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ORIGINAL RESEARCH CORONA EXPERIENCE

Psychological and motivational differences between athletes and non-athletes during the COVID-19 pandemic

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ABSTRACT

Background & objective: It was aimed to determine whether there was a difference in terms of motivation, sports commitment, depression, and perceived stress levels in male and female athletes, and to compare these parameters between athletes and non-athletes. In addition, in this study, the relationships between the level of COVID-19 fear and depression, perceived stress and motivation levels were investigated in athletes and non-athletes.

Methodology: This cross-sectional research was carried out on licensed athletes and healthy sedentary individuals living in Turkey between February and June 2022. The data were collected by completing the electronic form through online surveys method on Google Docs by the participants via self-report.

Results: 136 of the 232 individuals participating in our study were sedentary individuals (58.6%) and 96 were athletes (41.4%). This study has revealed that the motivation level is greater in athletes than non-athletes (P = 0.002). In addition, it has shown that the COVID-19 fear (.P = 0.004), depression (P = 0.026) and perceived stress levels (P = 0.045) in female athletes with a history of COVID-19 are higher than male athletes with a history of COVID-19. We also conclude that the catching COVID-19 was not a parameter that affect the sport engagement level in athletes.

Conclusion: The results of this research has shown that as COVID-19 fear increases, there is also an increase in depression and stress levels in athletes without a history of COVID-19. However, we may also report that COVID-19 fear does not trigger parameters such as depression and stress level in athletes caught by COVID-19. In conclusion, psychological support may be recommended to address the fear of COVID-19 in individuals who have not had the disease, while motivational support may be beneficial for those who have had COVID-19 to help them return to their previous routine life.

Keywords: Athletes; Sports Psychology; Sports Commitment; Motivation

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1. INTRODUCTION

Although COVID-19 is a new type of coronavirus, it is known to cause a variety of illnesses, from the common cold to more serious illnesses including MERS and SARS. People infected with coronavirus infection may experience some symptoms such as cough, myalgia, pneumonia, chills, sore throat, fever, nausea, dyspnea, diarrhea, and vomiting.[1] People with severe

coronavirus illness may experience cardiac and respiratory failure, acute respiratory syndrome, and even death.[2] COVID-19 is associated with a wide clinical spectrum, ranging from mild cases to severe cases that require intensive care. The treatment protocols for COVID-19 are still not completely clear, despite the fact that it affects millions of people around the world.[3]

With the COVID-19 pandemic, countries are taking various measures according to their own conditions, with the advice of WHO and scientists, in order to reduce social contact and viral spread.[4] In this context, many activities, especially social isolation, were temporarily suspended or restricted. While a partial or complete lockdown has been declared in some settlements, quarantine has been declared in others. All these efforts are aimed at preventing the collapse of the health systems of countries by reducing and controlling the spread of the epidemic. As it brings so many people together, sporting events, the potential threat of the global spread of the virus, have also been affected by restrictions policies.[5,6] Accordingly, sports activities were cancelled or postponed. It is thought that these preventive decisions and practices may increase the COVID-19 fear in both athletes and healthy sedentary individuals.[7]

Depending on the measures taken, the daily lives of all people have undergone major changes. These changes have been seen in many different points such as working style, social life, financial anxiety. It has been reported that these changes have negative effects on physical activity.[4] The COVID-19 pandemic represents a major threat to both the physical and mental health of the population. A wide variety of psychological consequences have been observed at the individual, societal, national and international levels due to the prolonged feelings of fear and uncertainty that increase during the virus outbreak.[8] It is thought that the motivation of individuals with energy depletion will decrease due to the increase in anxiety with COVID-19, which creates many uncertainties.[9] Emerging international evidence indicates that symptoms of post-traumatic stress disorder, fear, anxiety, loss of motivation, and depression are common in the general population in the early phase of this pandemic.[2] For this reason, studies on the anxiety of catching COVID-19, depression, and stress in COVID-19 have become popular.[10]

In line with all the measures taken, both athletes and sedentary people have been negatively affected physically and psychologically.[7] The fact that this level of exposure may differ among individuals has led to the question whether the effects of the COVID-19 fear on depression, perceived stress and motivation levels will also differ in healthy individuals and athletes with and without a history of COVID-19. In this context, our purpose was to determine whether there was a difference in terms of COVID-19 fear, depression, perceived stress, and motivation levels, and sports commitment between male and female athletes with and without a history of COVID-19, and to compare these parameters between sedentary individuals and athletes. In addition, in this study, the relationships between the level of COVID-19 fear and depression, perceived stress, and motivation levels were investigated in sedentary individuals and athletes according to the status of catching COVID-19 or not.

The hypothesis of the present study was that there were differences between athletes and sedentary individuals in terms of fear of COVD-19, depression, perceived stress, motivation levels and commitment to sports according to gender and history of COVD-19 infection. Exploring the effects of COVID-19 in athletes, identifying the factors that affect their performance as well as their mental health will play an important role in ensuring that athletes are less affected by the pandemic.

