



# Investigation of Exercise Addiction Levels of Firefighter

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## Abstract

Exercise addiction is defined as the situation of restricting daily life and exercising more than once a day, exercising before other activities, and experiencing emotional deprivation if the exercise program is disrupted. This descriptive cross-sectional study aims to examine the exercise addiction of 219 firefighters working in the Konya Fire Department and the factors affecting this addiction. Personal Information Form and Exercise Addiction Scale were used in the research. One Way Anova and Post Hoc test were used to compare the data analyzed with the SPSS program. According to research findings, those who do sports two or three times a week have a higher level of focus and emotional change than those who do not do sports at all. In addition, tolerance development and passion scores of those who do sports twice a week are higher than those who do not do sports at all. The average of excessive focus and emotional change was highest in fire sergeants, the average of postponement of individual social needs was highest in fire sergeants, and the average of tolerance development and passion was highest in trainees. In conclusion, exercise addiction can pose a significant problem for professional firefighters. Any physical, social, or psychological problems that may arise due to the increased addiction level of fire personnel may negatively affect their success during duty. For this reason, firefighters should be encouraged to do sports under the title of sports.

**Keywords:** Exercise, exercise addiction, firefighter.

## İtfaiyecilerin Egzersiz Bağımlılık Düzeylerinin İncelenmesi

### Özet

Egzersiz bağımlılığı, günlük yaşamı kısıtlayarak günde birden fazla egzersiz yapma, egzersizin diğer aktivitelerin önüne geçmesi, egzersiz programının aksaması durumunda duygusal yoksunluk yaşama durumu olarak tanımlanmaktadır. Tanımlayıcı kesitsel tipteki bu araştırma Konya İtfaiyesinde çalışan 219 itfaiye personelinin egzersiz bağımlılığının ve bu bağımlılığa etki eden faktörleri incelemeyi amaçlamaktadır. Araştırmada Kişisel Bilgi Formu ve Egzersiz Bağımlılığı ölçeği kullanılmıştır. SPSS programı ile analiz edilen verilerin karşılaştırılmasında One Way Anova ve Post Hoc testi kullanıldı. Araştırma bulgularına göre haftada iki veya üç kez spor yapanlar, hiç spor yapmayanlara göre

daha yüksek düzeyde odaklanma ve duygusal değişime sahiptir. Ayrıca haftada iki kez spor yapanların tolerans gelişimi ve tutku puanları hiç spor yapmayanlara göre daha yüksektir. Aşırı odaklanma ve duygun değişimi ortalaması en fazla itfaiye çavuşlarında, bireysel sosyal ihtiyaçların ertelenmesi ortalaması en fazla itfaiye çavuşlarında, tolerans gelişimi ve tutku ortalaması en fazla stajyerlerde tespit edildi. Sonuç olarak egzersiz bağımlılığı profesyonel itfaiyeciler için önemli bir sorun teşkil edebilir. İtfaiye personelinin bağımlılık düzeyinin artmasına bağlı olarak ortaya çıkabilecek herhangi bir fiziksel, sosyal veya psikolojik sorun, görev esnasında başarısını olumsuz yönde etkileyebilir. Bu nedenle itfaiyecilerin spor başlığı altında spor yapmaları teşvik edilmelidir.

**Anahtar Kelimeler:** Egzersiz, egzersiz bağımlılığı, itfaiye personeli.

## INTRODUCTION

Exercise is a set of planned, structured, voluntary, continuous activities aimed at improving one or more elements of physical fitness, considered as a subclass of physical activity. [1]. Exercise includes activities that help individuals control weight, lower blood pressure and cholesterol, improve respiratory functions, and reduce the risk of heart attack [2]. Physical exercise contributes significantly to the maintenance of health and recovery from diseases. Regular physical exercise contributes to primary and secondary prevention of a wide range of diseases and prolongs life expectancy. Many studies have shown that physical exercise is associated with sleep patterns, cognitive and emotional well-being [3]. It has been explained that physical exercise has positive effects on anxiety, depression, and stress through physiological and biochemical mechanisms [4]. Exercise has been shown to reduce inflammation in physical health-related complaints (inflammation, cytokines, etc.) in people with mood disorders [5]. The additional benefits of exercise increase in proportion to the duration of exercise, but some problems arise in the case of excessive exercise [6]. It has been stated that exercise at the level of addiction does not contribute to the improvement of stress and depression symptoms in both men and women [4]. While exercise plays an important role in keeping individuals physically, mentally, emotionally, and socially healthy, excessive and uncontrolled exercise can lead to negative consequences such as exercise addiction rather than the expected benefit [7]. In addition, constant exercise may cause a person to become addicted without realizing it.

