

Examination of Anxiety Levels Among First-line Healthcare Professionals in the February 2023 Türkiye Kahramanmaraş Earthquake

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Abstract

Objective: Two earthquakes of 7.7 and 7.6 magnitudes on the Richter scale occurred in Kahramanmaraş on February 6, 2023, resulting in 50,000 deaths and significant devastation. Our aim was to assess the anxiety levels of emergency healthcare professionals (HPs) providing medical services in earthquake-stricken areas following the Kahramanmaraş earthquake.

Materials and Methods: This study included survivor and volunteer HPs. Only 89 of 159 HPs completed the questionnaire, resulting in a response rate of 57.1%.

Results: The mean Beck anxiety inventory (BAI) score for survivor HPs was 29.53 ± 13.25 , and for volunteer HPs was 7.62 ± 11.12 . The average BAI score for all HPs working in the earthquake zone was 19. The difference between these scores was statistically significant (95% confidence interval: 16.77-27.05, $p=0.000$).

Conclusion: Our study indicates that HPs providing first-line health services in earthquake-stricken areas exhibit high anxiety scores. The BAI scores of survivor HPs were higher than those of volunteer HPs. As the duration of work in earthquake-stricken areas increased, anxiety levels increased accordingly.

Keywords: Anxiety, Beck anxiety inventory, earthquake, score

Introduction

Earthquakes are sudden-onset disasters that occur rapidly and unpredictably, leading to human, material, economic, and environmental losses. Two earthquakes of 7.7 and 7.6 magnitudes on the Richter scale that occurred in Kahramanmaraş on February 6, 2023, have resulted in significant devastation in our country. According to data from the World Health Organization, approximately 20 million people have been affected by the earthquake in both Türkiye and Syria. The same report indicates that the death toll in Türkiye is estimated to be around 50,000 [1].

Earthquakes and other natural disasters impact individuals not only physically but also intensely on a psychological level. Anxiety,

fear, anger, and depression are the fundamental psychological pathologies caused by earthquakes. During the post-earthquake period, symptoms of post-traumatic stress disorder and anxiety increase and do not alleviate for an extended period [2]. In the immediate aftermath of the earthquake, there is a significant demand for numerous healthcare professionals (HPs) who will be involved in both rescuing the injured and participating in subsequent intervention and patient care processes within the disaster-stricken area. In the Kahramanmaraş earthquake, both earthquake survivors and HPs quickly responded to duty from the moment of the earthquake's onset. Additionally, volunteer HPs from across the country were mobilized and transferred to the earthquake-affected areas. HPs work in disaster-stricken



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areas under life-threatening conditions and endure long and strenuous hours of duty. In addition, losing their own relatives or the disaster victims they are serving is one of the primary psychological challenges faced by HPs working in earthquake-affected areas [3]. These factors increase HP susceptibility to post-earthquake psychological pathologies.

This study aimed to assess the anxiety levels of emergency HPs providing medical services in the earthquake-stricken area following the Kahramanmaraş earthquake. The Beck anxiety inventory (BAI) has been used to assess anxiety levels. In our study, we also aimed to examine characteristics specific to HPs that could influence anxiety levels.

Materials and Methods

Procedure and Sample

This study is designed as a cross-sectional study and includes emergency HPs who have been actively serving in the earthquake-stricken area since February 6, 2023, as well as those who have been dispatched to the region from other cities. The target population was reached through official online communication groups involving HPs, and an electronic questionnaire was administered to them. The duration of the study was set at 4 months and concluded upon the completion of the government's deployment of healthcare personnel to the earthquake-stricken area. Questionnaires were distributed to 156 HPs, but only 89 completed the survey, resulting in a response rate of 57.1%. Online consent was obtained from HPs who agreed to participate in this study. The BAI was used to measure the anxiety levels of healthcare workers who were asked whether they agreed to participate in this scale. Informed voluntary consent forms were obtained from healthcare workers who agreed to participate in the study. Participation in the study was facilitated through the online email communication groups of hospitals.

Research Ethics

Our study was initiated with the ethical committee approval of University of Health Sciences Türkiye, Haydarpaşa Numune Training and Research Hospital under Ethical Committee (decision number: HNEAH-KAEK 2023/63, date 03.04.2023).