Research Questions:

1: Were there any differences in terms of depression, perceived stress and motivation levels between male and female athletes compared to healthy and sedentary individuals with and without COVID-19?

2: Was the fear of COVID-19 related to depression, perceived stress and motivation level in male and female athletes and sedentary individuals with and without COVID-19?

2. METHODOLOGY

This online study that includes survey questions was designed in accordance with the Helsinki declaration as cross-sectional research. All subjects participated in the study were informed about the study. The study followed the STrengthening the Reporting of OBservational Studies in Epidemiology (STROBE) statement for cross-sectional studies.

Ethics approval was obtained from the Ethic Commission of Non-Interventional Clinical Research Ethics Committee of Marmara University Faculty of Health Sciences (Protocol Number: 24.02.2022/25).

2.1. Participants and Procedures

The study was carried out on licensed athletes and healthy sedentary individuals living in Turkey between February and June 2022.

2.1.1. Athletes: The subjects who had licence and participated regularly in sport at some point in their lifespan, according to their own statements. The inclusion criteria for athletes were to be aged between 18-45 years, to belong to an organized sport with having a licence, and to participate in the study voluntarily by filling out reasonably the online questionnaire.

2.1.2. Non-Athletes/Healthy Sedentary Individuals: The subjects who did not participate in any sport and physical activities regularly, according to their own statements. The inclusion criteria for sedentary individuals were to be aged between 18-45 years, not doing exercise regularly, and voluntary participation in this study by filling out the online questionnaire in a reasonable way.

Those who filled out the questionnaire incompletely or incorrectly, who did not want to voluntarily participate in the study, who had been diagnosed with depression, anxiety, or psychiatric illness, who had a chronic disease or a history of substance use were excluded from research.

2.2. Data Collection Tools

All evaluation forms in the study were electronically prepared and sent to the participants via social media and other communication channels. The data were collected by completing the electronic form through online surveys method on Google Docs by the participants via self-report. In the electronic form, demographic and descriptive information such as gender, age, educational status, height, weight, sports history, sports branches, COVID status were included.

The first section of the electronic form included the preliminary information stating the aim of the study and informed consent. Before the participants filled out the online survey, they were asked to read the first page and whether they agreed to participate in the study voluntarily or not. Individuals whose informed consent was obtained to participate in the study were able to access the second section of the electronic form. This section included questions related about sociodemographic variables, COVID-19 fear, depression, perceived stress, and motivation levels for the sedentary individuals. Second section of the electronic form also included questions related about sociodemographic level, fear of COVID-19, athlete's anxiety to catch the novel coronavirus, level of depression, perceived stress, motivation, and commitment to sport for licensed athletes, as well. It took about 20 to 25 min to fill out the electronic form on Google Docs for both of licensed athletes and sedentary individuals.

2.3. Measures

2.3.1. Sociodemographic form:

Sociodemographic characteristics of all subjects including both of licensed athletes and healthy individuals participating in the study, such as age, contact email address, body mass index including height and weight, gender, educational and covid status, branches and history of sports were questioned.

2.3.2. Fear of COVID-19: The level of COVID-19 fear was assessed using with "Fear of COVID-19 Scale" developed by Ahorsu [11] in 2020. The scale, has seven items that measure different aspects of COVID-19 fear, is a short, valid, and reliable questionnaire. The scale includes a Likert style rating system, ranging from 1 to 5. Total score on this scale can range from 7 to 35. A higher score on this scale indicates a greater COVID-19 fear. This scale was adapted to Turkish language by Satici et al.[12] in 2021. Turkish version of this scale had solid psychometric properties.

2.3.3. Perceived Stress Level: Perceived stress level was measured using with "Perceived Stress Scale (PSS)" in 1983. The scale has three versions which are PSS-14, PSS-10, and PSS-4. Three versions of the scale have highly adequate reliability and validity level. This scale contains 14 items rated on a five-point Likert-type rating system ranging from 0 to 4. Total score on this scale can vary from 0 to 56 points. A higher score on this scale indicates a higher perceived stress level.[13] The adaptation of this scale to Turkish language was carried out by Eskin et al.[14] in 2013.

2.3.4. Motivation Level: The level of motivation was measured using "Adult Motivation Scale" developed by Tulunay-Ates & İhtiyaroglu in 2019.[15] This index contains 2 sub-scales which include extrinsic and intrinsic motivation scales. While intrinsic motivation part of the scale is made up of 13 questions, extrinsic motivation part of the scale includes 8 questions. This scale has 21 items rated on a five-point Likert-type rating system ranging from 1 to 5. Getting a higher score on this scale means a higher level of motivation.