Exercise addiction is a mental illness that is called the "dark side" of exercise and negatively affects the health of the individual [8]. Important signs of exercise addiction are that the individual constantly increases the duration, intensity, and frequency of exercise, does not spare time for family, friends, and even social life to exercise, and perceives and plans his/her life around exercise [9]. Exercise addiction is divided into two groups: positive addiction and negative addiction. When an individual exercises excessively to cope with some difficulties and obstacles in his/her life, it is considered a positive addiction; when an individual who exercises excessively experiences problems such as stress, anxiety, depression, irritability, sleep, etc. when he/she does not exercise, it is considered as negative addiction [10]. In his research, Bishop found that athletes engage in more exercise activities for high motivation, physical appearance, and weight loss, and that these exercises increase the risk of addiction [11]. Other studies have found that excessive exercise to control weight, look good, and increase body motivation is addictive [12, 13]. In a study, the relationship between exercise addiction symptoms and some variables of people exercising in the fitness center was examined. It has been reported that the risks related to the development of exercise addiction are higher in men aged 18-20 and with an income of 3000-5000 Turkish lira [14]. In another study, the relationship between exercise addiction level of people who exercise and some variables was examined; It has been explained that exercise frequency and age level are related to exercise addiction [15]. There are many studies in the literature about exercise addiction of different groups. However, there is no study on the exercise addiction levels of firefighters, who are a professional group that responds to emergencies and has the task of saving lives in difficult conditions and needs to be strong for this purpose.

Fire personnel provide critical emergency services to communities across the country despite experiencing one of the highest occupational injury rates [16]. Firefighting is a profession that is carried out under tiring and difficult conditions that will physically push human limits due to negative factors such as smoke, high heat, chemical gases, and humidity. For this reason, firefighting is a profession that requires high

physical and physiological performance [17]. Firefighters have duties such as intervening in fires, responding to incidents requiring rescue such as collapse, explosion and stranding, providing first aid services, responding to floods, and participating in search and rescue efforts in natural disasters and extraordinary situations [18]. In addition, firefighters, a professional group where work-related musculoskeletal disorders are seen, face physically demanding activities due to the requirements of the profession [19]. Firefighting is an emotionally demanding job that puts significant stress on the physical, mental, and musculoskeletal systems [20]. The physical readiness of fire personnel, who work in difficult situations such as fires, earthquakes, floods and traffic accidents, must have at a good level of physical readiness for the task, when evaluated within the concept of "being ready for duty at any time". However, firefighters who exercise constantly may develop an exercise addiction without realizing it. It shows that the firefighter must have physical strength and fitness and exercise is a necessary profession to perform activities such as firefighting, climbing stairs, rescuing victims and carrying equipment. As a result, it is imperative that firefighters are physically fit to perform their professional duties, ensuring the safety of their colleagues and those to be rescued, as well as maintaining their own physical health. This study aims to examine the exercise addiction level of firefighters working in Konya city center and the variables affecting this addiction level. In addition, this study is important in terms of being the first study to examine the exercise addiction levels of fire brigade personnel, which is a professional occupational group.

## METHOD

### Design and Purpose of the Study

This cross-sectional study was designed to examine the effect of exercise on the addiction level of firefighters. In addition, this study aims to reveal the effects of age, gender, marital status, income level, male and body weight, working hours, and exercise time variables on the exercise addiction of firefighters.

### Research Group

This study was carried out with 268 firefighters working in Konya between 07.02.2022 and 28.05.2022. 268 firefighters agreed to administer the questionnaire. The total number of firefighters working in Konya is 600, and the sample size was calculated using the suggested formula when the number of universes is known [21]. According to this formula, the minimum sample size should be 235 with 95% confidence interval and 5% sampling error. The data were applied when firefighters had available time at the fire station.

### Data Collection Tool

Personal Information Form: It was designed by the researchers to obtain demographic information of the participants such as age, title, marital status, height/body weight, working time in the fire department, sports facility in the department, and frequency of exercise.

