HONG KONG JOURNAL OF SOCIAL SCIENCES

香港社會科學學報

第一的第 61 期 (2023 春/夏) Vol. 61 Spring/Summer 2023

Open Access Article https://doi.org/10.55463/hkjss.issn.1021-3619.61.8

Orthorexia Nervosa and Obsessive Compulsive Symptoms as Risk Factors for Exercise Dependence

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Received: March 6, 2023 ▪ Reviewed: April 2, 2023

▪ Accepted: May 1, 2023 ▪ Published: June 30, 2023

Abstract:
Regular exercise is beneficial both physiologically and toward mental health; however, excessive exercise can be the cause of dependence. One of the aims of this study was to evaluate exercise dependence, orthorexia nervosa levels, and symptoms of obsessive compulsive behavior in individuals who regularly exercise at the gym. Another aim of this study was to show the predictive effect of exercise dependence, orthorexia nervosa, and symptoms of obsessive compulsive behaviour. Participants aged 18 and over included in this study have been exercising regularly at a gym for a year. Within 390 participants, 179 females and 211 males were included in this study. EDS-21, ORTO-11, PE-WSUR were applied on the participants. Research findings show a statistically significant difference in the ORTO-11 scale between male and female participants, according to male participants whose female participants showed lower scores. Another important finding of this study shows that exercise dependence has negative relations to orthorexia nervosa levels and positive relations to obsessive compulsive traits. It has also been determined that both orthorexia nervosa and symptoms of obsessive compulsive behavior are predictive of exercise dependence. Study findings show that orthorexia nervosa and symptoms of obsessive compulsive behavior could be effective and important factors in improving exercise dependence. The findings of the study can be used to better understand the risk factors of exercise addiction, which is one of the behavioral addictions in the field of psychology. This is the first study in TRNC in which exercise addiction, orthorexia nervosa, and obsessive-compulsive symptoms work together. In addition, it is thought that the study will provide information about exercise addiction and a better understanding of the factors that may affect the development of exercise dependence.

Keywords: exercise dependence, orthorexia nervosa, obsessive compulsive disorder.

神经性厌食症和强迫症状作为运动依赖的危险因素

摘要：
定期锻炼对生理和心理健康都有好处；但是，过度运动可能会导致依赖。本研究的目的之一是评估经常在健身房锻炼的人的运动依赖性、神经性厌食症水平和强迫行为症状。本研究的另一个目的是显示运动依赖

、神经性厌食症和强迫行为症状的预测效果。参与这项研究的18岁及以上的参与者已在健身房定期锻炼一年。在390名参与者中，179名女性和211名男性被纳入本研究。能谱分析-21、或者-11、聚乙烯醇-WSUR应用于参与者。研究结果显示，男性参与者和女性参与者的或者-11量表在统计学上存在显着差异，男性参与者的女性参与者得分较低。这项研究的另一个重要发现表明，运动依赖与神经性厌食症水平呈负相关，与强迫症特征呈正相关。还确定神经性厌食症和强迫行为的症状都可以预测运动依赖性。研究结果表明，神经性厌食症和强迫行为症状可能是改善运动依赖性的有效和重要因素。该研究的结果可用于更好地了解运动成瘾的危险因素，运动成瘾是心理学领域的行为成瘾之一。这是TRNC的第一项研究，其中运动成瘾、神经性厌食症和强迫症状共同作用。此外，该研究被认为将提供有关运动成瘾的信息，并更好地了解可能影响运动依赖发展的因素。