2.3.5. Sport Engagement Level: Sport engagement level was measured with "Sport Engagement Scale" adopted and validated by Guillen in 2014.[16] This scale includes 15 items distributed in three separate factors: Vigor, Dedication, and Absorption (five items each). The adaptation of the scale to Turkish language was carried out by Sırgancı et al. in 2019.[17]

2.3.6. Depression Level: The level of depression was measured using with "Beck Depression Inventory" which was developed in 1961. Reliability and validity for the scale was carried out by Hisli[18] in 1989. This scale includes 21 different items to measure the impact of depression symptoms. Each item is scored from 0 to 3. Total points for this scale can vary from 0 to 63. A higher score on this index means higher depressive symptoms. Depression levels are classified into four different levels: minimal, mild, medium, and severe.[19]

2.4. Statistical Analysis

"Statistical Package for Social Sciences (SPSS)" with 11.5 version (SPSS inc, Chicago, IL, USA) was used for analyzing the data of the study. The statistical significance level was assessed at the $P < 0.05$ in all analyzes. The normal distribution was evaluated with Kolmogorow Smirnow/Shapiro-Wilk Test,

mean/standard deviation values, and normal distribution graphs (histogram plot).

Mean and standard deviation, percentage, and also frequency variables were reported in this study. While "Independent Sample T Test" was performed to analyze the difference between athletes and non-athletes, "Mann-Whitney U Test" was applied in comparison of gender to show the difference between athletes and non-athletes with and without COVID-19. "Pearson Correlation Test" was chosen to examine the relationship between COVID-19 fear and levels of depression, perceived stress and motivation in athletes and non-athletes.

The determination of the sample size was based on the study of Vancini et al. "Quality of Life, Depression, Anxiety Symptoms and Mood State of Wheelchair Athletes and Non-athletes: A Preliminary Study".[31] In this study, the "Profile of Mood State/Depression" score of non-athletes was 2.6 ± 2.9 and the "Profile of Mood State/Depression" score of athletes was 5.3 ± 10.5. It was calculated to include at least 102 cases in the study with 80% power and an α error coefficient of 0.05. Despite the possibility of repetitive or incomplete answers in the study, the number of cases in the study was increased by 10% to have at least 112 in each group. G*Power v.3.1.9.7 program (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany) was used to determine the sample size.

3. RESULTS

3.1. Sociodemographic Characteristics

Between February and June 2022, 139 sedentary individuals and 98 athletes, totally 237 subjects participated in our study by filling out our electronic form on Google Docs. The answers of 5 participants (3 sedentary, 2 athletes) were excluded from the study due to the fact that there were incomplete or incorrect answers among the 237 answers that filled out the survey. Finally, the responses of 232 participants were analyzed in this study. All participants live in Turkey. Accordingly, 136 of the 232 individuals participating in our study were sedentary healthy individuals (58.6%) and 96 were athletes (41.4%). A total of 136 sedentary individuals, 85 females (62.5%) and 51 males (37.5%), aged between 16 and 42 years (22.72 ± 3.56 years) participated in the study. A total of 96 athletes, 42 females (43.8%) and 54 males (56.3%), aged between 15 and 62 years (24.87 ± 8.83 years) participated in this study (shown in Table 1).

While 57 of the 136 sedentary individuals included in our study were infected with COVID-19 (41.9%), 79 individuals had never had COVID-19 (58.1%). While 45 of the 96 athletes included in our study were infected with COVID-19 (46.9%), 51 athletes had never had COVID-19 (53.1%). Among healthy and sedentary individuals, 30 (52.6%), 23 (40.4%), and 4 (7%) stated the severity of COVID-19 as mild, moderate and severe, respectively. Among athletes, 24 (53.3%), 19 (42.2%), and 2 (4.4%) stated the severity of COVID-19 as mild, moderate and severe, respectively.

While the time elapsed since 57 healthy and sedentary individuals caught COVID-19 varies between 1 and 26 months (11.31 ± 6.01), the severity level of COVID-19 according to VAS ranged from 0 to 9 (4.07 ± 2.49) scores. While the time elapsed since 45 athletes caught COVID-19 varies between 3 and 28 months (11.13 ± 6.45), the severity level of COVID-19 according to VAS ranged from 0 to 9 (3.55 ± 2.47) scores (Table 1).

Of the 96 athletes who participated in our study, 80 stated the sports branch they were licensed in, and the license years of the athletes ranged from 1 to 23 years

Table 1: Demographic and physical characteristics of participants

Characteristic	Non-Athletes (n = 136)	Athletes (n = 96)
Age (years)	22.72 ± 3.56	24.87 ± 8.83
Body Height (cm)	169.27 ± 9.37	175.70 ± 10.14
Body Weight (kg)	64.22 ± 13.67	72.05 ± 15.75
BMI (kg/m^2)	22.24 ± 3.39	23.12 ± 3.53
Gender		
• **Female**	85 (62.50)	42 (43.80)
• **Male**	51 (37.50)	54 (56.20)
COVID-19		
• **Yes**	57 (41.90)	45 (46.90)
• **No**	79 (58.10)	51 (53.10)
COVID-19 Severity		
• **Mild**	30 (52.60)	24 (53.30)
• **Moderate**	23 (40.40)	19 (42.20)
• **Severe**	4 (7.00)	2 (4.40)
COVID-19 Severity (cm)	4.07 ± 2.49	3.55 ± 2.47
Time elapsed after COVID-19 (month) (Min - Max)	11.31 ± 6.01 (1 - 26)	11.13 ± 6.45 (3 - 28)

