



EMOTIONAL EXPERIENCES AND PROTECTIVE FACTORS FOR RESILIENCE AMONG NURSES INVOLVED IN THE EARTHQUAKES CENTERED IN KAHRAMANMARAS AND HATAY

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Abstract

Objective: This study was conducted to determine the levels of emotional experiences and protective factors for resilience among nurses who worked during the earthquakes centered in Kahramanmaras and Hatay on February 6, 2023, and to examine the relationships between these variables.

Methods: This cross-sectional and correlational study was conducted between September 2023 and February 2024 with 88 nurses who worked during the February 6, 2023, earthquakes at two healthcare institutions. Data were collected using the Brief Emotional Experience Scale and the Protective Factors for Resilience Scale. Descriptive statistics and Spearman's correlation analysis were used to analyze the data.

Results: The mean total score of the Brief Emotional Experience Scale was -3.01 ± 3.23 , while the mean scores for negative and positive emotions were 5.53 ± 2.16 and 2.52 ± 1.48 , respectively. The mean total score of the Protective Factors for Resilience Scale was 86.09 ± 15.91 , with mean scores of 27.97 ± 5.06 , 26.74 ± 7.40 , and 31.39 ± 6.70 for the personal, peer, and family protective factors subscales, respectively. A weak, positive relationship was found between negative emotions and peer-related protective factors ($r=0.219$).

Conclusion: Nurses who worked during the February 6, 2023, earthquakes experienced more negative than positive emotions. These findings highlight the importance of considering nurses' emotional experiences and protective factors related to resilience in disaster settings. Accordingly, disaster preparedness programs should incorporate psychosocial preparedness, including strategies to strengthen peer-related protective factors and support nurses' emotional well-being before, during, and after disasters.

Keywords: Disaster, Earthquake, Emotional Experience, Nurses, Protective Factors.

Introduction

Disasters are events that affect the physical, social, and economic structures of communities, can result in substantial loss of life and property, and threaten the continuity of healthcare services.¹⁻³ Following disasters, the effective functioning of the healthcare system and the ability of healthcare professionals to appropriately utilize their knowledge, skills, and attitudes play an important role in maintaining healthcare services for the affected individuals. Nurses, who constitute a major group of healthcare professionals, undertake various roles, including those of leaders, educators, responders, and researchers, throughout disaster preparedness and response processes.^{1,4} The International Council of Nurses emphasizes the importance of all nurses being prepared for disasters and contributing to the planning and delivery of disaster care by utilizing their knowledge and skills during disaster responses.⁵ Accordingly, disaster management is no longer an area of practice limited to public health, emergency, or military nursing; rather, it has become an important field that requires all nurses to participate in every phase of disasters, in addition to their respective areas of specialization.⁶

Healthcare professionals working in disaster settings may face various stressors in addition to their critical roles in maintaining healthcare services, including prolonged deployment in disaster areas, exposure to traumatic events, intense emotional involvement, role-related stressors, perceived threats and risks to personal safety, and the possibility of harm to themselves or their loved ones.⁷ The traumatic stress caused by disasters may adversely affect healthcare professionals' ability to perform effectively and the quality of healthcare services they provide.⁸ Nurses may experience emotional and psychological challenges during disaster response, while also demonstrating resilience and adaptive responses.⁹ Previous studies have reported that nurses working in disasters may experience psychological problems such as anxiety, post-traumatic stress, and depression, highlighting the importance of interventions aimed at protecting nurses' mental health.^{8,10} Understanding the emotional experiences of nurses working in disasters and the factors that facilitate their ability to cope with these experiences is important for protecting their psychological well-being.¹⁰

Psychological resilience is defined as an individual's ability to cope with adverse life events and challenging conditions and adapt to changes in life.¹¹ Psychological resilience is shaped by the interaction between risk and protective factors and contributes to an individual's ability to recover quickly from the effects of adverse life events.^{11,12} Protective factors include individual and organizational resources that may support nurses' adaptation and coping during crises.¹³ Identifying protective factors among nurses exposed to traumatic events, such as disasters, is particularly important for supporting their adaptation and psychological well-being.^{10,13} Resilience may help nurses cope with the emotional and environmental challenges of disaster settings. Research among nurses in Türkiye has highlighted the importance of resilience in disaster preparedness and response.¹⁴

