Rwanda Medical Journal RMJ

ORIGINAL ARTICLE Open Access

Prevalence of anxiety and depression and associated factors among firefighters: a cross-sectional study in Turkey

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ABSTRACT

INTRODUCTION: Firefighting is a demanding profession that requires physical strength, mental fortitude, and unwavering dedication. While firefighters are known for their bravery and heroism, it is essential to recognize the potential impact of their work on their mental health. This study examined the prevalence of anxiety and depression and contributing factors among firefighter in Turkey.

METHODS: This cross-sectional study included 250 full-time professional firefighters, and used the Beck anxiety inventory and the Beck depression inventory forms for data collection. The chi-square analysis method was used to compare categorical data. Predictors of anxiety and depression were determined using a univariate binary logistic regression model.

RESULTS: The mean age, BAI score and BDI score of the participants were 43.7±11.4, 5.9±8.1, and 6.2±8.8, respectively. The prevalence of anxiety and depression were 10.8%, and 9.6%, respectively. The prevalence of anxiety (p=0.007) and depression (p=0.008) among participants with chronic diseases was higher than among participants without chronic diseases. The identified predictors of anxiety were smoking (OR 4.873, 95% CI 1.293-18.419, p=0.019) and depression (OR 11.411, 95% CI 3.861-33.772, p=0.001). The identified predictors of depression were alcohol consumption (OR 2.722, 95% CI 1.072-6.872, p=0.034) and chronic disease (OR 2.582, 95% CI 1.031-6.532, p=0.044).

CONCLUSION: The findings revealed that anxiety and depression as very common psychiatric problems among firefighters, more prevalent among those working in the city center, smokers, alcohol consumers, verbal violence victims, and those with chronic diseases

Keywords: Anxiety, Depression, Associated Factors, Firefighters, Turkey

INTRODUCTION

Firefighters are the pillars of our communities, among the first to arrive in times of crisis. Their days are often comprised of attending to some of the worst days of their fellow community members' lives [1]. Firefighting is a high-risk profession, and firefighters are regularly exposed to a variety of critical and emergency situations (for example, fires, natural disasters, motor vehicle accidents, medical emergencies) [2,3]. This ongoing situation increases their vulnerability to the development of

***Corresponding author:** Ismet Çelebi, Gazi University, Turkey, ismetcelebi@gazi.edu.tr; **Potential Conflicts of Interest (CoI):** All authors: no potential conflicts of interest disclosed; **Funding:** All authors: no funding has been sought or gained for this project; **Academic Integrity.** All authors confirm that they have made substantial academic contributions to this manuscript as defined by the ICMJE; **Ethics of human subject participation:** The study was approved by the local Institutional Review Board. Informed consent was sought and gained where applicable; **Originality:** All authors: this manuscript is original has not been published elsewhere; **Review:** This manuscript was peer-reviewed by three reviewers in a double-blind review process; **Type-editor:** Harrison (USA).

Received: 04nd January 2023; **Initial decision given:** 11th April 2023; **Revised manuscript received:** 14th May 2023; **Accepted:** 30th June 2023.
 Publisher: Rwanda Biomedical Centre (RBC)/Rwanda Health Communication Center, P. O. Box 4586, Kigali. ISSN: 2079-097X (print); 2410-8626 (online)

Citation for this article: I. Çelebi; E. Gökkaya. Prevalence of anxiety and depression and associated factors among firefighters: a cross-sectional study In Turkey. Rwanda Medical Journal, Vol. 80, no. 3, p. 53-61, 2023. https://dx.doi.org/10.4314/rmj.v80i3.1

not only physical but also psychological problems [4,5].

Depression and anxiety are non-communicable diseases under mental health issues [1]. In particular, the nature of firefighters' repeated exposure to trauma increases their own risk of trauma and stress-related challenges with regard to the general population [2]. Many studies on the mental health of firefighters have reported that they experience high levels of anxiety, depression, and burnout [2,5-8].

Medical problems and sleep disorders, smoking or alcohol addiction, and cognitive failures have been observed in people with high levels of anxiety and depression [9]. Some studies have shown that vulnerability to anxiety is a dangerous factor that may increase the risk of suicide in firefighters [10] and that anxiety sensitivity may increase the likelihood of developing depression and social anxiety [11].

When the literature is examined, it is noteworthy that there are limited studies on the prevalence of anxiety and depression among firefighters working in Turkey. Thus, this study aimed to examine the prevalence of anxiety and depression in a firefighter sample in Turkey, as well as the factors affecting it.

