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ISC 05251-58426 Scopus CIVILICA ۲۸ و ۲۷ مهر



Effectiveness of Virtual Reality Simulation in Disaster and Emergency Nursing Education: Impact on Triage Skills, Self-Efficacy, and Disaster Response Competency; A Narrative Review

Code: 1625



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Backgrounds

The situations of disasters and emergencies are complicated and unpredictable for the health sector, causing the need for quick decision-making, appropriate prioritization of patients, and the presence of nursing personnel who have necessary special skills and knowledge, as acquired and developed by them specifically in critical situations. The inability to safely repeat such situations in real conditions makes it apparent that modern methods of education need to be used even more actively compared to the past. Virtual reality simulation gives the chance to practice disaster response-related skills in a safe way using interactive and realistic environment for the skills practiced. The aim of this narrative review was to study the available data about virtual reality simulation efficiency in disaster and emergency training.

Methods

This literature review was performed by searching for relevant documents published between 2018 and September 2026 across multiple databases including PubMed, SID, Web of Science, ScienceDirect, Wiley Online Library, and Google Scholar. The search utilized various terms such as “virtual reality”, “simulation”, “nursing education”, “disasters, and emergencies”, “triage”, “self-efficacy”, “disaster preparedness”, and “competency”. The literature was chosen based on the relevance of studies that evaluated the efficiency of using virtual reality-based educational techniques among nursing students or nurses in emergencies, disasters, and emergency situations. The results obtained from the literature were categorized based on three criteria: performance and skills in triage, self-efficacy and preparedness, and competency and performance in responding to disasters.

Findings

The evidence available has revealed that, in numerous studies, the use of virtual reality-based education has some association with enhanced preparedness for calamities, confidence, self-efficacy, educational outcomes as well as some indicators of competency. In studies linked to triage, the use of virtual environments has led to improvements in the accuracy of triage and in the confidence of students in the processes of decision-making. Moreover, among emergency care nurses, vocational training based on virtual reality led to the enhancement of competencies related to the preparedness for disasters and self-efficacy in the process of disaster response. Nevertheless, the strength of such effects was inconsistent among studies and some research did not discover any difference in cognitive or other aspects as compared to traditional education.

Conclusion

The utilization of virtual reality simulation can be beneficial in the education process of disaster nursing and emergency nursing as it creates a good chance for practicing triage, making decisions in challenging situations, improving individual self-efficacy, and enhancing some aspects of disaster response competence. Nonetheless, the variety of interventions used and the absence of any objective evaluation require carrying out randomized studies with a greater number of participants and follow-up duration. The combination of virtual reality technology with theoretical education, standardized scenarios, and debriefing can form the basis for more effective implementation of this technology in disaster nursing education.



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