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Nursing Students' Healthy Living Skills and Disaster Preparedness: A Relationship Study After the Kahramanmaraş Earthquakes (Mw 7.7 and Mw 7.6) in Türkiye

Meltem Sungur, Büşra Atsal Kılıç, Uğur Doğan

Department of Nursing, Kilis 7 Aralık University, Kilis, Türkiye

Abstract

Background: Deteriorated living conditions after earthquakes hinder individuals from adopting healthy lifestyle behaviors. During this process, nursing students' guidance to individuals and their role as role models for healthy lifestyle behaviors play an important role.

Aim: This study aimed to investigate the relationship between disaster preparedness and healthy lifestyle behaviors in nursing students who survived the Kahramanmaraş earthquakes (Mw 7.7 and Mw 7.6) in Türkiye on February 6, 2023.

Methods: An online cross-sectional study was conducted with 229 undergraduate nursing students who were earthquake survivors in Türkiye in June 2023. Data were collected using an individual information form, the Disaster Preparedness Scale, and the Healthy Living Skills Scale. Independent t-tests, one-way analysis of variance (ANOVA), Pearson correlation, and linear regression analyses were used for data analysis.

Results: Most nursing students had not experienced a disaster before and had not received disaster training prior to the earthquake. Higher income levels, maternal education, and prior disaster training were associated with better disaster preparedness. Disaster preparedness significantly influenced all dimensions of healthy lifestyle behaviors, including importance given to health, healthy nutrition, access to health-related resources, and health priority.

Conclusion: The findings of the present study indicate that higher levels of disaster preparedness were associated with nursing students' ability to maintain healthy lifestyles after the earthquake and to adapt during the recovery process. Accordingly, integrating comprehensive disaster preparedness training into nursing curricula and strengthening national nursing education policies in this area are recommended.

Keywords: Disaster, earthquakes, healthy lifestyles, nursing students, preparedness

Introduction

Disasters are defined as sudden events that result in significant damage, destruction, and loss of life.[1] Preparedness for disasters is crucial not only for protecting the health of individuals but also for minimizing the devastating effects that disasters can have.[2] Disaster preparedness involves planning, implementation, and evaluation processes designed to reduce destruction caused by various risks and hazards.[3] Türkiye, due to its geographical location, is particularly prone to natural disasters, with earthquakes being one of the leading causes of widespread loss of life and material damage. The Kahramanmaras earthquakes, referred to as the "disaster of the century," occurred on February 6, 2023, approximately 9 hours apart in the Pazarcık (Mw 7.7) and Elbistan (Mw 7.6) districts of Kahramanmaras, leading to extensive destruction across 11 provinces. According to the Disaster and Emergency Management Presidency of Türkiye, over 50,000 people lost their lives.[4]

Following natural disasters such as earthquakes, survivors often prioritize survival over health, leading to the neglect of healthy lifestyle behaviors. This neglect can result in a variety of health issues, such as malnutrition, limited physical activity, and weight gain.[5] Healthy living behaviors are actions that individuals adopt to protect and improve their health.[6] However, changes in living conditions after a disaster hinder individuals from practicing healthy living behaviors.[5] In the aftermath of the February 6, 2023 Kahramanmaras earthquakes, survivors experienced disruptions to their daily routines. As many earthquake survivors struggled to meet their basic physiological, psychological, and social needs, their ability to maintain healthy living behaviors was significantly affected.[7]

Nursing students, as future health professionals who will guide individuals in protecting and improving public health, must first integrate healthy living practices into their own lives. It is essential for students, particularly during their university years when life patterns are being shaped, to learn, develop, and adopt healthy lifestyles.[8,9] A review of the literature reveals that the post-earthquake healthy lifestyles of nursing students who are survivors have not been adequately explored. This study suggests that undergraduate nursing students with higher levels of disaster preparedness may be better equipped to adapt to changing living conditions and maintain healthy lifestyles despite post-earthquake challenges. Accordingly, the aim of this study is to deter-

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Corresponding author: Büşra Atsal Kılıç
E-mail: busraatsal@gmail.com

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mine the relationship between disaster preparedness levels and healthy lifestyles among nursing students who survived the Kahramanmaraş earthquakes (Mw 7.7 and Mw 7.6) that occurred in Türkiye on February 6, 2023.

