

## EXERCISE DEPENDENCE DURING COVID-19 PANDEMIC: AGE AND GENDER DIFFERENCES

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### ABSTRACT

**Introduction:** The COVID-19 pandemic has been threatening people's lives with an unhealthy lifestyle for the last two years. Most notably, nation-wide quarantine policies made people stay at home, resulting in reduced physical fitness. Although regular physical activity and exercise offer both physical and psychological benefits to individuals, compulsive and excessive exercise have some harmful consequences such as exercise dependence, which was defined as over commitment behaviors that make people continue to run despite injuries, illness, and so forth. The aim of this research is to examine the exercise dependence levels of individuals who exercise regularly according to their age and gender in the COVID-19 period.

**Material and methods:** This survey research was conducted using stratified purposeful sampling. A total of 269 participants ( $\bar{x}$  age = 26.50 ± 9.42), including 110 female ( $\bar{x}$  age = 26.38 ± 9.63) and 159 male ( $\bar{x}$  age = 26.38 ± 9.63) aged between 14-65 participated in the research voluntarily. Demographic information form and exercise dependence scale were used as data collection instruments. Pearson correlation and One-way MANOVA were used in data analysis.

**Results:** As a result of the Pearson correlation analysis, while there was a small negative correlation between the age and "time and exercise preference" ( $r = -.19$ ,  $r^2 = .04$ ,  $p < .05$ ), "lack of control" ( $r = -.15$ ,  $r^2 = .02$ ,  $p < .05$ ), "withdrawal" ( $r = -.18$ ,  $r^2 = .04$ ,  $p < .01$ ), "tolerance" ( $r = -.19$ ,  $r^2 = .04$ ,  $p < .05$ ), "continuance" ( $r = -.21$ ,  $r^2 = .04$ ,  $p < .05$ ) in participants. There was no significant difference between the female and male people in terms of all subscales of the exercise dependence scale ( $p > .05$ ).

**Conclusion:** While time and exercise preference, lack of control, withdrawal, tolerance, and continuance decreased when the age increased. Furthermore, the exercise dependence of male and female individuals was at similar levels in COVID-19 period.

**Keywords:** COVID-19, Exercise addiction, Lifestyle change.

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### Introduction

Regular physical activity and exercise offer both physical and psychological benefits to individuals<sup>(1)</sup>. Despite the benefits of exercise behavior, there is an informal consensus that compulsive exercise can have some harmful and negative consequences<sup>(2)</sup>. A study on the negative effects of exercise<sup>(3)</sup> focused on addiction as a result of excessive exercise. It was described in the past with the concepts of "running addiction", "morbid exercise", and "running

anorexics", which is now referred to as "exercise addiction"<sup>(4)</sup>.

Exercise addiction is defined as an individual's inability to control himself and exercise excessively despite some obstacles and many negativities<sup>(2, 5, 6)</sup>. It was emphasized in many studies that excessive exercise is one of the types of addiction because it improves mood, creates a state of euphoria and vitality, and increases endorphin production<sup>(7, 8)</sup>. Furthermore, psychological characteristics that occur due to excessive exercise support the addiction

hypothesis<sup>(9)</sup>. Exercise addiction is related to factors such as personality traits, psychological factors, physiological factors, exercise type, gender, and participation in exercise<sup>(2,10)</sup>.

Although there might be some positive outcomes of the home confinement during the pandemic<sup>(11)</sup>, findings from the literature yielded some negative outcomes which might differ by gender<sup>(12)</sup> and age<sup>(13,14)</sup>. During the COVID-19 pandemic, individuals have had difficulty participating in exercise both indoors and outdoors due to restrictions and closures in Turkey<sup>(15)</sup>. Therefore they may struggle with psychological symptoms such as anxiety or panic attacks due to the inability to exercise<sup>(16)</sup>. The aim of this research is to examine the exercise dependence of individuals who exercise regularly according to their age and gender in the COVID-19 period.

