

Evaluating the Level of Exercise Dependence and Psychological Resilience of Athletes from Different Branches

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ABSTRACT In this study, exercise dependence level and psychological resilience of the athletes in different sport branches were examined in terms of gender, sport branches and sports participation types as individual or team sports. For these purposes, 313 female and 464 male athletes who are interested in single sport branch at least 5 years in Mugla and neighbor cities. The average age of the participants was found 22.72±3.024. Data was collected with two different scales. Result shows that there is no significant difference in dependence level and psychological resilience in terms of gender ($p>0.05$). There are significant differences in exercise dependency in terms of sport branches variable ($p<0.05$). Significant difference was found in exercise dependence in terms of individual and team sports variables. It is concluded that more exercise dependence risk occurs in endurance sports and weight training sports when compared to team sports.

INTRODUCTION

Many researches have proven that exercise provided individuals with psychological and physiological benefits. Even there is no certain information about the type, exercise can help curing many psychological diseases, and it has also positive effects on coping with stress, self-esteem and body perception (Zmijewski 2003; Mor et al. 2009; Adilogullari et al. 2012). Exercise can help with chronic muscle pains or chronic backaches. It contributes to weight-control, along with weight-control prevents diseases such as cardiac problems, high blood pressure, stroke and diabetes (Edward 2003; Bicer et al. 2009). Additionally, walking exercises reduce the risk of cardiac diseases, strengthen the bones, and therefore reduce the risk of osteoporosis, and help with joint problems (Oktik 2014).

Exercise Dependence

In recent years, there have been researches that suggested that exercise might have disadvantages besides its advantages (Hausenblas 2002a). Researchers embarked on with this idea discoursed that overdoing exercise might result in exercise dependence (Adams 2001). Hausenblas and Giacobbi (2004) defined exercise dependence as “desire that ends in overdoing exer-

cise, and create negative physiological and psychological symptoms”. Researches that tried to determine the effects of exercise dependence of psychological factors, found that exercise made individuals feel good, and help them cope with stress (Yeltepe 2005).

According to Szabo (2000), regular exercise results in decrease in sympathoexcitation during rest. This causes indolence of exercise deficiency in adaptation. In order to maintain an appropriate level of stimulation, and overcome the indolence during rest, the individuals doing regular exercise need exercise in order to increase stimulation.

Individuals who present three or more criteria for DSM-IV (Diagnostic and Statistical Manual of Mental Disorders) substance dependence clearly can be defined as exercise dependents. These are:

1. Tolerance: Increasing the amount of exercise in order to attain the expected effects or the effects' going down when the same amount of exercise is done.
2. The Effects of Exercise Withdrawal: Doing the same amount of exercise in order to relax and avoid symptoms of exercise deprivation (anxiety, fatigue).
3. Intention Effect: Doing exercise more or longer than planned.
4. Loss of Control: Urge to do exercise or failure in controlling or quitting exercise.
5. Time: Spending more time on exercise.
6. Conflict: Reducing or quitting other social and recreational activities to do exercise.

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7. Continuanace: Continuing to do exercise in spite of the existence of a physiological problem.

Exercise Dependence Scale-21 was based on the 7 criteria mentioned above (Hausenblas and Symons Downs 2002b).

Psychological Resilience

Psychological resilience is defined as a trait that decreases the negative effects of stressful situation, enables a successful accommodation process, and eluding negative consequences (Wagnild and Young 1993; Kearney 2010). Some researchers define psychological resilience as a personality trait, while some others define it as a developmental process (Jacelon 1997).

Psychological resilience is a process. In order to understand psychological resilience, one needs to reveal and define the roles played by parts that enable an accommodation despite harmful environments (Masten et al. 1994).

Psychological resilience is a personality trait that reduces the negative effects of stress, and prevents organismic tension that results in sickness (Terzi 2005). According to Tusaire and Dyer (2004), resilience the process of accommodating to serious stress resources such as a trauma, a threat, or family and relational problems, serious health problems, workplace or economic problems. In addition, many researches on psychological resilience did not find the definition of risk alone, and they tried to determine positive consequences such as competence in academic and social fields (Gurgan 2006).

Psychologically resilient individuals require skills and competences in order to reduce the negative effects of difficult living conditions and to attain protective factors that will help them overcome problems (Dearden 2004).

Researches conducted up to now have revealed that psychological resilience is a trait that changes depending on location, time, age, gender and culture, as well as different living conditions of individuals (Gurgan 2006).