Research Questions

- Are nursing students' individual characteristics associated with their disaster preparedness and healthy lifestyle levels after the Kahramanmaraş earthquakes?
- Is disaster preparedness associated with healthy lifestyle levels among nursing students affected by the Kahramanmaraş earthquakes?

Materials and Methods

Study Design

This descriptive, cross-sectional study was conducted with 229 nursing students studying in the nursing departments of universities in Türkiye in June 2023. To ensure the quality of the research, the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist for cross-sectional studies was used.

Population and Sampling

In this study, it was aimed to reach the entire population using the snowball sampling method. The minimum sample size for the present study was calculated using the G*Power program (version 3.1.9.7, Heinrich Heine University, Düsseldorf, Germany). For the correlation analysis, the minimum sample size was calculated as 191, assuming a small effect size (0.2), a 5% margin of error (α=0.05), and a study power (1-β) of 0.80.[10] The inclusion criteria were determined as: voluntary participation; being enrolled in the nursing department of a university; living in one of the 11 provinces affected by the earthquake during the first 72 hours after the earthquake; having no diagnosis of any psychiatric disorder; and being 18 years of age or older. The study was completed with 229 nursing students.

Data Collection Tools

Data were collected using an individual information form, the Disaster Preparedness Scale (DPS), and the Healthy Living Skills Scale for University Students (HLSSUS).

The individual information form was prepared by the researchers based on a review of the literature.[11-14] This form collected information on participants' sociodemographic data, previous disaster experience, receipt of disaster-related training, and participation in disaster drills.

The DPS consists of 13 items and four subdimensions: disaster physical protection, disaster planning, disaster assistance, and disaster warning systems. Scores on the 4-point Likert scale range from 13 to 52, with higher scores indicating better disaster preparedness. The Cronbach's alpha coefficient for the entire scale was reported as 0.82.3. In the present study, the Cronbach's alpha coefficient for the overall scale was 0.74, indicating acceptable internal consistency for social science research.[15]

The HLSSUS consists of 21 items and four subdimensions: importance given to health, healthy nutrition, access to health-related resources, and health priority. As the scale is scored on a 4-point Likert type scale, the total score ranges from 21 to 84. Higher scores indicate better healthy lifestyle behaviors. The Cronbach's alpha coefficient of the scale has been reported as 0.90.[6] In the present study, the Cronbach's alpha coefficient was 0.70, reflecting acceptable internal consistency according to commonly used psychometric criteria.[15]

Data Collection

After the data collection forms were uploaded to the Google Forms application, the created access link was sent to students via the WhatsApp application. Each student who participated in the study was asked to share the study link with other students who met the inclusion criteria. Students were asked to complete the HLSSUS by considering their experiences during the first 72 hours following the Kahramanmaraş earthquake on February 6, 2023. Thus, the study aimed to evaluate the healthy lifestyle behaviors of survivor nursing students during the early post-earthquake period.

Data Analysis

The obtained data were evaluated using the Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM Corp, Armonk, NY, USA). The one-sample Kolmogorov-Smirnov test was used to assess the normal distribution of the data. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize the data. Differences in scale scores according to categorical variables with a normal distribution were examined using independent t-tests and one-way analysis of variance (ANOVA). Post hoc tests were then used to determine differences between groups. Pearson correlation analysis was conducted to examine relationships between total scale scores and subdimensions. Linear regression analysis was employed to estimate the extent to which students' healthy living skills were influenced by their disaster preparedness levels. Statistical significance was set at $p<0.05$.

Ethical Considerations

Approval to conduct the study was obtained from Ethics Committee of Kilis 7 Aralık University (Approval Number: 2023/10, Date: 20.05.2023). Data were collected online because students transitioned to online education during the post-earthquake period. Since the study was not conducted within a specific institution, institutional permission was not required. Before the study commenced, participants received a message containing detailed information about the study, and informed consent was obtained. Individuals who accepted the terms of participation were included in the study. The study was conducted in accordance with the principles of the Declaration of Helsinki. Permission was obtained from the responsible authors via e-mail to use the Turkish versions of the scales.

Results

The majority of nursing students were female (68.6%), had an income equal to expenses (67.2%), and were first-year students (35.4%). In addition, most students' mothers (61.6%) and fathers (55.0%) had completed primary school education. When the change in disaster preparedness level according to the individual characteristics of survivor nursing students was examined, it was determined that those whose income was higher than their expenses ($p<0.01$) and those whose mothers had a high school education level and above ($p<0.05$) had higher disaster preparedness levels (Table 1).

