DID THE EARTHQUAKE OF THE CENTURY AFFECT OUR PREPAREDNESS FOR DISASTERS?: DETERMINING THE EARTHQUAKE PREPAREDNESS OF STUDENTS IN TURKEY

Mehtap Kavurmaci

Atatürk University, Faculty of Nursing, Department of Internal Medicine Nursing, Erzurum/Turkey

Summary

Background: *Disasters will always exist in human life. Therefore, societies must learn to live with disasters. This research was carried out to determine the disaster preparedness levels of nursing students after the earthquake of the century in Turkey.*

Subjects and Methods: *The descriptive study was conducted with 1067 students studying at nursing faculties in Turkey between April and May 2023. Data was collected via Google Forms using the "Disaster Preparedness Scale". The data obtained from the research were analyzed using descriptive tests in the SPSS 21 package program.*

Results: *Of the students participating in the research, 66.3% are women and 25% are 4th-grade students. The general total "Disaster Preparedness Scale" mean score of the students was 27.6. The knowledge of the students in the sub-dimensions of disaster physical protection, planning, and warning systems is insufficient.*

Conclusions: *Our research results show that even after the earthquake of the century in our country, the expected awareness of the students about the importance of being prepared for disasters has not developed. New research and innovative educational interventions are needed to improve students' disaster preparedness.*

Keywords: *Disaster preparedness, earthquake, nursing students, the disaster of the century*

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INTRODUCTION

Throughout history, people have experienced many disasters and continue to live (Ćosić et al. 2020, Romic et al. 2021). Although there are different definitions, a disaster is defined as an unexpected and usually sudden event that exceeds the local response capacity requires national or international assistance, and causes great damage, destruction, and loss of life (WHO 2019).

Disasters are generally divided into two main groups natural and man-made disasters. Natural disasters are disasters such as earthquakes, floods, and landslides that develop as a result of natural events that occur in the earth and atmosphere. Man-made disasters, on the other hand, are disasters such as transportation accidents, industrial accidents, and wars that develop with human intervention (Ocal 2019). According to the EM-DAT database, a total of 387 disasters occurred worldwide in 2022. These disasters affected 185 people and caused 30,704 deaths. When the number of deaths by disaster type is examined, it is seen that 1 626 of those who lost their lives died due to earthquakes. In 2022, there were 1,036 deaths in the southeast Afghanistan earthquake in June and 334 deaths in the Indonesian earthquake in November (EMDAT 2022).

Apart from tropical storms and volcanic eruptions, Turkey is one of the countries where all other natural disasters seen in the world are experienced (Akengin & Dölek 2019). Turkey is located on the highly seismically active Anatolian plate, where major earthquakes have occurred throughout history. Between 1900 and 2023, 269 earthquakes occurred in Turkey that caused loss of life and damage (Bahadır & Uçku 2018, Şahan & Kaya 2021).

Among these earthquakes, the biggest one in terms of loss of life and heavy damage was the Kahramanmaraş earthquake that took place on February 6, 2023. Two earthquakes with magnitudes Mw7.7 (focus depth=8.6km) and Mw7.6 (focal depth=7km) occurred in Pazarcık and Elbistan districts of Kahramanmaraş at 04:17 and 13:24 Turkish time. Then, on February 20, 2023, at 20:04 Turkish time, another earthquake with a magnitude of Mw6.4 occurred, the epicenter of which was Hatay Yayladağı. These earthquakes caused great destruction in 11 provinces in total, including Adana, Adıyaman, Diyarbakır, Elazığ, Gaziantep, Hatay, Malatya, Kahramanmaraş, Şanlıurfa, Kilis and Osmaniye. These earthquakes are unprecedented in recent history in terms of intensity and area covered. As a result of the earthquakes, more than 50 thousand people lost their lives, more than half a

million buildings were damaged, communication and energy infrastructures were damaged, and significant financial losses occurred. These earthquakes took place in the world press and were described as the disaster of the century. The World Health Organization (WHO) declared a level 3 emergency for the earthquakes that shook Turkey (Kahramanmaras and Hatay Earthquakes Report 2023).

