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Article

Investigation of the Exercise Dependence of Athletes Doing Kickboxing, Taekwondo and Muaythai

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Abstract: Debates about the conditions in which the frequency and intensity principles of regular exercise, depending on the fact that sports background can be accepted as extremism, are still a controversial topic. The purpose of this research is to investigate the Exercise Dependence of Athletes doing Kickboxing, Taekwondo and Muaythai. The study included 141 athletes consisting of 87 men and 54 women. Exercise Dependence Scale composed of 21 items developed by Hausenblas and Downs and adapted into Turkish version by Yeltepe and İkizler was applied to athletes. As a result of the research, while athletes showed more sensitivity to exercise dependence scale (= 71.41), this scale was also defined as symptomatic. It was found that 5 athletes (3.5%) were asymptomatic-nondependent, 117 athletes (83.0%) were symptomatic-nondependent and 19 athletes (13.5%) were at-risk for exercise dependence. It was determined that athletes were at-risk for exercise dependence group while 8 athletes were doing kickboxing, 10 athletes were doing taekwondo and 1 athlete was doing muaythai athlete. A significant difference was observed according to regular training and number of daily training. It didn't significantly differ in other variables. It is possible to say that regular training can be effective to reveal the exercise dependence.

Keywords: dependence; symptomatic; asymptomatic; kickboxing; taekwondo; muaythai.

1. Introduction

Experimental studies have proven that exercise has positive effects on physical and mental development. Although exercise has been observed to have a negative effect on depression, anxiety, premenstrual syndrome, it helps to cope with stress and positively affects body sensation, mood and self-esteem. The physical benefits of exercise include reducing risk of coronary heart disease, ensuring weight control, flexibility, improving muscle strength and durability, reducing back and waist problems [1,2,3,4].

Regular physical activity has a number of effects on mental health such as reducing depression and anxiety, improving sleep, providing relief and enhancing physiological benefits with self-esteem. However, uncontrolled excessive exercise and physical activity are often defined as exercise dependence [4,5]. However, not all people exercising with increasing frequency and intensity should be considered as dependent on exercise. Those who do not have problems with their exercise can only be considered as highly engaged in this behavior [6].

Exercise dependence is defined as the exercise routine controlling the individual, the duration of the exercise with increasing frequency and severity, the inability to take time away from exercising to see family and friends, to exercise instead of participating in social activities and rehabilitating the individual's life within the framework of exercise habits [7,8]. In another definition, exercise addiction is defined as "an exercise that is incompatible with the desire for physical activity creates negative psychological symptoms such as physical injury, anxiety and depression" [9].

Some of the studies have shown that exercise dependency can change by factors such as age, gender, educational status, exercise duration and exercise frequency [5,10,11,12]. There are scales for the evaluation of excessive physical exercise in addition to the studies indicating which sports predispose more to sports dependence [8]. For example, exercise dependency is observed in bodybuilders more than the other athletes [10].

Exercise dependence, in particular, expresses the desire to exercise with a strong emotion in every leisure time of a person [13]. It manifests itself with physiological symptoms (tolerance, avoidance) or psychological symptoms (depression, tension) in the exercise process. Hausenblas and Symons explain this with the term "Exercise Dependence". The prevalence of exercise dependence isn't known. However, quite a few of the male and female athletes have stated to suffer from heavy dependency. Multidimensional measurements of exercise dependence show that men are addicted to exercise more than women [14]. In contrast, it is emphasized that women tend to be more addictive than men regarding weight control [7,15].

Researchers have found that exercise dependence manifests itself negatively with anxiety, depression, nervousness, insomnia [16] and positively when the person doing excessive exercise can't do it and they do exercise in order to cope with the difficulties encountered by the individual in her/his life [17]. Exercise dependence is broadly stated to be associated with such factors as personality traits, psychological factors, physiological factors, type of exercise, gender and years of participation in exacerbations [16].

