



The Relationship between Sport Motivation and Exercise Dependence: Comparing Turks Living in Different Countries

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Abstract

The aim of this study was to examine the relationship between Sport Motivation and Exercise Dependence and compare Turks living in different countries. Exercise Dependence Scale, developed was used to determine exercise dependence levels while Sport Motivation Scale, was used for assessing motivation level. Data was analyzed with frequency and percentage, independent t-test, one-way ANOVA and Pearson correlation. Significant differences were found between the participants according to the country they live in regarding WDE, CON, TOL, LC, ROA, TM, IE, ER, INR, IDR, AMOT, ED, MOT. Exercise dependence negatively correlated with sport motivation for all participants.

Keywords: Dependence, Addiction, Motivation, Exercise

1. Introduction

People can motivate themselves to carry on an exercise program. This motivation may have impact on the behavior to keep working out until they reach the set goals. In this process, the commitment to reach a goal becomes a dependence or addiction.

Exercise dependence has been conceptualized by modeling Diagnostic and Statistical Manual for Mental Disorder's definition of substance dependence as a set of cognitive, behavioral, and physiological symptoms. [1,2] Hausenblas [3] exercise dependence includes "behavioral factors, psychological factors and/or physiological factors." Exercise dependence consists of subdimensions including tolerance, withdrawal, intention effects, loss of control, time, conflict, and continuance. The detrimental effects of exercise have been examined with the term of addiction. [4] Griffiths [5] proposed six criteria for behaviors to be an addiction: salience, mood modification, tolerance, withdrawal, conflict, and relapse. Exercise dependence was first defined as a positive addiction because exercise was thought to be beneficial for human body both psychologically and physiologically. [6] Contrary to this approach, Morgan [7] based his definition as negative addiction: "There are various definitions for the term addiction. For this paper, addiction is present if two basic requirements are met. First, the person must require daily exercise to cope, and believe that he or she cannot live without daily running. Second, if deprived of exercise, the person must manifest various withdrawal symptoms. A runner who is unable to run for a week or more because of medical, vocational, or personal problems is not addicted if the layoff does not provoke withdrawal symptoms or aberrant behavior, but the hardcore exercise addict will have numerous symptoms and behavioral manifestations representative of addictions in general if deprived of exercise". In sport setting motivation can influence individuals' exercise behaviors. According to the results of Hamer et al. [8], introjected regulation and identified regulation positively associated with exercise dependence. Sport motivation can be examined in three dimensions including intrinsic motivation, extrinsic motivation, and a motivation. According to the model developed by Pelletier et al. [9] to assess sport motivation, which based on Deci and Ryan's theory [10,11], intrinsic motivation includes intrinsic motivation to know, toward accomplishment, and to experience stimulation while extrinsic motivation has external regulation, introjection, and identification. People living in different regions can displayed similar behaviors in exercise and sport setting. Cultural background may have impacts on these behaviors. Even they are raised by families having similar cultural background; people can have different approaches to sport or exercise. The aim of this study was to examine sport motivation and exercise dependence levels of Turks raised by Turkish families that grew up in Turkey and living in different countries. The important characteristics of the participants were that they were Turkish, born in different countries, raised by families lived in Turkey. The participants did not live in Turkey for a long time except for holidays.



2. Method

2.1. Participants

Four hundred six individuals living in Turkey (n=176), Germany (n=94), Norway (n=45), Belgium (n=51), and Netherland (n=40) voluntarily took part in the study by reporting that they carried on individual (n=228) and team (n=178) sports. Of the participants, 178 were female, and 228 were male while 215 were single and 191 were married. The age mean was 27.12±5.13. The participants reported to do exercise for 4 days per week. The participants reported to be graduated from primary (n=7), secondary (n=34), university (n=267). Some of the participants reported to have postgraduate degree.

2.2. Procedure

Exercise Dependence Scale: Hausenblas and Downs [12] developed the original form with seven subscales (Withdrawal Effects: WDE, Tolerance: TOL, Continuance: CON, Lack of Control: LC, Reduction in Other Activities: ROA, Time: TM, Intention Effects: IE) including 21 items. The alpha internal consistency coefficient of the original scale was reported to be good with the value of 0.83, Yeltepe and İkişler [13] translated the scale into Turkish and tested the validity and reliability. The alpha coefficient of the Turkish form was high (pre-test: 0.96, post-test: 0.97). The alpha coefficient in this study was 0,88.

Sport Motivation Scale: Pelletier et al. [9] developed the original scale to measure motivational aspects of participation in sports. The original scale has 7 subscales including amotivation (A), external regulation (ER), introjected regulation (INR), identified regulation (IDR), intrinsic motivation to know (IMTK), intrinsic motivation-accomplishment (IMA), and intrinsic motivation-stimulation (IMS). In original study, the alpha coefficients for A, ER, INR, IDR, IMTK, IMA, and IMS were 0.75, 0.77, 0.74, 0.63, 0.80, 0.80, and 0.74, respectively. Kazak [14] adapted the scale into Turkish by merging IMTK and IMA in IMTKA. The alpha values in Turkish version for IMTKA, IMS, ER, INR, IDR, A were 0,88, 0.73, 0.74, 0.82, 0.72, 0.70, respectively. The alpha coefficient in this study was 0.78 for sport motivation scale.

2.3. Statistical Analysis

The demographical information of the participants was analyzed by using frequency and percentage. Gender and marital status differences were analyzed with independent samples t-test. The differences between countries were analyzed with one-way ANOVA test. The relationship between sport motivation and exercise dependence was analyzed by using Pearson correlation.