Disasters such as earthquakes affect public health deeply and good disaster management is required to reduce the social effects of disasters (Bajs Janović et al. 2021, Chacko et al. 2019, Chen 2021, Khan et al. 2023). Disaster management consists of pre-disaster, during-disaster, and post-disaster intervention stages. The pre-disaster response includes the steps of risk prevention, risk reduction, and emergency preparedness. The risk prevention step includes raising awareness about disasters in society, establishing early warning systems, training disaster response teams, and creating a regional disaster prevention plan. The risk reduction step includes identifying hazards and risks, physical/structural mitigation studies, training and exercises, awareness raising and training activities, strengthening structures at risk, and protecting the environment and natural life. The final stage, emergency preparedness, includes preparing evacuation plans, training and exercises, and creating volunteering systems (Bronfman et al. 2019).

Disaster preparedness refers to the planning, implementation, and evaluation to reduce the destruction that risks and hazards may create in the face of disasters, from the households to the national level (Rañeses et al. 2018). For this reason, all health workers and especially nurses have important responsibilities at every stage of disaster management. Nurses are one of society's most vital human resources to cope with disasters (ICN 2019, Reedy et al. 2022). Beginning with the work of Florence Nightingale in the Crimean War, nurses have taken an active role in the care of the sick and injured in all disasters throughout history (Fletcher et al. 2022, Kalanlar & Kubilay 2015). Nurses have roles such as being prepared for disasters, participating in disaster management, responding to disasters, providing post-disaster care, and ensuring the health and welfare of the community (Akpınar Bektaş & Ceran Aşkın 2022, Demirtaş & Altuntaş 2023, Taşkıran & Baykal 2017).

Nurses should first know the preventive measures to be taken in earthquakes and should comply with the measures. Afterward, nurses should raise public awareness and ensure preparedness for disaster. Nursing students, who will be the health workers of the future, should also be informed about disaster nursing from their student years and be prepared for earthquakes and other disasters. However, when the literature is examined, it is seen that nursing students are not prepared for disaster events in general, and their knowledge of disaster preparedness and response is insufficient (Abou Hashish & Banoona 2023, Kaviani et al. 2022, Öztekin et al. 2015).

Disaster preparedness is a global issue. Major disasters, which are generally experienced in societies, lead to awareness for a short time but do not provide long-term measures. Finally, the disaster of the century in Turkey has once again revealed the importance of disaster management and its deficiencies (AFAD 2023, Yıldız & Duruel 2022). This research was carried out to determine how the disaster preparedness levels of nursing students were affected after the earthquake of the century in Turkey.

SUBJECTS AND METHODS

Study Setting

This descriptive study was conducted with nursing faculty students in Turkey. Starting from the nursing faculty in the region where the study was conducted, a snowball sampling plan was used to recruit nursing students across Turkey. Data collection was conducted through an online survey using Google Forms between April and May 2023. The survey was distributed on WhatsApp and Instagram, Turkey's most used communication platforms.

Study Instruments

In the first part of the survey, there are questions such as age, gender, previous disaster experience, including the introductory characteristics of the students. The second part of the questionnaire is the "Disaster Preparedness Scale" questions developed by Şentuna and Çakı. This scale is a 4-point Likert scale measurement tool consisting of 13 items and 4 dimensions. Scale sub-dimensions; "Disaster Physical Protection", "Disaster Planning", " Disaster Help " and "Disaster Warning Systems". The minimum score that can be obtained from the scale is 13, and the maximum score is 52. As the score obtained from the scale increases, the level of disaster preparedness increases (Şentuna & Çakı 2020). The internal consistency coefficient was determined to be 0.82.

Statistical Analysis

The data obtained from the research were analyzed using descriptive tests in the SPSS 21 package program. Arithmetic mean and standard deviation analyses were used in the analysis of the data.

ETHICAL STATEMENT

Ethical permissions were obtained from the university's ethics committee and the relevant faculty before the research (B.30.2. ATA.0.01.00/194). In the first item of the questionnaire, the consent of the participants was obtained by giving a mandatory consent question stating that the participants agreed to participate in the research. Only participants who gave informed consent were able to continue with the survey.

RESULTS

Findings on Students' introductory characteristics

Of the students participating in the research, 66.3% are women and 25% are 4th-grade students. 38% of the students lived in the provinces affected by the 6 February earthquake. Students helped earthquake victims by participating in various steps of disaster management. 39% of them participated in earthquake fundraisers, 16% helped carry debris, 5% participated in food and water distribution, and 3% helped with patient transport and first aid practices. 37% of the students did not participate in any aid activities (Table 1).

