

ORIGINAL RESEARCH ORJİNAL ARAŞTIRMA

DOI: 10.5336/nurses.2024-106502

The Effect of Earthquake on Nursing Students' Attitude Towards Death, Academic Success, and Future Anxiety: Descriptive and Cross-Sectional Study

Depremi Hemşirelik Öğrencilerinin Ölüme Karşı Tutum, Akademik Başarı ve Gelecek Kaygısı Üzerine Etkisi: Tanımlayıcı ve Kesitsel Çalışma

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ABSTRACT Objective: In countries prone to natural disasters, such as earthquakes, deficiencies and problems in education significantly impact students. This impact becomes even more crucial, particularly in fields with practical applications. This research was conducted to determine the impact of earthquake on nursing students' attitudes towards death, academic achievement, and future anxiety. **Material and Methods:** The research is a descriptive cross-sectional study. The research was conducted in the nursing department of a state university in the eastern part of Türkiye. The sample of the study consisted of 820 nursing students. The research data were collected using a descriptive information form, the Death Attitude Profile Revised, and the Future Anxiety Scale. **Results:** It was determined that the nursing students had positive attitudes towards death, that their academic achievements, however, decreased due to the earthquake, and that their levels of anxiety about the future were above average. It was also found that the students whose academic performance decreased due to the earthquake had higher levels of future anxiety ($r=-0.182$, $p<0.001$). **Conclusion:** The research revealed significant associations between various variables and attitudes towards death and future anxiety. Specifically, factors such as female gender, decreased academic achievement due to the earthquake, loss of a loved one in the earthquake, and fear of another earthquake were found to have a significant impact on these attitudes. In particular, it is thought that the reason for the decrease in the academic achievement of the students after the earthquake is due to their high anxiety levels. It may be recommended to organise programmes to raise awareness of students against natural disasters such as earthquakes and to recognise psychological symptoms.

ÖZET Amaç: Deprem gibi doğal afetlerin yaşandığı ülkelerde eğitimde görülen aksaklıklar ve sorunlar öğrencileri son derece önemli düzeyde etkilemektedir. Bu etkilenme özellikle uygulaması olan bölümlerde daha da büyük önem kazanmaktadır. Bu araştırma depremin hemşirelik öğrencilerinin ölüme karşı tutum, akademik başarı ve gelecek kaygısı üzerine etkisini belirlemek amacıyla yapıldı. **Gereç ve Yöntemler:** Tanımlayıcı kesitsel bir araştırmadır. Araştırma Türkiye'nin doğusunda bir devlet üniversitesi hemşirelik bölümünde yürütüldü. Örneklemi 820 hemşirelik öğrencisi oluşturdu. Araştırma verileri tanımlayıcı anket formu, Ölüme Karşı Tutum Ölçeği ve Gelecek Kaygısı Ölçeği ile toplandı. **Bulgular:** Hemşirelik öğrencilerinin ölüme karşı tutumlarının olumlu olduğu, ancak deprem nedeniyle akademik başarılarının düştüğü ve geleceğe yönelik kaygı düzeylerinin ortalamasının üzerinde olduğu belirlendi. Deprem nedeniyle akademik başarısı düşen öğrencilerin gelecek kaygılarının daha yüksek olduğu saptandı ($r=-0,182$, $p<0,001$). **Sonuç:** Bu araştırma, kadın cinsiyet, deprem nedeniyle akademik başarının düşmesi, depremde yakınına kaybetme ve tekrardan deprem olmasından korku duyma gibi değişkenlerin ölüme karşı tutumu ve gelecek kaygısını önemli ölçüde etkilediğini göstermiştir. Özellikle, öğrencilerin deprem sonrasında akademik başarılarının düşmesinin nedeninin kaygı düzeylerinin yüksek olmasından kaynaklandığı düşünülmektedir. Deprem gibi doğal afetlere karşı öğrencilerin bilinçlendirilerek psikolojik belirtileri tanıyabilmelerine yönelik programların düzenlenmesi önerilebilir.