METHODS

Study design and setting: Participants in this cross-sectional study consisted of 250 full-time professionals (i.e., non-volunteer) firefighters in a fire department in a city in Central Anatolia, Turkey (percentage reached: 89.3%).

According to the 2022 data of the city, the total population consists of 1.434.357 people, and there are 14 Fire Brigades (2 urban centers, 12 rural). A total of 280 employees were employed in these teams. It was aimed to reach all firefighters by not using the sample selection method. The inclusion criteria for the main study were that participants were 18 years of age or older, that they were active firefighters in the department and that they had agreed to participate in completing all online questionnaires. The inability or reluctance to give informed consent formed the exclusion criteria. The characteristics of the participants are summarized in Table 1. There was one woman among the participants. Due to the low participation rate, the data set of the study was evaluated on the basis of 249 people.

Data collection form: The data collection tool used in the study consists of three parts, including the individual introduction form, the Beck anxiety inventory, and the Beck depression inventory.

The individual introduction form consisting of 11 questions in total was used, including questions about the age, education, marital status, smoking and alcohol consumption, exposure to violence, and chronic diseases of participants

Beck Anxiety Inventory (BAI): Beck et al. [12] developed a self-assessment scale used to determine the frequency of anxiety symptoms experienced by individuals. It is a Likert-type scale consisting of 21 items scored in the range of 0-3 points. The global score is an arithmetic sum of scores across all 21 symptoms scored from 0 to 63 [12]. The Turkish version of BAI was developed by Ulusoy, Şahin, and Erkmen in 1998 and consisted of a translation and modification of the original version created by Beck in 1988. The BAI cut-off value is 16, and the alpha value is 0.93 [13]. In this study, the alpha value was found to be 0.83.

Beck Depression Inventory (BDI): The inventory developed by Beck, Ward, Mendelson, Mock, and Erbaugh in 1961 is used to measure the changes in the depression index, and Cronbach's reliability coefficient is α=0.86. BDI is a self-report tool consisting of 21 items covering cognitive, affective, motivational, and physiological domains in which each item is graded on a 4-point Likert-type scale in the range of 0-3 points [11]. The total scores range from 0 to 63 points. The Turkish version of the BDI developed by Hisli (1989) was used. According to the Turkish version, the scale cut-off point is 17, and the alpha value is 0.88 [14]. In this study, the alpha value was found to be 0.86.

Procedure

The data collection forms were filled out between April and June 2022 through face-to-face interviews and were based on the statements of the participants. Each fire station was visited at least three times to collect the data (as the fire department works with 3 different 24-hour shifts). The questionnaire took approximately 20 minutes to complete.

Statistical analysis: The SPSS 21.0 package program was used for the data analysis in this study. Independent variables were expressed in numbers and percentages, and the chi-square analysis method was used to compare categorical

data. In addition, age, term of work experience, BAI and BDI mean scores, standard deviations, Mode, and Median values were given. Predictors of anxiety and depression were determined using a univariate binary logistic regression model. Significance was established at p<0.05.

The ethical approval for this study was obtained from the Ethics Committee of Kayseri University, Turkey (Ethical approval number: 31.01.2022/01). All relevant institutional review boards approved this study. The firefighters were given a description of the questionnaire and the opportunity to review the informed consent form describing the study. The firefighters were given the option to refuse or halt their participation without any penalties. Interested participants, were given an informed consent form. The questionnaire was anonymous to protect respondent privacy.

RESULTS

Socio-demographic data: The volunteers with the highest participation rate were aged 45 and older (48.6%), were married (85.9%), and worked in the city center (61.4%). A percentage of 55.4% of the participants smoked, and 20.9% consumed alcohol. When the participants' exposure to violence was examined, it was determined that 32.5% had experienced verbal violence, 20.1% had experienced physical violence, and 3.2% had experienced sexual violence. The prevalence of anxiety in the participants was 10.8%, and the prevalence of depression was 9.6% (Table 1).

Table 2 shows that the prevalence of anxiety and depression in the participants whose place of employment is in the city center was higher and statistically significant compared to the participants whose workplace was in a rural area (p<0.05). The prevalence of anxiety and depression was zero in unmarried participants. The prevalence of anxiety and depression in participants with chronic diseases was higher and statistically significant compared to participants without chronic diseases (p<0.05). Anxiety in participants with depression was higher than participants without depression (p<0.001).