Szabo and Griffiths (2007) have indicated that the manifestation of exercise dependence symptoms and the prevalence of exercise dependence at risk can be affected from the sample studied [18]. According to a recent national survey, the prevalence of exercise dependence at-risk ranges from 0.3% to 0.5 % in the general adult population [19,20]. Higher prevalence figures have been reported in other groups as follows; 3.2% in athletes competing in ultra-marathons [6], 3.6% in the population doing general exercise and 6.9% in British students studying sports science [18], 5.1% in college students [21] and 15.1% in bodybuilders, powerlifters, and fitness lifters [22]. Among the clients of a fitness center in France, the prevalence rate for exercise dependence was found as 42% [23] whereas the same prevalence was established as 45.9% among college students in another study [7]. Results obtained from other studies suggest that levels of exercise dependence and body dissatisfaction are even higher among marathon runners and body builders [15,17]. Blaydon and Lindner (2002) have found that 28% of nonprofessional athletes experience exercise dependence [24]. Other studies conducted in college-aged populations exerted that 21.8% of participants displayed obligatory or dysfunctional activity patterns [12] and 18.1% reported compulsive exercise [25]. Literature data on the epidemiology of sports dependence are preliminary and inconsistent. Most probably, significant variations between different studies regarding the prevalence of sports dependence exist because of the unclear definition of dependence aside from the use of ineffective evaluation tools.

In the literature, it is stated in a new behavioral addiction study that the problem of physical exercise has started to be the problem of extremism and it is reported to be based on different ethiopathogenic theories. According to these theories, it can be seen that the concepts of addiction, dependence, obligatory exercise, compulsive exercise or driven exercise become prominent [8,26]. In the current paper, the term exercise dependence will be used to be consistent with the name of the survey used (i.e., EDS-R) and the terminology used in previous investigations that incorporated the EDS-R [21,22,27].

There is a need for studies to focus on the status of these factors in different sports branches and a group of Turkish populations. The purpose of examining these needs was to determine the differences in exercise dependence of individuals participating in Kickbox, Taekwondo and Muaythai exercises, which require special discipline and regular training by the exercise type, exercise age and loading dynamics. The participants of this study were described as exercise dependent, nondependent-symptomatic and nondependent asymptomatic. The purpose of this research is to investigate the exercise dependence of athletes doing kickboxing, taekwondo and muaythai.

2. Materials and Methods

In this part of the study, the purpose of the research, the variables involved in the research, the population and sample of the research, the data collection tools used in the study, the procedures for collecting the data and the analysis methods used in analyzing the data obtained are explained.

2.1.Purpose of Study

The purpose of this research is to investigate the exercise dependence of athletes doing kickboxing, taekwondo and muaythai.

2.2.Research Population and Sample

The general screening model being one of the descriptive research methods was used in this research. The athletes engaged in kickboxing, taekwondo and muaythai constitute the research population and sample. Athletes were selected from 8 clubs from the Elazig province in Turkey. All the athletes had a history of doing regular exercise for at least 1 year and they were at the age of 18 and over. All participants were informed about the study. Based on volunteerism, they have been provided with an institutional approved informed consent form. In a separate room of the sports hall, participants completed the questionnaire form which is composed of personal information form and exercise dependence scale within a 5-minute evaluation process. A research assistant was ready to provide assistance during the process of filling out the questionnaire. However, a total of 198 questionnaires were applied. Of these, 33 were withdrawn from work (their questionnaires were returned) and 24 people were not evaluated since the questionnaire was incorrect / incomplete. Thus, the survey of 141 athletes composed of 87 males and 54 females was taken into consideration.

2.3.Data Collection Techniques

Exercise Dependence Scale composed of 21 items developed by Hausenblas and Downs [28] and adapted into Turkish by Yeltepe and İkizler [29] was applied to athletes. Face to face interview technique was applied and questionnaire data were collected via mail. The measuring instruments and test protocols used in the study are stated below.