Questionnaire

Demographic Information

The initial section of the questionnaire included questions related to HPs demographic data, such as age, gender, marital status, work experience, and duration of front-line work in the earthquake zone. Participants were evaluated in two groups: survivor HPs residing in the earthquake zone and volunteer HPs who went to the region to provide healthcare services. For survivor HPs, inquiries were made about their level of earthquake impact, including questions about physical

injuries, loss of loved ones, and displacement from their residences.

BAI

The BAI is a self-reported anxiety scale consisting of 21 questions [4]. The BAI scale is a 4-point Likert-type scale, ranging from "0= not at all" to "3= severe, I could barely stand it," and the total score range is defined as 0-63. In our study, anxiety levels were categorized based on BAI scores as follows: <8 points indicate normal anxiety, 8-15 points represent low-level anxiety, 16-25 points indicate moderate-level anxiety, and 26-63 points represent severe-level anxiety [5]. The BAI has a high internal consistency (Cronbach's $\alpha=0.92$).

Statistical Analysis

During the statistical analysis, the Statistical Package for the Social Sciences (version 23.0, USA) and Medcalc software (version 19.2.6, Medcalc Software, Belgium) programs were used. The normal distribution of continuous variables was assessed using the Shapiro-Wilk test. Percentages and frequencies were calculated for categorical variables, whereas mean (\pm standard deviation) values were determined for continuous variables. Student's t-test was employed for comparing BAI scores in binary comparisons. For categorical variables, the chi-square test was used. The Pearson correlation test was applied to analyze correlations among normally distributed data. The confidence interval (CI) was set at 95%, and a p-value less than 0.05 was considered statistically significant.

Results

The data of the 89 HPs who completed the questionnaire were examined. Of the participants, 47 (52.8%) were male and 42 (47.2%) were female. The mean age was 32.16 ± 5.84 , with an age range of 24-50 years. Regarding marital status, 59 participants (66.35%) were married, 27 (30.3%) were single, and 3 (3.4%) were divorced. When participants were classified based on work experience, it was observed that 36 individuals (40.4%) had been working for 1-5 years, 27 individuals (30.3%) for 6-10 years, 19 individuals (21.3%) for 11-15 years, and 7 individuals (7.9%) for 16-20 years. Among the participants, 47 individuals (52.8%) were identified as survivors of HP. Demographic information of the two groups of HP operating within the earthquake-affected region is presented in Table 1.

The average BAI score for all included HP was 19.19 ± 16.44 . The mean BAI score for females was 23.31 ± 18.70 , while for males it was 15.51 ± 13.28 , and the difference was statistically significant (95% CI: 1.02-14.57, $p=0.025$). The mean BAI score for survivor HP was 29.53 ± 13.25 , and for volunteer HP was 7.62 ± 11.12 . The difference between scores was 21.91 ± 2.61 , and this difference was statistically significant (95% CI: 16.77-27.05, $p=0.000$). When anxiety levels were examined on the basis of BAI scores, it was determined that 35 participants

Table 1. Demographic information pertaining to two groups of healthcare professionals operating within the earthquake-affected region

	Healthcare professionals			p values
	Total n=89 (%)	Survivors n=47 (%)	Volunteers n=42 (%)	
Age (years) (mean ± SD)	32.16±5.84	31.02±4.88	33.43±6.59	0.056
Sex				
- Male	47 (52.8)	24 (51.1)	23 (54.8)	0.727
- Female	42 (47.2)	23 (48.9)	19 (45.2)	
Marital status				
- Married	59 (66.35)	27 (57.4)	32 (76.2)	0.175
- Single	27 (30.3)	18 (38.3)	9 (21.4)	
- Divorced	3 (3.4)	2 (4.3)	1 (2.4)	
Work experience (healthcare-years)				
- 1 to 5	36 (40.4)	19 (40.4)	17 (40.5)	0.091
- 6 to 10	27 (30.3)	18 (38.3)	9 (21.4)	
- 11 to 15	19 (21.3)	9 (19.1)	10 (23.8)	
- 16 to 20	7 (7.9)	1 (2.1)	6 (14.3)	
Duration of work (earthquake zone-days)	15.20±9.85	21.11±10.13	8.60±2.87	0.000
BAI score (mean ± SD)	19.19±16.44	29.53±13.25	7.62±11.12	0.000