## Materials and methods

### Participants

This survey research was conducted on people who exercise regularly in 2020-2021 in Turkey. They were determined by stratified purposeful sampling method<sup>(17)</sup>, which is one of the non-random sampling methods. A total of 269 individuals ( $\bar{X}$  age = 26.50  $\pm$  9.42), including 110 female ( $\bar{X}$  age = 26.38  $\pm$  9.63) and 159 male ( $\bar{X}$  age = 26.38  $\pm$  9.63) aged between 14-65 participated in the study voluntarily. The study followed the ethical procedures and was approved by the ethics committee of Eskisehir Technical University (No: E-87914409-050.03.04-19720). The data were collected during the COVID-19 period online from participants. In the process of data collection, the information related to the content of the study, rights of the participants and information of the researchers were provided to the participants.

### Data collection instruments

The data collection tool used in the research consists of two parts.

**Demographic Information Form:** In this form, gender and age information was asked by the researchers.

**Exercise Dependence Scale:** Gurbuz and Aşçı<sup>(18)</sup> adapted the questionnaire to Turkish culture, which was developed by Hausenblas and Downs<sup>(2)</sup>. Six point Likert questionnaire has subscales of time and exercise preference, lack of control, withdrawal, tolerance, and continuance. According to the

reliability analysis performed in the Turkish version of the scale, Cronbach Alpha values were 0.87 for time and exercise preference subscale and 0.59 for continuance subscale.

### Data analysis

SPSS 25 package program was used in the analysis of the data. While the data were checked for suitability of extreme values, linearity, covariance, and normality assumptions for correlation analysis; the data were checked for univariate and multivariate normality, outliers, linearity, homogeneity of regression, multicollinearity/singularity, and homogeneity of variance-covariance matrices for multivariate analysis of variance (MANOVA)<sup>(19)</sup>. Then, as a result of scatter plot analysis for linearity and covariance conditions, assumptions were provided. For univariate normality assumption,  $\pm 1$  interval was used for kurtosis and skewness values<sup>(20)</sup>. For multivariate normality assumption, Mahalanobis distances; for multicollinearity/singularity assumption, correlation analysis were used<sup>(19)</sup>. Since the data has assumptions of homogeneity, normality (univariate and multivariate), and multicollinearity/singularity was analyzed by Pearson correlation and MANOVA. Correlation ranges were considered to be: .10-.29 small; .30-.49 medium; .50-1.00 large<sup>(21)</sup>. The variance value shared by the variables used in the research; that is, what percentage of the change in variables is explained by the change in other variables, was calculated by the determination coefficient ( $r^2$ )<sup>(19)</sup>. Cronbach Alpha was used for internal consistency coefficient. The provided internal consistency coefficients are .63, .80, .50, .62, and .73 for time and exercise preference, lack of control, withdrawal, tolerance, intention, and continuance subscales respectively. These results showed that the findings obtained from the data collection tools used in the research were reliable<sup>(20)</sup>. The results were tested at the levels of  $p < .05$  and  $p < .01$  (Bonferroni adjusted alpha level).

## Results

The correlation findings between the age and the exercise dependence in terms of gender were given in Table 1.

The relationships between age and “time and exercise preference” ( $r = -.19$ ,  $r^2 = .04$ ,  $p < .05$ ), “lack of control” ( $r = -.15$ ,  $r^2 = .02$ ,  $p < .05$ ), “withdrawal” ( $r = -.18$ ,  $r^2 = .04$ ,  $p < .01$ ), “tolerance” ( $r = -.19$ ,  $r^2 = .04$ ,  $p < .05$ ), and “intention” ( $r = -.19$ ,  $r^2 = .04$ ,  $p < .05$ ) were significant.

= .04,  $p < .05$ ), “continuance” ( $r = -.21$ ,  $r^2 = .04$ ,  $p < .05$ ) were significant in people who exercise regularly.

Variables	Age	Time and exercise preference	Lack of control	Withdrawal	Tolerance	Continuance
Age	1	-.191*	-.150*	-.181**	-.193*	-.208**
Time and exercise preference		1	.737***	.678***	.695***	.621***
Lack of control			1	.619***	.787***	.669***
Withdrawal				1	.600***	.625***
Tolerance					1	.804***
Continuance						1

**Table 1:** Correlation analysis findings between age and exercise dependence.

\*\*\* $p < .001$  \*\* $p < .01$  \* $p < .05$   $p > .05$

The findings of the MANOVA, which showed the difference between male and female participants in terms of their exercise dependence, were provided in Table 2.