The definitions of psychological resilience emphasize two elements of resilience—the first of which is encountering a serious threat or difficulty, and second is standing up to this threat or difficulty, and accommodate anyway (Rutter 2006).

METHODOLOGY

Research Model

The present research adopted the screening model and descriptive research model, which is used to reveal an existing situation.

Universe and Sample

The universe of the present research consisted of 313 female, 464 male, that is, a total of 777 registered athletes who had been playing volleyball, basketball, handball, football, boxing, Muay Thai, wrestling, and Taekwondo regularly for at least 5 years in the province of Mugla and nearby cities, at the age of 22.72 ± 3.024 .

The sports age of the participants was 8.13 ± 3.632 . The participants studied in two groups according to their branches as individual sports and team sports. Boxing, Muay Thai, wrestling, and Taekwondo branches formed the individual sports group, and volleyball, basketball, handball and football formed the team sports group. Of the participants of the present research, 61.9 percent were in teams sports group, and 38.1 percent were in individual sports group.

Data Collection Tools

In order to collect data for the present research, a questionnaire form to define demographic features of the participants, and Exercise Dependence Scale-21 developed by Hausenblas and Downs (2002b), and adapted to Turkish by Yeltepe and Ikizler (2007) were used. In the analyses, KMO (Kaiser-Meyer Olkin) value was calculated as 0.91. This finding indicates that the size of the sample is suitable for the research. Bartlett's test value was calculated as 7819.18 ($p < 0.01$). According to the results of these two tests, collected data was appropriate for factor analysis of the scale.

The Ego Resiliency Scale developed by Block and Kremen (1996), and adapted to Turkish by Karairmak (2007b) was used to measure the psychological resilience levels of the participants. Conformity of the scale to factor analysis was tested with Bartlett's test and KMO [7913.945 ($df=1540$, $p=.000$)] coefficients.

Exercise Dependence Scale-21

EDS-21 was developed by Heather A. Hausenblas from Florida University, Department

of Exercise and Sports Sciences, Exercise Laboratory, and Daniel Symons Downs from Pennsylvania State University Department of Kinesiology, Division of Exercise Psychology in five stages on a sample of 2420 participants. Test-retest results presented $P < 0.001$ level significance, and the calculated alpha value (Cronbach) $\alpha = 0.95$ was considered as perfect. The scale can be implemented on individuals or groups aged 18 and above. The answers were organized on a 6-point Likert Scale as never (1), and always (6). Response time for Exercise Dependence Scale-21 was projected as 5 minutes. EDS-21 consists of 21 questions based upon DSM-IV (Diagnostic and Statistical Manual of Mental Disorders-IV) substance dependence criteria and provides following information:

- 1- Mean scores for exercise dependence symptoms.
- 2- Differentiates between following:
 - a. Exercise dependent
 - b. Non-dependent symptomatic
 - c. Non-dependent asymptomatic
- 3- Determination of the following:
 - a. Physiological dependence (tolerance, exercise withdrawal symptoms)
 - b. Physiological non-dependence (no syndrome proofs in tolerance or exercise withdrawal)

Exercise Dependence Scale-21 was based upon seven dependency criteria, and the individuals presenting three or more of these criteria were defined as exercise dependent. Dependency range is determined with 5 or 6 points from the items forming the criteria. The individuals who get 3-4 points from these items are defined as symptomatic, and these individuals are considered to have the risk of being exercise dependent theoretically. Individuals who get 1-2 points from the items in the scale are defined as non-dependent asymptomatic (Yeltepe and Ikizler 2007). Cronbach alpha coefficient of the scale was reported as 0.95 in this research.

The Ego-Resiliency Scale

The Ego-Resiliency Scale was developed by Block and Kremen (1996) in order to measure psychological resilience and it was adapted to Turkish by Karairmak (2007b). The variance explained by three factors called as strong personality traits for recovery, positive evaluation of oneself, and openness to new experiences was

reported to be forty-seven percent. Three subdimension obtained through explanatory factor analysis was also confirmed through confirmatory factor analysis. The scores obtained from three subdimensions form the psychological resilience score of the individual. Higher scores indicate high-level psychological resilience. However, it is suggested that the total score obtained from the scale is used instead of sub-scales scores. Internal consistency coefficient of the 14-item 4-point Likert type scale was tested through Cronbach alpha and test-retest methods. Cronbach's alpha value obtained from scale items was calculated as .80. Internal consistency coefficient calculated with test-retest method conducted in three weeks interval was reported as .76. Similar scales validity test was conducted with Connor-Davidson Resilience Scale, and the correlation between was calculated as .68 (Karairmak 2007b). There was a positive significant relationship between the scores obtained from two scales. Cronbach alpha coefficient in this test was calculated as .89.