Keywords: Academic achievement; attitude towards death; future anxiety; earthquake; nursing student

Anahtar Kelimeler: Akademik başarı; ölüme karşı tutum; gelecek kaygısı; deprem; hemşirelik öğrencisi

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Peer review under responsibility of Türkiye Klinikleri Journal of Nursing Sciences.

Received: 27 Oct 2024

Received in revised form: 21 Jan 2025

Accepted: 29 Jan 2025

Available online: 08 May 2025

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Earthquakes are one of the most common natural disasters worldwide. Due to their sudden occurrences, destruction, and consequences, they rank among the most traumatic events. Psychological responses such as shock, disbelief, sadness, fear of death, future anxiety, and helplessness are commonly observed in individuals who experience earthquakes.¹⁻³ Wang et al. conducted a study following an earthquake in northern China and found that participants experienced symptoms such as fear, depression, sleep disturbances, and aggression, which persisted even 9 months after the earthquake.⁴ Türkiye, due to its geographical location, is a country prone to earthquakes and has experienced significant loss of life and property in major earthquakes throughout its history.⁵ The earthquakes of magnitudes 7.7 and 7.6 that occurred on February 6, 2023, significantly affected 11 provinces in Türkiye, resulting in the loss of over 50,000 lives and injuries.^{2,6,7} In the provinces affected by the earthquake, face-to-face education could not be conducted for nearly a year and was carried out online.^{8,9} While the harmful effects of natural disasters on the psychological well-being and student learning have been reported, the steps to overcome challenges in education during and after a major disaster have not been sufficiently clarified. Although the detrimental effects of natural disasters on students' academic performance and attendance have been documented, the impact of natural disasters on university students' learning and academic success has not been clearly established.¹⁰⁻¹² The effects of natural disasters on students' academic performance and school attendance can vary depending on the nature and duration of the disaster, the time available for students to adapt, their attitudes towards death, and the level of future anxiety.^{9,11,13} Events such as earthquakes often negatively affect academic learning processes and can lead to devastating social, psychological, and economic consequences for students.¹¹ Post-disaster health issues, such as significant loss of life, lack of drinking water, and unsafe shelter, are influenced by social and environmental factors.^{8,14} These health issues can lead to increased future anxiety, negative attitudes towards death, depression, and exacerbation of pre-existing physiological and psychological conditions.¹⁵⁻¹⁷ During and after a disaster, nurses play critical roles as healthcare professionals. It is noted that

nurses' attitudes towards death may be negatively affected during the post-disaster period, leading to decreased functionality, diminished hope, effective communication, coping mechanisms, and intrinsic motivations.^{3,18,19} A study by Mustikasari et al. found that nurses experienced trembling and fear symptoms for up to 2 years after an earthquake.²⁰ The interruption of education due to earthquakes and the loss or injury of loved ones can cause future nurses to feel increased anxiety about the future.^{8,9,21}

Despite numerous studies examining the impact of natural disasters on economic growth and psychological well-being, research on the effects of natural disasters on students' academic achievement, development, and future concerns is relatively limited.^{3,8,9,14,17,19,22} There is a lack of research that simultaneously investigates the impact of students' attitudes towards death, academic achievement, and future anxiety during the post-disaster period, particularly among future nurses. Conducting studies on students affected by natural disasters can provide valuable insights into helping them overcome these challenges as quickly as possible.^{9,11} The aim of this study was conducted to examine the impact of earthquake on nursing students' attitudes towards death, academic achievement, and future anxiety.

MATERIAL AND METHODS

DESIGN AND PARTICIPANTS

The research is a descriptive cross-sectional study. The population of this descriptive cross-sectional study consisted of all students (1,223 students) enrolled in the Nursing Department of the Faculty of Health Sciences of Gaziantep University, Türkiye. Since the entire population was intended to be included in the study, no sampling method was used. The research was completed with a total of 820 students. First-year students were excluded from the study because they were new to education and training and did not have academic averages at the time the research data were collected.

DATA COLLECTION TOOLS

The research data were collected using a descriptive information form, the Death Attitude Profile Revised (DAP-R), and the Future Anxiety Scale.