3. Results

Table 1. Means and Standard Deviations of the Motivation and Exercise Dependence Subscales and Total Scores for Females and Males

Variables	All participants			Turkey			Germany		
	Female	Male	t	Female	Male	t	Female	Male	t
	$\bar{X}\pm SD$	$\bar{X}\pm SD$		$\bar{X}\pm SD$	$\bar{X}\pm SD$		$\bar{X}\pm SD$	$\bar{X}\pm SD$	
WDE	3.40±0.64	3.34±0.61	.935	3.49±0.49	3.31±0.52	2.296*	3.39±0.52	3.47±0.53	-.744
CON	3.40±0.74	3.49±0.77	-1.238	3.44±0.56	3.49±0.73	-.458	3.40±0.63	3.60±0.67	-1.460
TOL	3.33±0.68	3.39±0.67	-.955	3.40±0.56	3.38±0.58	.129	3.33±0.47	3.45±0.57	-1.031
LC	3.46±0.78	3.47±0.80	-.237	3.65±0.61	3.60±0.76	.452	3.59±0.67	3.57±0.64	.155
ROA	3.42±0.75	3.41±0.75	.139	3.53±0.58	3.41±0.67	1.178	3.47±0.67	3.55±0.56	-.605
TM	3.58±0.69	3.55±0.66	.521	3.73±0.52	3.59±0.56	1.654	3.85±0.59	3.66±0.52	1.681
IE	3.54±0.73	3.50±0.67	.617	3.62±0.56	3.50±0.59	1.373	3.57±0.50	3.52±0.48	.542
IMTKA	4.76±0.59	4.82±0.70	-.948	4.65±0.67	4.86±0.82	-1.765	4.55±0.45	4.42±0.40	1.424
IMS	4.84±0.69	4.90±0.67	-.853	4.83±0.79	4.91±0.78	-.630	4.86±0.50	4.70±0.44	1.594
ER	4.28±0.98	4.58±0.99	-2.987**	4.02±0.83	4.58±1.03	-3.753**	3.78±0.45	3.89±0.50	-1.044
INR	4.71±0.78	4.89±0.83	-2.987**	4.73±0.89	4.87±0.82	-1.034	4.46±0.58	4.44±0.61	.147
IDR	4.87±0.74	4.90±0.82	-2.221*	4.80±0.81	4.89±0.97	-.608	4.87±0.74	4.85±0.77	.101
A	3.48±0.49	3.49±0.55	-.369	3.46±0.53	3.49±0.64	-.275	3.33±0.41	3.37±0.41	-.397
ED	3.45±0.54	3.45±0.55	-.076	3.55±0.38	3.47±0.48	1.194	3.51±0.46	3.54±0.41	-.324
MOT	4.49±0.47	4.59±0.55	-2.016*	4.42±0.53	4.60±0.64	-1.941	4.31±0.29	4.28±0.27	.507



Variables	Norway			Belgium			Netherland		
	Female	Male	t	Female	Male	t	Female	Male	t
	$\bar{X}\pm SD$	$\bar{X}\pm SD$		$\bar{X}\pm SD$	$\bar{X}\pm SD$		$\bar{X}\pm SD$	$\bar{X}\pm SD$	
WDE	3.51±0.49	3.46±0.51	.297	3.21±1.02	3.38±0.72	-.697	3.15±0.93	3.03±0.98	.385
CON	3.68±0.78	3.51±0.75	.684	3.21±0.96	3.64±0.82	-1.695	3.00±0.96	2.98±0.99	.054
TOL	3.59±0.54	3.41±0.61	.995	3.11±1.02	3.59±0.79	-1.858	2.88±0.90	2.96±1.03	-.272
LC	3.29±0.82	3.33±0.62	-.163	3.18±0.99	3.29±0.93	-.390	3.08±0.98	2.91±1.01	.527
ROA	3.60±0.74	3.71±0.54	-.501	2.85±0.94	3.47±0.88	-2.383*	3.21±0.97	2.68±1.09	1.627
TM	3.55±0.53	3.64±0.58	-.489	3.03±0.87	3.65±0.73	-2.740**	3.18±0.92	2.78±0.97	1.330
IE	3.84±0.57	3.76±0.65	.378	3.10±1.02	3.79±0.76	-2.764**	3.16±1.15	2.80±0.94	1.097
IMTKA	4.63±0.44	4.59±0.37	.291	5.32±0.32	5.37±0.46	-.377	5.17±0.39	5.07±0.35	.902
IMS	4.53±0.55	4.44±0.57	.481	4.83±0.55	5.15±0.48	-2.148*	5.32±0.73	5.30±0.64	.114
ER	3.85±0.57	4.05±0.60	-1.079	5.07±0.61	5.45±0.61	-2.181*	6.00±0.61	5.48±0.68	2.503*
INR	4.38±0.65	4.30±0.82	.322	5.23±0.63	5.66±0.56	-2.490*	5.08±0.52	5.46±0.64	-2.022
IDR	4.62±0.68	4.40±0.50	1.048	5.08±0.55	5.27±0.51	-1.225	5.32±0.50	4.88±0.44	2.934*
A	3.49±0.39	3.51±0.51	-.191	3.66±0.55	3.59±0.44	.468	3.65±0.49	3.65±0.51	.000
ED	3.58±0.48	3.54±0.48	.212	3.10±0.64	3.54±0.60	-2.506*	3.09±0.82	2.88±0.87	.808
MOT	4.25±0.21	4.22±0.26	.418	4.87±0.25	5.08±0.24	-3.020**	5.09±0.13	4.97±0.27	1.727

ALL= $n_{female}=178$, $n_{male}=228$; Turkey= $n_{female}=69$, $n_{male}=107$; Germany= $n_{female}=37$, $n_{male}=57$; Norway= $n_{female}=32$, $n_{male}=13$; Belgium= $n_{female}=20$, $n_{male}=31$; Netherland= $n_{female}=20$, $n_{male}=20$; * $p<0,05$, ** $p<0,01$,

Table 1 shows the differences between males and females regarding exercise dependence and sport motivation. The analyses were run for the participants according to the country. Each country has its gender comparison in table 1. The analysis for all participants revealed gender differences in terms of ER ($p<0.01$. $t=-2.988$). INR ($p<0.01$. $t=-2.987$). IDR ($p<0.05$. $t=-2.221$). and MOT ($p<0.05$. $t=-2.016$). Males reported higher scores regarding ER ($\bar{X}\pm SD_{female}=4.28\pm 0.98$. $\bar{X}\pm SD_{male}=4.58\pm 0.99$). INR ($\bar{X}\pm SD_{female}=4.71\pm 0.78$. $\bar{X}\pm SD_{male}=4.89\pm 0.83$). IDR ($\bar{X}\pm SD_{female}=4.87\pm 0.74$. $\bar{X}\pm SD_{male}=4.90\pm 0.82$). and MOT ($\bar{X}\pm SD_{female}=4.49\pm 0.47$. $\bar{X}\pm SD_{male}=4.59\pm 0.55$).

