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Prevalence rate of PTSD, Depression and Anxiety symptoms among Saudi Firefighters

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Abstract

Background: Firefighters have a high likelihood of being exposed to a variety of traumatic events. Traumatic events may occur during any rescue, such as providing aid to seriously injured victims or seeing a colleague injured. The psychological cost of this exposure may increase the risk of long-term problems such as PTSD symptoms, anxiety and depression. Moreover, firefighters who are injured in the line of duty sometimes have to retire as a consequence of their injury.

Objective: The aim of this study was to investigate the prevalence of traumatic events, PTSD symptoms, anxiety and depression, and assess related variables such as coping strategies and social support among Saudi firefighters.

Method: Two hundred Saudi firefighters completed the Firefighter Trauma History Screen (FTHS) to measure the number of traumatic events; the Screen for Post-traumatic Stress Symptoms (SPTSS) scale to assess the prevalence of PTSD symptoms; the Hospital Anxiety and Depression Scale (HADS) to assess depression and anxiety; the Brief COPE (BC) Scale to measure coping strategies used; and the Social Support Scale to evaluate the support that firefighters receive.

Results: The results showed that 57% of firefighters fully met DSM-IV criteria for PTSD symptoms; the prevalence of anxiety and depression was 44.4% and 53.3% respectively. PTSD symptoms were significantly correlated with, anxiety, depression and passive coping strategies but not with active coping or social support.

Conclusion: These results suggest that firefighters who experience multiple traumatic events as a result of their work environment may develop related symptoms, and they should not be neglected.

Keywords

PTSD; Anxiety; Depression; Firefighters

Introduction

Firefighters have a high probability of being exposed to a variety of traumatic events. Potentially traumatic events can occur during a single rescue. The trauma may arise from providing aid to seriously injured or helpless victims; serious injuries to the self, work colleagues and victims; and exposure to death and dying. Moreover, firefighters who are injured or diseased in the line of duty may have to retire as a consequence of their injury or occupational disease. The psychological cost of this 'traumatic events' exposure may increase the risk of long-term mental health problems such as post-traumatic stress disorder (PTSD) symptoms [1-4] as well as anxiety and depression [5-7]. It should be noted however that despite repeated exposure to potentially traumatic events, most firefighters do not develop PTSD symptoms.

The reported prevalence rate for PTSD symptoms in firefighters differs widely, from 6.5% to 37% [8,9]. Differences in prevalence rates for PTSD might be related to: the sample size [3,8]; the type of research participant such as firefighters only [1,9] or a mix of other emergency responders [10,11]; and the nature of PTSD measures, since some scales represent an incomplete measure of PTSD symptoms when compared to the DSM-IV [4,10].

Anxiety and depression are common disorders and these outcomes could be comorbid with PTSD. Comorbidity of PTSD, anxiety and depression was found in previous studies, with between 39% and 97% suffering from comorbid anxiety [12-14]; 21–94% suffering from comorbid depression [12,13] and 11–67% suffering from a triple-comorbidity, namely having anxiety and depression in addition to the PTSD symptoms [13,15].

Other factors can affect the prevalence rates of PTSD symptoms. For example, the type and severity of the traumatic event can lead to an increase in negative affect [16], while multiple traumas may contribute to the development of effective coping strategies among firefighters [17]. Coping strategies, whether active or passive, can either protect against or contribute to the development of PTSD in firefighters, depending on how effective they are [4,10,18,19]. Social support is another factor which can play a significant role in predicting both PTSD symptoms and depression [20]. Finally, other risk factors such as years of service [21], low level of education [22], and cultural issues [23] might be associated with psychological symptoms.

Firefighters in the Kingdom of Saudi Arabia (KSA) who are also first responders have long been suffering from diverse problems associated with their work environment and cultural issues as well as a lack of psychological trauma care [23]. In addition, there is limited information regarding the nature and extent of Saudi firefighters' psychological responses associated with the daily incidents to which they attend; to date no studies have been conducted on Saudi firefighters to investigate these issues. Therefore, the aim of the present study was to examine the prevalence of traumatic events and PTSD symptoms, anxiety and depression, as well as assess related variables such as coping strategies and social support systems among Saudi firefighters.