The academic achievement of the students were determined with the questions of; did the earthquake affect your academic success? And how was your academic performance affected?

Descriptive Information Form: The form created by the researchers, which was generated by scanning the literature, consisted of a total of 7 questions (age, gender, class, etc.).^{1,3,4}

DAP-R: The Turkish validity and reliability of the scale developed by Wong et al. (2004) was conducted by Işık (2009). The scale consists of 26 items and 3 subscales. The total score that can be obtained from the scale varies between 26 and 182 and scores can be obtained for each sub-dimension. The items for the Neutral Acceptance and Approach Acceptance subscale are 4, 6, 8, 12, 13, 14, 15, 19, 21, 22, 23, and 25. The items for the Escape Acceptance subscale are 5, 9, 11, 20, and 24. The items for the Fear of Death and Death Avoidance subscales are 1, 2, 3, 7, 10, 16, 17, 18, and 26. The Cronbach alpha coefficient of the scale was found to be 0.81.²³ The Cronbach alpha coefficient of this study was determined to be 0.79.

Future Anxiety Scale: The scale developed by Geylani and Yıldız to determine university students' future anxiety consists of 19 items and 2 subscales. The scale consists of fear of future (1, 3, 5, 7, 9, 11, 13, 14, 15, 16, 17, 18, 19) and hopelessness of future (2, 4, 6, 8, 10, 12) sub-dimensions. Questions 2, 4, 6, 8, 10, and 12 in the scale are reverse-scored. The Cronbach alpha coefficient of the scale was found to be 0.91. The Cronbach alpha coefficient of the sub-dimensions were found to be 0.95 and 0.88.²⁴ The Cronbach alpha coefficient of this study was determined to be 0.90. The Cronbach alpha coefficient of the sub-dimensions of this study were found to be 0.83 and 0.88.

STATISTICAL ANALYSIS OF DATA

The data were analyzed using the IBM SPSS 25.0 software package. Descriptive statistics were presented as numbers, percentages, means, and standard deviations. The normality distribution of the data was evaluated with the Kolmogorow-Smirnov test. A one-way multivariate analysis of variance (MANOVA) was performed to assess potential differences among

groups based on an independent variable across multiple dependent variables. Correlation analysis was employed to examine the relationship between scale averages and academic achievement. A significance level of $p < 0.05$ was considered statistically significant.

ETHICS OF RESEARCH

The study obtained ethical approval from the Scientific Research and Publication Ethics Committee of İnönü University (date: September 5, 2023, no: 2023/4916). Additionally, institutional permission was obtained from the relevant faculty (no: 2023/369289) to conduct the research. Participation in the study was based on voluntary consent, and the students were informed about the study and their consent was obtained. All the requirements of the Declaration of Helsinki were fulfilled.

RESULTS

The students' average age is 20.93 ± 1.74 years, with 79.9% being female and 43.4% being in their 2nd year of study. 52.7% of the students reported that the earthquake affected their academic achievement, with 88.1% stating that their academic achievement decreased. 85.1% reported that they did not lose a loved one in the earthquake, while 87.3% expressed fear of another earthquake (Table 1). The mean score on the DAP-R was 117.84 ± 17.23 , with subscale mean scores as follows: Neutral Acceptance and Approach Acceptance 62.49 ± 11.32 , Escape Acceptance 21.43 ± 6.54 , Fear of Death and Death Avoidance 33.91 ± 10.46 . The mean score on the Future Anxiety Scale was 58.03 ± 11.51 , with a mean score of 41.65 ± 10.08 for Fear of Future and 16.37 ± 4.43 for Hopelessness About the Future (Table 1).