The data were obtained by using the questionnaire form used by Demir et al [1]. The questionnaire form consists of 17 questions in total and consists of 3 parts. Grading of the scale is done with a 5-point Likert-type rating. When the sub-dimensions were examined, it was determined that the first sub-dimension consisted of the first 7 items (1, 2, 3, 4, 5, 6, 7) under the name of "Excessive Focus and Emotional Change". This sub-dimension alone explains 34.89% of the exercise dependence variable in the scale. The second sub-dimension, "Postponement of Individual-Social Needs and Conflict", consists of 6 items (8, 9, 10, 11, 12, 13). This sub-dimension alone explains 13,06% of the exercise dependence variable in the scale. It was determined that the third sub-dimension consisted of 4 items (14, 15, 16, 17) under the name of "Development of Tolerance and Passion" and that the third sub-dimension alone explained 6.65% of the exercise addiction variable in the scale. Cronbach's alpha values of the data obtained from the participants were calculated as 0.71 in the dimension of excessive focus and emotion change; 0.78 in the dimension of postponement of individual-social needs and conflict; and 0.76 in the dimension of development of tolerance and passion.

## Statistical Analysis

Data were analyzed using SPSS (Statistical Package for the Social Sciences) 26 statistical package program. According to the normality test, parametric tests were used for normally distributed data. Accordingly, one-way analysis of variance (ANOVA) and Post Hoc test statistics (Tukey HSD) were used to analyze the data. Significance was accepted as  $p < 0.05$ .

## Ethical approval and institutional permission

Ethical approval was obtained from the Selcuk University Faculty of Medicine Local Ethics Committee to conduct the study (E-70632468-050.01.04-178906). Additionally, institutional permission was obtained from Konya Metropolitan Municipality Fire Department (E-11421874-622.01-71911).

## FINDINGS

Table 1 shows the characteristics of the participants. 219 participants agreed to apply the face-to-face survey. All firefighters are men (100%). Many participants (34.7%) are between the ages of 40-49. Many participants (73.76%) are married. The education level of the participants is mostly (31.51%) at high school level. The largest number of personnel (68.95%) are firefighters (Table 1).

Characteristics	n	%
Gender (n=219)		
Male	219	100.0
Age(n=219)		
18-19	5	2.28
20-29	62	28.31
30-39	39	17.81
40-49	76	34.70
50-59	35	15.98
>59	2	0.91
Marital status (n=219)		
Married	163	73.76
Single	58	26.24
Education (n=219)		
Secondary school	46	21.00
High school	69	31.51
Associate degree	65	29.68
License	35	15.98
Postgraduate	4	1.83
Degree		
Fire driver	41	18.72
Firefighter	151	68.95
Fire chifer	8	3.65
Inters	11	5.02
Fire sergeant	8	3.65

The mean (SD) age was  $44,28 \pm 6,72$  years, height was  $1,76 \pm 0,06$  m and weight was  $83,60 \pm 11,62$  for the 41 Firefighter driver; the mean (SD) age was  $37,84 \pm 10,13$  years, height was  $1,75 \pm 0,05$  m and weight was  $82,58 \pm 11,65$  for the 151 firefighter; the mean (SD) age was  $44,50 \pm 5,61$  years, height was  $1,81 \pm 0,05$  m and weight was  $81,50 \pm 13,04$  for the 8 Fire Chief; the mean (SD) age was  $19,73 \pm 0,91$  years, height was  $1,76 \pm 0,10$  m and weight was  $69,73 \pm 12,26$  for the 11 Interns; the mean (SD) age was  $43,75 \pm 3,28$  years, height was  $1,79 \pm 0,09$  m and weight was  $85,37 \pm 6,78$  for the 8 Fire Sergeant (Table 2).