Source	Dependent Variable	Sum of Squares	df	Mean Square	F	p	$\eta^2$	Male $\bar{X} \pm s.d$	Female $\bar{X} \pm s.d$
Gender	Time and exercise preference	.00	1	.00	.23	.63	.00	.03±.01	.03±.00
	Lack of control	.05	1	.05	.07	.80	.00	2.79±.92	2.76±.85
	Withdrawal	.31	1	.31	.47	.49	.00	2.92±.84	2.98±.79
	Tolerance	.20	1	.20	.24	.62	.00	3.04±.96	2.98±.84
	Continuance	.09	1	.09	.12	.73	.00	3.12±.94	3.08±.85
Error	Time and exercise preference	.02	267	.00					
	Lack of control	212.89	267	.80					
	Withdrawal	179.70	267	.67					
	Tolerance	222.18	267	.83					
	Continuance	219.57	267	.82					
Total	Time and exercise preference	.31	268						
	Lack of control	2292.89	268						
	Withdrawal	2515.78	268						
	Tolerance	2667.44	268						
	Continuance	2807.44	268						

**Table 2:** Findings of comparison test between exercise dependence by gender.

\*\*\* $p < .001$  \*\* $p < .01$  \* $p < .05$   $p > .05$

According to the results of the MANOVA analysis, there was no statistically significant difference between males and females on the combined dependent variables ( $F=.51$ ;  $p=.77$ ; Wilks’ Lambda = .01;  $\eta^2=.01$ ). When the results for the dependent variables were considered separately, no significant difference on gender ( $p>.05$ ).

**Discussion and conclusion**

This research aimed to examine the exercise dependence of individuals who exercise regularly according to their age and gender in the COVID-19 period. We should note that in the countries where the pandemic is more severe, males and females of all age groups might be affected the same. On the other

hand, age and gender effects might be more potent in countries where the pandemic is less impactful<sup>(13)</sup>. Although Turkey has been relatively less affected by the pandemic compared to Mediterranean countries<sup>(22)</sup>, measures were taken in many areas such as education, health, trade, and sports<sup>(15)</sup>. During the COVID-19 pandemic, it is found that exercise volume decreases about 50% of individuals who exercise regularly<sup>(23)</sup>. Due to restrictions and closures in pandemic conditions, individuals who cannot participate in exercise may show psychological symptoms specific to addictions, especially those who are not aware that they are exercise addicts<sup>(16)</sup>. In this context, if the relationship between these variables can be clarified, it might be beneficial for better understanding exercise dependence in people in the COVID-19 period.

It was found that a small negative correlation between age and time and exercise preference, lack of control, withdrawal, tolerance, and continuance in people who exercise regularly. Costa et al.<sup>(24)</sup> stated that exercise frequency, daily exercise time, and sports age may be effective in the emergence of exercise addiction. In a study<sup>(25)</sup>, while the increase in sports ages of elite athletes increases their addiction levels; the increase in the sports age of college students does not change their addiction level. The results in the literature show that exercise addiction varies between individuals and elite athletes, as well as between age and sports age. According to the results of the MANOVA analysis, there was no statistically significant difference between males and females on exercise dependence. However, it is a controversial in the literature. While exercise addiction of men is higher than that of women in both elite athletes and university students in some studies<sup>(25,26)</sup>, exercise addictions of men and women are similar in some studies<sup>(24,27,28)</sup>.

This survey research should be considered in the context of its limitations. The use of self-reporting instruments comes with its own set of limitations<sup>(29)</sup>. The data were collected online from the volunteer participants in the research due to the epidemic period. The online data collection process has led to the use of non-random sampling methods. However, the online collection of data facilitated the process in terms of time and cost and enabled both men and women to participate in the research at a similar rate in a wide age range in their comfort zone. Thus, the scope of research has expanded.

In conclusion, while time and exercise preference, lack of control, withdrawal, tolerance,

and continuance decreased when the age increased in people during COVID-19 period. Furthermore, the exercise dependence of male and female participants was at similar levels.

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