关键词：运动依赖、神经性正食症、强迫症。

1. Introduction

The importance of a healthy life both physically and mentally is known today, and regular physical activity is beneficial both physiologically and mentally (Teychenne et al., 2020). Regular exercise plays an important role in staying healthy and preventing illnesses, the activity of a series planned, structured and repeated complex movements is known to be done with sufficient adequacy, intensity and period (Berczik et al., 2012). However on the other hand research shows that for some people exercise could be the cause of dependence and with regard to health it could be dangerous. Defined as Exercise Dependence (ED), this situation is the excessive desire to fill most time with physical activity, and as opposed to obstacles, it is defined as excessive exercise uncontrollably (Hausenblas & Symons Downs, 2002a). ED indicates three basic components: tolerance, the effect of withdrawal, and compulsive behavior (Adams et al., 2003). By using the diagnosis criteria of addiction to psychoactive substances, the definition of exercise dependence is that it is also known to be repeated in compulsive behavior as well as psychoactive substance addiction. Exercise dependence and psychoactive substance addiction show similarities on behavioral levels as well as similarities in biological periods (Williams & Thompson, 2014; Hausenblas & Symons Downs, 2002a). Like other addiction types, exercise dependence is also repetitive, obsessive, and has compulsive aspects. In addition to this, once their behavior is inhibited or delayed, mental level behavior shows a characteristic of keeping busy on a mental level and this is seen in both behavioral and chemical addiction. This characteristic shows the obsessive aspect of ED (Hollander 1993). By seeing symptoms such as; tolerance, withdrawal, uncontrollable excessive exercise behavior and craving exercise in free time ED is appropriately defined as addiction; category of which class of definition has not yet been determined and an agreement of how it will be determined has not yet been reached (Adams 2009). It is seen that the reason for this is the fact that it is approved socially (Lichtenstein et al., 2014), there are no objective disorders and genuine diagnosis criteria and it is not yet defined also, people do not see the disorder as a problem and are therefore not looking for help (Hausenblas & Symons Downs, 2002a).

There are two known types of ED (Hausenblas & Symons Downs, 2002b) and they can be seen within eating disorders (Hauck et al., 2020). Primarily in ED, eating disorders are marginalized (Hausenblas & Symons Downs, 2002a; Hausenblas & Giacobbi, 2004). Alongside not having a clear explanation for how comorbid eating disorders occur, eating disorders seen within ED are the secondary type of ED (Bamber et al., 2003; Hausenblas & Symons Downs, 2002a). Along with eating disorders like anorexia and bulimia nervosa, orthorexia nervesa (ON) is amongst eating disorders as it turns into pathological behavior such as turning healthy diet behavior into consuming healthy nutrients in an obsessive way (Dunn & Bratman, 2016).

Orthorexia Nervosa (ON) is formed from the Greek words ‘orthos’ (straight, proper) and ‘orexis’ (appetite). First defined by Dr. Bratman in 1997 (Bundros et al., 2016), ON is a characterized health problem concerning serious nutritional restraint and obsession against the ingredients of pure nutrition in a biological perspective (Cena et al., 2019). According to Dr Batman these people do not consume goods that they believe to be impure (Bundros et al., 2016), they pay attention to the nutrition they are going to consume, namely: not processed, natural and additive free (Kazkondu 2010). For these reasons, orthorexic people have developed judgment toward nutrition and face health problems because they are avoiding these nutrients and therefore have a limited nutritional diet with a serious deficiency in nutrition and weight loss (Oğur & Aksoy, 2015). Due to this the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) published by the American Psychiatric Association ON does not compare to eating disorders it associates with ‘escaping/limiting the nutrients being eaten’ disorder (Smink et al., 2014). According to some researchers, orthorexic people are not concerned with the amount of nutrition, they are focused on the quality and instead of weight loss they are concerned about their health so they are limiting their diet therefore should be associated with Obsessive Compulsive Disorder (OCD). At the moment ON is a new concept, so there is no definite information concerning the classification for this diagnosis (Sánchez & Rial, 2005).

In the 1970s ED was thought to be ‘positive

dependence' due to it having psychological and physiological benefits such as, relaxation, happiness and success (Berczik et al., 2012; Carmack & Martens, 1979), however studies held later on showed levels of exercise rising in obsessive states, excessive exercise was causing injuries, interactions with family and work life showed deficiency and a reluctance to reduce the level of exercise were shown to be unbeneficial factors (Berczik et al., 2012; Adams, 2009). In later studies, ED could seriously harm an individual socially, physically, and psychologically (Terrya et al., 2004), and behaviors that are repeated obsessively could have destructive results and an obsession with exercise (Paradis et al., 2013).