2.4.Data Collection Tools

The Personal Information form was prepared by the researcher in order to be able to carry out the research better with personal information form. It was prepared as a form in which questions related to gender, age, sports branch, sports age, education status, marital status, type of exercise, exercise frequency, duration of exercise were included. The EDS-21 is a Likert type (never-1 and always-6) measure consisting of 21 questions developed to determine exercise dependence. EDS-21 has seven sub-dimensions. These are (1) Withdrawal (I am exercising to avoid tensions), (2) Continuity (I am exercising even when I am hurt), (3) Tolerance (I am constantly increasing exercise intensity to improve the desired effect), (4) Control Loss (I am not reducing my frequency of exercise), (5) Decrease of other activities (I think about exercise even if I have to focus on work or lessons), (6) Time (I spend a lot of time on the exercise and (7) Effect of Intention (I exercise longer than I plan). In order to determine the individuals who are classified into the dependent range of 3 or more of the EDS-21 criteria are classified as exercise dependent. The dependent range is operationalized as indicating a score of 5 or 6 for that item. Individuals who scored in the range of 3 to 4 are classified as symptomatic. These individuals may theoretically be considered at-risk for exercise dependence. Finally, individuals who score within the range of 1-2 are classified as asymptomatic [28]. The internal consistency coefficient (Cronbach Alfa coefficient) of the scale was found to be .95 by Hausenblas and Downs [17] and to be .97 by Yeltepe and İkizler [29]. The internal consistency coefficient of this study was found to be .97.

2.5.Ethical Approval

All participants gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was

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approved by the Ethics Committee of Firat University Non-Interventional Research (04.05.2017-08/15).

2.6.Statistical Analysis

Within the scope of the research, descriptive statistics were used to summarize the demographic and personal information of the sample group and the data were evaluated with the statistical package program. In addition, the data obtained were analyzed in statistical package program. According to the normality test, the data were seen not to be normally distributed. Mann-Whitney U was used for comparison of two independent variables while Kruskall-Wallis H test was used in the intergroup comparisons. In different groups, Dunnet's T3 was used to determine from which group the difference was derived. Significance level was accepted as 0.05 and 0.01.

3. Results

The purpose of this research is to investigate the exercise dependence of athletes doing kickboxing, taekwondo and muaythai. The distribution of a total of 141 people composed of 87 male and 54 female participants is as follows; 28 people in taekwondo, 76 in kickboxing and 37 in muaythai.

According to Table 1, 59.6% of them are male respondents, 59.6% are in the 18-22 age group, 66.7% are single, 39.0% are at the high school level, 53.9% do Kickboxing, 55.3% are students, 31.9% have 1-2 years of sports age, 66.0% do regular exercise, 43.3% have 3-4 days of training per week and 59.6% do training once a week. 36.2% of the participants perform training for 60-90 minutes while 51.1% are satisfied with the physical appearance and 62.4% are trained to be healthy and to be successful.

Table 1. Demographic characteristics of the participants

	f	%		f	%		f	%
Gender			**Job**			**Number of daily workouts**		
Male	87	59.6	Student	78	55.3	1 training	84	59.6
Female	54	38.3	Official	18	12.8	2 trainings	19	13.5
Age			Worker	14	9.9	3 trainings	26	18.4
18-22	84	59.6	Unemployed	23	16.3	4 trainings	6	4.3
23-27	29	20.6	Self-employed	8	5.7	5 trainings and over	6	4.3
28-32	12	8.5	**Sports Age**			**Daily training time**		
33-37	8	5.7	1-2 years	45	31.9	Less than 30 m	16	11.3
38 +	8	5.7	3-4 years	33	23.4	30-60 m	24	17.0
Marital Status			5-6 years	28	19.9	60-90 m	51	36.2
Single	94	66.7	7-8 years	10	7.1	90-120 m	36	25.5
Married	29	20.6	9 years and over	25	17.7	120 m and over	14	9.9
Divorced	9	6.4	**Regular training**			**Physical appearance**		
Widow	9	6.4	1-2 years	50	35.5	Yes	72	51.1
Education Level			3-4 years	43	30.5	Partially	54	38.3
Primary school	14	9.9	5-6 years	28	19.9	No	15	10.6
Secondary school	13	9.2	7-8 years	5	3.5	**Cause of training**		
High school	55	39.0	9 years and over	15	10.6	Like	13	9.2
Degree	45	31.9	**Weekly training day**			To feel good	30	21.3
Graduate	14	9.9	Irregular	28	19.9	Being healthy	41	29.1
Sports Branch			1-2 days	24	17.0	Succeed	47	33.3
Kickboxing	76	53.9	3-4 days	61	43.3	Material gain	7	5.0
Taekwondo	28	19.9	5-6 days	16	11.3	Other	3	2.1
Muaythai	37	26.2	7 days	12	8.5			

According to Table 2, when the responses of the participants to the exercise dependence scale were examined, 26.00 was found to be minimum value and 107.00 as maximum value with an average score of 71.41. This scale was defined as symptomatic with a score of 3.40.