Table 2 presents the examination of attitude towards death and future anxiety levels according to the students' demographic characteristics using MANOVA. Significant differences were found in the students' attitude towards death and future anxiety levels based on gender (Wilks' Lambda (λ)=0.978; $F=9.051$; $p < 0.001$). It was found that the female students had higher levels of both attitude towards death and future anxiety compared to the male students ($p < 0.001$). Significant differences were also deter-

TABLE 1: Descriptive characteristics of nursing students (n=820)		
Characteristics	n	%
Gender		
Female	655	79.9
Male	165	20.1
Class		
2 nd	356	43.4
3 rd	281	34.3
4 th	183	22.3
Did the earthquake affect your academic success?		
Yes	432	52.7
No	99	12.1
Partially	289	35.2
How was your academic performance affected?		
My academic success decreased	562	88.1
My academic success increased	76	11.9
Did you lose a loved one due to the earthquake?		
Yes	122	14.9
No	698	85.1
Are you afraid of another earthquake occurring?		
Yes	716	87.3
No	104	12.7
	$\bar{X} \pm SD$	
Age	20.93 \pm 1.74	
DAP-R	117.84 \pm 17.23	
Neutral Acceptance and Approach Acceptance	62.49 \pm 11.32	
Escape Acceptance	21.43 \pm 6.54	
Fear of death and death avoidance	33.91 \pm 10.46	
Future Anxiety Scale	58.03 \pm 11.51	
Fear of Future	41.65 \pm 10.08	
Hopelessness About the Future	16.37 \pm 4.43	

SD: Standard deviation; DAP-R: Death Attitude Profile Revised

mined in the students' attitude towards death and future anxiety levels based on whether the earthquake affected their academic achievement (Wilks' Lambda (λ)=0.979; F=4.415; p<0.05). According to the Tukey test, it was found that the attitude towards death and future anxiety levels of those whose academic achievement was affected (those who answered "yes") were significantly higher compared to those whose academic achievement was not affected (those who answered "no") (p<0.05).

There was a significant difference in attitude towards death and future anxiety levels based on the condition of whether students' academic achievement was affected (Wilks' Lambda (λ)=0.967; F=10.852; p<0.001), and it was found that those whose academic achievement decreased had higher levels of at-

TABLE 2: MANOVA analysis of attitude towards death and future anxiety levels according to students' descriptive characteristics					
Descriptive characteristics	Attitude Towards Death $\bar{X} \pm SD$	Future Anxiety $\bar{X} \pm SD$	λ	F	p value
Gender					
Female	118.93 \pm 16.04	58.66 \pm 10.97	0.978	9.051	<0.001
Male	113.53 \pm 20.79	55.50 \pm 13.20			
Class					
2 nd	117.30 \pm 17.97	57.62 \pm 11.40	0.996	0.796	0.528
3 rd	117.82 \pm 16.83	58.79 \pm 12.13			
4 th	118.91 \pm 16.37	57.65 \pm 10.74			
Did the earthquake affect your academic success?					
Yes	118.65 \pm 17.30	58.98 \pm 11.85	0.979	4.415	<0.05
No	118.53 \pm 15.71	57.59 \pm 10.58			
Partially	112.28 \pm 20.08	55.12 \pm 12.17			
How was your academic performance affected?					
My academic success decreased	119.07 \pm 17.28	59.45 \pm 11.03	0.967	10.852	<0.001
My academic success increased	116.72 \pm 13.76	53.13 \pm 11.58			
Did you lose a loved one due to the earthquake?					
Yes	116.26 \pm 16.49	58.84 \pm 11.26	0.991	3.522	<0.05
No	108.03 \pm 19.00	52.43 \pm 11.51			
Are you afraid of another earthquake occurring?					
Yes	119.15 \pm 16.85	58.80 \pm 11.22	0.937	27.598	<0.001
No	108.03 \pm 19.00	52.43 \pm 11.75			

λ : Wilks' Lambda; F: One-way multivariate analysis of variance; SD: Standard deviation

titude towards death and future anxiety (p<0.001). Significant differences were also observed in attitude towards death and future anxiety levels based on whether students lost a loved one due to the earthquake (Wilks' Lambda (λ)=0.991; F=3.522; p<0.05), and it was determined that those students who lost a loved one had higher levels of attitude towards death and future anxiety (p<0.05). There was a significant difference in attitude towards death and future anxiety levels based on the fear of another earthquake occurring (Wilks' Lambda (λ)=0.937; F=27.598; p<0.001), and it was found that the students who feared another earthquake had higher levels of both attitude towards death and future anxiety (p<0.001).