Data presented as mean ± SD or n (%): BMI: body mass index, Min: Minimum, Max: Maximum

(7.72 ± 4.59). Of the 80 licensed sports branches, while 18 were football (18%), 14 were basketball (17,5%), 11 were triathlon (13,8%), 8 were volleyball (10%), 4 were swimming (5%), 4 were taekwondo (5%), 3 were riding (3.8%), 3 are fitness (3.8%), and 15 of them (18.6%) were athletism, boxing, handball, rugby, mountaineering, tennis, karate, and pilates.

3.2. Outcomes

There were no statistically significant differences among two groups (athletes and non-athletes) in terms of fear of COVID-19 (P = 0.508), depression (P = 0.187), and perceived stress levels (P = 0.190). However, there were statistical differences among two groups in terms of intrinsic motivation sub-scale (P = 0.001) and adult motivation total score (P = 0.002). Accordingly, intrinsic motivation and total motivation score of the athletes were statistically higher than those of non-athletes (P < 0.05) (Table 2).

Table 2: Comparison of characteristic variables of athletes and non-athletes

Characteristic	Non-Athletes (n = 136)	Athletes (n = 96)	p
Fear of COVID-19 (score)	12.83 ± 4.70	12.42 ± 4.38	0.508 [a]
Depression Level (score)	14.91 ± 9.26	13.39 ± 9.15	0.187 [a]
Perceived Stress Level (score)	28.94 ± 8.37	27.28 ± 10.84	0.190 [a]
Adult Motivation Scale (score)			
• **Intrinsic Motivation**	54.77 ± 10.02	59.57 ± 6.82	**0.001** [a]
• **Extrinsic Motivation**	30.74 ± 6.64	31.89 ± 4.95	0.151 [a]
• **Total Motivation**	85.59 ± 15.60	91.38 ± 10.35	**0.002** [a]
Sport Engagement (score)			
• **Vigor**	-	20.61 ± 4.12	-
• **Absorption**		21.60 ± 3.68	
• **Dedication**		22.32 ± 3.63	
• **Total**		64.51 ± 10.22	

Data presented as mean ± SD; [a]: Independent Sample T Test; P < 0.05 considered significant

When the athletes with and without a history of COVID-19 who participated in our study were compared, there were no statistically differences in levels of COVID-19 fear (P = 0.898), depression (P = 0.597), perceived stress (P = 0.496), intrinsic motivation (P = 0.280), extrinsic motivation (P = 0.273), and total motivation (P = 0.190). When the sedentary individuals with and without a history of COVID-19 who participated in our study were compared, it was also found that there were no statistically differences in fear of COVID-19 (P = 0.314), depression (P = 0.905), perceived stress (P = 0.586), intrinsic motivation (P = 0.233), extrinsic

Table 3. Comparison of all outcome variables in athletes and non-athletes with and without a history of COVID

Characteristic	Non-Athletes			Athletes		
	No history of COVID-19 (n = 79)	History of COVID-1 (n = 57)	P	No history of COVID-19 (n = 51)	History of COVID-19 (n = 45)	P
Fear of COVID-19	13.17 ± 4.61	12.35 ± 4.82	0.314[a]	12.37 ± 4.83	12.48 ± 3.85	0.898[a]
Depression Level	15.00 ± 9.91	14.80 ± 8.35	0.905[a]	12.82 ± 10.24	13.82 ± 7.82	0.597[a]
Perceived Stress Level	28.60 ± 8.06	29.40 ± 8.84	0.586[a]	26.56 ± 10.81	28.08 ± 10.94	0.496[a]
Adult Motivation Scale						
Intrinsic Motivation	53.89 ± 10.79	55.98 ± 8.79	0.233[a]	58.86 ± 7.55	60.37 ± 5.88	0.280[a]
Extrinsic Motivation	30.30 ± 7.29	31.35 ± 5.63	0.367[a]	31.37 ± 5.11	32.48 ± 4.75	0.273[a]
Total Motivation	84.34 ± 17.42	87.33 ± 12.61	0.272[a]	90.07 ± 11.18	92.86 ± 9.22	0.190[a]
Sport Engagement						
Vigor				20.68 ± 4.11	20.53 ± 4.18	0.857[a]
Absorption				21.27 ± 3.74	21.97 ± 3.62	0.353[a]
Dedication				22.09 ± 3.75	22.57 ± 3.51	0.522[a]
Total				64.00 ± 10.32	65.08 ± 10.19	0.605[a]