Aim

The aims of this study are to investigate the following:

1) Investigate the prevalence rate of PTSD, depression, and anxiety?
2) What are the risk factors for psychological distress?
3) The difference in PTSD, anxiety, depression, coping strategies, and social support according to the marital state and level of education.

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4) The relationship between PTSD symptoms, anxiety, depression. coping strategies and social support.

Method

Participants

Two hundred of 219 Saudi male firefighters were selected and participated in this study; the questionnaires of 19 firefighters were excluded due to missing data or not being returned. Participants were randomly selected from the west region (Makkah Province) of Saudi Arabia as follows: 1) select four firefighter centres from each city (Makkah, Jeddah, Taif); 2) select one fire station from each center; 3) all firefighters in each fire station were asked to participate. The first two stages were conducted using simple random selection, with numbers assigned to the centres and fire stations and the numbers selected from a box. All firefighters were in active service and volunteered to participate.

The socio-demographic characteristics of the participants are summarised in Table 1. The sample was aged between 19 and 50 years (mean = 31.52 ± 6.75). Years of service ranged from 1 to 29 years (mean 10.75 ± 6.5). All participants had experienced traumatic events. The majority of participants was married and had a high-school level of education.

Measuring instruments

Five scales were administered: the Firefighter Trauma History Screen (FTHS), the Scale of Post-traumatic Stress Symptoms (SPTSS), the Hospital Anxiety and Depression Scale (HADS), the Brief COPE Scale, and the Social Support Scale. The data were collected in August 2012. This study was approved by the ethics committee of the Institute of Work, Health and Organizations (I-WHO) at the University of Nottingham, United Kingdom.

Firefighter Trauma History Screen (FTHS): The Arabic version of this screen was developed by the authors to measure 15 traumatic events, whether these events had happened to the participants themselves and/or to their family members or friends, and whether these events had occurred in the course of work and/or in their normal life (Criteria A1). It also measures the nature of the events that individuals have witnessed, the number of incidents to which they were exposed, and their reactions and feelings of fear and helplessness (emotions), and perceived threat (Criteria A2). The test-retest reliability of the FTHS was assessed by administering the scale to a sample of 22 Saudi firefighters who had been selected randomly from the original sample, with a time interval ranging from 15 to 20 days. The correlation coefficient was .75 for reported exposure to traumatic events, and .71 for related emotions (feelings of fear, horror and helplessness), indicating that the FTHS was internally consistent.

Table 1: Socio-demographic characteristics of participants (N=200).

Demographical Variables	N	%
Education		
Secondary school	26	13
High school	136	68
Undergraduate	38	19
Marital status		
Single	43	21.5
Married	157	78.5
	M	***SD***
Age	31.52	6.75
Years of service	10.57	6.50

***Note:** Secondary school (ages 12–15); high school (15-18) in the KSA the same as secondary school in the UK; undergraduate in the KSA is the same as tertiary education in the UK.

Screen for Post-traumatic Stress Symptoms (SPTSS): The prevalence of PTSD symptoms was assessed using the Screen for Post-traumatic Stress Symptoms (SPTSS) [24]. This scale has been used widely for assessing PTSD symptoms, and uses three subscales pertaining to: re-experience hyper-arousal and avoidance. The Arabic version was validated by Jaber [25]. Comprising 17 items that closely match the PTSD symptoms criteria in the DSM-IV, the scale is scored on a 5-point Likert scale from not at all (0) to extremely (4).

The present study was conducted using the DSM-IV, since the DSM-5 was introduced only after data collection. According to the APA (2000), the (DSM-IV) criteria for PTSD symptoms included: Criterion A: the person has been exposed to a traumatic event in which both of the following were present. (A1) The person experienced, witnessed, or was confronted with an event that threatened death or serious injury, or threatened the physical integrity of the self or other; (A2) the response of the person involved intense fear, helplessness, or horror. Criterion B: the traumatic event is persistently one or more of the re-experience cluster items. Criterion C: persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma) as indicated by three (or more) of the avoidance cluster items. Criterion D: persistent symptoms of increased arousal (not present before the trauma) as indicated by two (or more) of the arousal cluster items. Criterion E: the period of the disturbance (symptoms in Criteria B, C and D) is more than one month. Criterion F: the disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning. For the current study sample, Cronbach's alpha scores indicated acceptable internal consistency, being 90, .80, .78 and .73 for the total scale, re-experience, avoidance, and hyper-arousal subscales respectively.

