

Investigating Factors Influencing Disaster Preparedness Perception of Nurses in Turkey: A Meta-Analytic Approach

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Abstract

Aim and Background: In contemporary healthcare, the crucial importance of disaster preparedness and response within the nursing profession has gained recognition. Considering the elevated probability of encountering numerous disasters in Türkiye, it is noteworthy that limited research has been conducted in this domain. This study, therefore, aims to investigate the related factors to nurses' disaster preparedness Türkiye through a meta-analysis method. **Methods:** The study was conducted based on PRISMA guidelines. We searched the national databases in Türkiye and Web of Science Core Collection. Descriptive studies published in Turkish or English between 01.01.2000–31.12.2021 in Türkiye were included in the study to derive the pooled outputs.

Results: A total of nine studies, encompassing a sample size of 3222 nurses, met the inclusion criteria. The meta-analysis' results revealed that gender and prior experience with disasters did not exhibit a statistically significant impact on nurses' disaster preparedness ($p > 0.05$). Conversely, engaging in disaster education programs, familiarizing oneself with disaster plans, and actively participating in disaster drills were found to have a significant positive effect on nurses' preparedness for disasters ($p < 0.05$). However, it is worth noting that the analysis of disaster experience exhibited substantial heterogeneity ($I^2 = 85.6\%$), indicating variations among the included studies. Similarly, the analysis related to reading disaster plans also demonstrated high heterogeneity ($I^2 = 77.7\%$).

Conclusion: Based on the available evidence from the meta-analysis, it can be concluded that receiving disaster education, reading disaster plans, and participating in disaster drills have a positive and significant impact on nurses' perception of disaster preparedness.

Introduction

The frequency and intensity of disasters are on the rise globally, leading to adverse impacts on societies.^{1,2} While developed countries can more swiftly restore infrastructure and economy, a disaster can erase years of progress in developing nations. Particularly, the COVID-19 pandemic has posed challenges for all countries, regardless of their development status.³ In this context, the ability of nurses to respond to disasters is of vital importance, yet many nurses express a lack of preparedness in this area.^{1,4,5} In Turkey, there is a scarcity of research investigating nurses' perception of preparedness for disasters.⁴ The recent earthquake in 2023 underscores the urgency of this issue. The conflicting results of existing research make it challenging to formulate robust policies in this field.^{5,6} This study aims to identify the factors related to the preparedness and response competency of nurses for disasters in Turkey through meta-analysis.

Methods

Overview

This study employed a meta-analytic approach to investigate nurses' disaster preparedness in Turkey. The study encompassed articles published from January 1, 2000, to December 31, 2021, in both Turkish and English.

Data Sources and Search Strategy

A comprehensive search was executed across databases such as Dergipark, Turkey National Thesis Center, Web of Science, and PubMed, as well as Google Scholar. Keywords like “disaster,” “nurse,” “preparedness,” and “competency” were used in various combinations with Boolean operators “AND” and “OR.”

Table 1. Characteristics of the studies included in the meta-analysis

Author/ Year	Çalışma türü	Measurement/ Methods	Variables evaluated in assessing nurses' disaster preparedness perception	Province	Number of samples
Bahadır Tercan, 2015	Master's thesis/Article	Disaster Preparedness Perception Scale in Nurses	In this study, the effects of gender, experiencing a disaster, receiving disaster education and disaster drills on disaster preparedness were examined	Gümüşhane	226
Emrah Yürekli, 2019	Master's thesis	Disaster Preparedness Perception Scale in Nurses	In this study, the effects of experiencing a disaster, reading the disaster plan, receiving disaster education and disaster drills on disaster preparedness were examined.	Bitlis	330
Feride Özcan, 2013	Master's thesis	Disaster Preparedness Perception Scale in Nurses	In this study, the effects of gender, experiencing a disaster, receiving disaster education, reading the disaster plan and disaster drills on disaster preparedness were examined.	İstanbul	500
Gülcan Taşkıran, 2015	Master's thesis/Article	Basic Competences Scale in Disaster Preparedness	In this study, the effects of gender and experiencing a disaster, on disaster preparedness were examined.	İzmir	406
Hasret Zeren, 2019	Master's thesis	Competencies Scale in Disaster Nursing Management	In this study, the effects of experiencing a disaster and disaster education on disaster preparedness were examined.	İstanbul	430
Kübra Gizem Kuğum, 2021	Master's thesis	Basic Competences Scale in Disaster Preparedness	In this study, the effects of gender, experiencing a disaster, receiving disaster education and disaster drills on disaster preparedness were examined.	Bolu	311
Sevim Karakiş, 2019	Master's thesis	Disaster Preparedness Perception Scale in Nurses	In this study, the effects of gender, experiencing a disaster, receiving disaster education, reading the disaster plan and disaster drills on disaster preparedness were examined.	İstanbul	631
Utku Durgut, 2019	Master's thesis	Competencies Scale in Disaster Nursing Management	In this study, the effects of gender, experiencing a disaster, receiving disaster education and disaster drills on disaster preparedness were examined.	Tekirdağ	450
Yücel Bulut, 2019	Master's thesis	Basic Competences Scale in Disaster Preparedness	In this study, the effects of gender on disaster preparedness were examined.	Tekirdağ	181

