosa: A behavioral complex or a psychological condition? *Journal of Behavioral Addictions, 7*(4), 1143-1156.

Szabo, A., & Demetrovics, Z. (2022). *Passion and addiction in sports and exercise*. Routledge.

Tatlıses, M. (2016). *Spor salonunda düzenli spor yapan kişilerin ortoreksiya nervoza belirtileri ile beden algısı arasındaki ilişkinin incelenmesi*. Yüksek Lisans Tezi. Beykent Üniversitesi.

Tavşancıl, E. (2014). *Tutumların ölçülmesi ve SPSS ile veri analizi* (5. Baskı). Nobel Akademik Yayıncılık.

Tekkurşun Demir, G., Hazar, Z., & Cicioğlu, H. İ. (2018). Egzersiz bağımlılığı ölçeği (EBÖ): Geçerlik ve güvenirlik çalışması. *Kastamonu Eğitim Dergisi, 26*(3), 865–874.

Terry, A., Szabo, A., & Griffiths, M. (2004). The exercise addiction inventory: A new brief screening tool. *Addiction Research & Theory, 12*(5), 489-499.

Topçu F., & Aricak O.T. (2019). The Effect of Perfectionism and Body Perception on Orthorexia Among Young Adults. *Journal of Cognitive Behavioral Psychotherapies and Research, 8*(3)170-178.

Üstündağ, E. G. (2020). *Spor salonunda spor yapan bireylerde yeme farkındalığı ile ortoreksiya nervoza belirtileri arasındaki ilişkinin incelenmesi*. Yüksek Lisans Tezi. Çağ Üniversitesi.

Yao, S-J., Ma, Q-S., Liu, C., Cao, D-W., Lyu, T., & Guo, K-L. (2023). The relationship between physical exercise and subjective well-being among Chinese junior high school students: A chain mediating model. *Frontiers Psychology, 13*, 1053252.

Yeltepe, H. (2005). *Egzersiz Bağımlılığının Tanımlanması ve ''Egzersiz Bağımlılığı Ölçeği-21''in Geçerlilik Ve Güvenilirlik Çalışmasının Yapılması*. Yüksek Lisans Tezi. Marmara Üniversitesi.

Yıldırım, İ., Yıldırım, Y., Ersöz, Y., Işık, Ö., Saraçlı, S., Karagöz, Ş., & Yağmur, R. (2017). Egzersiz bağımlılığı, yeme tutum ve davranışları ilişkisi. *CBÜ Beden Eğitimi ve Spor Bilimleri Dergisi, 12*(1), 43-54.

Zmijewski, C. F., & Howard, M. O. (2013). Exercise dependence and attitudes toward eating among young adults. *Eating behaviors, 4*(2), 181-195.

CITATION

Turhan, M., & Ermiş, E. (2025). Examination of Exercise Addiction and Orthorexia Nervosa Symptoms of Individuals Engaged in Physical Exercise. *International Journal of Sport Exercise and Training Sciences - IJSETS, 11*(1), 67-75. https://doi.org/10.18826/useeabd.1609794