There were significant differences between female and male participants living in Turkey in terms of WDE ($p<0.05$. $t=2.296$) and ER ($p<0.01$. $t=-3.753$). Females reported higher scores in WDE ($\bar{X}\pm SD_{female}=3.49\pm 0.49$. $\bar{X}\pm SD_{male}=3.31\pm 0.52$) while males displayed higher scores in terms of ER ($\bar{X}\pm SD_{female}=4.02\pm 0.83$. $\bar{X}\pm SD_{male}=4.58\pm 1.03$). There were no significant differences between genders for those living in Germany and Norway. The individuals living in Belgium displayed gender differences in terms of ROA ($p<0.05$. $t=-2.383$). TM ($p<0.01$. $t=-2.740$). IE ($p<0.01$. $t=-2.764$). IMS ($p<0.05$. $t=-2.148$). ER ($p<0.05$. $t=-2.181$). INR ($p<0.05$. $t=-2.490$). ED ($p<0.05$. $t=-2.506$). and MOT ($p<0.01$. $t=-3.020$). Males reported higher scores regarding ROA ($\bar{X}\pm SD_{female}=2.85\pm 0.94$. $\bar{X}\pm SD_{male}=3.47\pm 0.88$). TM ($\bar{X}\pm SD_{female}=3.03\pm 0.87$. $\bar{X}\pm SD_{male}=3.65\pm 0.73$). IE ($\bar{X}\pm SD_{female}=3.10\pm 1.02$. $\bar{X}\pm SD_{male}=3.79\pm 0.76$). IMS ($\bar{X}\pm SD_{female}=4.83\pm 0.55$. $\bar{X}\pm SD_{male}=5.15\pm 0.48$). ER ($\bar{X}\pm SD_{female}=5.07\pm 0.61$. $\bar{X}\pm SD_{male}=5.45\pm 0.61$). INR ($\bar{X}\pm SD_{female}=5.23\pm 0.63$. $\bar{X}\pm SD_{male}=5.66\pm 0.56$). ED ($\bar{X}\pm SD_{female}=3.10\pm 0.64$. $\bar{X}\pm SD_{male}=3.54\pm 0.60$). and MOT ($\bar{X}\pm SD_{female}=4.87\pm 0.25$. $\bar{X}\pm SD_{male}=5.08\pm 0.24$). The participants living in Netherland showed gender differences in terms of ER ($p<0.05$. $t=2.503$) and IDR ($p<0.05$. $t=2.934$). Females showed higher scores regarding ER ($\bar{X}\pm SD_{female}=6.00\pm 0.61$. $\bar{X}\pm SD_{male}=5.48\pm 0.68$) and IDR ($\bar{X}\pm SD_{female}=5.32\pm 0.50$. $\bar{X}\pm SD_{male}=4.88\pm 0.44$).



Table 2. Means and Standard Deviations of the Motivation and Exercise Dependence Subscales and Total Scores for Marital Statuses