It was determined that the majority of the students had not experienced a disaster before (47.6%), had not received disaster training before the earthquake (60.3%), and had participated in disaster drills before the earthquake (59.8%). It was found that students who received disaster training before the earthquake had higher disaster preparedness levels ($p<0.01$). It was also determined that students who received disaster training before the earthquake ($p<0.01$) and participated in disaster drills ($p<0.001$) had higher healthy living skills after the earthquake (Table 1).

When the relationship between the students' mean scores on the disaster preparedness and healthy living skills scales and their subdimensions was examined, a positive moderate relationship was found between disaster preparedness levels and healthy lifestyles after the earthquake ($r=0.445$, $p<0.001$) (Table 2).

Subsequently, a five-model linear regression analysis was conducted to determine the effect of disaster preparedness on the maintenance of healthy lifestyle behaviors among survivor nursing students after the earthquake. Each dimension of the HLSSUS was analyzed as a separate model. Students' DPS levels had a statistically significant effect on their overall HLSSUS scores ($\beta=0.257$, $p<0.001$). In addition, DPS levels had statistically significant effects on all HLSSUS subdimensions: importance given to health ($\beta=0.472$, $p<0.001$), healthy nutrition ($\beta=0.724$, $p<0.001$), access to health-related resources ($\beta=0.529$, $p<0.001$), and health priority ($\beta=0.423$, $p<0.05$) (Table 3).

Discussion

Previous earthquake disasters have shown that individuals with higher levels of disaster preparedness experience fewer earthquake-related losses.[16] However, in the post-disaster period, individuals often struggle to maintain healthy lifestyle behaviors due to disruptions in social life, reduced opportunities for physical activity, difficulties in accessing healthy foods, changes in dietary habits, and a tendency to prioritize survival.[5] A seismic event that disrupts established social structures leads to a noticeable decline in individuals' quality of life.[17] A study conducted after the Great East Japan Earthquake revealed that earthquake survivors may experience obesity, dyslipidemia, and significant weight changes (≥10 kg).[18] Additionally, the literature indicates that increases in waist circumference, fasting blood glucose

Table 1. Comparison of nursing students' DPS and HLSSUS scores according to individual characteristics (n=229)

Characteristics	n	%	DPS		HLSSUS	
			Mean±SD	p	Mean±SD	p
Age (years) (mean±SD)			21.03±1.67			
Gender						
Female	157	68.6	30.99±3.46	0.120	62.57±5.58	0.844
Male	72	31.4	31.79±3.95		62.75±7.62	
Perception of economic situation						
Income less than expenses	64	27.9	30.22±2.80	**0.003**	62.52±6.58	0.574
Income equal to expenses	154	67.2	31.53±3.69	**a<b=c***	62.63±6.13	
Income more than expenses	11	4.8	33.18±5.55		63.27±7.09	
Year of study						
1st year	81	35.4	30.79±3.80	0.334	62.44±7.13	0.962
2nd year	73	31.9	31.23±3.23		62.79±5.67	
3rd year	42	18.3	31.40±3.35		62.40±6.18	
4th year	33	14.4	32.15±4.31		63.00±5.63	
Mother's education level						
Not literate	53	23.1	30.77±3.65	**0.017**	62.55±5.36	0.967
Primary education	141	61.6	31.02±3.49	**c>a=b***	62.71±6.62	
High school and above	35	15.3	32.83±3.85		62.43±6.30	
Father's education level						
Not literate	9	3.9	29.33±3.39	0.063	61.44±3.21	0.665
Primary education	126	55.0	31.06±3.25		63.04±6.52	
High school and above	94	41.0	31.67±4.07		62.19±6.16	
Have you ever experienced a disaster?						
Never	109	47.6	31.18±3.68	0.647	61.96±6.20	0.121
Once	73	31.9	31.53±3.71		63.71±6.77	
Twice	31	13.5	31.29±3.83		63.16±5.73	
Three times or more	16	7.0	30.19±2.37		61.19±4.90	
Have you received disaster-related training?						
Yes	91	39.7	32.07±4.05	**0.005**	64.14±6.80	**0.003**
No	138	60.3	30.70±3.23		61.63±5.71	
Where was the disaster training received?						
Search and rescue organizations	29	31.9	31.79±3.72	0.599	62.34±4.53	0.298
During school-based education	62	68.1	32.08±4.31		64.55±7.55	
Have you ever participated in a disaster drill before?						
Yes	137	59.8	31.56±3.72	0.097	63.73±6.74	**0.001**
No	92	40.2	30.76±3.46		60.99±5.12	

*: Bonferroni test. DPS: Disaster preparedness scale, HLSSUS: Healthy living skills scale for university students, SD:Standard deviation.