Data Analysis

For the analyses of the obtained data, arithmetic average, standard deviation (SD), frequency (N), and percentage (%) values of descriptive statistics were obtained. Independent groups were compared with Paired T test. Unrelated groups of more than two were compared with Npar Tests and the Kruskal-Wallis Test (independent sample median test). Regression analysis method was used to test the relationship between the scale for individual and team sports variables. In these analyses, the significance level was taken as $p < 0.05$, and the confidence interval was taken as ninety-five percent.

FINDINGS

Table 1 shows that, 60 of the 313 female and 61 of the 464 male participants have a risk of exercise dependence.

Table 1: Distribution of exercise dependence by gender

Gender	Exercise dependent	Symptomatic	Asymptomatic	Total
Female	60	181	72	313
Male	61	277	126	464
Total	121	458	198	777

Table 2 presents that there is no significant difference between psychological resilience scores of participants across genders ($p>0.05$).

There is also no significant difference between exercise dependence levels of participants across genders ($p>0.05$).

There is no significant difference between psychological resilience scores of participants across sport branches ($p>0.05$).

There is a statistically significant difference between exercise dependency scores of individuals across sport branches ($p<0.05$). Respectively, athletes doing Muay Thai $\mu=75.94$, boxing $\mu=75.66$ and volleyball $\mu=74.06$ have a high risk of exercise dependency. Basketball $\mu=65.19$, and football $\mu=67.12$ are the branches of which the athletes have lower risk of exercise dependency than the above branches (Table 3).

Table 4 shows that there is a statistically significant difference between exercise dependency levels of participants across sport types ($p<0.05$). Exercise dependency core average of

participants doing individual sports is 71.91 and exercise dependency core average of participants doing team sports is 68.24. In other words, participants doing individual sports have a higher risk of exercise dependency than participants doing team sports.

There is no statistically significant difference between psychological resiliencies core averages of participants across sport types ($p<0.05$) (Table 5).

Sport types (individual-team) of the participant sex plain seven percent of the variance of their exercise dependency levels ($R^2=0.07$). The relationship between sport type variable and exercise dependency levels is statistically significant ($F=5.266$, $p=0.022$). There is a positive (0.082) and statistically significant relationship between sport type variable and exercise dependency levels ($t=-2.295$, $p=0.022$). Participants doing individual sports have a higher risk of exercise dependency than the participants doing team sports.

Table 2: t-test results on psychological resilience and exercise dependence levels of participants by gender

	Gender	N	A.Av	SD	t	p
Psychological Resilience TP	Female	313	40.24	7.96	-0.362	0.717
	Male	464	40.45	8.22		
Exercise Dependency TP	Female	313	70.59	21.85	1.002	0.316
	Male	464	68.99	21.66		

$p<0.05$

Table 3: Kruskal-Wallis (Median) test results on psychological resilience and exercise dependency levels of participants by sport branches

	Sport branch	N	Rank A. av.	Chi-square	SD	P
Psychological Resilience TP	Boxing	86	41.59	5.338	7	.15
	Taekwondo	71	40.41			
	Wrestling	75	39.60			
	Muay Thai	64	41.33			
	Handball	67	38.99			
	Basketball	140	39.87			
	Volleyball	104	41.99			
	Football	170	39.67			
	Total	777	40.37			
	Exercise DependencyTP	Boxing	86			
Taekwondo		71	68.10			
Wrestling		75	67.81			
Muay Thai		64	75.94			
Handball		67	68.43			
Basketball		140	65.19			
Volleyball		104	74.06			
Football		170	67.12			
Total		777	69.64			

$p<0.05$

Table 4: t-test Results on psychological resilience and exercise dependence levels of participants by sport type (individual-team) variable

	<i>Sport type</i>	<i>N</i>	<i>A.</i>	<i>av. SD</i>	<i>t</i>	<i>p</i>
<i>Exercise dependency TP</i>	Individual sports	296	71.91	22.54	2.295	.02*
	Team sports	481	68.24	21.12		
<i>Psychological resilience TP</i>	Individual sports	296	40.75	7.56	2.295	.30
	Team sports	481	40.14	8.43		

p<0.05

Table 5: Regression analysis results on exercise dependency levels of participants by sport type (individual-team) variable