Variables	All participants			Turkey			Germany		
	Single	Married	t	Single	Married	t	Single	Married	t
	$\bar{X}\pm SD$	$\bar{X}\pm SD$		$\bar{X}\pm SD$	$\bar{X}\pm SD$		$\bar{X}\pm SD$	$\bar{X}\pm SD$	
WDE	3.34±0.63	3.40±0.62	-.949	3.35±0.55	3.45±0.45	-1.192	3.40±0.65	3.47±0.41	-.696
CON	3.42±0.80	3.49±0.70	-1.002	3.42±0.75	3.59±0.43	-1.567	3.36±0.83	3.64±0.47	-2.016*
TOL	3.33±0.69	3.40±0.65	-.940	3.35±0.61	3.47±0.47	-1.242	3.31±0.69	3.46±0.38	-1.343
LC	3.48±0.79	3.46±0.79	.252	3.61±0.74	3.65±0.62	-.341	3.52±0.74	3.62±0.58	-.752
ROA	3.39±0.81	3.43±0.68	-.524	3.42±0.72	3.53±0.42	-.968	3.50±0.81	3.53±0.41	-.274
TM	3.57±0.71	3.56±0.64	.173	3.64±0.58	3.66±0.47	-.210	3.79±0.63	3.69±0.48	.841
IE	3.48±0.74	3.55±0.65	-.930	3.53±0.61	3.60±0.49	-.785	3.51±0.59	3.56±0.40	-.495
IMTKA	4.90±0.71	4.67±0.55	3.512**	4.90±0.83	4.49±0.54	3.302**	4.60±0.47	4.38±0.36	2.550*
IMS	4.96±0.70	4.76±0.65	2.958**	4.97±0.81	4.67±0.67	2.363*	4.86±0.42	4.70±0.50	1.677
ER	4.62±1.02	4.25±0.93	3.759**	4.60±1.03	3.84±0.66	4.951**	3.96±0.51	3.76±0.44	2.051*
INR	4.86±0.84	4.75±0.77	1.478	4.93±0.86	4.56±0.77	2.721**	4.41±0.53	4.48±0.64	-.515
IDR	4.91±0.90	4.87±0.64	.506	4.84±1.01	4.87±0.64	-.223	5.01±0.85	4.75±0.67	1.632
A	3.45±0.58	3.52±0.45	-1.394	3.43±0.65	3.58±0.43	-1.476	3.41±0.42	3.32±0.41	1.006
ED	3.43±0.58	3.47±0.50	-.708	3.47±0.50	3.56±0.29	-1.223	3.48±0.58	3.57±0.28	-.934
MOT	4.62±0.57	4.47±0.45	2.844**	4.61±0.66	4.33±0.42	2.818**	4.38±0.29	4.23±0.25	2.563*
Variables	Norway			Belgium			Netherland		
	Single	Married	t	Single	Married	t	Single	Married	t
	$\bar{X}\pm SD$	$\bar{X}\pm SD$		$\bar{X}\pm SD$	$\bar{X}\pm SD$		$\bar{X}\pm SD$	$\bar{X}\pm SD$	
WDE	3.42±0.67	3.52±0.40	-.612	3.25±0.81	3.36±0.88	-.456	3.22±0.84	2.98±1.03	.783
CON	3.66±1.02	3.62±0.64	.171	3.60±0.92	3.37±0.87	.892	3.12±0.75	2.87±1.12	.812
TOL	3.50±0.72	3.55±0.48	-.324	3.31±1.00	3.47±0.84	-.590	3.14±0.76	2.74±1.07	1.349
LC	3.09±0.87	3.39±0.71	-1.231	3.18±1.00	3.29±0.92	-.432	3.14±0.71	2.87±1.17	.853
ROA	3.66±0.90	3.62±0.57	.193	3.13±1.07	3.29±0.86	-.599	3.05±0.92	2.86±1.17	.566
TM	3.50±0.71	3.61±0.46	-.636	3.31±0.77	3.48±0.89	-.688	2.96±1.10	3.00±0.85	-.120
IE	3.88±0.80	3.79±0.48	.442	3.39±1.09	3.62±0.79	-.856	2.98±1.02	2.98±1.11	-.010
IMTKA	4.76±0.44	4.55±0.39	1.565	5.38±0.42	5.33±0.40	.412	5.07±0.41	5.16±0.34	-.692
IMS	4.89±0.58	4.33±0.45	3.510**	4.89±0.48	5.12±0.54	-1.566	5.30±0.59	5.31±0.76	-.057
ER	3.89±0.63	3.94±0.47	.271	5.47±0.69	5.18±0.56	1.673	5.68±0.83	5.79±0.55	-.519
INR	4.50±0.74	4.05±0.49	-2.045*	5.53±0.66	5.46±0.60	.386	5.25±0.75	5.29±0.47	-.232
IDR	4.54±0.61	4.58±0.73	.196	5.19±0.58	5.20±0.50	-.090	5.04±0.57	5.15±0.46	-.712
A	3.55±0.42	3.37±0.41	-1.333	3.53±0.56	3.68±0.41	-1.136	3.63±0.46	3.65±0.53	-.126
ED	3.59±0.34	3.53±0.71	-.367	3.31±0.76	3.41±0.56	-.544	3.09±0.70	2.90±0.94	.696
MOT	4.27±0.22	4.23±0.23	.520	5.00±0.30	5.00±0.23	.026	4.99±0.22	5.06±0.21	-.931

ALL= $n_{\text{single}}=215$, $n_{\text{married}}=191$; Turkey= $n_{\text{single}}=122$, $n_{\text{married}}=54$; Germany= $n_{\text{single}}=39$, $n_{\text{married}}=55$; Norway= $n_{\text{single}}=14$, $n_{\text{married}}=31$; Belgium= $n_{\text{single}}=22$, $n_{\text{married}}=29$; Netherland= $n_{\text{single}}=18$, $n_{\text{married}}=22$; * $p<0.05$, ** $p<0.01$.

Table 2 presents the differences between marital statuses in terms of exercise dependence and sport motivation according to the countries in which the participants live. There were significant differences between married and single participants regarding IMTKA ($p<0.01$, $t=3.512$). IMS ($p<0.01$, $t=2.958$). ER ($p<0.01$, $t=3.759$). MOT ($p<0.01$, $t=2.844$). Single participants reported to have higher scores than those who married in terms of IMTKA ($\bar{X}\pm SD_{\text{single}}=4.90\pm 0.71$, $\bar{X}\pm SD_{\text{married}}=4.67\pm 0.55$). IMS ($\bar{X}\pm SD_{\text{single}}=4.96\pm 0.70$, $\bar{X}\pm SD_{\text{married}}=4.76\pm 0.65$). ER ($\bar{X}\pm SD_{\text{single}}=4.62\pm 1.02$, $\bar{X}\pm SD_{\text{married}}=4.25\pm 0.93$). MOT ($\bar{X}\pm SD_{\text{single}}=4.62\pm 0.57$, $\bar{X}\pm SD_{\text{married}}=4.47\pm 0.45$). Significant marital status differences were found among the individuals living in Turkey in terms of IMTKA ($p<0.01$, $t=3.302$). IMS ($p<0.05$, $t=2.363$). ER ($p<0.01$, $t=4.951$). INR ($p<0.01$, $t=2.721$). MOT ($p<0.01$, $t=2.818$). Single participants displayed higher scores regarding IMTKA ($\bar{X}\pm SD_{\text{single}}=4.90\pm 0.83$, $\bar{X}\pm SD_{\text{married}}=4.49\pm 0.54$). IMS ($\bar{X}\pm SD_{\text{single}}=4.97\pm 0.81$, $\bar{X}\pm SD_{\text{married}}=4.67\pm 0.67$). ER