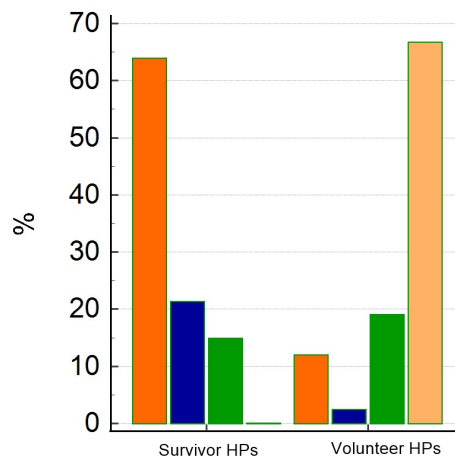
BAI: Beck anxiety inventory, SD: Standard deviation
 The chi-square test was performed for categorical variables. The mean BAI scores of survivors and volunteers were compared using Student’s t-test.

(39.3%) had severe anxiety. In the volunteer HP group, this frequency was 11.9%, whereas in the survivor HP group, it was 63.8%. This difference between the two groups was statistically significant (p=0.000). The frequency distribution of BAI levels among HP, categorized as survivors and volunteers, is presented in Figure 1.

The average duration of active work of all participants in the earthquake zone was 15.20±9.85 days. This period was 21.11±10.13 days in the survivor HP group, whereas it was calculated as 8.60±2.87 days in the volunteer HP group. The mean difference between the two groups was statistically significant (95% CI: 9.42-15.60, p=0.000). There was a positive linear association between the duration of work in the earthquake zone and BAI scores (correlation coefficient r=0.78; p<0.0001). Scatter plot depicting the correlation analysis between BAI and the duration of work (days) are presented in Figure 2.

Among the survivor HPs, it was determined that 5 individuals (10.6%) had suffered physical injuries due to the earthquake, 11 individuals (23.4%) had lost relatives, and 13 individuals (27.7%) had lost their homes. Moderate to severe levels of anxiety were identified in all BAI scores of survivor HPs who had experienced physical injury, lost relatives, or lost their homes.

The relationship between the participants’ work experience as HPs and BAI scores was examined. The average BAI score for



Level of Anxiety	Survivor HPs (n=42)	Volunteer HPs (n=47)	p=0.000
Normal (<8 points)	0 (0%)	28 (66.7%)	
Mild (8–15 points)	7 (14.9%)	8 (19.0%)	
Moderate (16–25 points)	10 (21.3%)	1 (2.4%)	
Severe (26–63 points)	30 (63.8%)	5 (11.9%)	

Figure 1. Graphic illustrating the frequency distribution of healthcare professionals according to their Beck anxiety inventory levels, categorized as survivor HPs and volunteer HPs

HPs: Healthcare professionals

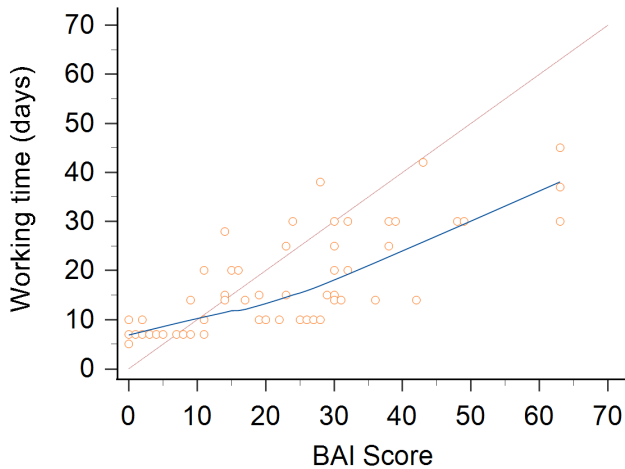


Figure 2. Scatter plot depicting the correlation analysis between BAI and the duration of work (days)

BAI: Beck anxiety inventory

HPs with work experience of over 10 years was calculated as 12.88 ± 14.22 , while the average BAI score for HPs with 10 years or less of work experience was 21.79 ± 16.69 . The difference between these two groups was statistically significant (95% CI: 1.90-15.91, $p=0.019$).

Discussion

Providing healthcare services in earthquake-stricken areas is a highly challenging task, both physically and mentally. The primary aim of our study was to examine the anxiety levels of survivor HPs (continued their duties after experiencing a disaster in the earthquake zone) and volunteer HPs. Because of our study, we found significantly higher BAI scores among survivors of HPs, which corresponded to moderate to severe levels of anxiety. We observed a correlation between BAI scores and the duration of work in the earthquake zone among HPs, and we also identified that anxiety levels were higher in survivors than in volunteers. Among all participants, we concluded that HPs with longer total work experience had lower anxiety levels.