Table 2. Mean overall score of exercise dependence scale.

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Scala	n	Min	Max	Scala Score	Scala Value
Exercise Dependence Scale	141	26.00	107.00	71.41	3.40

According to Table 3, in categorizing the exercise dependence averages of the participants, it was found that 5 athletes (3.5%) were asymptomatic-nondependent, 117 athletes (83.0%) were symptomatic-nondependent and 19 athletes (13.5%) were at-risk for exercise dependence. There was a significant difference between the symptoms of exercise dependence (F=150.882, p=.000).

Table 3. Comparison of mean overall score of exercise dependence symptoms (Kruskall Wallis, Anova).

Exercise Dependence Symptoms	n	%	$\bar{x}$	SD	F	p
Asymptomatic	5	3.5	34.00	0.40		
Symptomatic	117	83.0	69.00	0.25	150.882	.000**
Dependent	19	13.5	96.11	0.32		

* The mean difference is significant at the .05 level. ** The mean difference is significant at the .01 level.

According to Table 4, the symptomatic group was significantly different from the asymptomatic group and the dependence group (p=.000).

Table 4. Intra-group comparison of mean overall score of exercise dependence symptoms (Kruskall Wallis, Post Hoc Test)

Exercise Dependence Symptoms (I)	Exercise Dependence Symptoms (J)	Mean Difference (I-J)	Std. Error	Sig.
Asymptomatic	Symptomatic	-35.00000(**)	2.66155	.000
	Dependent	-62.10526(**)	2.95126	.000
Symptomatic	Asymptomatic	35.00000(**)	2.66155	.000
	Dependent	-27.10526(**)	1.67145	.000
Dependent	Asymptomatic	62.10526(**)	2.95126	.000
	Symptomatic	27.10526(**)	1.67145	.000

* The mean difference is significant at the .05 level. ** The mean difference is significant at the .01 level.

In Table 5, the percentage ratios between the variables and the exercise dependence symptoms were given as cross-comparisons. The highest values are as follows; 5 athletes are male with a rate of 5.7%, 1 athlete is in the 18-22 age group with 1.2%, 3 athletes are married with 10.3%, 3 athletes have a degree with 6.7%, 2 athletes are students with 2.6%, 4 athletes do kickboxing with 5.3%, 4 athletes have 1-2 years of sports age with 8.9%, 5 athletes have 1-2 years of regular training with 10.0%, 3 athletes do irregular training per week with 10.7%, 5 athletes do training of daily workouts once a week with 6.0%, 2 athletes train during 60-90minutes with 3.9%, 4 athletes are partially satisfied with the physical appearance with a rate of 7.4% and 3 athletes are trained to be healthy with 7.3% in the asymptomatic from the symptoms of exercise dependence.

The highest values are also as follows; 69 athletes are male with a rate of 79.3%, 71 athletes are in the age group of 18-22 with 84.5%, 77 athletes are single with 81.9%, 42 athletes study in high school with 76.4%, 64 athletes are students with 82.1%, 64 athletes do kickboxing with 84.2%, 37 athletes have 1-2 years of sports age with 82.2%, 42 athletes have 1-2 years of regular training with 84.0%, 49 athletes do 3-4 days of training per week with 80.3%, 63 athletes do training once a week with 75.0%, 40 athletes have 60-90m of training time with 78.4%, 60 athletes are satisfied with the physical appearance with 83.3%, 37 athletes are trained to be healthy with 78.7% and 35 athletes are trained to be successful with 85.4% in the symptomatic from the symptoms of exercise dependence.