The earthquakes centered in Kahramanmaraş and Hatay on February 6, 2023, affected 11 provinces in Türkiye, resulting in numerous deaths and injuries, as well as severe disruptions to healthcare services.¹⁵ During this period, nurses working in disaster-affected areas faced intense working conditions and traumatic events while attempting to meet the care needs of

individuals affected by the earthquakes.^{16,17} Understanding the emotional experiences and coping processes of nurses who worked during the February 6 earthquakes, as well as the protective factors supporting their psychological resilience, is important for developing psychosocial support interventions for nurses in future disasters.^{10,17}

Although studies have examined the psychological well-being of healthcare professionals working in disasters, further research is needed to evaluate nurses' emotional experiences, coping processes, and protective factors for resilience in an integrated manner. Accordingly, jointly assessing the emotional experiences of nurses working in disaster-affected areas and their personal, peer, and family protective factors for resilience may contribute to understanding nurses' psychosocial needs and the development of supportive interventions for future disasters. Therefore, this study aimed to examine the emotional experiences and personal, peer, and family protective factors for resilience among nurses who worked during the earthquakes centered in Kahramanmaraş and Hatay and to examine the relationships between these variables.

Research Questions

- What are the levels of positive and negative emotional experiences among nurses who worked during the earthquakes centered in Kahramanmaraş and Hatay?
- What are the levels of personal, peer, and family protective factors for resilience among nurses who worked during the earthquakes centered in Kahramanmaraş and Hatay?
- Is there a relationship between emotional experiences and personal, peer, and family protective factors for resilience among nurses who worked during the earthquakes centered in Kahramanmaraş and Hatay?

Methods

Purpose of the Study

This study was conducted using a cross-sectional, and correlational design to determine the levels of emotional experiences and protective factors for resilience among nurses who worked during the earthquakes centered in Kahramanmaraş and Hatay, and to examine the relationship between these variables.

Location and Time of Study

The study was conducted between September 2023 and February 2024 at two hospitals in Northwestern Türkiye.

The Sample of the Study

The study population consisted of 88 nurses who had worked voluntarily or by assignment during the February 6, 2023, earthquakes and were employed at the two hospitals during the study period. As the entire eligible population was targeted, no sampling was performed, and all 88 nurses were included in the study, resulting in a participation rate of 100%.

Data Collection Method and Tools

Data were collected through face-to-face interviews using a Questionnaire Form, the Brief Emotional Experience Scale (BEES), and the Protective Factors for Resilience Scale (PFRS). Participants were instructed to complete the BEES by recalling their emotional experiences during the period when they worked in the disaster-affected areas following the February 6, 2023, earthquakes. The data collection process took approximately 15 min for each participant.

Questionnaire Form

The Questionnaire Form was developed by the researchers to assess nurses' personal, professional, and disaster-related characteristics relevant to the objectives of the study. The

form included four personal characteristics (age, sex, marital status, and educational level), two professional characteristics (years of professional experience and clinical department), and four disaster-related characteristics (previous experience of a major disaster, loss of a relative or acquaintance during a disaster, mode of deployment during the February 6 earthquakes, and duration of deployment).

Brief Emotional Experience Scale (BEES)

The Brief Emotional Experience Scale (BEES) was developed by Rogers et al. to assess positive and negative emotional experiences in individuals' lives, and its Turkish validity and reliability were assessed by Çağlar.^{18,19} The scale consists of six items, rated on a four-point scale ranging from "Never (0)" to "Very, very much (3)." Separate scores can be obtained for the positive and negative emotion subscales, and a total emotional experience score can be calculated. Scores for each of the positive and negative emotion subscales ranged from 0 to 9, whereas the total emotional experience score ranged from -9 to +9. The total score was calculated by subtracting the negative emotion score from the positive emotion score. In the Turkish adaptation study, the overall Cronbach's alpha coefficient was reported as 0.76.¹⁸ In the present study, the overall Cronbach's alpha coefficient was 0.74.