Study Selection and Data Extraction

Two independent researchers (FU and BA) assessed the relevance of the identified studies based on titles and abstracts. Any discrepancies were resolved through discussion with a third researcher (MA). Selected studies were systematically coded for parameters like title, author(s), publication year, and location, as well as sample size, and comparison statistics (Table 1).

Statistical Analysis

Data were analyzed using Comprehensive Meta-Analysis software, version 2 (BioStat, Englewood, NJ, USA). Heterogeneity was assessed using the I^2 test, and publication bias was evaluated through Egger's test (Table 2). Sensitivity analysis was also conducted to assess the influence of each study on the overall rate.

Results

Study Selection

Out of 1930 initially identified articles, 22 were selected for full-text review. Ultimately, 7 master's theses and 2 articles met the inclusion criteria and were analyzed, encompassing a total of 3222 nurses. While master's theses typically do not undergo peer review, the authors believe that the research information, data, and conclusions contained therein are pertinent to the scope of this study. Some of these theses may indeed undergo further review by peers, while others may not. It should be noted that the scientific

Table 2. Summary statistics related to the heterogeneity and publication bias

Variables	Heterogeneity statistics				Publication bias	
	Q	P	I^2	Tau^2	Egger	P
Gender	11.3	0.081	46.7	0.009	- 2.41	0.073
Disaster survival status	48.8	0.0001	85.6	0.033	-1.577	0.817
Getting disaster education	10.2	0.116	41.28	0.005	0.109	0.928
Reading the disaster plan	9.0	0.011	77.7	0.035	6.37	0.355
Participate in disaster drill	7.0	0.221	28.5	0.002	-1.86	0.177

Q: Cochran Q statistic for homogeneity test; I^2 : proportion of observed variance that is real (%); Tau^2 : between-study variance in random effect model; Egger: Egger's regression test.

examination of various aspects of disaster preparedness in Turkey is currently under-represented. Incorporating the data from these theses into our study will contribute to the ongoing efforts to enhance disaster preparedness in Turkey within the academic medical community.

Key Findings (Figure 1)

- 1) Gender and Preparedness: No significant effect of gender on nurses' disaster preparedness was found ($P = 0.851$).
- 2) Disaster Experience and Preparedness: No significant impact of disaster experience on preparedness was observed