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It has been observed that the highest values indicate that 13 athletes are male with a rate of 14.9%, 12 athletes are in the age group of 18-22 with 14.3%, 15 athletes are single with 16.0%, 12 athletes study in high school with 21.8%, 12 athletes are students with 15.4%, 10 athletes do taekwondo with 35.7%, 12 athletes have 3-6 years of sports age with 39.6%, 11 athletes have 3-4 years of regular training with 25.6%, 11 athletes do 3-4 days of training per week with 18.0%, 16 athletes train once a week with 19.0%, 9 athletes have 60-90m of training time with 17.6%, 11 athletes are satisfied with the physical appearance with 15.3% and 10 athletes are trained to be successful with 21.3% in the dependence from the symptoms of exercise dependence.

Also, exercise dependence scores were compared with variables. In Table 5 according to Mann-Whitney U test results, there is no significant difference between the variable of gender and exercise dependence scores (U=2319, p= .845). According to Anova (Kruskall Wallis), when the averages of exercise dependence were compared with the variables, it was seen that there was a significant difference between regular training (x^2=7.192, p=.027) and number of daily workouts (x^2=11.023, p=.004). It was determined that the participants of the study did not have a statistically significant difference between the age (x^2=4.906, p=.086), marital status (x^2=2.732, p=.255), education level (x^2=3.249 , p=.197), job (x^2=0.034, p=.983), sports branch (x^2=1.892, p=.388), sports age (x^2=5.337, p=.069), weekly training day (x^2=5.743, p=.057), daily training time (x^2=0.095, p=.954), physical appearance (x^2=1.863, p=.394) and cause of training (x^2=4.262, p=.119) compared to the total exercise dependence score.

Table 5. Comparison of mean overall score of exercise dependence symptoms (Mann Whitney U, Kruskall Wallis)

		Exercise Dependence Symptoms									
		Asymptomatic		**Symptomatic**		**Dependent**		**Total**		**U**	**p**
		Count	%	Count	%	Count	%	Count	%		
Gender	Male	5	5.7%	69	79.3%	13	14.9%	87	100.0%		
	Female	0	.0%	48	88.9%	6	11.1%	54	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		44.00		72.92		66.26				2319	.845
										Chi-Square	**p**
Age	18-22	1	1.2%	71	84.5%	12	14.3%	84	100.0%		
	23-27	1	3.4%	23	79.3%	5	17.2%	29	100.0%		
	28-32	1	8.3%	11	91.7%	0	.0%	12	100.0%		
	33-37	1	12.5%	6	75.0%	1	12.5%	8	100.0%		
	38 +	1	12.5%	6	75.0%	1	12.5%	8	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		105.60		70.18		66.95				4.906	.086
Marital Status	Single	2	2.1%	77	81.9%	15	16.0%	94	100.0%		
	Married	3	10.3%	22	75.9%	4	13.8%	29	100.0%		
	Divorced	0	.0%	9	100.0%	0	.0%	9	100.0%		
	Widow	0	.0%	9	100.0%	0	.0%	9	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		84.40		72.14		60.45				2.732	.255
Education Level	Prim. school	0	.0%	14	100.0%	0	.0%	14	100.0%		
	Sec. school	0	.0%	13	100.0%	0	.0%	13	100.0%		
	High school	1	1.8%	42	76.4%	12	21.8%	55	100.0%		
	Degree	3	6.7%	35	77.8%	7	15.6%	45	100.0%		
	Graduate	1	7.1%	13	92.9%	0	.0%	14	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		100.90		69.33		73.42				3.249	.197
Job	Student	2	2.6%	64	82.1%	12	15.4%	78	100.0%		
	Official	2	11.1%	15	83.3%	1	5.6%	18	100.0%		
	Worker	1	7.1%	12	85.7%	1	7.1%	14	100.0%		
	Unemployed	0	.0%	21	91.3%	2	8.7%	23	100.0%		