**Table 2.** Physical characteristics of the firefighters participating in the study.

Variables	Age (years)	Height (m)	Weight (kg)
	Mean±SD	Mean±SD	Mean±SD
Firefighter driver (n=41)	44,28±6,72	1,76±0,06	83,60±11,62
(n=151)	37,84±10,13	1,75±0,05	82,58±11,65
Fire Chief (n=8)	44,50±5,61	1,81±0,05	81,50±13,04
Interns (n=11)	19,73±0,91	1,76±0,10	69,73±12,26
Fire Sergeant (n=8)	43,75±3,28	1,79±0,09	85,37±6,78

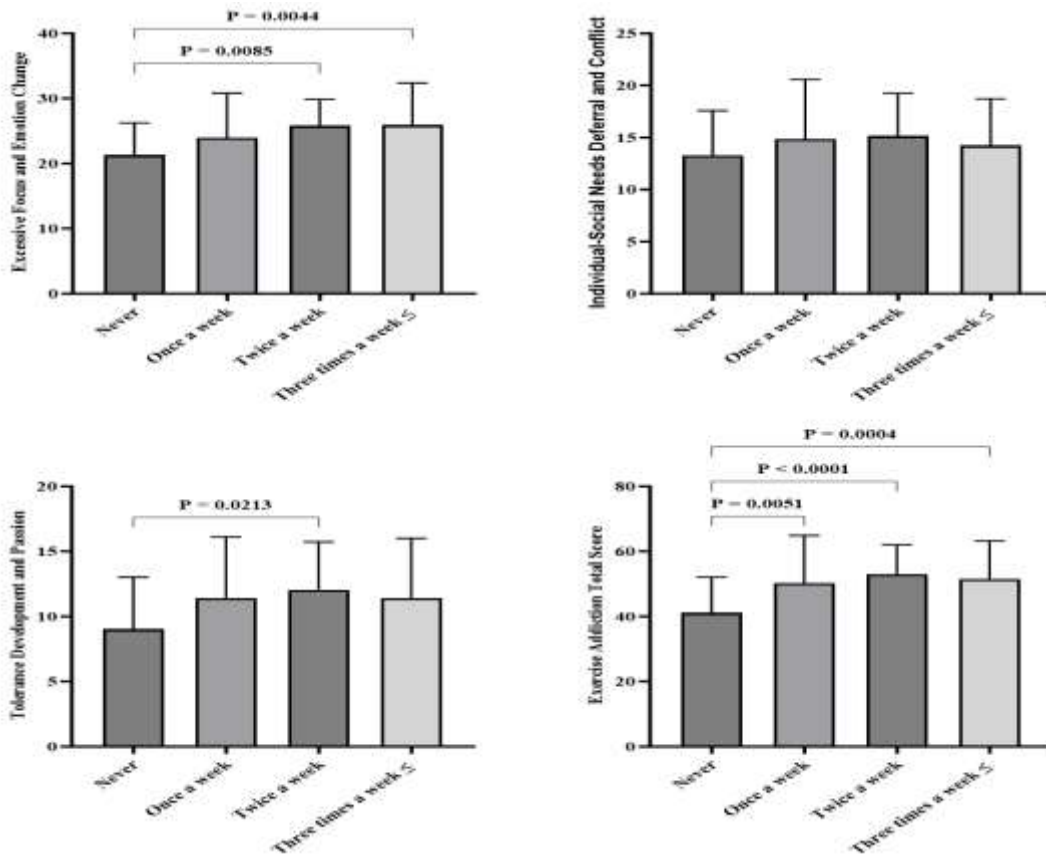
The Fire Chief, who participated in the study, was in the dependent group in terms of exercise addiction, while the Firefighter driver, firefighter, Interns, and Fire Sergeant were in the risk group (Table 3).

**Table 3.** Exercise addiction levels of the firefighters participating in the study

Variables	Firefighter driver (n=41)	firefighter (n=151)	Fire Chief (n=8)	Interns (n=11)	Fire Sergeant (n=8)
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Excessive Focus and Emotion Change	24,20±5,81	25,13±6,04	25,12±7,62	24,91±5,52	25,50±5,13
Individual-Social Needs Deferral and Conflict	13,98±4,41	14,67±4,77	15,25±4,16	14,09±4,72	14,63±4,98
Tolerance Development and Passion	10,56±4,91	11,37±4,18	12,50±4,72	12,82±5,23	11,38±3,42
Exercise addiction total score	48,24±12,85	51,20±11,99	52,88±9,80	51,82±13,93	51,50±8,82

**Exercise addiction:** 1-17 normal group, 18-34 low-risk group, 35-51 risk group, 52-69 dependent group, 70-85 highly dependent group.