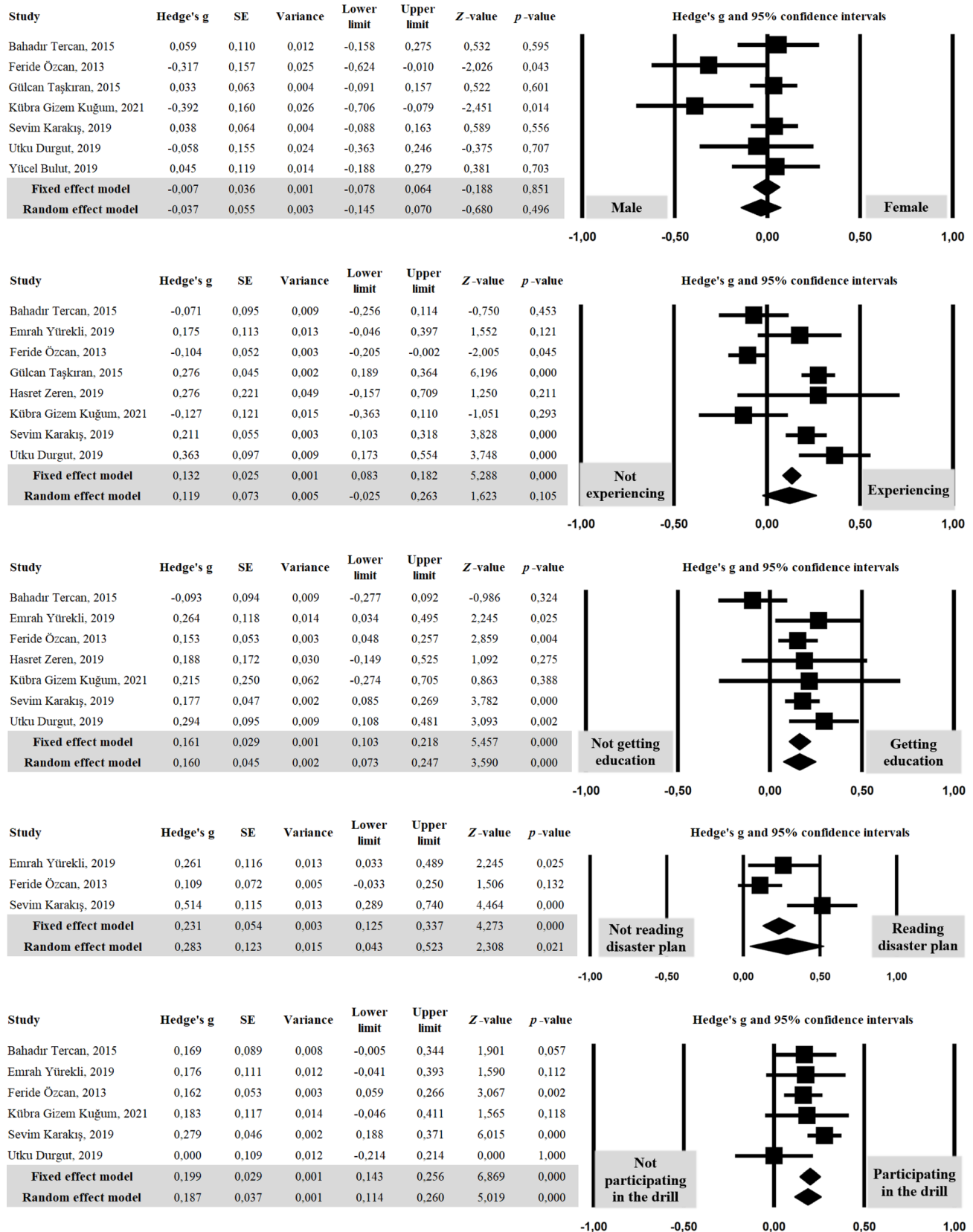


Figure 1. The Meta-Analysis Outcomes of the Impact of Related Factors on Nurses' Disaster Preparedness.

($P = 0.105$). However, sensitivity analysis indicated near-significance when 1 study was excluded ($P = 0.051$).

- 3) Disaster Education and Preparedness: A significant positive effect of disaster education on preparedness was noted ($P < 0.001$).
- 4) Reading Disaster Plans and Preparedness: A significant positive effect was found ($P = 0.021$).
- 5) Participation in Disaster Drills and Preparedness: A significant positive effect was observed ($P < 0.001$).

Heterogeneity and Publication Bias

Significant heterogeneity was detected for “disaster experience” and “reading disaster plans” variables. No evidence of publication bias was found across all variables, confirmed by Egger’s test (Table 2).

Discussion

A previous study underlined a critical gap in nurses’ disaster preparedness, emphasizing the need for better education.⁷ In Turkey, this is a pressing issue as the educational system lacks specialized courses in disaster nursing. Current efforts like in-service training and occasional drills are insufficient given Turkey’s vulnerability to various disasters. This meta-analysis reveals mixed findings on whether prior disaster experience improves nurses’ preparedness. While some studies^{5-6,8-9} found no impact, others^{4,10-11} reported a positive effect. The results are inconclusive, suggesting that experience alone may not be the key factor for policymaking.

Training, however, consistently shows a positive impact on preparedness. Several studies^{6,10-12} confirm that disaster training significantly elevates nurses’ readiness levels. This highlights the need for integrating comprehensive disaster education into both undergraduate and postgraduate curricula. In Turkey, while healthcare institutions have disaster plans, there’s no system to gauge nurses’ familiarity with them. Limited studies^{6,11,12} suggest that reading these plans can improve preparedness, indicating the importance of incorporating this into training programs. Lastly, participation in disaster drills was found to be effective in enhancing practical skills in disaster management. This calls for policies that prioritize such drills and allocate necessary resources. In summary, while individual experience in disasters may contribute to preparedness, it is not sufficient for policy-making. The focus should be on comprehensive education and practical training, supported by policies that ensure regular drills and familiarization with disaster plans.

Consequently, this study sheds light on the key factors affecting nurses’ disaster preparedness, notably the significance of comprehensive training, familiarity with disaster plans, and participation in drills. While the study has limitations, such as the exclusion of master’s theses and a focus on 1 country, it offers actionable insights. Gender was found to be inconsequential, but training and practical exercises stood out as pivotal. These findings underscore

the need for national policies that prioritize disaster nursing education and continuous professional development. In clinical practice, nurses equipped with this specialized knowledge can enhance communication, contribute to effective disaster planning, and ultimately improve patient care and safety during emergencies. Therefore, a multi-faceted approach involving theoretical education, hands-on drills, and active engagement in disaster planning is crucial for preparing nurses for any disaster scenario.

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Ethical Approval. Prior to commencing research, approval (2021/6.44) was obtained from the Non-Interventional Clinical Research Ethics Committee of Selcuk University, Faculty of Nursing, with the meeting held on June 16, 2021.

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