Data presented as mean ± SD; [a]: Independent Sample T Test; P < 0.05 considered significant

Table 4. Comparison of all outcome variables of athletes and non-athletes with and without a history of COVID-19

Characteristic	With a history of COVID-19			Without a history of COVID-19		
	Non-Athletes (n = 57)	Athletes (n = 45)	p	Non-Athletes (n = 79)	Athletes (n = 51)	p
Fear of COVID-19	12.35 ± 4.82	12.48 ± 3.85	0.876[a]	13.17 ± 4.61	12.37 ± 4.83	0.342[a]
Depression Level	14.80 ± 8.35	13.82 ± 7.82	0.545[a]	15.00 ± 9.91	12.82 ± 10.24	0.230[a]
Perceived Stress Level	29.40 ± 8.84	28.08 ± 10.94	0.504[a]	28.60 ± 8.06	26.56 ± 10.81	0.221[a]
Adult Motivation Scale						
• Intrinsic Motivation	55.98 ± 8.79	60.37 ± 5.88	**0.005[a]**	53.89 ± 10.79	58.86 ± 7.55	**0.005[a]**
• Extrinsic Motivation	31.35 ± 5.63	32.48 ± 4.75	0.281[a]	30.30 ± 7.29	31.37 ± 5.11	0.364[a]
• Total Motivation	87.33 ± 12.61	92.86 ± 9.22	**0.015[a]**	84.34 ± 17.42	90.07 ± 11.18	**0.039[a]**
Sport Engagement	-		-	-		-
Vigor		20.53 ± 4.18			20.68 ± 4.11	
Absorption		21.97 ± 3.62			21.27 ± 3.74	
Dedication		22.57 ± 3.51			22.09 ± 3.75	
Total		65.08 ± 10.19			64.00 ± 10.32	
Time Elapsed After COVID-19 (month)	11.31 ± 6.01 (1 - 26 month)	11.13 ± 6.45 (3 - 28 month)	0.883	-		

Data presented as mean ± SD; [a]: Independent Sample T Test; P < 0.05 considered significant

motivation (P = 0.367), and total motivation (P = 0.272) (Table 3).

When the athlete and non-athletes with COVID-19 were compared, it was found that the athletes had higher intrinsic motivation (P = 0.005) and total motivation (P = 0.015) levels than non-athletes. When the athlete and non-athletes without COVID-19 were compared, it was also found that the athletes had higher intrinsic motivation (P = 0.005) and total motivation (P = 0.039) levels than non-athletes as well (Table 4).

While a statistical difference was found between men and women in term of COVID-19 fear in non-athletes without COVID-19 (P = 0.017), there was no statistical difference between men and women in term of COVID-19 fear in non-athletes with COVID-19 (P = 0.363) (Table 5).

A statistical difference was found between women and men in term of COVID-19 fear in athletes with (P = 0.004) and without (P = 0.002) COVID-19. In addition, there was a statistical difference between women and men in levels of depression (P = 0.026) and perceived stress (P = 0.045) in athletes with COVID-19, whereas there was not significant difference between women and men in levels of depression (P = 0.431) and perceived stress (P = 0.449) in athletes without COVID-19 who participated in our study (Table 5).

There was a low-positive correlation between COVID-19 fear and depression levels (r=0.306, P = 0.021) and extrinsic motivation (r=0.276, P = 0.037) in non-athletes with COVID-19. Also, there was a moderate-positive correlation between COVID-19 fear and depression levels (r=0.445, P = 0.001) in non-athletes without COVID-19 (Table 6).

While there was a moderate-positive correlation between COVID-19 fear and depression levels (r=0.419, P = 0.002), there was a positive but low correlation between COVID-19 fear and perceived stress levels (r=0.303, P = 0.031) in athletes without COVID-19 (Table 6). Also, there was a low-negative correlation between COVID-19 fear and vigor subscale of sport engagement level (r=-0.281, P = 0.046) (Table 6).

4. DISCUSSION

Investigating the impact of COVID-19 on athletes, identifying the factors that affect their performance as well as their mental health will play an important role in ensuring that athletes are less affected by the pande

mic. For these reasons, it was aimed to determine whether there was a difference between female and male athletes with and without COVID-19 in terms of COVID-19 fear, depression, perceived stress, motivation and engagement levels in this study. In addition, our secondly purpose was to compare these parameters between athletes and sedentary individuals. Lastly, association between COVID-19 fear and levels of depression, perceived stress, motivation were investigated in athletes and non-athletes depending on caught by COVID-19 or not.