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	Self-Empl.	0	.0%	5	62.5%	3	37.5%	8	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		71.50		71.21		69.55				0.034	.983
Sports Branch	Kickboxing	4	5.3%	64	84.2%	8	10.5%	76	100.0%		
	Taekwondo	1	3.6%	17	60.7%	10	35.7%	28	100.0%		
	Muaythai	0	.0%	36	97.3%	1	2.7%	37	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		48.90		72.06		70.32				1.892	.388
Sports Age	1-2 years	4	8.9%	37	82.2%	4	8.9%	45	100.0%		
	3-4 years	1	3.0%	26	78.8%	6	18.2%	33	100.0%		
	5-6 years	0	.0%	22	78.6%	6	21.4%	28	100.0%		
	7-8 years	0	.0%	8	80.0%	2	20.0%	10	100.0%		
	9 years and +	0	.0%	24	96.0%	1	4.0%	25	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		30.80		72.53		72.16				5.337	.069
Regular Training	1-2 years	5	10.0%	42	84.0%	3	6.0%	50	100.0%		
	3-4 years	0	.0%	32	74.4%	11	25.6%	43	100.0%		
	5-6 years	0	.0%	25	89.3%	3	10.7%	28	100.0%		
	7-8 years	0	.0%	4	80.0%	1	20.0%	5	100.0%		
	9 years and +	0	.0%	14	93.3%	1	6.7%	15	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		25.50		72.09		76.26				7.192	.027*
Weekly training day	Irregular	3	10.7%	23	82.1%	2	7.1%	28	100.0%		
	1-2 days	1	4.2%	21	87.5%	2	8.3%	24	100.0%		
	3-4 days	1	1.6%	49	80.3%	11	18.0%	61	100.0%		
	5-6 days	0	.0%	13	81.3%	3	18.8%	16	100.0%		
	7 days	0	.0%	11	91.7%	1	8.3%	12	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		33.40		71.12		80.16				5.743	.057
Number of daily workouts	1 training	5	6.0%	63	75.0%	16	19.0%	84	100.0%		
	2 trainings	0	.0%	16	84.2%	3	15.8%	19	100.0%		
	3 trainings	0	.0%	26	100.0%	0	.0%	26	100.0%		
	4 trainings	0	.0%	6	100.0%	0	.0%	6	100.0%		
	5 tra. and +	0	.0%	6	100.0%	0	.0%	6	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		42.50		75.53		50.63				11.023	.004**
Daily training time	< 30m	0	.0%	16	100.0%	0	.0%	16	100.0%		
	30-60 m	1	4.2%	19	79.2%	4	16.7%	24	100.0%		
	60-90 m	2	3.9%	40	78.4%	9	17.6%	51	100.0%		
	90-120 m	2	5.6%	28	77.8%	6	16.7%	36	100.0%		
	120 m and +	0	.0%	14	100.0%	0	.0%	14	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		75.90		70.65		71.84				0.095	.954
Physical appearance	Yes	1	1.4%	60	83.3%	11	15.3%	72	100.0%		
	Partially	4	7.4%	42	77.8%	8	14.8%	54	100.0%		
	No	0	.0%	15	100.0%	0	.0%	15	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		86.90		71.62		63.03				1.863	.394
Cause of training	Like	1	7.7%	9	69.2%	3	23.1%	13	100.0%		
	To feel good	1	3.3%	28	93.3%	1	3.3%	30	100.0%		
	Being healthy	3	7.3%	35	85.4%	3	7.3%	41	100.0%		
	Succeed	0	.0%	37	78.7%	10	21.3%	47	100.0%		
	Material gain	0	.0%	6	85.7%	1	14.3%	7	100.0%		
	Other	0	.0%	2	66.7%	1	33.3%	3	100.0%		
Total		5	3.5%	117	83.0%	19	13.5%	141	100.0%		
Mean Rank		45.50		69.97		84.03				4.262	.119

* The mean difference is significant at the .05 level. ** The mean difference is significant at the .01 level.

According to Table 6, post-hoc analyses were made to determine from which group the difference originated. It was found that there were significant differences between asymptomatic group and other groups according to regular training (Dunnet's-HSD, p=.000). Significant differences were also found between symptomatic group and other groups according to number of daily workouts (Dunnet's-HSD, p=.000).