Table 3 shows that the mean age of the participants is 43.7±11.4 (min: 21.0, max: 64.0), the mean BAI score is 5.9±8.1 (min: 0.0, max: 56.0) and the mean

Table 1. Socio-demographic characteristics

	Number	%
Age		
18-25	24	9.6
26-35	36	14.5
36-45	68	27.3
45 and older	121	48.6
Education		
Primary education	30	12.0
Secondary education	93	37.2
Associate Degree	91	36.5
Bachelor	35	4.0
Marital status		
Married	214	85.9
Unmarried	35	14.1
Presence of chronic diseases		
Yes	52	21.3
No	197	78.7
Place of employment		
Urban	153	61.4
Rural	96	38.6
Term of employment		
0-4 years	43	17.3
5-9 years	25	10.0
10-14 years	38	15.3
15 years and longer	143	57.4
Smoking		
Yes	138	55.4
No	111	44.6
Alcohol consumption		
Yes	52	20.9
No	197	79.1
Exposure to verbal violence		
Yes	81	32.5
No	168	67.5
Exposure to physical violence		
Yes	50	20.1
No	199	89.9
Exposure to sexual violence		
Yes	8	3.2
No	241	96.8
Anxiety (according to BAI)		
No	222	89.2
Yes	27	10.8

Table 2: Effect of some characteristics of the participants on BAI and BDI

	Anxiety				Depression			
	Yes	No			Yes	No		
	Number (%)	Number (%)	Chi-square	p	Number (%)	Number (%)	Chi-square	p
Age								
18-25	0(0.0)	24(100.0)			0(0.0)	24(100.0)		
26-35	3(8.3)	33(91.7)	4.269	0.234	3(8.3)	33(91.7)	3.651	0.302
36-45	10(14.7)	58(85.3)			9(13.2)	59(86.8)		
45+	14(11.6)	107(88.4)			12(9.9)	109(90.1)		
Place of employment								
Urban	22(14.1)	131(85.6)	5.132	**0.023**	20(13.1)	133(86.9)	5.371	**0.020**
Rural	5(5.2)	91(94.8)			4(4.2)	92(95.8)		
Term of employment								
0-4	0(0.0)	43(100.0)			1(2.3)	42(97.7)		
5-9	1(4.0)	24(96.0)	8.835	**0.032**	0(0.0)	25(100.0)	7.275	0.064
10-14	5(13.2)	33(86.8)			5(13.2)	33(86.8)		
15+	21(14.7)	122(85.3)			18(12.6)	125(12.6)		
Marital status								
	27(12.6)	187(87.4)	4.953	**0.026**	24(11.2)	190(88.8)	4.344	**0.037**
	0(0.0)	35(100.0)			0(0.0)	35(100.0)		
Education								
	2(6.7)	28(93.3)			4(13.3)	26(86.7)		
	14(15.1)	79(84.9)	3.285	0.350	9(9.7)	84(90.3)	0.995	0.802
	9(9.9)	82(90.1)			7(7.7)	84(92.3)		
	2(5.7)	33(94.3)			4(11.4)	31(88.6)		
Smoking								
Yes	23(16.7)	115(83.3)	10.859	**0.001**	17(12.3)	121(87.7)	2.553	0.110
No	4(3.6)	107(96.4)			7(6.3)	104(93.7)		
Alcohol								
Yes	13(25.0)	39(75.0)	13.625	**<0.001**	10(19.2)	42(80.8)	6.944	**0.008**
No	14(7.1)	183(92.9)			14(7.1)	183(92.9)		
Physical violence								
Yes	9(18.0)	41(82.0)	3.314	0.069	8(16.0)	42(84.0)	2.907	0.088
No	18(9.0)	181(91.0)			16(8.0)	183(92.0)		
Verbal violence								
Yes	14(17.3)	67(82.7)	5.151	**0.023**	12(14.8)	69(85.2)	3.693	0.055
No	13(7.7)	155(92.3)			12(7.1)	156(92.9)		
Sexual violence								
Yes	1(12.5)	7(87.5)	0.023	0.878	2(25.0)	6(75.0)	2.239	0.135
No	26(10.8)	215(89.2)			22(9.1)	219(90.9)		
Chronic diseases								
Yes	11(21.2)	41(78.8)	7.227	**0.007**	10(19.2)	42(80.8)	6.944	**0.008**
No	16(8.1)	222(89.2)			14(7.1)	183(92.9)		
Depression								
Yes	13(54.2)	11(45.8)	51.565	**<0.001**				
No	14(6.2)	211(93.8)						