One of the key findings of this research was that there was a difference in motivation levels between athletes and sedentary individuals. As a result of this finding,

Table 5. Comparison of all outcome variables by gender in athletes and non-athletes with and without a history of COVID-19

Characteristic	Non-Athletes (n = 136)						Athletes (n = 96)					
	Individuals with a history of COVID-19 (n = 57)			Individuals without a history of COVID-19 (n = 79)			Individuals with a history of COVID-19 (n = 45)			Individuals without a history of COVID-19 (n = 51)		
	Female (n = 41)	Male (n = 16)	p	Female (n = 44)	Male (n = 35)	p	Female (n = 19)	Male (n = 26)	p	Female (n = 23)	Male (n = 28)	p
Fear of COVID-19	12.5 ± 4.5	11.8 ± 5.5	0.363	14.2 ± 4.6	11.8 ± 4.1	**0.017***	14.1 ± 3.1	11.8 ± 3.9	**0.004***	14.9 ± 5.7	10.2 ± 2.5	**0.002***
Depression Level	14.7 ± 7.7	15.0 ± 10.0	0.943	16.5 ± 8.3	13.0 ± 11.4	0.053	16.9 ± 7.4	11.5 ± 7.4	**0.026***	15.0 ± 12.4	10.9 ± 7.8	0.431
Perceived Stress Level	29.4 ± 8.7	29.3 ± 9.4	0.943	29.5 ± 7.0	27.3 ± 9.1	0.167	32.0 ± 9.8	25.2 ± 10.9	**0.045***	27.9 ± 12.1	25.4 ± 9.7	0.449
Adult Motivation Scale												
Intrinsic Motivation	55.7 ± 6.8	56.6 ± 12.7	0.176	54.2 ± 9.2	53.5 ± 12.5	0.771	59.9 ± 7.8	60.6 ± 4.0	0.516	60.0 ± 5.0	57.8 ± 9.1	0.582
Extrinsic Motivation	31.7 ± 4.2	30.2 ± 8.2	0.880	30.5 ± 6.0	29.9 ± 8.6	0.726	32.1 ± 4.2	32.7 ± 5.1	0.595	32.0 ± 4.2	30.8 ± 5.7	0.649
Total Motivation	87.5 ± 8.6	86.8 ± 19.8	0.393	85.0 ± 14.7	83.4 ± 20.4	0.767	92.1 ± 11.4	93.4 ± 7.4	0.917	92.0 ± 7.7	88.4 ± 13.2	0.495
Sport Engagement												
Vigor							20.1 ± 4.0	20.8 ± 4.3	0.391	20.2 ± 3.8	21.0 ± 4.3	0.284
Absorption							21.7 ± 4.2	22.1 ± 3.2	0.888	21.6 ± 3.4	21.0 ± 3.9	0.954
Dedication							22.3 ± 4.1	22.7 ± 3.0	0.757	21.6 ± 3.1	22.4 ± 4.2	0.109
Total							64.2 ± 11.6	65.7 ± 9.1	0.818	63.3 ± 8.9	64.5 ± 11.4	0.382
Time Elapsed After COVID-19 (month)	-	11.31 ± 6.01 (1 - 26 month)					-	11.13 ± 6.45 (3 - 28 month)				

M: Mean, SD: standard deviation, n: number, [a]: Mann Whitney U Test, P < 0.05

the athletes participated in our study had significantly higher intrinsic motivation and total motivation scores than non-athletes. However, no statistical difference was observed between athletes and non-athletes in levels of COVID-19 fear, depression and perceived stress. In a study exploring whether mental health status of professional athletes was affected by the isolation period, it was found that athletes showed lower levels of depression and anxiety symptoms compared to non-athletes.[20] In our study, it was an expected result that the athletes had a higher motivation level than the sedentary individuals. It has been shown in studies that participating in regular physical activities reduces symptoms such as depression and anxiety.[20,21] The main reason why there was no significant difference between athletes and non-athletes in the parameters of COVID-19 fear, depression, and perceived stress levels other than motivation level may be due to the fact that, unlike the study of Şenışık et al.[20], the data were not collected in the isolation or lockdown period in this study. On the other hand, although it was not statistically significant, sedentary individuals were found to have higher covid-19 fear, depression, and perceived stress scores than athletes participated in this study. When these parameters were examined depending on a history of COVID-19, it was found that non-athletes without COVID-19 had a higher COVID-19 fear and depression score, as well as a lower motivation score than those with a history of COVID-19, although the scores were not at statistically significant levels. On the other hand, although it was not statistically significant, it was found that, unlike the sedentary individuals, athletes with COVID-19 had higher COVID-19 fear, depression, perceived stress, and total motivation scores than those without COVID-19. In this research

Table 6. Relationships between fear of COVID-19 and other outcome variables in athletes and non-athletes with and without a history of COVID-19