Hospital Anxiety and Depression Scale (HADS): Anxiety and depression were measured using the Hospital Anxiety and Depression Scale [26]. The reliability of the Arabic version of the HADS has been assessed by El-Rufaie [27]. It has been suggested that scores above 8 in the subscales indicate "probable anxiety" and scores above 6 in the subscales indicate "probable depression", if the researcher's objective is to estimate the prevalence rate with a sensitivity of .66 and .70 respectively [27]. For the current study sample, Cronbach's alpha scores indicated acceptable internal consistency, being .76 and .65 for anxiety and depression respectively.

Brief COPE Scale (BC): Coping skills was measured using an adapted Brief COPE Scale (2012). Jaber validated and assessed the reliability of the Arabic version of this scale Jaber [25]. The responses to the items range from 1 to 4, representing: 'I haven't been doing this at all', 'I've been doing this a little bit', 'I've been doing this a medium amount', 'I've been doing this a lot'. This Arabic version was reassessed by the authors for the current sample by conducting factor analysis. The final version of the Brief COPE has 19 items measuring two types of coping strategies: Active (13 items) and Passive (6 items). Cronbach's alpha scores were 0.88 and 0.65 for the active and passive types respectively. Active coping includes planning, religion and positive reframing, while passive coping includes behavioral disengagement, substance abuse and self-blame.

Social Support Scale: Social Support was assessed using Jaber's Social Support Scale [25]. The scale contains 13 items and aims to measure three sources of social support: family, friends, and governmental and non-governmental organizations (GO-NGO). A 4-point Likert scale was used: from not at all (0) and little (1) to moderate (3) and very much (4) for each source. For the current study sample, Cronbach's alpha scores indicated acceptable internal consistency, being 0.95, 0.94 and 0.93 for family, friends, and GO-NGO respectively.

Procedure

The questionnaire was orally administered face-to-face by the researcher, who is a native Arabic speaker. The questionnaire was read out to each group of firefighters during work hours. The participants were informed that all scale items were focused on traumatic events to ensure that the latent psychological variables were associated with exposure to traumatic events. The duration of the oral administration ranged from 15 to 20 minutes for each group.

Results

The prevalence rate of PTSD symptoms and anxiety and depression among Saudi firefighters

Only 169 of the 200 participants (84.5%) reported experiencing traumatic events with intense fear, horror or helplessness which fit criterion A1 and A2 of the DSM-IV (APA, 2000). 57% (96 of 169) fully met the DSM-IV criteria for PTSD; 39% (66 of 169) partially met the PTSD criteria; and only 4% of participants did not meet the PTSD criteria. The prevalence of anxiety and depression were 44.4% (75 of 169 participants) and 53.3% (90 of 169) respectively. Table 2 below presents the number of firefighters who met the criteria for PTSD symptoms, anxiety and depression.

Risk factors

Table 3 below presents the mean and standard deviation (SD) of the scores for the coping strategy and social support variables of this study. The mean scores and SDs were considered since there were no cut-off points for these scales.

Descriptive analysis of coping strategies and social support subscales: In terms of coping strategies, the mean score for 'active coping strategies' was higher than that for 'passive coping strategies', that is, M=35.85 (SD=7.89) and M=11.90 (SD=3.24) respectively. In terms of social support, 'received social support from family' was higher than 'received social support from friends', that is, M=22.62 (SD=9.82) and M=15.05 (SD=9.49) respectively. This might be because the majority of participants are married.

Table 2: Prevalence of PTSD symptoms, anxiety and depression among Saudi firefighters (n=169).

Participants meeting criteria for PTSD	N	%
Fully	96	57
Partially	66	39
None	7	4
Total	169	
Participants with anxiety	**N**	**%**
Yes	75	44.4
No	94	55.6
Total	169	
Participants with depression	**N**	**%**
Yes	90	53.3
No	79	46.7
Total	169	

Table 3: Mean and standard deviation of measures.