Table 3: Properties of Age, Term od employment, BAI and BDI

	Min	Max	Mean	Sd	Mod	Median
Age	21.0	64.0	43.7	11.4	49.00	45.00
Term of employment	1.0	38.0	16.8	10.3	1.00	17.00
BAI	0.0	56.0	5.9	8.1	0.00	2.00
BDI	0.0	48.0	6.2	8.8	0.00	2.00

BAI: Beck Anxiety Inventory, BDI: Beck Depression Inventory

In the univariate analysis, the identified predictors of anxiety were smoking (OR 4.873, 95% CI 1.293-18.419, p=0.019) and depression (OR 11.411, 95% CI 3.861-33.772, p=0.001). In the univariate analysis, the identified predictors of depression were working in the city center (OR 4.625, 95% CI 1.493-14.244, p=0.008), alcohol consumption (OR 2.722, 95% CI 1.072-6.872, p=0.034) and chronic diseases (OR 2.582, 95% CI 1.031-6.532, p=0.044).

DISCUSSION

The current study evaluated the prevalence of anxiety and depression and influencing factors among firefighters. This study touches primarily on two important points regarding smoking and the consumption of alcohol by firefighters. First, more than half of the firefighters smoked (55.4%), and one-fifth of them consumed alcohol (20.9%). According to the 2020 report of the Turkish Institute for Statistics, the rate of tobacco use in Turkey is 28.0%, and the alcohol consumption rate is 14.9% [15]. It was found that the rate of smoking by firefighters was two times higher than that of the Turkish population, and the alcohol consumption rate was one and a half times higher.

Table 4: Logistical regression analysis of BAI and BDI

	Anxiety					Depression			
	β	p	OR	% 95 GA	Characteristic	β	p	OR	% 95 GA
Place of employment					**Place of employment**				
Rural (Ref)					Rural (Ref)				
Urban	0.911	0.114	2.481	0.802-7.655	Urban	1.531	**0.008**	4.625	1.493-14.244
Verbal violence					**Alcohol consumption**				
No (Ref)					No (ref)				
Yes	0.951	0.063	2.595	0.946-7.024	Yes	1.002	**0.034**	2.722	1.072-6.872
Chronic disease					**Chronic disease**				
No (Ref)					No (Ref)				
Yes	0.819	0.120	2.261	0.803-6.331	Yes	0.951	**0.044**	2.582	1.031-6.532
Smoking									
No (Ref)		-							
Yes	1.584	**0.019**	4.873	1.293-18.419					
Alcohol consumption									
No (Ref)									
Yes	0.885	0.090	2.429	0.875-6.744					

In the literature, higher alcohol consumption and smoking rates among firefighters compared to the general population were observed, consistent with other studies conducted with firefighters [7,8]. The second point is the relationship between smoking and alcohol consumption on the one hand and anxiety and depression on the other hand. In this study, the rate of anxiety was found to be higher in smokers, and the rate of anxiety and depression was higher in those who consumed alcohol. Concurrently, according to the result of logistic regression, smoking increased the occurrence of anxiety by 4.87, and alcohol consumption increased the occurrence of depression by 2.72. Regarding the severity of alcohol and smoking use, the available literature has consistently shown strong associations, particularly in firefighter populations [7,16-18]. The consumption of alcohol and smoking have been associated with high levels of comradeship in some occupational settings [19] and could be considered part of a culturally relevant method of coping with stressful situations [8]. A growing volume of literature has found that emergency responders experiencing workplace violence report feelings of increased stress, depression, anxiety, overwhelming fear, powerlessness, hopelessness, and self-blame [20]. This study supports the literature, and it was observed that 32.5% of the firefighters had experienced verbal violence and that 20.1% of them experienced physical violence, whereby the anxiety rate was significantly higher in those who experienced verbal violence. Similarly, in the study conducted by Brais et al., the rates of depression and anxiety were found to be higher in firefighters who were exposed to any type of violence (verbal, physical, sexual) [21]. Additionally, in a study conducted by Pinto, Radon, and Van with firefighters in Guatemala, the rate of physical violence was found to be 37%, and it was stated that this situation was integrated with psychological problems [22].