Covid-19 status	Characteristic parameters	Fear of COVID-19					
		Non-Athletes			Athletes		
		p	r	n	p	r	n
With a History of COVID-19	**Depression Level**	**0.021[a]**	0.306	57	0.906[a]	0.018	45
	Perceived Stress Level	0.324[a]	0.133	57	0.181[a]	0.203	45
	Adult Motivation Scale						
	Intrinsic Motivation	0.755[a]	0.042	57	0.136[a]	0.373	45
	Extrinsic Motivation	**0.037[a]**	0.276	57	0.281[a]	0.164	45
	Total Motivation Level	0.256[a]	0.153	57	0.171[a]	0.261	45
	Sport Engagement						
	Vigor	–			0.126[a]	0.231	45
	Absorption	–			0.811[a]	0.037	45
	Dedication	–			0.343[a]	0.145	45
	Total	–			0.300[a]	0.158	45
Without a History of COVID-19	**Depression Level**	**0.001[a]**	0.445	79	**0.002[a]**	0.419	51
	Perceived Stress Level	0.002[a]	0.340	79	**0.031[a]**	0.303	51
	Adult Motivation Scale						
	Intrinsic Motivation	0.159[a]	0.160	79	0.713[a]	-0.053	51
	Extrinsic Motivation	0.123[a]	0.175	79	0.218[a]	0.175	51
	Total Motivation Level	0.119[a]	0.177	79	0.700[a]	0.055	51
	Sport Engagement						
	Vigor	–			**0.046[a]**	-0.281	51
	Absorption	–			0.952[a]	0.009	51
	Dedication	–			0.112[a]	-0.225	51
	Total	–			0.156[a]	-0.201	51

n: number; [a]: Pearson Correlation Test, P < 0.05

when athletes and non-athletes were compared depending on having a history of COVID-19, it was found that participants with the highest scores of COVID-19 fear and depression in addition to the lowest motivation score were non-athletes without COVID-19.

Another important finding in this research was that while there was a significant difference among genders in levels of COVID-19 fear in non-athletes without COVID-19, there was no statistical difference among genders in levels of COVID-19 fear in non-athletes with COVID-19. The main reason for this may be that fear of covid-19 (12.5 ± 4.5) in sedentary women with a history of COVID-19 is much lower than those without a history of COVID-19 (14.2 ± 4.6). In addition, there was a statistical difference among genders in levels of COVID-19 fear in athletes with and without COVID-19. Accordingly, COVID-19 fear levels in female athletes with and without COVID-19 are higher than male athletes with and without COVID-19. Although there are many possible reasons for this situation, these findings can mainly be explained by biological, socio-cultural and psychological factors. We attribute these findings to the different role of female athletes in society compared to male athletes, hormonal effects or higher levels of anxiety. Similar to this research, in another research conducted by Kaçoğlu et al.[22], a statistical difference was found in the fear of catching COVID-19 among the genders of athletes from different sport branches. Accordingly, it has been reported that mean scores of the COVID-19 fear in female athletes were higher than those in male athletes. In our study, unlike the study conducted by Kaçoğlu et al.[22] the results were also analyzed depending on catching COVID-19 or not. More importantly, while there was a statistical difference among genders in levels of depression and perceived

stress in athletes with COVID-19, there was no statistical difference between men and women in levels of depression and perceived stress in athletes without COVID-19. Accordingly, the difference in depression and perceived stress levels between women and men was higher in athletes with COVID-19 compared to those without COVID-19. This difference may be related to higher levels of depression and perceived stress in female athletes, due to a possibly decrease in athletic performance after catching COVID-19. While there is some research reporting that perceived stress level differs according to gender, there are also studies stating that it does not. In research conducted by Aksoy et al.[23], no statistical difference was found in perceived stress scores among university athletes according to gender. The different results in these researches may be due to the fact that the sports branches of the athletes were different, whether the athletes were licensed or not, the years of participation in sports, and the fact that study data was taken during the quarantine or lockdown period.

Another key finding of the research was that there was no statistical difference in level of sport engagement between the athletes with and without COVID-19. Accordingly, catching COVID-19 was not a parameter that affect the sport engagement level in athletes. This finding also supports another finding in our study. Because, it was found that there was no correlation between COVID-19 fear and sport engagement level in athletes with and without COVID-19 in this study. Accordingly, COVID-19 fear levels in athletes with and without COVID-19 does not significantly change the sport engagement level. We attribute the main reasons for this finding to the desire of professional athletes to return to sport in a shorter period of time due to financial conditions or the greater number of measures taken by the authorities for athletes. Similarly, in research conducted by Özgün et al.[24] it was found that there was no correlation between the anxiety of catching COVID-19 and the sport engagement level. So that, it was reported that the anxiety of catching COVID-19 in athletes did not have direct effect on the sport engagement level. In the literature, the numbers of studies investigating relationship between catching COVID-19 and sport engagement level in male and female athletes are limited. In research conducted by Aksoy et al.[23] it was reported that sport engagement level varies according to the gender. In another study evaluating the effects of sport engagement on university students, Albay et al.[25] found that there was a statistical difference in favor of men between sport engagement scores in university students according to the gender variable. On the other hand, this study was conducted in university students before the pandemic issue. However, in this research, the sport engagement levels in athletes with and without COVID-19 did not differ according to gender. Accordingly, there was a similarity between female and male athletes with and without COVID-19 in term of sport engagement level. Although there was no statistical difference between the female and male athletes with and without COVID-19 in term of sport engagement level, it was reported that sport engagement score was higher in male athletes with and without COVID-19 than female athletes. Similar to our study, in a study examining the sport engagement level in Taekwondo athletes, it was reported that sport engagement level did not differ according to gender. On the other hand, it was found that sport engagement level varies according to the sports experience, national status, and belt colour of the athletes in Taekwondo athletes in the same study.[26] In this context, we think that our study may shed light on other future studies investigating the factors that may be related to the sport engagement level in male and female athletes during the pandemic period.