Table 2. Correlation between DPS and post-earthquake HLSSUS scores among survivor nursing students (n=229)

Variables		1	2	3	4	5	6	7	8	9	10
1. Importance given to health	r	1									
2. Healthy nutrition	r	0.486[b]	1								
3. Access to health-related resources	r	0.445[b]	0.453[b]	1							
4. Health priority	r	0.392[b]	0.379[b]	0.076	1						
5. HLSSUS	r	0.831[b]	0.797[b]	0.711[b]	0.552[b]	1					
6. Disaster physical protection	r	0.246[b]	0.322[b]	0.300[b]	0.080	0.338[b]	1				
7. Disaster planning	r	0.287[b]	0.286[b]	0.201[b]	0.147[a]	0.323[b]	0.433[b]	1			
8. Disaster assistance	r	0.212[b]	0.335[b]	0.126	0.211[b]	0.298[b]	0.168[a]	0.175[b]	1		
9. Disaster warning systems	r	0.126	0.229[b]	0.221[b]	-0.008	0.208[b]	0.310[b]	0.251[b]	0.231[b]	1	
10. DPS	r	0.338[b]	0.438[b]	0.321[b]	0.168[a]	0.445[b]	0.783[b]	0.753[b]	0.534[b]	0.565[b]	1

[a]: p<0.05, [b]: p<0.01. r: Pearson correlation test, DPS: Disaster preparedness scale, HLSSUS: Healthy living skills scale for university students.

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Table 3. Effect of disaster preparedness on post-earthquake healthy living skills among survivor nursing students (n=229)

Healthy living skills	Disaster preparedness[A]				
	Model 1 β	Model 2 β	Model 3 β	Model 4 β	Model 5 β
Importance given to health	0.472				
Healthy nutrition		0.724			
Access to health-related resources			0.529		
Health priority				0.423	
HLSSUS					0.257
R^2	0.114	0.192	0.103	0.028	0.198
F	29.333	53.817	26.047	6.595	55.918
p	**<0.001**	**<0.001**	**<0.001**	**0.011**	**<0.001**

[A]: Independent variable, β: Standardized β, F: ANOVA value, HLSSUS: Healthy living skills scale for university students, R^2: Proportion of variance in the dependent variable explained by the regression model.

levels, and alcohol consumption have been observed among earthquake survivors, contributing to a higher prevalence of metabolic syndrome.[19,20] These findings highlight that disaster preparedness is crucial not only for mitigating the immediate impact of disasters on individuals but also for protecting their overall health.[2] Since disasters often occur unexpectedly, all healthcare professionals, particularly nurses, must be equipped with the necessary knowledge, tools, and resources to respond effectively before, during, and after emergencies.[21]

In line with these findings, the present study identified a moderate positive relationship between students' levels of disaster preparedness and their healthy lifestyle behaviors after the earthquake. Moreover, disaster preparedness significantly influenced all subdimensions of healthy lifestyle behaviors, including the importance given to health, healthy nutrition, access to health-related resources, and health priority. According to a qualitative study conducted in three provinces affected by the Kahramanmaraş earthquake, organizational deficiencies were reported across all regions. Administrators noted challenges in ensuring adequate nutrition, food safety, and resource management, and problems related to food transportation, preparation, cooking, distribution, and hygiene were observed in each of the three provinces.[17] The literature similarly indicates that disruptions in daily routines after an earthquake can negatively affect metabolic health indicators, increase obesity risk, and contribute to nutritional irregularities.[18–20]

A study conducted four months after the earthquake in Ecuador found widespread food insecurity, insufficient dietary diversity, and poor nutritional status among mothers and children under five living in rural areas. The study further reported that commonly consumed foods were low in nutritional value, while consumption of whole grains, fruits, and vegetables was limited. Additionally, a high prevalence of overweight and obesity among mothers and a high prevalence of chronic undernutrition among children under five were documented.[22] Following a catastrophic seismic event, survivors who witness the destruction of their homes may experience challenges in accessing livelihoods, especially in countries lacking adequate disaster preparedness. Such circumstances can lead to suboptimal food sanitation practices, which may subsequently contribute to various health problems.[17] For nursing students, who will play a vital role in guiding individuals toward protecting and improving community health, adopting healthy lifestyle habits is of critical importance.[8,9] Although post-earthquake uncertainty, resource limitations, and psychological distress may predispose individuals to unhealthy behaviors, this study demonstrated that students with higher levels of disaster preparedness were less affected by these adverse conditions. These findings suggest that a high level of disaster preparedness is essential for enabling students to sustain healthier lifestyle behaviors even under challenging post-disaster circumstances.