	<i>â</i>	<i>t</i>	<i>p</i>	<i>R</i> ²	<i>F</i>	<i>p</i>
Regression coefficient	9.747	166.928	.000	0.07	5.266	.022*
Exercise dependency TP	0.082	-2.295	.022			

p<0.05

Table 6: Regression analysis results on psychological resilience levels of participants by sport type (individual-team) variable

	<i>â</i>	<i>t</i>	<i>p</i>	<i>R</i> ²	<i>F</i>	<i>p</i>
Regression coefficient	9.708	109.612	.000	0.01	1.042	.308
Psychological resilience TP	0.037	-1.021	.308			

p<0.05

There is no statistically significant relationship between sport type (individual-team) variable and psychological resilience levels of participants (p=0.308) (Table 6).

DISCUSSION

According to the findings of the present research, 15.6 percent of the participants have a risk of exercise dependency, 58.9 percent of them are symptomatic, and 25.5 percent of them are asymptomatic. Most of the participants in the sample of 777 athletes are not exercise dependent, however they present the symptoms of dependence. Researches on the subject matter report that the high number of symptomatic individuals is due to sport age. Considering that the athletes in the sample of the present research have been doing sports for at least 5 years, the high number of the symptomatic individuals is an expected finding. Kagan (1987) found in his research that individuals who had been doing sports longer had higher exercise dependency scores. This finding is in agreement with this study's finding. Similarly, Bavli et al. (2011) conducted a research on individuals who had been

doing sports for at least 2 years, and they found that the number of symptomatic individuals increased with sport age.

The distribution of exercise dependency scores of participants by gender shows that 60 of the 313 female and 61 of the 464 male participants have a risk of exercise dependency. The number of female participants is lower than the number of male participants. Though, the numbers having the risk of exercise dependency are close. Findings on exercise dependency across genders changes by researches. Some researchers found that man have a higher risk of exercise dependency while some others suggest women do (Davis 1990).

According to the findings of the present research on the relationship between sport branch and exercise dependency, the participants doing Muay Thai, wrestling, and boxing branches respectively have a higher risk of exercise dependency, while the athletes playing basketball, football and handball have a lower risk. The researchers can suggest that risk of exercise dependency is higher among athletes doing combat sports. The number of asymptomatic participants is higher in basketball branch. Concordantly, the re-

searchers can claim that risk of exercise dependency is higher among individuals doing resistance-based sports. They also found that 57 of the 296 participants doing individual sports and 64 of the 481 participants doing team sports have a risk of exercise dependency. Related researches in the literature report that risk of exercise dependency is higher among athletes doing aerobic exercises (Blaydon 2004).

The distribution of the participants of the present research by gender is as follows, that is 40.3 percent are female, and 59.7 percent are male.

According to the findings, there is no statistically significant difference between exercise dependence levels of participants across genders ($p > 0.05$). Therefore, the researchers can claim that gender is not a predictor of exercise dependency. In other words, risk of exercise dependency does not vary by gender. Yeltepe (2005) found in his research that there is no significant difference between exercise dependency levels across genders. This finding is in agreement with the related finding of the present research. Hailey and Bailey (1982) conducted a research on runners and they found that female athletes had higher exercise dependency scores than male athletes. Vardar (2012) also did not find any statistically significant differences across genders. Costa et al. reported in their study conducted in 2015 that among symptomatic athletes, female had higher scores than male.

In the present research, the researchers found that there was no significant difference across genders in terms of psychological resilience levels ($p > 0.05$). Bayrakdaroglu (2014) who conducted a research on Taekwondo and team sports players also found that there is no statistically significant difference across genders in terms of psychological resilience scores. Ozcan (2005) also conducted a research on high school students and found that there was no significant relationship between gender and psychological resilience variables. Some researches report that psychological resilience level does not vary according to gender (Wang and Sound 2008; Tartakovsky 2009), while some others report that it does (Lindfors et al. 2006; Sipahioglu 2008).