Table 1. Distribution of students' introductory characteristics

Variables	n	%
Gender		
Female	731	66.3
Male	336	33.7
Class		
1. Class	280	26.0
2. Class	266	25.0
3. Class	258	24.0
4. Class	263	25.0
Disaster-affected		
Yes	410	38
No	657	62
Participation in disaster relief activities		
Providing financial aid	421	39
Didn't join the activity	393	37
Rubble transport	168	16
Food-water distribution	55	5
Injured transport/first aid	30	3

Findings related to Disaster Preparedness Scale

The general total "Disaster Preparedness Scale" mean score of the students was 27.6. The scores they got from the sub-dimensions of the scale were "Disaster Physical Protection" 8.5, "Disaster Planning" 6.6, "Disaster Help" 8.2, and "Disaster Warning Systems" 4.3 (Table 2).

When the "Disaster Physical Protection" sub-dimension was examined, it was found that most of the students did not have a disaster kit, earthquake insurance, or first aid kit. Half of the students did not have a disaster education. The "Disaster Physical Protection" score average of the students was low in general (Table 2).

In the "Disaster Planning" sub-dimension, nearly half of the students did not have a disaster plan, and the average score they got from it was at a moderate level. Most of the students had first aid knowledge and knew the numbers to call for help in case of disaster. The students' "Disaster Help" sub-dimension mean score was high. According to the results, most of the students did not know about disaster warning systems and their "Disaster Warning Systems" sub-dimension average score was low (Table 2).

DISCUSSION

According to the results of the research, the disaster preparedness level of the students is generally at a medium level. The knowledge of the students in the sub-dimensions of disaster physical protection, planning, and warning systems is insufficient. 37% of the students did not participate in any disaster relief activities. It was expected that the disaster preparedness of nursing students, who will do the nursing profession in the future and who will take important responsibilities in disaster management, would be higher. However, when the literature is examined, it is seen that the disaster preparedness of nursing students is not at the desired level in the results of the studies conducted in different regions.

As a result of their research Kang et al. determined that nursing students' disaster awareness, disaster preparedness, willingness to participate in disaster response, and disaster nursing competence should be improved and they emphasized that it is imperative to improve disaster nursing education programs in faculties (Kang et al. 2022).

Öztekin et al. conducted a study to evaluate and compare the perceptions of nursing faculty students living in different earthquake-prone cities, Istanbul and Miyazaki, regarding disaster preparedness and response. As a result of this study, it has been determined that nursing students

Table 2. Distribution of students' Disaster Preparedness
Scale and Sub-dimensions mean scores

Sub-dimensions	Strongly Agree	Agree	Disagree	Strongly Disagree	Average score	Min-Max points
Disaster Physical Protection						
Do you have a disaster kit containing the materials you will need in case of a disaster?	45 (%4)	219 (%21)	709 (%66)	94 (%9)	1.4	1-4
Have you taken any precautions against the items that may tip over in your home?	40 (%4)	398 (%37)	556 (%52)	73 (%7)	2.3	1-4
Do you have a bag or locker containing first aid supplies and medicines in your home?	52 (%5)	340 (%32)	589 (%55)	86 (%8)	2.3	1-4
Have you insured your home against natural disasters?	82 (%8)	260 (%24)	633 (%59)	92 (%9)	2.3	1-4
Have you attended any meeting/training on the things that can be done in the event of a possible disaster?	92 (%8)	445 (%42)	478 (%45)	52 (%5)	2.5	1-4
Total	**311**	**1.662**	**2.965**	**937**	**8.5**	**5-20**
Disaster Planning						
Have you determined a common meeting place for family members in case of disaster?	79 (%8)	471 (%44)	460 (%43)	57 (%5)	1.6	1-4
Have you made any planning within the family for the disaster situation?	89 (%8)	493 (%46)	428 (%40)	57 (%6)	2.5	1-4
Does everyone in your family know where to meet in case of an important natural disaster in your area?	75 (%7)	497 (%46)	433 (%41)	62 (%6)	2.5	1-4
Total	**243**	**1.461**	**1.321**	**176**	**6.6**	**3-12**
Disaster Help						
Does everyone in your family know the emergency numbers where you can request help in case of a natural disaster?	119 (%11)	603 (%57)	310 (%29)	35 (%3)	2.7	1-4
Do all your family members aged 15 and over know how to turn off the electricity, water and natural gas services in your home?	109 (%10)	597 (%56)	333 (%31)	28 (%3)	2.7	1-4
Does anyone in your family have first aid knowledge?	145 (%14)	646 (%60)	246 (%23)	30 (%3)	2.8	1-4
Total	**373**	**1.846**	**889**	**93**	**8.2**	**3-12**
Disaster Warning Systems						
Do you know if there is any warning system against natural disasters in your neighborhood?	28 (%3)	197 (%8)	744 (%70)	98 (%9)	2.1	1-4
Does everyone in your family know what the natural disaster warning signals mean?	27 (%3)	309 (%29)	653 (%61)	78 (%7)	2.2	1-4
Total	**55**	**506**	**1.397**	**176**	**4.3**	**2-8**
General Total	**982**	**5.475**	**6.572**	**827**	**27.6**	**13-52**