($\bar{X} \pm SD_{\text{single}} = 4.60 \pm 1.03$, $\bar{X} \pm SD_{\text{married}} = 3.84 \pm 0.66$). INR ($\bar{X} \pm SD_{\text{single}} = 4.93 \pm 0.86$, $\bar{X} \pm SD_{\text{married}} = 4.56 \pm 0.77$). MOT ($\bar{X} \pm SD_{\text{single}} = 4.61 \pm 0.66$, $\bar{X} \pm SD_{\text{married}} = 4.33 \pm 0.42$). There were significant differences between single and married individuals living in Germany regarding CON ($p < 0.05$, $t = -2.016$). IMTKA ($p < 0.05$, $t = 2.550$). ER ($p < 0.05$, $t = 2.051$), and MOT ($p < 0.05$, $t = 2.563$). Single individuals displayed higher scores in terms of IMTKA ($\bar{X} \pm SD_{\text{single}} = 4.60 \pm 0.47$, $\bar{X} \pm SD_{\text{married}} = 4.38 \pm 0.36$). ER ($\bar{X} \pm SD_{\text{single}} = 3.96 \pm 0.51$, $\bar{X} \pm SD_{\text{married}} = 3.76 \pm 0.44$). MOT ($\bar{X} \pm SD_{\text{single}} = 4.38 \pm 0.29$, $\bar{X} \pm SD_{\text{married}} = 4.23 \pm 0.25$) while married individuals showed higher scores regarding CON ($\bar{X} \pm SD_{\text{single}} = 3.36 \pm 0.83$, $\bar{X} \pm SD_{\text{married}} = 3.64 \pm 0.47$). Individuals living in Norway showed significant differences according to their marital status regarding IMTKA ($p < 0.01$, $t = 3.510$) and IMS ($p < 0.05$, $t = -2.045$). Single participants had higher scores regarding IMTKA ($\bar{X} \pm SD_{\text{single}} = 4.89 \pm 0.58$, $\bar{X} \pm SD_{\text{married}} = 4.33 \pm 0.45$) and IMS ($\bar{X} \pm SD_{\text{single}} = 4.50 \pm 0.74$, $\bar{X} \pm SD_{\text{married}} = 4.05 \pm 0.49$).

Table 3. Means and Standard Deviations of the Motivation and Exercise Dependence Subscales and Total Scores for Individual and Team Athletes

Variables	All participants			Turkey			Germany		
	Individual	Team	t	Individual	Team	t	Individual	Team	t
	$\bar{X} \pm SD$	$\bar{X} \pm SD$		$\bar{X} \pm SD$	$\bar{X} \pm SD$		$\bar{X} \pm SD$	$\bar{X} \pm SD$	
WDE	3.37±0.61	3.37±0.65	.019	3.43±0.53	3.33±0.50	1.350	3.42±0.52	3.48±0.53	-.562
CON	3.44±0.74	3.47±0.77	-.298	3.45±0.66	3.48±0.68	-.298	3.51±0.64	3.55±0.71	-.248
TOL	3.33±0.69	3.41±0.65	-1.259	3.34±0.59	3.43±0.55	-1.042	3.35±0.52	3.50±0.56	-1.245
LC	3.47±0.76	3.46±0.83	.153	3.59±0.70	3.66±0.71	-.673	3.63±0.63	3.46±0.68	1.208
ROA	3.42±0.74	3.39±0.77	.434	3.43±0.63	3.48±0.65	-.428	3.52±0.58	3.52±0.66	.045
TM	3.57±0.64	3.56±0.71	.117	3.64±0.52	3.65±0.58	-.135	3.73±0.52	3.75±0.62	-.155
IE	3.50±0.69	3.54±0.71	-.617	3.54±0.57	3.56±0.59	-.258	3.54±0.48	3.53±0.49	.160
IMTKA	4.77±0.66	4.82±0.64	-.767	4.76±0.82	4.79±0.73	-.318	4.44±0.43	4.54±0.39	-1.078
IMS	4.88±0.67	4.86±0.70	.270	4.84±0.75	4.91±0.81	-.575	4.80±0.50	4.70±0.41	.959
ER	4.37±0.97	4.54±1.01	-1.711	4.26±0.94	4.46±1.04	-1.306	3.77±0.44	3.98±0.52	-1.988
INR	4.86±0.80	4.74±0.82	1.446	4.90±0.80	4.72±0.89	1.420	4.45±0.57	4.45±0.66	.019
IDR	4.87±0.77	4.91±0.82	-.482	4.77±0.87	4.94±0.94	-1.220	4.86±0.77	4.85±0.74	.021
A	3.43±0.51	3.55±0.53	-2.289*	3.44±0.58	3.52±0.62	-.876	3.25±0.42	3.56±0.31	-3.625**
ED	3.44±0.52	3.46±0.58	-.252	3.49±0.42	3.51±0.47	-.343	3.53±0.39	3.54±0.50	-.106
MOT	4.53±0.50	4.57±0.54	-.772	4.50±0.55	4.56±0.66	-.662	4.26±0.27	4.35±0.29	-1.406
Variables	Norway			Belgium			Netherland		
	Individual	Team	t	Individual	Team	t	Individual	Team	t
	$\bar{X} \pm SD$	$\bar{X} \pm SD$		$\bar{X} \pm SD$	$\bar{X} \pm SD$		$\bar{X} \pm SD$	$\bar{X} \pm SD$	
WDE	3.49±0.45	3.50±0.55	-.044	3.28±0.78	3.36±0.95	-.313	2.98±0.84	3.23±1.08	-.820
CON	3.61±0.82	3.66±0.71	-.228	3.48±0.92	3.46±0.87	.111	2.98±0.84	3.00±1.13	-.046
TOL	3.53±0.66	3.55±0.40	-.098	3.40±0.98	3.41±0.82	-.048	2.88±0.90	2.98±1.05	-.311
LC	3.30±0.76	3.30±0.78	.029	3.35±0.83	3.09±1.09	.963	2.94±0.95	3.07±1.06	-.426
ROA	3.72±0.65	3.53±0.72	.907	3.45±0.91	2.90±0.93	2.099*	2.78±1.00	3.17±1.11	-1.169
TM	3.58±0.48	3.56±0.63	.120	3.56±0.75	3.19±0.92	1.594	2.84±0.90	3.17±1.02	-1.096
IE	3.78±0.59	3.86±0.60	-.446	3.56±0.90	3.46±0.99	.397	2.82±0.97	3.19±1.15	-1.095
IMTKA	4.63±0.33	4.60±0.51	.214	5.37±0.43	5.33±0.38	.324	5.11±0.32	5.14±0.44	-.256
IMS	4.45±0.51	4.57±0.61	-.743	5.08±0.51	4.95±0.55	.865	5.44±0.65	5.13±0.69	1.453
ER	3.89±0.66	3.93±0.46	-.269	5.31±0.66	5.29±0.60	.104	5.69±0.60	5.80±0.80	-.508
INR	4.36±0.62	4.36±0.80	-.012	5.58±0.64	5.36±0.57	1.214	5.41±0.68	5.08±0.45	1.707
IDR	4.55±0.61	4.57±0.69	-.128	5.25±0.50	5.11±0.57	.915	5.16±0.45	5.02±0.59	.807
A	3.45±0.43	3.56±0.42	-.877	3.58±0.45	3.67±0.53	-.685	3.70±0.50	3.57±0.49	.829
ED	3.57±0.46	3.56±0.51	.056	3.44±0.64	3.26±0.65	.948	2.89±0.74	3.12±0.96	-.842
MOT	4.22±0.20	4.26±0.25	-.682	5.03±0.28	4.95±0.24	.977	5.08±0.21	4.96±0.21	1.846