Table 6. Comparison of mean overall score of exercise dependence symptoms with variables differences (Kruskall Wallis, Post Hoc Test)

Dependent Variable	Exercise Dependence Symptoms (I)	Exercise Dependence Symptoms (J)	Mean Difference (I-J)	Std. Error	Sig.
Regular training	Asymptomatic	Symptomatic	-1.28205(**)	.12130	.000
		Dependent	-1.26316(**)	.22739	.000
	Symptomatic	Asymptomatic	1.28205(**)	.12130	.000
		Dependent	.01889	.25772	1.000
	Dependent	Asymptomatic	1.26316(**)	.22739	.000
		Symptomatic	-.01889	.25772	1.000
Number of daily workouts	Asymptomatic	Symptomatic	-.94017(**)	.11079	.000
		Dependent	-.15789	.08595	.221
	Symptomatic	Asymptomatic	.94017(**)	.11079	.000
		Dependent	.78228(**)	.14022	.000
	Dependent	Asymptomatic	.15789	.08595	.221
		Symptomatic	-.78228(**)	.14022	.000

* The mean difference is significant at the .05 level. ** The mean difference is significant at the .01 level.

4. Discussion

A total of 141 individuals participated in this study in order to determine the factors that could affect exercise dependence in kickbox, taekwondo and muaythai athletes. There were 87 male and 54 female athletes composed of 76 athletes in kickboxing, 28 in taekwondo and 37 athletes doing muaythai. In this study, 59.6% of the respondents are male, 59.6% are in the age group of 18-22, 66.7% of them are single, 39.0% are at the high school level, 53.9% of them do kickboxing, 55.3% are students, 31.9% have 1-2 years of sports age, 66.0% do exercise regularly, 43.3% do 3-4 days of training per week and 59.6% do only 1 training per week. 36.2% of the participants perform training for 60-90 minutes, 51.1% are satisfied with the physical appearance and 62.4% are trained to be healthy and successful.

Studies performed on exercise addiction are mostly conducted with university students. Therefore, knowledge on the prevalence of exercise dependence in different age groups is limited [19,20]. In his study, a large majority (32.9%) of the participants have been reported to be students [11].

Costa has reported that the number of male adults (25-44 years) reported to be at risk of exercise dependence are significantly higher than younger male adults (18-24 years) whereas no difference has been ascertained in females with respect to age groups [30]. However, our results are similar to the study of Hale et al. who have failed to find age difference in exercise dependence between young adults (18–24 years) and adults (25–55 years) [22]. Araz et al. (2007) have performed a study with individuals between the ages of 18 and 80 and determined that young individuals prefer exercise mostly while exercise and sports are considered to be among the behaviors ensuring health [31]. In this study, Ergun and Güzel (2018) have found that exercise dependence is more common among single participants [32]. This may be due to a higher level of perceived loneliness among single people [33], the greater importance of self-respect and a greater desire to be liked.

In this study trying to establish the dependency status, 83.0% of the participants are in the symptomatic group who are not dependent, but at risk of dependence. When categorizing the exercise dependence mean values of the participants, 5 athletes (3.5%) have been found to be

asymptomatic-nondependent, 117 athletes (83.0%) are symptomatic-nondependent and 19 athletes (13.5%) are at-risk for exercise dependence. In addition, there are significant differences between symptomatic group and the other groups according to total scores of the scale. The studies conducted by Yeltepe and İkizler [29] and Zırhlıoğlu [10] have also put forth that the proportion of participants in the non-dependent symptomatic group is high. Similar findings have been found in the study of Bavli et al. [11]. Zırhlıoğlu didn't observe exercise-related symptoms in the study [10]. Although the incidence of exercise dependence symptom is low in the study groups, it is observed that this symptomatic group bears high risk of dependence in the exercise dependency classification and this finding is supported with this study and previous ones [5,10,11,16,34].

Exercise dependence is not a frequently observed phenomenon as noted in previous studies. These studies show that the rate of exercise dependence is between 3-12% [5, 11, 16]. The prevalence of risky exercise dependence in this study (13.5 %) appears to be above the range of rates ascertained in other subject groups [18,21,27]. However, a recent national survey has reported much lower rates in general adult population (0.3 to 0.5 %) [19] and another study has similarly revealed much higher rates in the sample of bodybuilders, powerlifters, and fitness lifters (15.1%) [22]. The athletes doing kickboxing, taekwondo and muaythai are likely to participate in exercise activities that increase muscle strength and endurance; thus, future research should discover that sports may be more likely to show signs of dependence in exercises that require patience, endurance, and strength.