Measures		Range	Mean	SD
Brief COPE	Active	0-36	35.85	7.98
	Passive	0-14	11.90	3.24
Social Support	Family	0-34	22.62	9.82
	Friends	0-33	15.05	9.49
	GO-NGO	0-30	3.68	6.11

***Note:** GO-NGO = government and non-government organizations.

The difference in PTSD, anxiety, depression, coping strategies, and social support according to the marital state and level of education

Demographic characteristics: Marital status: Independent samples t-tests and one-way analyses of variance (ANOVA) were used to examine the differences on scale scores among sub-groups. The results for marital status are presented in Table 4.

Single participants reported significantly higher PTSD scores than did married participants (p=.009). There was also a significant difference in 'passive coping strategies' between single and married participants (p=.023), with single participants reporting higher scores on this measure than did married participants. In contrast, no significant differences were found between single or married participants on the other variables (HADS, Active coping, Social support).

Socioeconomic status: Education: Table 5 shows that a significant difference was found for depression only between the least and the most educated groups. No significant differences were found between the different education levels and PTSD symptoms, anxiety, coping strategies, and social support.

Relationships between PTSD symptoms, anxiety, depression, coping strategies and social support

The relationship between PTSD symptoms, anxiety, depression, coping strategies, social support, age, and years of service was examined. The results of the Pearson's correlation analysis showed that anxiety ($r=0.57$, $p<0.01$), depression ($r=0.41$, $p<0.01$), and passive coping ($r=0.35$, $p<0.01$) are the only variables correlated with the total PTSD score; no significant relationships were found between PTSD scores, active coping, social support, age and years of service. The results also showed a significant positive correlation between depression and age ($r= 0.15$, $p<0.05$).

Discussion

In terms of PTSD symptoms, more than half of the participants or 57% (96 of 169) reported fully meeting the PTSD criteria; 39% (66 of 169) partially met the PTSD criteria and only 4% of participants did not meet the PTSD criteria. The prevalence rate of PTSD symptoms in this sample is higher than that of previous studies, which ranges from 6.5% to 37% [8,9]. The relatively high rate of PTSD symptoms in the present study may be associated with other factors such as the type, severity and duration of the traumatic events, and years of service, as well as the surrounding culture such as the lack of outlets for Saudi firefighters to talk about their experiences. The

Table 4: T-test results by marital status.

Measures		Group	Mean	SD	*df*	*t*	*p*
PTSD		Single	18.88	12.84	167	2.64	0.009**
		Married	12.62	12.29			
HADS	Anxiety	Single	7.58	3.93	167	0.74	0.45
		Married	7.04	3.79			
	Depression	Single	7.11	3.47	167	-0.72	0.47
		Married	7.59	3.39			
Coping	Active	Single	36.14	6.99	167	0.24	0.81
		Married	35.77	8.23			
	Passive	Single	13.02	3.37	167	2.29	0.023*
		Married	11.62	3.15			
Social Support	Family	Single	22.79	9.49	167	0.11	0.91
		Married	22.58	9.93			
	Friends	Single	14.58	8.48	167	-0.31	0.75
		Married	15.17	9.76			
	GO-NGO	Single	4.67	6.69	167	1.05	0.29
		Married	3.43	5.96			

***Note:** GO-NGO = government and non-government organisations. Single (n=34), Married (n=135) *p<0.05; **p<0.01; ***p<0.001.

Table 5: ANOVA results by education level.

Measures		Group	Mean	SD	*df*	*f*	*p*	*Post hoc*
PTSD		Secondary	11.45	11.39	2,166	1.97	0.14	-
		High school	13.19	11.62				
		Undergraduate	17.38	15.34				
HADS	Anxiety	Secondary	8.50	3.22	2,166	2.10	0.12	-
		High school	7.17	3.95				
		Undergraduate	6.33	3.52				
	Depression	Secondary	9.15	2.64	2,166	4.14	0.018*	1/3*
		High school	7.53	3.50				
		Undergraduate	6.47	3.13				
Coping	Active	Secondary	35.25	5.98	2,166	2.34	0.09	-
		High school	35.15	8.74				
		Undergraduate	38.38	5.79				
	Passive	Secondary	10.65	3.40	2,166	1.72	0.18	-
		High school	12.06	3.35				
		Undergraduate	12.11	2.65				
Social Support	Family	Secondary	21.05	12.25	2,166	0.71	0.49	-
		High school	23.25	8.91				
		Undergraduate	21.52	11.10				
	Friends	Secondary	11.90	10.08	2,166	1.77	0.17	-
		High school	15.92	9.18				
		Undergraduate	14.08	9.94				
	GO-NGO	Secondary	1.85	3.52	2,166	1.11	0.33	-
		High school	3.81	6.16				
		Undergraduate	4.30	6.98				