Protective Factors for Resilience Scale (PFRS)

The Protective Factors for Resilience Scale (PFRS) was developed by Harms et al. and adapted into Turkish by Tanko et al.^{20,21} The scale assesses personal, peer, and family protective factors that may contribute to resilience in the face of risky and stressful events. The PFRS measures these protective factors rather than psychological resilience itself. The 15-item scale is rated on a 7-point Likert-type scale and contains no reverse-scored questions. The scale has three subscales: personal, peer, and family. The total score ranges from 15 to 105, with higher scores indicating greater levels of protective factors for resilience. In the Turkish adaptation study, the Cronbach's alpha coefficient of the scale was reported as 0.91.²⁰ In the present study, the overall Cronbach's alpha coefficient was 0.94, while the Cronbach's alpha coefficients for the subscales ranged from 0.85-0.96.

Data Analysis

Data were analyzed using IBM SPSS Statistics version 26.0. Categorical variables were summarized using frequencies and percentages, and continuous variables were summarized using means, standard deviations, medians, minimums, and maximums. The normality of continuous variables was assessed using the Kolmogorov-Smirnov test. The relationships between continuous variables were examined using Spearman's rank correlation analysis. Statistical significance was set at $p < 0.05$.

Results

The mean age of the 88 nurses who participated in the study was 29.06 ± 5.56 years, and 62.5% were aged 23-29. Of the participants, 59.1% were female, 71.6% were single, and 81.8% held a bachelor's degree. More than half of the nurses (53.4%) had 2-6 years of experience. Regarding clinical departments, 30.7% of the nurses worked in intensive care units, 23.9% in medical units, and 19.3% in emergency departments. Previous experience of a major disaster was reported by 21.6% of the nurses, while 10.2% had experienced the loss of a relative or acquaintance during a disaster. During the February 6 earthquakes, 63.6% of the nurses participated voluntarily, and 36.4% were officially assigned to the disaster area. In addition, 60.2% of the

participants worked in disaster-affected areas for more than one week (Table 1).

Table 1. Distribution of the nurses' personal, professional, and disaster-related characteristics (n=88)

Variables	n (%)
Age (Mean $\pm$ SD = 29.06 ± 5.56 years)	
23-29 years	55 (62.5)
30-57 years	33 (37.5)
Sex	
Female	52 (59.1)
Male	36 (40.9)
Marital status	
Married	25 (28.4)
Single	63 (71.6)
Educational level	
High school	8 (9.1)
Bachelor's degree	72 (81.8)
Master's degree	7 (8)
Doctoral degree	1 (1.1)
Years of professional experience	
0-1	9 (10.2)
2-6	47 (53.4)
7-11	23 (26.1)
≥ 12	9 (10.3)
Clinical department	
Medical units	21 (23.9)
Surgical units	8 (9.1)
Emergency department	17 (19.3)
Pediatrics	5 (5.7)
Operating room	5 (5.7)
Intensive care unit	27 (30.7)
Outpatient clinics	5 (5.6)
Previous experience of a major disaster	
Yes	19 (21.6)
No	69 (78.4)
Loss of a relative or acquaintance during a disaster	
Yes	9 (10.2)
No	79 (89.8)
Mode of deployment during the February 6 earthquakes	
Officially assigned	32 (36.4)
Voluntary participation	56 (63.6)
Duration of deployment	
≤ 1 week	35 (39.8)
> 1 week	53 (60.2)

SD: Standard Deviation

As shown in Table 2, the mean total BEES score among the nurses was -3.01 ± 3.23 . The mean scores for the negative and positive emotion subscales of the BEES were 5.53 ± 2.16 and 2.52 ± 1.48 , respectively. The mean total PFRS score was 86.09 ± 15.91 . The mean scores for the personal, peer, and family subscales of the PFRS were 27.97 ± 5.06 , 26.74 ± 7.40 , and 31.39 ± 6.70 , respectively (Table 2).