Earthquakes are disasters that, in addition to causing destruction and loss of life, have a negative impact on the remaining life processes of survivors. A significant majority of survivors lose their secure living spaces, and some have to confront the loss of their relatives [6]. The combination of factors like these and many others increases the frequency of mental health problems among survivors. This situation has been confirmed in the literature through existing studies [7,8]. Thapa et al. [9] reported that the prevalence of anxiety remained high even during the first year after the Nepal earthquake. In a study conducted by Muntingh et al. [10], which examined the effectiveness of BAI scores in assessing anxiety

levels in patients with multiple anxiety disorders, the average BAI score was reported to be 18.5. In our study, the average BAI score for all HPs working in the earthquake zone was 19. This indicates that the BAI scores of HPs working in the earthquake zone are at a level that can be defined as anxiety disorders. In addition, we observed that the BAI score was significantly higher in survivor HPs than in volunteer HPs. Among survivor HPs, we also found that the BAI scores of all survivor HPs who had experienced physical trauma, lost relatives, or lost their homes indicated moderate to severe levels of anxiety.

The study conducted by Kang et al. [11] found that there was an increased frequency of post-traumatic stress disorder among healthcare workers who began their duties in the area from the very first day of the disaster. In various studies examining the psychological symptoms of HP in the literature, no relationship has been found between the duration of work in earthquake-stricken areas and the psychological symptoms [12,13]. In our study, we found that the BAI scores of HPs increased in correlation with the duration of work in the earthquake-stricken area. As the time spent in the area increased, HPs had to cope with various stress factors such as the fear of being caught in aftershocks and experiencing physical trauma, fatigue caused by working long hours without adequate rest, and the sadness stemming from the loss of earthquake survivors they were trying to assist.

Perrin et al. [14] indicated in their study that specialized professionals such as police officers and emergency healthcare workers experienced with disasters had lower levels of post-traumatic stress disorder in the post-disaster period. Ma et al. [12] indicated in their study that HPs who were involved in the Taiwan earthquake and had more work experience (duration in their profession) had a lower frequency of post-traumatic stress disorder. Consistent with the literature, our study demonstrated that emergency HPs with over 10 years of work experience had significantly lower anxiety levels than those with less work experience. This finding suggests that the increased experience gained by emergency medical workers over years in their profession has made them psychologically resilient during the post-disaster period.

Study Limitations

The most significant limitation of our study is the reliance on scoring based on individuals' questionnaire responses to assess anxiety levels. HPs included in our study were not clinically evaluated by a psychiatrist. Additionally, the inability to appoint volunteer HPs to the earthquake-stricken areas simultaneously resulted in each participant completing the survey at different time periods after the earthquake. This prevented the study from being conducted at a standardized time after the earthquake and for all participants simultaneously.

Conclusion

The most significant outcome of our study was that HPs providing first-line health services in earthquake-stricken areas exhibited high anxiety scores. In particular, the BAI scores of survivor HPs were even higher than those of volunteer HPs. Additionally, as the duration of work in earthquake-stricken areas increased, anxiety levels correlated and increased accordingly. The results of our study indicate that despite being accustomed to working in challenging conditions and under stress, HPs may struggle to cope with stress during major disaster situations like earthquakes and exhibit anxiety symptoms. We believe that it is essential to provide psychological support for HPs who continue to work in disaster-stricken areas to prevent long-term, persistent mental disorders that could develop and become chronic.

Ethics

Ethics Committee Approval: Ethics committee approval of the study was obtained from the University of Health Sciences Türkiye, Haydarpaşa Numune Training and Research Hospital Clinical Research Ethics Committee (decision number: HNEAH-KAEK 2023/63, date 03.04.2023).

Informed Consent: Informed consent was obtained from all the participants.

Authorship Contributions

Concept: İ.A., M.Ö., Design: K.Y., İ.A., S.D., B.G.Y., Data Collection or Processing: K.Y., İ.A., S.D., İ.A., Analysis or Interpretation: K.Y., İ.A., S.D., İ.A., M.Ö., Literature Search: K.Y., İ.A., S.D., B.G.Y., Writing: K.Y., S.D., İ.A., M.Ö., B.G.Y.

Conflict of Interest: No conflicts of interest were declared by the authors.

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