***Note:** GO-NGO = government and non-government organisations. 1=Secondary school (n=20); 2= High school (n=113); 3 = Undergraduate (n=36). *p<0.05; **p<0.01; ***p<0.001

absence of psychological trauma care support in Saudi Arabia [23], and the stigma associated with receiving psychological support in Saudi culture [28] could have resulted in the relatively high rate of psychological symptoms among Saudi firefighters.

In terms of anxiety and depression, 44.4% of participants reported anxiety, while 53.3% reported depression. Most participants who fully met the DSM-IV criteria for PTSD also reported anxiety and depression, possibly at clinically significant levels. PTSD symptoms were significantly positively associated with both anxiety and depression. This finding is consistent with previous studies [7,29]. The diagnostic criteria that these studies used for psychological disorders can play a significant role in the association between PTSD symptoms and anxiety and depression comorbidity. The high rates of these disorders might be an epiphenomenon [30,31]. Conditions that may be comorbid with PTSD, presenting before the trauma occurred, and which may constitute a risk factor for PTSD, include major depression [30]. In terms of coping strategies, this finding is consistent with previous studies that investigated the association between PTSD symptoms and coping strategies [32]. Firefighters who reported PTSD symptoms are more likely to use passive coping strategies than active coping strategies in order to overcome and/or prevent ongoing PTSD symptoms.

The socio-demographic variables that were found to be risk factors for PTSD or other comorbid symptoms include marital status and education level. Being single is a significant risk factor for PTSD in Saudi Firefighters. This might be because single firefighters have less opportunity for emotional support than married firefighters. In terms of the level of education, a low level of education has been found to be a significant risk factor for depression disorder [33,34]. However, in the present study, it was found that those with a higher level of education reported a higher level of depression than those with a lower level of education, which is not consistent with the findings of previous studies. This might be because more highly educated firefighters tend to study part-time which could compound the stressors faced in their job as firefighters, leading them to report more depression than those with lower levels of education. Moreover, marital status and level of education have been found to impact on a person's degree of vulnerability, and are associated with knowledge about coping skills and accessing social resources [35].

The results indicate that marital status and education level can be risk factors for PTSD symptoms and depression. For example, a lower level of educational might be associated with lower resilience, poor coping skills, less insight and lower self-esteem, which make it difficult for people to recover from trauma. This idea is supported by the finding that people with lower levels of education, and lower income, report less active coping and more passive coping as well as less social support from friends and others. These findings could be referred to as social causation, according to social causation theory which holds that people who live with high levels of stress, and environmental adversity or drawbacks, including low socio-economic status (SES), are more vulnerable to the onset of psychiatric disorders [35,36].

The results of this study were based on data collected from Saudi firefighters as first responders. The five scales used in this study – Firefighter Trauma History Screen (FTHS), Screen for Post-traumatic Stress Symptoms (SPTSS), Hospital Anxiety and Depression Scale (HADS), Brief COPE Scale (BC), and Social Support Scale – will enable further research to be conducted in the field of traumatic stress, whether in Saudi Arabia or in another Arabic-speaking population.

In conclusion, the prevalence rate of PTSD symptoms was investigated and the majority of participants reported significant levels of PTSD symptoms. Participants who reported PTSD symptoms also reported high levels of anxiety and depression. The prevalence rate of psychological morbidity in the Saudi firefighters could not be estimated in this cross-sectional study due to the inclusion of male participants only and a small sample size (N=200). However, as this study did not serve an epidemiological aim, the sample size is sufficient for obtaining important information about the psychological status of the participants; therefore no evidence is available to report whether the participants developed PTSD symptoms or anxiety and/or depression first. For first responders such as firefighters, this study provides indications of the association between some risk factors e.g., years of service, marital status, low level of education, cultural issues and PTSD symptoms as well as acceptable" within the firefighters' work environment where traumatic events have been occurring on an ongoing basis. Longitudinal research, recruiting firefighters at the beginning of their job and tracking them over time to explore the pattern of symptom development, would be useful for the future research.

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