Obsessive compulsive disorder (OCD) is a characteristic disorder with obsession and/or compulsive existence. Obsession is unwanted, intrusive, constantly repeated urges, imagery, and thoughts. Compulsion is the mental pursuit or repetitive behavior to strongly oppose obsession because they feel like they must abide by the rules (Köroğlu, 2013). Studies show that obsessive compulsive behavior is a risk factor for ED (Grandi et al., 2011) and shows an adequate level of relation to the behavior of excessive exercise (Landolfi, 2013).

It is stated that physical activity and nutrition intake are important aspects of a healthy life. However, low quality nutritional intake and no physical activity create a serious risk factor for health (Tainio et al., 2017). In the studies held it is indicated that along with exercise dependence eating disorders can also be seen (Bamber et al., 2003; Hausenblas & Symons Downs, 2002a). Studies show that orthorexia levels are higher in those who exercise at the gym regularly than in those who do not exercise (Tatlıses 2016). According to Dalmaz (2014), those who regularly exercise at gym show more orthorexic symptoms than those who do not.

One of the aims of this study is to examine ED, the tendency of ON, and signs of obsessive compulsive behavior in those who regularly exercise at the gym. Another aim of this study was to determine the predictive effect of ED of ON and obsessive-compulsive symptoms.

2. Methods

The population of this study included participants aged 18 and over who regularly exercised at gyms in the Turkish Repuclic of Northern Cyprus. Being one of the purposive sampling methods, criterion sampling was used to include the participants in this study. The criteria of this study were based on participants who had been exercising regularly for at least a year, taking time out of their schedule, and exercising on specific days. In this study, there were 179 female and 211 male participants with a total of 390 participants who exercise regularly at the gyms across the TRNC. The average age of the participants is 24,95±6,45. It was determined that 45,90% of the athletes were bodybuilding, 20,51% cardio and 33,59% fitness. Before applying the criteria, the participants signed a consent form to state that they were volunteers. This study was approved by the Near East University Social Studies Ethical Institution with the 2019/447 decision number on May 6, 2019.

2.1. Measurement Tools

To gather personal information such as the gender, age, year of exercise, how many days a week, how many hours spent exercising at the gym, and what type of exercises being done were prepared by the researcher.

Exercise Dependence Scale (EDS-21): Developed by Hausenblas and Downs in 2002, the EDS-21 is based on a multiple-dimensional theory separated into three groups and evaluates those who are in the risk category, those who have exercise dependence symptoms, and those who are nearing dependence. This scale has 7 sub-dimensions and is made up of 21 items and is a scale with a score of 6. The adaptation to Turkish was done by Gürbüz and Aşçı (2006). In the study of adaptation, there are five sub-dimensions and 21 items different from the original from. The scale has a score of 5. The sub-dimensions of the scale are time and choice of exercise, inability to control, withdrawal, tolerance, and continuance.

ORTO-11: The original form of this scale was developed by Bratman and Knight in 2000. Later, Donini et al. (2004) used this form to develop the ORTO-15 scale. The adaptation of ORTO-15 to Turkish was done by Arusoğlu et al. (2008). After the adaptation study, the differentiation from the original scale was that the items fell to 11 and were named ORTO-11. ORTO-11 is a one-dimensional Likert-style self-report measurement scale. The decrease in rating on this scale shows a rise in levels of orthorexia. Only the 8th item in this scale is reverse coded.