There is significant difference between exercise dependence scores and sport branches of the participants of the present research ($p < 0.05$). Respectively, athletes doing Muay Thai $\mu = 75.94$, boxing $\mu = 75.66$, and volleyball $\mu = 74.06$ have a high risk of exercise dependency. Basketball

$\mu = 65.19$ and football $\mu = 67.12$ are the branches of which the athletes have lower risk of exercise dependency. Accordingly, the researchers can suggest that athletes doing resistance-based individual sports have a higher risk of exercise dependency. Thus, related researches in the literature also report that athletes doing resistance-based sports such as marathon running and weightlifting have high risk of exercise dependency (Pierce 1997; Hurst 2000). In the present research, the researchers found that there is a significant difference in exercise dependency levels according to sport type (individual-team) variable ($p < 0.05$). Exercise dependency score average of participants doing individual sports is 71.91, and exercise dependency score average of participants doing team sports is 68.24. In other words, participants doing individual sports have a higher risk of exercise dependency than participants doing team sports. Yeltepe (2005) who conducted a research on athletes doing team sports, and athleticism, tennis, rowing, and swimming found that athletes doing athleticism and rowing have higher risk of exercise dependency. This finding is in agreement with the related finding of the present research. There is no significant difference between psychological resilience scores of participants of the present research across sport branches ($p > 0.05$). Psychological resilience scores of athletes doing boxing, Muay Thai, Taekwondo, and volleyball are a little higher than the other athletes. However, this difference is not statistically significant. There is no statistically significant difference between psychological resilience score averages of participants across sport types (individual-team) ($p < 0.05$).

Bayrakdaroglu (2014) found that there was no significant difference between psychological resilience scores of athletes according to their sport type. He also suggested that the differences in arithmetic score averages between sport types were random. Siadat and Keikha (2013) found in their research that anxiety and stress levels decreased and self-esteem levels increased among athletes doing any type of sports-individual or team. Accordingly, the researchers can suggest that high self-esteem affects psychological resilience positively. Mahoney (1987) who conducted a research on athletes of 23 different sport branches, and stated the differentiation in concentration, anxiety management, self-esteem, mental preparation, and motivation skill

levels, and the importance of this. Vaez Mousavi (2000), reported in his research on team and individual sport types that psychological skills of athletes doing individual sports were less developed than the athletes doing team sports.

The researchers found a statistically significant relationship between sport type (individual-team), and exercise dependence level variables ($F=5.266, p=0.022$). There is a positive (0.082) and statistically significant relationship between sport type variable and exercise dependency levels ($t=-2.295, p=0.022$). Participants doing individual sports have a higher risk of exercise dependency than the participants doing team sports. The researchers can suggest that there is more need for exercise in individual sports than team sports. Athletes doing individual sports always try to control their weight so that they can compete with athletes in the lower weight class. Therefore, they need to lose weight and need more exercise for weight-control. Concomitantly, athletes doing this kind of sports have a higher risk of exercise dependency. Bishop (2009) reported in his research that, athletes did more exercise for a higher motivation, better looks and lower weights, and these exercise increased the risk of exercise dependency. Exercises done for weight-control, good looks and body motivation result in exercise dependency (Furnham 2002; LePage 2008; Prichard 2008). In addition, Bavli et al. (2015) who conducted a research on individuals who do dancing sport, in which aesthetics is important, reported that most of the participants had the risk of exercise dependency.

In the present research, the researchers did not find any statistically significant relationship between sport type and psychological resilience levels of participants ($p=0.308$). Psychological resilience was considered to be important for both types of sportive activities (Siadat 2013). Kabafnezhad (2012) conducted a regression analysis, and found that psychological skills, self-esteem, success motivation, and performance were significantly related. According to this, exercise contributes to developing psychological skills. Another research reported that self-regulation and trust aid contributed to performance and psychological conditions of athletes in competitions (Sarkar 2014). In other words, athletes with optimal levels of psychology are more likely to present a better performance. Eraslan (2015) stated that there was not a significant difference

between team and individual sport players in terms of characteristics and levels of coping with stress. It was also reported that participation in sport promoted psychological resilience.

Ilyasi and Salehian (2011) conducted a research on team and individual sport players, and they found that psychological wellbeing indicators such as extraversion, outspokenness, and tolerance of individual sport players were higher than team sport players.

According to Hosseini and Besharat (2010), athletes with higher levels of psychological resilience are more likely to achieve, and make use of positive emotions when during negative experiences is easier for them.

CONCLUSION

In the present research, the researchers found that risk of exercise dependency is related with sport branch, and sport type variables, whereas it is not with gender variable. Individuals doing individual sports have a higher risk of exercise dependency than individuals doing team sports. Moreover, risk of exercise dependency is higher among athletes doing resistance-based sports. Psychological resilience can be developed with any kind of exercise, regardless of sport type and branch. Concomitantly, the researchers can claim that exercise contributes to recovering from negative psychological syndromes and developing positive psychological traits such as self-esteem, self-confidence, and motivation to succeed.

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