Table 2. Distribution of the total and subscale scores of the Brief Emotional Experience Scale and the Protective Factors for Resilience Scale among nurses

Scale/Subscale	Mean $\pm$ SD	Median (Min-Max)
BEES	-3.01 ± 3.23	-3.00(-9.0-5.0)
Negative Emotion	5.53 ± 2.16	6.00(0.0-9.0)
Positive Emotion	2.52 ± 1.48	2.00(0.0-8.0)
PFRS	86.09 ± 15.91	90.00(30.0-105.0)
Personal	27.97 ± 5.06	29.00(10.0-35.0)
Peer	26.74 ± 7.40	29.00 (10.0-35.0)
Family	31.39 ± 6.70	35.00(5.0-35.0)

BEES: Brief Emotional Experience Scale, PFRS: Protective Factors for Resilience Scale, SD: Standard deviation; Min: Minimum; Max: Maximum.

As shown in Table 3, a statistically significant, weak, positive correlation was found between the Negative Emotion and

Peer subscales among the nurses ($r = 0.219$, $p = 0.041$). No statistically significant relationship was found between the Negative Emotion subscale and the Personal or Family subscales ($p > 0.05$). Similarly, no statistically significant relationships were found between the Positive Emotion subscale and the Personal, Peer, or Family subscales ($p > 0.05$).

Table 3. Correlations between the subscales of the Brief Emotional Experience Scale and the Protective Factors for Resilience Scale among nurses

	Personal		Peer		Family	
	r	p	r	p	r	p
Negative Emotion	0.094	0.386	0.219	0.041*	0.042	0.70
Positive Emotion	0.019	0.857	-0.061	0.570	-0.040	0.714

* $p < 0.05$; r: Spearman's rho correlation coefficient.

Discussion

Nurses are healthcare professionals who assume important responsibilities in disaster preparedness, response, and recovery processes. Although nurses are expected to maintain roles such as providing care, emergency response, coordination, and psychosocial support under disaster conditions, they may also be exposed to traumatic events, intense working conditions, threats to their personal safety, and concerns about harm to their loved ones.^{22,23} These conditions may affect not only nurses' professional functioning but also their emotional well-being and psychological adjustment. Indeed, research involving healthcare professionals, including nurses, has reported psychological problems such as anxiety, depression, post-traumatic stress symptoms, and emotional exhaustion in disaster settings.^{24,25} Therefore, it is important to consider nurses' emotional experiences and the protective factors that may facilitate adaptation and coping during disasters. This study examined the emotional experiences of nurses who worked during the earthquakes centered in Kahramanmaraş and Hatay and the protective factors for resilience.

In this study, nurses' negative emotion scores were higher than their positive emotion scores, and the total BEES score was negative. This finding suggests that nurses working after a traumatic disaster, such as an earthquake, may experience negative emotions, such as anxiety, sadness, and fear, more intensely than positive emotions, such as happiness, calmness, and security. Altuntaş et al. reported that nurses working in an earthquake-affected area experienced feelings of helplessness, anger, hopelessness, anxiety about the future, and fear of experiencing another earthquake.²⁶ Emirza et al. reported that feelings of sadness, grief, hopelessness, helplessness, fear, and panic were prominent among nurses working after earthquakes.¹⁷ In a study conducted by Akçay et al. among healthcare professionals following the 2023 Kahramanmaraş earthquakes, high levels of emotional exhaustion and psychological distress were reported.²⁷ Li et al. found that feelings such as fear, anxiety, sadness, shock, and tension were common among nurses who experienced an earthquake.²⁸ These findings suggest that uncertainty in disaster settings, witnessing traumatic events, intense working conditions, and caring for individuals with substantial care needs may increase nurses' emotional burden. Following the February 6 earthquakes, which affected a vast geographical area and created substantial demands on healthcare services, nurses had to continue

providing care while also coping with their own traumatic experiences. These demanding conditions may have influenced their emotional experiences.