In comparing the weekly exercise frequency of firefighters participating in the study in terms of exercise addiction, it was found that those who exercised twice a week and those who exercised three times a week or more exhibited higher scores for hyperfocus and emotional development than those who never exercised ( $P < 0.05$ ). However, no difference was found between non-exercisers and exercisers in terms of postponement of individual social needs and conflict ( $P > 0.05$ ). In terms of tolerance development and passion, the scores of those who never exercised were found to be lower than the scores of those who exercised twice a week ( $P < 0.05$ ). In terms of the total score for exercise addiction, the score of those who exercised was found to be higher than the score of those who never exercised ( $P < 0.05$ ) (Figure 1).



**Figure 1.** Comparison of exercise addiction in terms of weekly exercise frequency of the firefighters participating in the study

## DISCUSSION AND CONCLUSION

People's duration of physical activity is increasing day by day. This situation leads to addiction in exercise. Exercise addiction has started to emerge in almost every segment and has led people to unethical situations. This study is the first to examine exercise addiction and the variables affecting this addiction in firefighters. In this study, the levels of exercise addiction of fire brigade personnel were examined, and comparisons were made with various variables.

Considering the harms that exercise addiction can cause on individuals, it is thought that examining the addiction levels of firefighters will have an impact on their duties. In this context, a total of 219 firefighters participated in the research. Many fire department employees are firefighters. The reason for this is thought to be that firefighters directly intervene in the fire and perform search and rescue. On the other hand, fire chiefs, sergeants, interns, and drivers do not have the priority to intervene directly in the fire. Physical problems that may arise due to exercise addiction include joint/muscle damage, injuries, bone loss, stress fractures, etc [22]. Firefighters who are dependent on exercise may experience torn ligaments, arthritis, and increased anxiety and irritability. Excessive dependence on exercise can lead to bad and immoral behaviors in individuals [23].

According to the Municipal Fire Brigade Regulation, male fire brigade personnel must be at least 1.67 m tall and there should be no more than 10 kg difference between the part of the height more than 1 m and the weight (+,-) [24]. The weight and height conditions of all individuals participating in the study were compatible with the literature.

When the addiction levels of the employees are examined, fire chiefs are in the exercise-dependent group, while fire drivers and privates are in the risk group. The higher exercise scores of fire chiefs were found to be an unexpected result. It is thought that firefighters who directly intervene in fire and search and rescue

activities should act quickly against a sudden event and that this action can be improved by continuous sports and exercise. However, a study conducted abroad in this field states that exercise addiction is related to factors such as personality characteristics, psychological factors, physiological factors, exercise type, gender, and year of participation in exercise [10].

It was found that those who exercised twice a week and those who exercised three or more times a week exhibited higher scores in hyperfocus and emotional development than those who did not exercise at all. In addition, it was determined that the scores of those who did not exercise at all in terms of tolerance development and passion were lower than the scores of those who exercised twice a week. In parallel with the research results, Çakır's research examining the exercise addiction levels of university students concluded that regular exercise will affect exercise addiction [25]. In the study conducted by Cicioğlu et al. to determine the 'Exercise Addiction Levels of Elite Level Athletes and Sports Sciences Faculty Students', it was concluded that regular exercise affects exercise addiction [26]. In the study of Polat and Şimşek, which examined the exercise addiction of 242 participants who regularly exercise in sports centers in Eskisehir, a significant difference was found between exercise addiction according to exercise frequency [27]. In another study, Costa et al. concluded that exercise frequency, daily exercise duration, and sports age may be effective in the emergence of exercise addiction [6]. Therefore, it is known that physiological, psychological, and social problems such as exercise addiction occur as a result of the inability to control exercise frequency and exercise duration.

In conclusion, those who do sports twice or three times a week have higher levels of focus and emotional changes than those who do not do sports at all. In addition, tolerance development and passion scores of those who do sports twice a week are higher than those who do not do sports at all. In this context, it can be said that exercise addiction poses a significant problem for professional firefighters. Any physical, social, or psychological problems that may occur due to the increase in the addiction level of fire personnel may negatively affect the success of their jobs. For this reason, firefighters can be encouraged to do sports under sports.

### **Limitations**

Because this study has several limitations, caution is needed when interpreting these findings. Data collection was cross-sectional (evaluation occurred at a single point in time) and therefore study results may not be generalizable to other fire departments. Finally, selection bias may be present in the data due to the sampling method. For future research, it would be interesting to examine whether it is mediated by other factors

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