ALL= $n_{\text{individual}}=228$, $n_{\text{team}}=178$; Turkey= $n_{\text{individual}}=88$, $n_{\text{team}}=88$ Germany= $n_{\text{individual}}=62$, $n_{\text{team}}=32$ Norway= $n_{\text{individual}}=25$, $n_{\text{team}}=20$ Belgium= $n_{\text{individual}}=30$, $n_{\text{team}}=21$ Netherland= $n_{\text{individual}}=23$, $n_{\text{team}}=17$ * $p < 0.05$, ** $p < 0.01$,



Table 3 displays the differences between individual and team sport participants regarding sport motivation and exercise dependence. In all participants and participants living in Germany, significant differences were found between individual and team sport participants in terms of AMOT ($p < 0.05$, $t_{all} = -2.289$; $p < 0.01$, $t_{Germany} = -3.625$). Team sport participants displayed higher scores in both samples.

Table 4. The correlations between exercise dependence and sport motivation regarding the Turks living in different countries

	All (n=406)		Turkey (n=176)		Germany (n=94)	
ED	3.45±0.55		3.50±0.44		3.53±0.43	
MOT	4.55±0.52	-.099*	4.53±0.61	-.059	4.29±0.27	.148
	Norway (n=45)		Belgium (n=51)		Netherlands (n=40)	
ED	3.57±0.48	-.022	3.37±0.65	.463**	2.98±0.84	.050
MOT	4.24±0.23		5.00±0.26		5.03±0.22	

Table 4 presents the relationship between exercise dependence and sport motivation regarding Turks living in different countries. Exercise dependence negatively correlated with sport motivation for all participant. These variables showed no association in the samples of Turkey, Germany, Norway, and Netherlands. There were significant and positive correlation between exercise dependence and sport motivation in the sample of Turks living in Belgium.

Table 5 shows the comparison of the participants according to the country they live in regarding exercise dependence and sport motivation. Significant differences were found between the participants according to the country they live in regarding WDE, CON, TOL, LC, ROA, TM, IE, ER, INR, IDR, AMOT, ED, MOT. Turks living in Germany and Norway displayed higher scores than those living in Netherlands in terms of WDE while Turks living in Netherlands showed lower scores than those living in Turkey, Germany, Norway, and Belgium regarding CON and TOL. The Turks living in Turkey displayed higher scores than those living in Belgium while those living in Netherlands showed lower scores than the Turks living in Turkey and Germany in terms of LC. The Turks living in Netherlands had lower scores than those living in Turkey, Germany, and Norway regarding ROA, additionally than Belgium in terms of TM. The participants living in Germany had higher scores than those living in Belgium in TM. The individuals living in Netherlands also showed lower scores than the individuals living in the other countries in terms of IE. The individuals living in Netherlands had higher scores than those living in Turkey, Germany and Norway while the Turks living in Turkey had higher scores than those living in Norway in terms of IMS. Regarding ER, the individuals living in Turkey had higher scores than those living in Germany and Norway while those living in Belgium reported higher scores than the individuals living in Turkey, Norway, and Germany. In the same dimension, the participants living in Netherlands reported higher scores than the individuals living in Turkey, Norway, and Germany. The same results were found for INR as ER. The participants living in Belgium reported higher scores than those living in Turkey and Norway whereas the individuals living in Netherlands had higher scores than those living in Norway. The Turks living in Germany displayed lower scores than those living in Belgium and Netherlands. The Turks living in Netherlands reported lower scores than those living in other countries in terms of ED. Regarding MOT, the individuals living in Turkey had higher scores than those living in Germany and Norway while those living in Belgium reported higher scores than the individuals living in Turkey, Norway, and Germany. In the same dimension, the participants living in Netherlands reported higher scores than the individuals living in Turkey, Norway, and Germany. Regarding IMTKA, the individuals living in Turkey had higher scores than those living in Germany while those living in Belgium reported higher scores than the individuals living in Turkey, Norway, and Germany. In the same dimension, the participants living in Netherlands reported higher scores than the individuals living in Turkey, Norway, and Germany.

Table 5. The comparison of the scores of Motivation and Exercise Dependence Subscales and Total Scores for Turks living in different countries