Padua Inventory (PE-WEUR): The original Padua Inventory was developed by Sanavio in 1988. Later, Burns et al. (1996) reviewed the inventory and removed items that caused confusion and created the PE-WEUR form that consists of 39 items. The inventory has a 5 factor structure. The adaptation of the PE-WEUR to Turkish was performed by Yorulmaz et al. (2007) and it was determined that the factor structure was similar to the original form. It was determined that the inventory of the sample group consisted of OCD.

3. Results

Table 1 shows the independent sample results of the t test related to the comparison of points scored according to the gender of the participants on ORTO-11, PE-WEUT and EDS-21. Statistically, a substantial difference was determined between the scores gathered between the male and female participants in this study in ORTO-11, and it was found that the scores of women who exercise regularly show lower scores on the

ORTO-11 scale compared to males ($p < 0,05$).

Table 1. Independent sample results of the t test

	Gender	n		s	t	p
ORTO-11	Female	179	22,03	5,09	-5,788	0,000*
	Male	211	24,82	4,44		
Compulsion of Control	Female	179	18,35	9,53	3,689	0,000*
	Male	211	14,78	9,49		
Obsessions about infection / contamination and compulsion about cleaning	Female	179	20,24	8,18	3,948	0,000*
	Male	211	16,90	8,45		
Obsessive urges about harming themselves or others	Female	179	7,20	7,72	-0,104	0,917
	Male	211	7,29	9,53		
Self-Care Rituals	Female	179	4,75	3,07	1,584	0,114
	Male	211	4,27	2,96		
Obsessive thoughts about harming themselves or others	Female	179	12,17	7,04	5,284	0,000*
	Male	211	8,52	6,61		
PE-WEUR	Female	179	62,71	25,56	0,384	0,000*
	Male	211	51,76	29,99		
The choice of Time and Exercise	Female	179	25,30	8,99	4,162	0,000*
	Male	211	22,08	6,19		
The lack of Control	Female	179	9,95	3,03	5,837	0,000*
	Male	211	8,32	2,49		
Effects of Withdrawal	Female	179	10,37	3,63	4,749	0,000*
	Male	211	8,87	2,59		
Tolerance	Female	179	10,42	3,42	4,907	0,000*
	Male	211	8,89	2,76		
Continuance	Female	179	10,41	3,70	4,462	0,000*
	Male	211	8,99	2,57		
EDS-21	Female	179	66,46	21,41	5,061	0,000*
	Male	211	57,15	14,73		

Statistically, a substantial difference was found in the scores gathered by the sub-dimensions when considering the gender of the participants generally in the PE-WEUR and inventorying the obsession to control, obsessive compulsion about infection/contamination, compulsion about cleaning, and obsessive thoughts about harming themselves or others ($p < 0,05$). According to the scores of male participants, female participants showed lower scores on the PE-WEUR on the sub-dimensions of obsessions to control, obsessive compulsion about infection / contamination, compulsion about cleaning, and obsessive thoughts about harming themselves or others.

In general on the EDS the scores of the females included in the research on the sub-dimensions according to choice of time and exercise, lack of control, effects of withdrawal, tolerance, and continuance are statistically found to be substantially higher than males ($p < 0,05$).

Table 2. Comparison of the participants according to the scores on the type of exercise in ORTO-11, PE-WEUR, EDS-21 (n = 390; *$p < 0,05$)