There was a significant positive relationship between the students' attitude towards death and future anxiety levels, indicating that as their attitude towards death increased, their future anxiety also increased (p<0.001). A negative relationship was found be-

TABLE 3: Relationship between scale averages and academic achievement

Scales	1	2	3	4	5	6	7	8
1 DAP-R	1	0.740**	0.603**	0.468**	0.294**	0.391**	-0.126**	-0.045
2 Neutral Acceptance and Approach Acceptance		1	0.448**	-0.144**	-0.012	0.087*	-0.229**	0.033
3 Escape Acceptance			1	-0.117**	0.179**	0.216**	-0.028	0.021
4 Fear of Death and Death Avoidance				1	0.385**	0.414**	0.057	-0.121**
5 Future Anxiety Scale					1	0.924**	0.496**	-0.182**
6 Fear of Future						1	0.126**	-0.168**
7 Hopelessness About the Future							1	-0.092*
8 Academic Achievement								1

*p<0.05; **p<0.001; DAP-R: Death Attitude Profile Revised

tween academic achievement and the Fear of Death and Death Avoidance subscale, indicating that students who scored higher on the Fear of Death and Death Avoidance subscale had lower academic achievement ($p<0.001$). In addition, a negative relationship was found between academic success and future anxiety, and it was determined that the academic success of students whose future anxiety increased decreased ($p<0.001$) (Table 3).

DISCUSSION

In this study investigating the impact of earthquakes on nursing students' attitudes towards death, academic achievement, and future anxiety, it was observed that the majority of the students were negatively affected in terms of academic achievement due to the earthquake. Pietro's study suggests that earthquakes negatively affect students' academic performance, reduce the likelihood of graduating on time due to the earthquake, and increase the likelihood of dropping out of school.¹⁴ Despite the rapid restoration of educational activities in temporary facilities after disasters, it is noted that disruptions in the learning environment and the psychological traumas experienced by students after earthquakes worsen their academic performance.^{8,14,25} Studies consistently demonstrated that individuals often faced elevated levels of trauma and encountered various psychological challenges following disasters.^{1,3,6,16} Considering the results of this study, it can be stated that the experiences of witnessing nurses on the front lines during the earthquake, participating in the care of earthquake victims during internship programs, enduring ongoing severe aftershocks, and facing

changes in the educational process due to destruction may have decreased the participating students' academic achievement.

In the research, it was determined that the majority of the students were afraid of another earthquake occurring. Li et al. found that nurses experienced fear and anxiety during disaster periods due to being unprepared educationally and psychologically and finding themselves in horrific scenes of destruction.²¹

In this study, it was found that the students exhibited a positive attitude towards death, believing that death is an inevitable part of life and a transition to life after death, and that death would rescue individuals from the psychological or physical harms of life. Berndtsson et al. assigned nursing students to care for dying patients and found a statistically significant change towards a more positive attitude towards death in students.²⁶

In this study, it was found that the students who lost a loved one due to the earthquake had a higher positive attitude towards death compared to the other participating students. The exposure of those students, who experienced the earthquake, to mass deaths may have increased their acceptance of death and led them to exhibit a positive attitude. Wallace et al. found in their research on death and bereavement that experiencing death reduced anxiety about death.²⁷ However, while encountering death may foster acceptance of death among nursing students, it is noted in the literature that death can also evoke feelings of helplessness, uncertainty, and inadequacy that may affect students' attitudes.²⁶ Nursing students may also feel unprepared to cope with death.²⁵

In this study, it was found that the students experienced a moderate level of fear of death (discussing and thinking about death). Mass deaths resulting from an uncontrollable and sudden disaster may have triggered students' fear of death. In a study by Mızrak et al. evaluating the risk analysis of disasters, students reported experiencing high anxiety and fear in uncontrollable events.²⁸ Additionally, it was found that nursing students who experienced fear of death and high future anxiety also had decreased academic achievement.