The last important finding in our study was that while COVID-19 fear was not correlated to levels of depression and perceived stress in athletes with COVID-19, there was an association between COVID-19 fear with levels of depression and perceived stress in athletes without COVID-19. Accordingly, while COVID-19 fear is high in athletes without COVID-19, the levels of depression and stress increase, it was reported that COVID-19 fear does not trigger parameters such as levels of depression and stress in athletes with COVID-19. One of the most common reasons that increase anxiety and stress during the pandemic period is the fear of spreading the virus to other people.[27] It is thought that fear of COVID-19 does not trigger parameters such as perceived stress level in athletes with a history of COVID-19, since those with COVID-19 are less likely to catch the virus again. In addition, it was found that the fear of COVID-19 was correlated with depression score in non-athletes with and without COVID-19. Accordingly, it was reported that as the COVID-19 fear increases, the depression level also increases in non-athletes with and without COVID-19. Similar to this research, it was stated that there was a statistically significant relationship between COVID-19 fear and depression level in the study conducted by Kılıç et al.[28] in geriatrics. In the study conducted by Durmuş et al.[29] on pregnant women, it was reported that there was a statistically significant correlation between COVID-19 fear and level of depression. Güdül-Öz[30] found that COVID-19 fear was also associated with levels of anxiety, depression, and stress in disabled individuals. Although COVID-19 fear levels have been investigated in different groups in the literature, the number of studies that reveal the differences between groups with and without COVID-19 is limited. In this research, in addition to investigating the impacts of the pandemic between athletes and non-athletes, various parameters were also examined depending on catching COVID-19. This is one of the strengths of our study.

5. LIMITATIONS

There are some limitations in this study. The main limitation is that we used only self-reports. The parameters were taken according to the personal statements of the participants because of collecting from them on a voluntary method through an online questionnaire. We included them in the groups of athletes or healthy and sedentary individuals, depending on whether they introduced themselves as licensed athletes or stated that they did not perform any regular physical activity or sportive performance. Another limitation concerns that we did not query participants about whether they had been vaccinated. Vaccination against COVID-19 may have helped them to change their status. Lastly, the number of athletes in the study is relatively small compared to the sample analysis. However, given the limitations during the pandemic period, we believe that the number of participants is still significant, especially when compared with similar studies.

6. CONCLUSIONS

The present study highlighted by showing the different effects of pandemic issue on athletes and non-athletes with and without COVID-19.

In conclusion, this study has revealed that the motivation level is greater in athletes compared to sedentary individuals. In addition, it has shown that the COVID-19 fear, depression and perceived stress levels in female athletes with COVID-19 are higher than male athletes with COVID-19. We also conclude that the catching COVID-19 was not a parameter that affect the sport engagement level in athletes.

This research showed that as the COVID-19 fear increases in athletes without COVID-19, there is also an increase in depression and stress levels. However, we may also report that COVID-19 fear does not trigger parameters such as depression and stress level in athletes with COVID-19.

Given these results, we are supposed that there is a need to implement different biopsychosocial treatment methods to support the athletes and non-athletes with and without COVID-19 for the difficult situations caused by the lockdown and social isolation during the pandemic issue. Therefore, further research could explore the effects of the programs include multidisciplinary treatment approaches applied by different health professionals on athletes depending on different branches and sedentary individuals categorized by different sociodemographic levels.

In conclusion, psychological support may be recommended to address the fear of COVID-19 in individuals who have not had the disease, while motivational support may be beneficial for those who have had COVID-19 to help them return to their previous routine life. In addition, motivational support can be provided to sedentary individuals in terms of starting to exercise and explaining the importance of exercise, while psychological support can be given to female athletes.

7. Data availability

Numerical data generated n this study is available with the authors.

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10. Conflicts of interest

There is no conflict of interest in the study.

11. Key Points

- The motivation level is greater in athletes than non-athletes.
- COVID-19 fear, depression and perceived stress levels in female athletes with COVID-19 were higher than male athletes with COVID-19.
- Catching COVID-19 was not a parameter that affect the sport engagement level in athletes.
- As COVID-19 fear increases, there is also an increase in depression and stress levels in athletes without COVID-19.
- COVID-19 fear does not trigger the parameters such as depression and stress level in athletes with COVID-19.

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