	The type of Sport	n		s	Min	Max	F	p	Difference
ORTO-11	Bodybuilding	179	22,44	5,32	11	38	11,653	0,000*	1-2
	Cardio	80	25,50	4,34	15	37			1-3
	Fitness	131	23,86	4,32	14	33			2-3
Compulsion of Control	Bodybuilding	179	18,22	9,78	1	40	7,794	0,000*	1-3
	Cardio	80	16,50	10,62	1	37			
	Fitness	131	13,91	8,31	2	35			
Obsessions about	Bodybuilding	179	17,53	8,07	2	38	2,037	0,132	
infection/contamination and	Cardio	80	18,83	8,94	2	36			
compulsion about cleaning	Fitness	131	19,44	8,68	0	37			
Obsessive urges about harming	Bodybuilding	179	8,85	9,17	0	36	13,977	0,000*	1-3
themselves or others	Cardio	80	8,89	10,47	0	34			2-3
	Fitness	131	4,07	5,58	0	29			
Self-Care Rituals	Bodybuilding	179	4,39	3,09	0	12	1,903	0,150	
	Cardio	80	4,09	2,94	0	11			
	Fitness	131	4,88	2,93	0	12			
Obsessive thoughts about	Bodybuilding	179	11,62	7,83	0	28	7,092	0,001*	1-2
harming themselves or others	Cardio	80	9,26	6,18	0	25			1-3
	Fitness	131	8,82	5,99	2	26			
PE-WEUR	Bodybuilding	179	60,60	31,25	8	152	4,295	0,014*	1-3
	Cardio	80	57,56	29,89	7	117			
	Fitness	131	51,11	22,46	6	118			
The choice of Time and	Bodybuilding	179	27,20	8,15	8	38	46,985	0,000*	1-2
Exercise	Cardio	80	19,28	5,80	8	33			1-3

	Continuation of Table 2								
	Fitness	131	21,19	5,80	9	37			
The lack of Control	Bodybuilding	179	10,23	2,86	3	15	34,765	0,000*	1-2
	Cardio	80	7,53	2,67	3	13			1-3
	Fitness	131	8,42	2,31	3	14			
Withdrawal Effects	Bodybuilding	179	10,93	3,30	3	15	36,015	0,000*	1-2
	Cardio	80	8,28	3,21	3	15			1-3
	Fitness	131	8,47	2,15	5	15			
Tolerance	Bodybuilding	179	10,84	3,15	3	15	31,413	0,000*	1-2
	Cardio	80	8,05	2,99	3	15			1-3
	Fitness	131	8,82	2,63	3	15			
Continuance	Bodybuilding	179	11,13	3,16	5	15	43,617	0,000*	1-2
	Cardio	80	8,11	3,04	3	14			1-3
	Fitness	131	8,55	2,44	3	15			
EDS-21	Bodybuilding	179	70,34	19,20	26	95	48,509	0,000*	1-2
	Cardio	80	51,24	15,82	20	87			1-3
	Fitness	131	55,46	13,31	26	96			

Table 2 shows the scores related to the ANOVA results compared to the results of ORTO-11, PE-WEUR and EDS-21 according to the type of sport of the participant. Statistically, a substantial difference between the scores was determined between the scores of ORTO-11 according to the sport of interest ($p < 0,05$). Those who are involved in bodybuilding have substantially shown lower levels on the ORTO-11 scores than those who do cardio and fitness. It was also found that those who did fitness showed lower scores on ORTO-11 than those who did cardio.

The general scores of the PE-WEUR and the obsession to control, obsessive compulsion about infection/contamination, obsessive urges about cleaning, and obsessive urges about harming themselves or others that occur in the inventory have determined a statistically substantial difference in the scores gathered by the sub-dimensions when considering the type of sport of the participants ($p < 0,05$). The scores of bodybuilders generally show higher scores on the PE-WEUR and the sub-dimension of control compulsion than those who do fitness. It was also found that those who did fitness showed lower scores than other participants in the following sub-dimensions: obsessive urges about harming themselves or others and obsessive thoughts and urges about harming themselves or others.

The general scores of the EDS-21 and the sub-dimensions of; time, choice of exercise, lack of control, effects of withdrawal, tolerance and continuance of bodybuilders are statistically shown to be substantially higher than other participants ($p < 0,05$).