The mean BAI score was 5.9±8.1, the mean BDI score was 6.2±8.8, and anxiety and depression percentages among firefighters were found to be 10.8% and 9.6%. It was observed that similar results were obtained in studies with firefighters. In the study conducted by Harvey et al., the depression rate of firefighters was 11.3%.8 In the study conducted by Ranney et al., the prevalence of depression in firefighters was found to be 10.55%, and the prevalence of anxiety was 8.22% [23]. In the study conducted by Lebeaut et al., with firefighters, the prevalence of depression was found to be 10.33% [18]. Some evidence suggests that the prevalence of depression and anxiety symptomatology in firefighters is higher than in the general population [7,11]. In this study, the rate of depression was higher than the general population in Turkey (depression rate in Turkey 3.81%, anxiety rate: 5.87%) [24]. The main reason why firefighters have higher rates of depression and anxiety compared to the general population is undoubtedly the chronic exposure of firefighters to potentially traumatic events (for example, natural disasters and car accidents) due to the nature of their work. Once more, the anxiety rate was high in participants with depression, and the presence of depression increased the occurrence of anxiety by 11.41. There were many studies in the literature parallel to our research with firefighters [11,21,23]. When the effects of age, working time, and marital status on anxiety and depression in firefighters were examined, the age variable did not significantly affect the level of anxiety and depression. However, while anxiety and depression were not observed in the younger age group, the prevalence of both anxiety and depression increased with age. Similarly, with the increase in terms of employment, the anxiety rate increased significantly. Finally, all of the participants with anxiety and depression were married. In the study conducted by Alghamdi, Hunt, and Thomas on Saudi firefighters, no difference was found between marital status on the one hand and anxiety and depression on the other hand [26]. In a study conducted by Ayhan, Karakaya, and Kutlu, the level of anxiety and depression was higher in married participants who were on the front line in emergencies [27]. We are of the opinion that the reason for the high anxiety and depression rates of married participants may be due to their commitment to their spouse and children.

The anxiety and depression rate of participants working in the city center was significantly higher, and the risk of depression was 4.62 times higher in those working in the city center. In the study conducted by Chen et al. (2020), no significant difference was found between the prevalence of depression and the studied region. However, there was a significant difference between anxiety and the studied region, and the prevalence of anxiety was higher in participants working in the city

center [7]. We are of the opinion that the reason for the high rates of anxiety and depression in firefighters working in the city center may be due to their more frequent intervention in traumatic events.

In this study, 21.3% of the firefighters had a chronic disease. Concurrently, the risk of depression increased by 2.58 in those with chronic diseases. Anxiety and depression may have a significant impact on physical health. People with high levels of anxiety and depression are more likely to develop hypertension, heart disease, gastrointestinal disease, or migraine [28]. Accordingly, in this study, the rate of anxiety and depression was higher in those with chronic diseases. In the study conducted by Ranney et al., a positive correlation was found between the occurrence of depression and cardiovascular diseases in firefighters [23].

In this study, it was observed that education did not affect the prevalence of anxiety and depression. In the study conducted by Alghamdi, Hunt, and Thomas (2016) with Saudi firefighters, it was determined that education did not affect the prevalence of anxiety and that the prevalence of depression was higher in secondary school graduates [26]. In the study conducted by Chen et al., high depression symptoms were found in firefighters with low education levels. However, it did not significantly affect the prevalence of anxiety [7].

Our findings are subject to several limitations. Primarily, a sample of firefighters from a single fire department serving an urban area was used. Therefore, the findings may not be generalized to firefighters in general. Moreover, care should be taken in generalizing our results to females and individuals in occupations other than firefighting. Furthermore, the use of self-report standards for this study may result in information bias and participant bias on the level of perceived depression and anxiety. Among the strengths of the study was the high response rate (89.3%), which probably reduced the selection bias. Another strength is the limited number of similar studies on firefighters in Turkey. In this context, we believe it will fill an important gap in the literature.

CONCLUSION

The study revealed that anxiety and depression are common psychiatric problems in this group. Our findings indicate that the rate of anxiety is higher in those working in the city center, those who use smoke and consume alcohol, those who are exposed to verbal violence, and those with chronic diseases. It also revealed that the rate of depression is higher in those who work in the city center, those who consume alcohol, and those who suffer from chronic diseases. There is a need for larger sampling and qualitative research on anxiety and depression in firefighters. In addition, we recommend that comprehensive psychosocial support programs be established and enhanced among firefighters.

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