It has been observed in this study that the mean scores of asymptomatic group performing regular training are significantly lower than the other groups. According to the number of daily training, the mean score of the symptomatic group is significantly higher than the other two groups. It has also been determined that the participants of the study don't have a statistically significant difference between gender, age, exercise age, marital status, education level, sports branch, job, weekly training day, the daily exercise duration, physical appearance and cause of exercise compared to the total exercise dependence score. Looking at the studies performed in this field, it has been determined that high frequency exercise and year of exercise is closely related to exercise dependence [11,17]. In addition, the fact that the increase in the number of days and the number of hours of exercises seems to be a premise of exercise dependence also supports Başoğlu's study [35]. Based on these findings, it is possible to say that the risk of exercise dependence is high in individuals doing exercise regularly.

In the study, 13 men and 6 women were determined to be at risk of exercise dependence while 69 men and 49 women were stated as symptomatic non-dependent. In the study, no statistically significant difference exists between genders. Berczik et al. (2012) have reported that men reveal exercise dependence symptoms more than women [26]. Costa has found that there are no significant gender differences in the number of participants classified as at-risk for exercise dependence [30]. Lichtenstein et al. (2014) have established that exercise dependence is more common among men [36]. Polat and Şimşek (2015) have conducted a study in Eskisehir and ascertained that men do exercise more, the rate of exercise dependence is low for both genders and no statistically significant difference exists between the genders [16]. Our results are similar to those of previous research.

Another result of the study indicates that 19 athletes are at a risk of exercise dependence while 8 athletes do kickboxing, 10 athletes do taekwondo and 1 athlete does muaythai. It has been determined that 117 athletes exhibit the characteristics of being symptomatic non-dependent while 64 athletes do kickboxing, 17 athletes do taekwondo and 36 athletes do muaythai. There is no statistically significant difference between the sports branches in the study. Since no other studies regarding this field exists in the literature, it cannot be compared. But in similar studies, it has been determined that the participants prefer exercising regularly in football (38.3%) [10], and they prefer such types of exercises as running, jogging and weight lifting in the sports halls [11]. Yeltepe and Ikizler have established that athletes being at a risk of exercise dependence are engaged in rowing (n=6), team sports (n=4), fitness (n=2), runners (n=1) and tennis players (n=1) and those from team sports (n=25), fitness (n=18), runners (n=9), rowing (n=9), tennis (n=4) and swimmers (n=3) [29] are symptomatic non-dependent. A study conducted by the Vardar has revealed that a total of 11 athletes have participated in branches of judo, taekwondo and karate but exercise addiction prevalence hasn't been observed in these athletes [5].

A large majority of the athletes have showed similar characteristics as the symptomatic non-dependent and at a risk of exercise dependence in the study: they are male, students, 18-22 years old, single, study in high school, have 3-4 training days per week, do 1 training per day, have 60-90 min of training time per day, are satisfied with the physical appearance, healthy and successful. This can be explained with the specific dynamics and characteristics of fighting and defense sports, which require special discipline and regular work. The fact that there is no difference in all these variables also supports this idea.

Research on exercise dependence has several limitations since the terminology, definition and evaluation scales are still not well developed. Further research is required to determine the factors that contribute to addiction, prevention and treatment of addiction. It should be noted that exercise dependence scale is a screening tool to identify symptoms and is not used to make any official diagnosis. The fact that the work has been performed in the province of Elazig constitutes a limitation in terms of research. Another limitation is that the sample group is only selected from three sports branch. In addition to these limitations, it may be beneficial to increase the generalizability of the data obtained by applying the exercise dependence scale to a larger sample group when taking into account other areas of exercise and provinces.

5. Conclusions

In conclusion, it is estimated that this study will provide information about the prevalence of exercise dependence in different sports branches and make significant contributions to the literature in terms of revealing information about groups at risk for exercise addiction. It is also an important first step in understanding the differences in the symptoms of exercise dependence and the relationship between exercise dependence symptoms and sports branches. Finally, this study can be a guide in identifying individuals who may be at risk of exercise dependence and thus may raise awareness in the implementation and guidance of lifelong prevention programs.

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