Table 3. Correlation between the scores of participants from ORTO-11, PE-WEUR and EDS-21 (n = 390; *p < 0,05)

ORTO-11 (1)	r	1											
	p												
Compulsion of control (2)	r	-0,125	1										
	p	0,014											
Obsessions about infection/contamination and compulsion about cleaning (3)	r	-0,135	0,448	1									
	p	0,008	0,000*										
Obsessive urges about harming themselves or others (4)	r	-0,073	0,564	0,172	1								
	p	0,148	0,000*	0,001									
Self-care rituals (5)	r	-0,121	0,547	0,572	0,339	1							
	p	0,017	0,000*	0,000*	0,000*								
Obsessive thoughts about harming themselves or others (6)	r	-0,258	0,738	0,423	0,614	0,359	1						
	p	0,000*	0,000*	0,000*	0,000*	0,000*							
PE-WEUR (7)	r	-0,181	0,884	0,666	0,735	0,653	0,848	1					
	p	0,000*	0,000*	0,000*	0,000*	0,000*	0,000*						
Choice of Time and Exercise (8)	r	-0,465	0,342	0,041	0,408	0,097	0,475	0,381	1				
	p	0,000*	0,000*	0,415	0,000*	0,057	0,000*	0,000*					
The lack of Control (9)	r	-0,428	0,322	0,094	0,331	0,152	0,375	0,347	0,789	1			
	p	0,000*	0,000*	0,065	0,000*	0,003	0,000*	0,000*	0,000*				
Withdrawal Effects (10)	r	-0,430	0,367	0,125	0,379	0,116	0,455	0,402	0,873	0,696	1		
	p	0,000*	0,000*	0,014	0,000*	0,022	0,000*	0,000*	0,000*	0,000*			
Tolerance (11)	r	-0,450	0,363	0,071	0,372	0,159	0,414	0,377	0,798	0,852	0,782	1	
	p	0,000*	0,000*	0,160	0,000*	0,002	0,000*	0,000*	0,000*	0,000*	0,000*		
Continuance (12)	r	-0,410	0,324	0,115	0,362	0,146	0,398	0,368	0,796	0,740	0,822	0,848	1
	p	0,000*	0,000*	0,023	0,000*	0,004	0,000*	0,000*	0,000*	0,000*	0,000*	0,000*	
EDS-21 (13)	r	-0,480	0,372	0,085	0,411	0,136	0,472	0,408	0,959	0,873	0,916	0,912	0,902	1
	p	0,000*	0,000*	0,094	0,000*	0,007	0,000*	0,000*	0,000*	0,000*	0,000*	0,000*	0,000*	

With the aim of determining the correlation between the participant scores on the ORTO-11, PE-WEUR and

EDS-21, table 3 shows the Pearson correlation analysis results. Statistically substantial correlations between the participants' scores on ORTO-11 and EDS-21 were determined ($p < 0,05$). These correlations are negatively oriented. As the scores of the participants on ORTO-11 increased, the scores on their EDS-21 decreased.

It was determined that the scores between the PE-WEUR and EDS-21 of the participants were statistically substantial and had positively oriented correlations ($p < 0,05$). As the scores of the participants on PE-WEUR increase, the scores on their EDS-21 are seen to increase.

Statistically, a substantial and negatively oriented correlation was detected between the ORTO-11 scores and PS-WEUR of the people who participated in this research. As the scores on ORTO-11 increase, a decrease in the PE-WEUR scores is shown ($p < 0,05$).

Table 4. Prediction of the participants' scores in ORTO-11 and PE-WEUR to the scores in EDS-21 (*$p < 0,05$; $R^2 = 0,337$; $AdjR^2 = 0,333$)

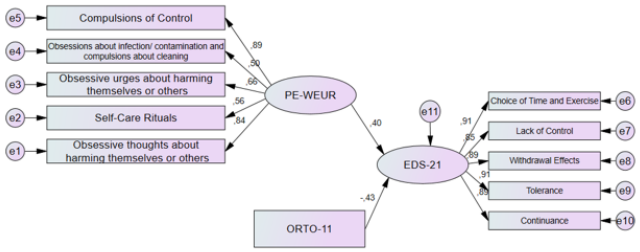
	Not Standardized Coefficients		Standardized Coefficients	t	p
	B	S.H.	Beta		
(Fixed)	86,43	4,38		19,725	0,000*
Padua Inventory	0,22	0,03	0,33	7,879	0,000*
The risk of Orthorexia Nervosa	-1,59	0,16	-0,42	-9,966	0,000*

When the results of linear regression are analyzed in Table 4, it is determined that the 33.3% total variance and the scores of the participants on ORTO-11, PE-WEUR and the scores on EDS-21 a statistically substantial level of progression can be explained ($p < 0,05$).