Parallel to the literature, in this study, it was found that the students who lost a loved one due to the earthquake had higher levels of future anxiety. Research indicates that losing a loved one in disasters increases factors such as anxiety, stress, prolonged grief, and depression.^{16,17,29}

In this study, it was also observed that the nursing students experienced increased levels of anxiety, fear, and Hopelessness About the Future. Additionally, it was found that the students who feared another earthquake had high levels of both death attitude and future anxiety. Many studies conducted with young people who experienced earthquakes showed various psychiatric disorders such as severe depression, future anxiety, fear of death, and stress disorders.^{15,16,30} The process of adapting to new learning and working methods due to the earthquake, coping with the loss of family members or friends, experiencing isolation from loved ones, witnessing deaths or injuries, being relocated to other areas, or residing in container cities can result in feelings of fear, hopelessness, stress, future anxiety, and depression.^{8,14-16} Therefore, the findings of this study are consistent with the literature.

Different studies in the literature emphasize that certain demographic variables, such as gender, influence trauma response.^{1,6,15} In this study, it was found that the female students had higher levels of both death attitude and future anxiety compared to the male students. In previous studies, it was reported that women were psychologically more affected by disasters.^{31,32} A study by Cansel and Ucuz found a significant correlation between post-earthquake anxiety and trauma level scores and being female.¹ Koçoğlu, in research conducted after the February 6,

2023 earthquakes in Türkiye, reached several noteworthy conclusions, such as higher trauma levels among female earthquake survivors compared to male survivors.¹⁶ This gender difference may be attributed to women's nurturing and protective nature, their tendency to express emotions more easily, their emotional nature, hormonal changes, high stress levels, excessive threat perception, and fear of losing control.^{6,31,32} A study by Ergün et al. determined that women who lost loved ones after the Van earthquake were more likely to experience depression compared to men.²⁹

In this study, it was found that the students had a positive attitude towards death, and a significant positive relationship was identified between their death attitudes and levels of future anxiety. A study by Rupprecht et al. found that future time perspective decreased and death anxiety increased after disasters.¹⁷ The difference observed in this study is thought to be related to social beliefs. Following a devastating earthquake, students may experience future anxiety, but beliefs such as the idea that this disaster came from Allah and that the deceased will go to heaven, despite causing anxiety, may enable students to exhibit a positive attitude towards death and accept death.³³⁻³⁵ In a study by Rahvati and Reni, it was found that the emotions caused by the inner pain experienced by disaster victims were related to religiosity.³³ Victims with strong beliefs in religious values tended to cope with their inner pain more quickly and easily. In contrast, victims with less belief were reported to be more prone to expressing their disappointments excessively and experiencing strong trauma.

LIMITATIONS

Several limitation should be considered. This; the inclusion of nursing students from a specific university, the reliance on self-assessment for the research constitute, the data were of a cross-sectional design; thus, causality cannot be firmly established. The results of the study can be generalised to the group in which the study was conducted.

CONCLUSION

The present study highlights how the aftermath of the earthquake impeded the academic advancement of the participating nursing students, manifesting in

heightened fear of death and future anxiety, ultimately leading to a decline in academic performance. The belief in the potential recurrence of the destructive earthquake, being female, and the experience of losing loved ones heightened anxiety among the nursing students about the future. However, confronting mass deaths and injuries paradoxically facilitated an acceptance of death among nursing students and fostered a positive attitude towards it.

In the light of the results of this study, it should be ensured that nursing students' awareness of concepts such as death and anxiety should be increased especially against disasters. In addition, it is recommended that students should be provided with trainings about the situations that may be experienced during and after the disaster period during their undergraduate education.

Acknowledgments

We would like to thank all the nursing students who participated in this research study.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Kevser Işık; **Design:** Kevser Işık; **Control/Supervision:** Kevser Işık, Hilal Yıldırım; **Data Collection and/or Processing:** Kevser Işık, Hilal Yıldırım; **Analysis and/or Interpretation:** Kevser Işık; **Literature Review:** Kevser Işık, Hilal Yıldırım; **Writing the Article:** Hilal Yıldırım; **Critical Review:** Kevser Işık, Hilal Yıldırım; **References and Fundings:** Kevser Işık; **Materials:** Kevser Işık.

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