Variab les	Country	$\bar{X}\pm SD$	F	Post Hoc Comparison	Variab les	Country	$\bar{X}\pm SD$	F	Post Hoc Comparison	Variab les	Country	$\bar{X}\pm SD$	F	Post Hoc Comparison											
WDE	Turkey	3.38±0.52	2.922*	Germany>Netherland Norway>Netherland	IMS	Turkey	4.88±0.78	9.218**	Turkey>Norway Netherland>Turk ey Netherland>Ger many Netherland>Nor way	IMTKA	Turkey	4.78±0.77	21.699**	Turkey>Germany Belgium>Turk ey Belgium>Norway Netherland>Turk ey Netherland>Ger many Netherland>Nor way											
		Germany					3.44±0.52					Germany			4.47±0.42										
		Norway					3.49±0.49					Norway			4.62±0.41										
		Belgium					3.32±0.84					Belgium			5.35±0.40										
	Netherland	3.09±0.94				Netherland	5.12±0.37																		
	CON	Turkey				3.47±0.67	4.791*				Turkey>Netherland Germany>Netherland Norway>Netherland Belgium>Netherland	ER			Turkey	4.36±0.99	61.370*	Turkey>Germany Turkey>Norway Belgium>Turk ey Belgium>Norway Netherland>Turk ey Netherland>Ger many Netherland>Nor way Turkey>Germany Turkey>Norway Belgium>Turk ey Belgium>Norway Netherland>Turk ey Netherland>Ger many Netherland>Nor way	nTurkey=176 nGermany=94 nNorway=45 nBelgium=51 nNetherland=40 *p<0.05 **p<0.05						
						Germany										3.52±0.66				Germany	3.84±0.48				
						Norway										3.63±0.77				Norway	3.91±0.58				
						Belgium										3.47±0.89				Belgium	5.30±0.63				
		Netherland				2.99±0.96									Netherland	5.74±0.68									
		TOL				Turkey									3.39±0.57	5.393*				Turkey>Netherland Germany>Netherland Norway>Netherland Belgium>Netherland	INR	Turkey	4.81±0.85	24.794*	Belgium>Norway Netherland>Turk ey Netherland>Ger many Netherland>Nor way
															Germany								3.40±0.53		
Norway			3.54±0.56	Norway	4.36±0.70																				
Belgium			3.40±0.91	Belgium	5.49±0.62																				
Netherland			2.92±0.95	Netherland	5.27±0.60																				
LC			Turkey	3.62±0.70	7.663*	Turkey>Belgium Turkey>Netherland Germany>Netherland		IDR	Turkey	4.85±0.91			4.933**	Belgium>Turkey Belgium>Norway Netherland>Nor way											
				Germany						3.58±0.65					Germany							4.86±0.76			
	Norway			3.30±0.76			Norway			4.56±0.64															
	Belgium			3.24±0.94			Belgium			5.20±0.53															
	Netherland		3.00±0.98	Netherland			5.10±0.51																		
	ROA		Turkey	3.46±0.64			6.531*		Turkey>Netherland Germany>Netherland Norway>Netherland	AMOT	Turkey	3.48±0.60			3.260*		Belgium>German y Netherland>Ger many								
				Germany								3.52±0.60						Germany	3.35±0.41						
		Norway		3.63±0.68								Norway				3.50±0.42									
		Belgium		3.22±0.95								Belgium				3.62±0.48									
		Netherland	2.95±1.05	Netherland							3.65±0.49														
		TM	Turkey	3.65±0.55							11.341**	Turkey>Netherland Germany>Netherland Norway>Netherland Belgium>Netherland Germany>Belgium				ED		Turkey	3.50±0.44	9.649**	Turkey>Netherland Germany>Netherland Norway>Netherland Belgium>Netherland				
				Germany															3.73±0.55			Germany	3.53±0.43		
Norway				3.57±0.54	Norway	3.57±0.48																			
Belgium				3.41±0.84	Belgium	3.37±0.65																			
Netherland			2.98±0.96	Netherland	2.98±0.84																				
IE			Turkey	3.55±0.58	8.620*	Turkey>Netherland Germany>Netherland Norway>Netherland Belgium>Netherland		MOT					Turkey	4.53±0.61				37.591**	Turkey>Germany Turkey>Norway Belgium>Turk ey Belgium>German y Belgium>Norway Netherland>Turk ey Netherland>Ger many Netherland>Nor way						
				Germany										3.54±0.48								Germany	4.29±0.27		
	Norway			3.82±0.59			Norway		4.24±0.23																
	Belgium			3.52±0.93			Belgium		5.00±0.26																
	Netherland		2.98±1.05	Netherland			5.03±0.22																		



4. Discussion and Conclusion

This study aimed to compare the Turks living in different countries by testing the relationship between sports motivation and exercise addiction. The present study showed that there were cultural effects on exercise behaviors of individuals having similar background. Even the participants were raised with the families having similar cultural background, they displayed different exercise dependence levels. They reported to be motivated at various levels.

In this study, there were no significant differences between team and individual athletes regarding exercise dependence. Szabo et al. [15] found that team athletes reported higher scores than individual athletes. In the same study, genders had lower scores than males in exercise dependence. The individuals living in Belgium displayed gender differences in terms of exercise dependence. The only consistent result with literature was findings of Turks living in Belgium in terms of exercise dependence. [15, 16, 17, 18] Lichtenstein and Jensen [19] reported that exercise addiction was more common among women and men. Yıldız et al. [20] found no significant differences between genders in terms of exercise addiction. Kovascik et al. [21] found no significant differences between team and individual sports regarding exercise addiction. This is consistent with some findings in literature. [22] Lichtenstein et al. [23] suggested that team sport athletes might have the problem regarding exercise addiction. Downs et al. [24] reported that adolescent boys had greater symptoms than girls. Weik and Hale [25] reported gender differences in terms of WDE, CON, TOL, LC, TM, and IE. Males reported higher scores than females. In this study, in our study, exercise dependence negatively correlated with sport motivation for all participants. Significant and positive correlation was found between exercise dependence and sport motivation in the sample of Turks living in Belgium. Downs et al. [24] found that exercise dependence correlated with exercise motivation for both girls and boys. Duncan et al. [26] found that introjected regulation was a significant predictor of exercise dependence for females.

This study presented the relationships between sport motivation and exercise dependence by comparing Turks living in different countries. According to the findings, there might have a cultural effect on exercise dependence and sport motivation on individuals.

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Conflict of interests

The authors declare that there is no conflict of interest.