As the ORTO-11 and EDS-21 scores of participants predict in a negative aspect ($\beta = -1,59$; $p < 0,05$), the scores of the PE-WEUR are predicted in a positive aspect ($\beta = 0,22$; $p < 0,05$).

In order to evaluate the participants' scores within the scope of this study on the scores of ORTO-11 and PE-WEUR and the predictive scores of EDS-21, structural equality models were used, and the details related to these models are shown in Diagram I.

When evaluating the goodness of fit model value created for the case of evaluating the predictive scores of the EDS-21 and the scores of the participants OTRO-11 and PE-WEUR of this study related to the model: the x2/sd = 4,441 value is an acceptable fit and from the viewpoint of the Root Mean of Square Error of Approximation, (RMSEA = 0,074), Normed Fixed Index (NFI = 0,951), Comparative Fit Index (CFI = 0,961), Goodness of Fit Index (GFI = 0,930) there is an acceptable fit. It has been statistically determined that the participants scores on ORTO-11 predict the EDS-21 in a negative aspect ($\beta = -0,551$; $p < 0,05$) and the PE-WEUR scores effect the EDS-21 scores in a positive aspect ($\beta = 0,428$; $p < 0,05$) on a substantial level. The increase in scores on the ORTO-11, decrease of scores on the EDS-21 and the increase in scores in the PE-WEUR increase the scores in the EDS-21 (Figure 1).



$X^2/df=4,441$ / RMSEA= 0,074 / NFI = 0,951 / CFI=0,961 / GFI= 0,930

Figure 1. The predictive scores related to the EDS-21 to the scores of ORTO-11 and PE-WEUR

4. Conclusion

Findings of this study show that females have higher levels in ON and higher ED symptoms than males. Studies showed that females who regularly exercise show more change in eating attitudes and behavior and have higher dependency on exercise than men (Yıldırım et al., 2017). The current study shows that ON was determined as a predictive factor of ED. Findings also show that as the disposition of ON increases, the risk of ED also increases, in other words, ON is seen as an effective factor in the development of ED. In Kyle and Mesagno's (2014) study, it was determined that there is a relationship between primary exercise dependency and eating disorder behaviors; dependency has a mediating effect between exercise and eating disorder relations. It was also determined that the participants who depended on exercise showed higher scores on eating disorders than the participants who were not dependant on exercise. Similarly, Mavrandrea and Gonidakis (2022) found that orthorexia nervosa is a noticeable phenomenon in the population of active exercisers. In this study, it was seen that obsessive compulsive traits are a predictive factor of exercise dependency. In Back et al. (2021) study is compulsive traits were similarly found as a risk of exercise dependence.

The main implications of this study, there is a substantial negative relationship between ON and ED and ON is determined as an effective factor in the development of ED. Findings also suggest that ON and obsessive compulsive symptoms can be effective and important factors in developing exercise dependency.

The strength of this study is, it is thought that it will provide information about exercise dependence and a better understanding of the factors that may affect the development of exercise addiction.

This study is important in terms of showing that regular exercise can reach dangerous measures both in physical and psychological aspects and in terms of guiding studies that will be conducted in the future.

4.1. Limitations and Further Study

A limitation of the current study is, only ON and

obsessive compulsive traits are investigated as risk factors for exercise dependence. To have more information about exercise dependency, individuals who exercise regularly, the relational factors of exercise dependency and ON, social-physical anxiety, and socio-cultural research can be beneficial for future studies.

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