In this study, the mean total PFRS score was 86.09 ± 15.91 . Among the PFRS subscales, the family protective factors subscale had the highest mean score (31.39 ± 6.70), followed by the personal (27.97 ± 5.06) and peer (26.74 ± 7.40) protective factors subscales. This finding indicates that family-related protective factors had the highest mean score among the three domains in this sample. Nowicki et al. reported that family, peer, and colleague support contributed to maintaining emotional balance among nurses experiencing traumatic stress.²⁹ A study conducted among healthcare professionals working after the Haiti earthquake identified family members, friends, and colleagues as important sources of support.³⁰ Mao et al. also emphasized the importance of support from family and close social networks in maintaining the psychological resilience of healthcare professionals working in disasters.³¹ These findings support the importance of considering family, peer, and personal resources together in maintaining nurses' psychological adjustment in disaster conditions.

One of the noteworthy findings of this study was the weak but statistically significant positive correlation between negative emotion and peer-related support scores. Given the weak magnitude of the correlation, this finding should be interpreted cautiously. One possible explanation is that negative emotional experiences and peer-related protective factors may be associated because both may be influenced by nurses' interpersonal experiences during disaster response. However, this is only a possible explanation and cannot be established from the cross-sectional design of the study. Other unmeasured factors may also have influenced the relationship between negative emotional experiences and peer-related protective factors. Previous research has shown that sharing emotional reactions with colleagues may support nurses working in disaster settings.³² A study of nurses who responded to the Kermanshah earthquake highlighted effective teamwork and emotional support as important needs during disaster responses.³³ From this perspective, peer-related protective factors may be relevant to nurses' social and psychological adjustment in the face of adverse emotional experiences during disasters. In contrast, no statistically significant relationships were found between positive emotion scores and personal, peer, or family protective factors. Further research is needed to clarify how protective factors for resilience relate to positive emotional experiences among nurses in disaster settings.

Limitations

This study had some limitations. First, the cross-sectional design limited the assessment of changes in nurses' emotional experiences and protective factors over time. Second, the study was conducted with 88 nurses who worked during the February 6, 2023, earthquakes in specific healthcare institutions, which may limit the generalizability of the findings to nurses working in other regions and those with different disaster experiences. The relatively small sample size may have affected the statistical power of the comparisons between the subgroups. In addition, the use of self-report measures may have introduced bias related to participants' perceptions and reports of their emotions and experiences. Finally, because the data were collected at a specific time after the earthquakes, changes in nurses' emotional experiences and protective factors for resilience across different disaster phases could not be assessed. Six

correlations were examined, but only one was statistically significant ($p = 0.041$). Therefore, this finding should be interpreted cautiously, as the possibility of a Type I error due to multiple comparisons cannot be excluded.

Conclusion

This study found that nurses who worked during the February 6, 2023, earthquakes experienced more negative than positive emotions. A weak, positive, and statistically significant relationship was found between negative emotions and peer-related protective factors. These findings highlight the importance of considering nurses' emotional experiences and protective resources that may facilitate adaptation and coping during disasters. Accordingly, disaster preparedness programs should include psychosocial preparedness in addition to clinical knowledge and skills, with attention to strengthening peer-related protective factors among nurses during disasters. Psychiatric and mental health nurses may contribute to psychosocial preparedness, psychological first aid, psychoeducation, early identification of psychosocial risks, referral, and post-deployment psychosocial follow-up. Future studies should include larger samples from different healthcare institutions and regions and further explore nurses' emotional experiences and protective factors for resilience during disasters using qualitative research.

Conflict of Interest

The authors have no conflicts of interest to disclose.

Compliance with Ethical Statement

Ethical approval was obtained from the Scientific Research Ethics Committee of the Faculty of Medicine of a state university (June 5, 2023; decision no. TUTF-GOBAEK 2023/243). Institutional permissions were obtained from the first hospital (August 22, 2023; decision no. 500315) and the second hospital (August 31, 2023; decision no. 223335884). Necessary institutional permissions and permissions for the use of the measurement tools were obtained. The participants were informed of the purpose of the study, the confidentiality of their personal information, and the voluntary nature of participation. Written informed consent was obtained from all participants who agreed to participate in the study in accordance with the principles of the Declaration of Helsinki. This study complied with the provisions of the Declaration of Helsinki.

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Author Contributions

N.A.S., F.U.: Hypothesis; Design; Analysis and interpretation of results; Writing; Critical review; Literature review; F.U.: Data collection.

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