References

1. American Psychiatric Association. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Arlington: American Psychiatric Association., 2013. P. 81.
2. Allegre B, Souville M, Therme P, Griffiths M. Definitions and measures of exercise dependence. *Addiction Research and Theory*, 2006; 14(6): 631-646. <https://doi.org/10.1080/16066350600903302>
3. Hausenblas HA, Downs DS, Exercise dependence: a systematic review. *Psychology of sport and exercise*, 2002, 3(2): 89-123. [https://doi.org/10.1016/S1469-0292\(00\)00015-7](https://doi.org/10.1016/S1469-0292(00)00015-7)
4. Lukacs A, Sasvári P, Varga B, Mayer K. Exercise addiction and its related factors in amateur runners. *Journal of Behavioral Addictions*, 2019; 8(2): 343-349. <https://doi.org/10.1556/2006.8.2019.28>
5. Griffiths MD. Behavioural addiction: an issue for everybody? *Journal of Workplace Learning*, 1996; 8(3): 19-25.
6. Glasser W. Positive Addiction; Harper & Row: Oxford, UK, 1976, P. 112-130.
7. Morgan WP. Negative addiction in runners. *The Physician and Sports Medicine*, 1979; 7(2): 55-77. <https://doi.org/10.1080/00913847.1979.11948436>
8. Hamer M, Karageorghis CI, Vlachopoulos SP. Motives for exercise participation as predictors of exercise dependence among endurance athletes. *The 8 Journal of Sports Medicine and Physical Fitness*, 2002; 42: 233-238.
9. Pelletier LG, Tuson KM, Fortier MS, Vallerand RJ, Briere NM, Blais MR. Toward a new measure of intrinsic motivation, extrinsic motivation, and a motivation in sports: The Sport Motivation Scale (SMS). *Journal of sport and Exercise Psychology*, 1995; 17(1): 35-53. <https://doi.org/10.1123/jsep.17.1.35>



10. Deci EL, Ryan RM. *Intrinsic motivation and self-determination in human behavior*. New York: Plenum. 1985. P. 60-75.
11. Deci EL, Ryan RM. A motivational approach to self: Integration in personality. In R. Dientsbier (Ed.), *Nebraska symposium on motivation: Vol. 38. Perspectives on motivation* Lincoln: University of Nebraska Press. 1991. P. 237-288.
12. Hausenblas HA, Downs DS. How much is too much? The development and validation of the exercise dependence scale. *Psychology and Health*, 2002; 17(4): 387-404. <https://doi.org/10.1080/088704402200004894>
13. Yeltepe H, İközler C. Egzersiz bağımlılığı ölçeği-21'in Türkçe geçerlilik ve güvenilirlik çalışması. *Bağımlılık Dergisi*, 2007; 8(1): 29-35.
14. Kazak Z. Sporda güdülenme ölçeğinin Türk sporcuları için güvenilirlik ve geçerlik çalışması. *Spor Bilimleri Dergisi*, 1995; 15(4): 191-206.
15. Szabo A, De La Vega R, Ruiz-Barquín R, Rivera O. Exercise addiction in Spanish athletes: Investigation of the roles of gender, social context and level of involvement. *Journal of Behavioral Addictions*, 2013; 2(4): 249-252. <https://doi.org/10.1556/JBA.2.2013.4.9>
16. Cook B, Hausenblas HA, Rossi J. The moderating effect of gender on ideal-weight goals and exercise dependence symptoms. *Journal of Behavioral Addictions*, 2013; 2(1): 50-55. <https://doi.org/10.1556/jba.1.2012.010>
17. Hausenblas HA, Downs DS. Relationship among sex, imagery and exercise dependence symptoms. *Psychology of Addictive Behaviors*, 2002; 16(2): 169-172. <https://doi.org/10.1037/0893-164X.16.2.169>
18. Tata P, Fox J, Cooper J. An investigation into the influence of gender and parenting styles on excessive exercise and disordered eating. *European Eating Disorders Review*, 2001; 9(3): 194-206. <https://doi.org/10.1002/erv.394>
19. Lichtenstein MB, Jensen TT. Exercise addiction in CrossFit: Prevalence and psychometric properties of the Exercise Addiction Inventory. *Addictive Behaviors Reports*, 2016; 3: 33-37. <https://doi.org/10.1016/j.abrep.2016.02.002>
20. Yıldız M, Bingöl E, Şahan H, Bayköse N, Şenel E. A Cross-Cultural approach to sport psychology: is exercise addiction a determinant of life quality? *Sport Journal*, 2017; 1: 1-10.
21. Kovacsik R, Soós I, de la Vega, R, Ruiz-Barquín R, Szabo A. Passion and exercise addiction: Healthier profiles in team than in individual sports. *International Journal of Sport and Exercise Psychology*, 2018; 5: 1-11. <https://doi.org/10.1080/1612197X.2018.1486873>
22. Szabo A, Griffiths MD, Marcos RDLV, Mervó B, Demetrovics Z. Methodological and conceptual limitations in exercise addiction research. *The Yale Journal of Biology and Medicine*, 2015; 88(3): 303-308.
23. Lichtenstein MB, Larsen KS, Christiansen E, Støving, RK, Bredahl TVG. Exercise addiction in team sport and individual sport: Prevalences and validation of the exercise addiction inventory. *Addiction Research & Theory*, 2014; 22(5): 431-437. <https://doi.org/10.3109/16066359.2013.875537>
24. Downs DS, Savage JS, DiNallo JM. Self-determined to exercise? Leisure-time exercise behavior, exercise motivation, and exercise dependence in youth. *Journal of Physical Activity and Health*, 2013;10(2): 176-184. <https://doi.org/10.1123/jpah.10.2.176>
25. Weik M, Hale BD. Contrasting gender differences on two measures of exercise dependence. *British Journal of Sports Medicine*, 2009; 43(3): 204-207. <http://dx.doi.org/10.1136/bjism.2007.045138>
26. Duncan LR, Hall CR, Wilson PM, Jenny O. Exercise motivation: a cross-sectional analysis examining its relationships with frequency, intensity, and duration of exercise. *International Journal of Behavioral Nutrition and Physical Activity*, 2010; 7(1): 7-15. <http://doi.org/10.1186/1479-5868-7-7>