in Istanbul and Miyazaki are generally not prepared for disaster events, and their knowledge of disaster preparedness and response is insufficient (Öztekin et al. 2015). In their research, Abou Hashish and Banoona determined that nursing students' awareness of the importance of disaster preparedness and their competencies in disaster nursing were not at the desired level (Abou Hashish & Banoona 2023).

According to our results, most of the students do not have disaster kits and emergency supplies. Nearly half of the students do not have a designated assembly area and emergency plan in the family and in the region where they live (Table 2). Longo found that 88% of nursing students do not have a household emergency plan, 82% do not have emergency supplies, and students' disaster preparedness is insufficient (Longo 2022). Kaviani et al. in their study in Iran, determined that the disaster nursing competencies of nursing students were weak (Kaviani et al. 2022).

The results of the studies in which the earthquake preparedness of nurses was examined also did not differ. Taşkıran and Baykal in their study examining the disaster preparedness of nurses in Turkey, found that nurses do not consider themselves ready and sufficient to respond to disasters (Taşkıran & Baykal 2017). Labrague et al. stated in their systematic review that nurses' disaster preparedness was insufficient (Labrague et al. 2018).

The results of all these studies show that neither the students who will be the nurses of the future nor the disaster preparedness of today's nurses are at the desired level. This situation "How is disaster nursing handled in nursing education?" begs the question. Loke et al. analyzed 75 articles in their study in which they examined the development of disaster nursing education and training programs in the last 20 years (2000-2019). As a result of this analysis, it has been determined that the number of disaster nursing education and training programs has increased gradually in the last 20 years, but most of the existing programs do not cover the entire spectrum of disaster management (Loke et al. 2021). In this context, Su et al. suggested the creation of scenario-based simulation training programs to improve the training programs of disaster nursing (Su et al. 2022).

Hosseini et al. used game-based and case-based education models in their quasi-experimental studies to increase nurse students' knowledge and behavioral fluency in crisis and disaster management (Hosseini et al. 2022). As a result of this research, they determined that game-based education is more effective than case-based education. The results show that new roadmaps are needed to improve disaster management (Goniewicz et al. 2023, Ma et al. 2021, Tussing et al. 2022).

LIMITATIONS

The study has some limitations. One of them is that the questionnaire was distributed via WhatsApp. It is possible that those who did not have internet access after the earthquake could not participate in the survey. However, the country administration had facilitated internet access in the earthquake area, and the area without internet access was very few. Regardless of this limitation, such an online survey was the most appropriate method for collecting nationwide data after the current earthquake.

CONCLUSIONS

Our research results show that even after the earthquake of the century in our country, the expected awareness of the students about the importance of being prepared for disasters has not developed. Disaster preparedness of students is still insufficient. However, due to many reasons such as changing climatic conditions, epidemics, and global warming, more disasters await us in the future.

All health system members, especially nursing students, should be prepared for disasters as soon as possible. For this purpose, disaster nursing and disaster preparedness issues should be a part of the nursing education curriculum and innovative educational interventions should be developed in these areas.

For nursing professionals to overcome the new global disaster challenges that await us in the future, more research on disaster preparedness and more applicable solutions should be found. First of all, disaster preparedness in nursing education should be handled more broadly and effectively, and new education models should be tried. We think that the results of this research will be the basis for revealing the importance of the subject and for the measures to be taken.

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Correspondence:
Mehtap Kavurmaci
Atatürk University, Faculty of Nursing, Department of
Internal Medicine Nursing, Erzurum/Turkey
mehtapkavurmaci25@gmail.com
P +90-442 231 57 68, F +90-442 236 09 84