In the present study, students who had received disaster training and participated in drills were found to have higher levels of both disaster preparedness and healthy lifestyle behaviors. A study conducted with nursing students reported that, following disaster training, students performed more successfully in complex tasks such as triage, identifying health problems, and providing first aid during disaster drills.[23] Another study conducted after the Kahramanmaraş earthquake described that a nurse, despite being an earthquake victim herself, continued to work in the hospital and assist other survivors.[24] To fulfill their expected roles in post-disaster care effectively, nurses must possess adequate disaster preparedness. However, previous studies indicate that nurses' disaster preparedness remains insufficient.[25] Research conducted with nursing and midwifery students also demonstrated that those who received disaster-related education had significantly higher levels of preparedness.[2] As nurses acquire most of their knowledge and skills during their student years,[9] examining the preparedness of nursing students who will be at the forefront of future disasters is essential.[21] In another study investigating nursing students' disaster preparedness knowledge and attitudes, the majority (86.4%) stated that identifying and managing risks that may lead to disasters is important and that training in this area is necessary.[21] Because nurses are indispensable members of the healthcare team, collaboration during the disaster preparedness process between nursing students and nurses is crucial.[21] Disaster education and drills conducted during training not only enhance nursing students' disaster preparedness but also strengthen their ability to provide higher-quality services to the community during future disasters. This emphasizes that, particularly for nursing students, practical drills as well as theoretical knowledge play a crucial role in reinforcing behavioral outcomes in the post-disaster period.

In this study, it was determined that students with higher income levels had higher disaster preparedness scores. The literature shows that individuals with higher income levels, better education, and prior disaster training tend to have higher levels of disaster preparedness.[26–28] In a study evaluating disaster preparedness levels among nursing and midwifery students, those whose income exceeded their expenses were found to have higher levels of disaster preparedness.[2] This finding indicates that disaster preparedness is shaped not only by individual motivation but also by economic and educational resources. It is also presumed that students with better socioeconomic status may have easier access to disaster preparedness training, drills, and educational materials. Therefore, it is important that disaster education programs be made accessible to, and prioritized for, students from lower socioeconomic backgrounds.

Study Limitations

The present study reflects only the data obtained from nursing students and does not provide information about the disaster preparedness level of the general population or post-earthquake healthy living skills. Since the data were collected online via Google Forms, nursing students who did not have access to smartphones, tablets, or computers could not be reached.

Conclusion

The findings of this study show a relationship between nursing students' disaster preparedness level and their ability to maintain healthy lifestyle behaviors after an earthquake. Furthermore, the study found that disaster preparedness level influenced the maintenance of healthy lifestyle behaviors among nursing students. This suggests that stronger preparedness contributes to more effective adaptation and continuation of healthy living practices during the post-disaster recovery period.

Based on these results, enhancing disaster preparedness among nursing students is essential to promote both individual well-being and professional readiness in dis aster contexts. Integrating structured disaster preparedness courses into nursing curricula, alongside regular disaster training focused on pre-disaster preparedness, emergency planning, and effective disaster management, is strongly recommended. Educational content should also emphasize the importance of maintaining healthy lifestyle behaviors following disasters. Furthermore, incorporating practical components such as disaster drills and sim ulations into nursing education programs is crucial to bridge the gap between theoretical knowledge and clinical practice. Evaluating the effectiveness of these educational interventions will help ensure their impact on students' preparedness and health-related behaviors. Strengthening disaster preparedness through com prehensive education and policy support can enhance nursing students' capacity to protect their own health and provide effective care to disaster-affected populations, thereby contributing to improved disaster response and public health outcomes.

Ethics Committee Approval: The study was approved by the Kilis 7 Aralık University Ethics Committee (Approval Number: 2023/10, Date: 20.05.2023).

Informed Consent: Informed consent was obtained from all individual participants included in the study.

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