

Effectiveness of *Tabletop Disaster Exercise* (TDE) as A Means to Improve The Competence of Medical Personnel in Disaster Emergency Response

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Abstract

Background: Indonesia is one of the countries with a high risk of natural disasters with 20,380 events between 2020-2024. The high number of disasters that occur will have an impact on the high number of casualties that must be handled by medical personnel. Often what happens in the field is the limited number of medical personnel who handle victims, making the impression of poor service for the community and the lack of competence of medical personnel related to disaster management. Therefore, one of the efforts to improve the competence of medical personnel in disaster emergency response is through *Tabletop Disaster Exercise* (TDE) training. **Objective:** To determine the effectiveness of the TDE method to improve the competence of medical personnel in disaster management. **Methods:** The method used was a literature review taken from several sources with a limit of 2018- 2024. **Results and Discussion:** The implementation of training with the TDE method is proven to increase knowledge and competence in disaster management. This is because TDE has several advantages, namely, real scenario-based simulation, a stress-free training environment, and the development of coordination between teams. **Conclusion:** TDE is one of the effective disaster management training methods to improve the competence of medical personnel in disaster management.

Keywords: Disaster simulation; medical personnel; *Tabletop Disaster Exercise*

Introduction

Disasters are a series of events that threaten and disrupt people's lives and livelihoods caused by natural and/or non-natural and human factors, which cause casualties, environmental damage, property losses, and psychological impacts.¹ Indonesia is one of the countries with a high risk of natural disasters such as earthquakes, floods, volcanic eruptions, tsunamis, and many others. This is due to the geologic and geographical location of Indonesia, which is in the tropics and at the confluence of two oceans and two continents.² This is also supported by data in the field, based on Indonesian Disaster Information Data, throughout 2020-2024 there have been 20,380 natural disasters in Indonesia. The high number of disasters in Indonesia will also have a very broad impact, such as the high number of casualties that arise during disasters.

Health care institutions have a crucial role when a disaster occurs, especially in the management system. Disasters that occur can pose their own challenges and art for every existing health service agency ranging from infrastructure, capacity, and readiness from a hospital point of view.⁴ Often, the number of disaster victims who need treatment will be higher than the number of health workers who can provide initial management and treatment, so this has an impact on hospitals that need to spend extra resources to deal with disaster victims.⁵ The results of the UN Conference on Disaster Reduction confirmed that every hospital must operate several facilities immediately to minimize the high mortality rate in disaster victims. However, it is not only hospital facilities that play a role in disaster management, highly competent medical personnel with good initial disaster management knowledge also play an important role in minimizing high disaster casualties.

When a disaster occurs, medical personnel will be the spearhead in handling it. The knowledge and skills possessed by medical personnel related to disaster management will increase the effectiveness of existing services in the hospital. One method to improve the competence of medical personnel in disaster management is through *Tabletop Disaster Exercise* (TDE) training. TDE is an indoor simulation that is used to test the preparedness of medical personnel, various components of disaster management by analyzing the reactions of trainees when completing certain disaster scenarios.⁶ TDE is a simple and systematic concept where trainees can train themselves according to their respective roles by imagining a real disaster situation. TDE can help teams understand specific contingency action plans in disaster simulations. TDE can also train and improve the ability of medical

personnel on roles and responsibilities in disaster simulation and disaster management. TDEs also help teams talk openly about emergency or disaster situations in a stress-free setting. One of the essentials in disaster preparedness is to prepare the best disaster teams through simulated disaster management skills and experience, so that they can work effectively to manage volatile situations during disasters.⁷

Based on the description above, this article aims to find out and also explore more about the effectiveness of the TDE method to improve the competence of medical personnel in disaster management.

Methods

The method used in this article is a literature review where analysis is carried out from various literature sources. The literature search was conducted through google scholar and mendeley sources with a range of years between 2018-2024. The keywords used in the literature search were disaster simulation; medical personnel; and *Tabletop Disaster Exercise*.

Discussion

Tabletop Disaster Exercise (TDE) is a simple and systematic training method conducted on a board or table where participants must complete a realistic disaster scenario presented. Each trainee involved has different roles and responsibilities in the decision-making process based on their knowledge and skills.⁸ With TDE, participants can demonstrate their abilities in scenario-based exercises, mitigation and response against disasters. The purpose of this TDE method is to test the correlation of theoretical and practical abilities of the trainees in responding to situations related to pre-made realistic disaster scenario cases. This training can be used as a tool to evaluate disaster preparedness or training plans or improve disaster management competencies.⁶ Based on the analysis of some of the literature obtained that discusses the effect of TDE training on medical personnel's knowledge of disaster management, it shows a significant effect between before and after the implementation of the training.

Based on research conducted by Addiarto & Wahyusari (2018), TDE has proven to be an effective intervention in improving the skills of medical personnel, especially in disaster management situations. Apart from being evidenced by the increased *pretest* and *posttest* scores, this intervention provides an in-depth learning experience because it allows

participants to practice and develop their ability to cope with emergency situations. In the study conducted, the treatment group that received TDE training showed significant improvement in triage and casualty referral skills compared to the group that received conventional learning. The learning process through TDE does not only involve teaching theory, but also emphasizes active participation of participants through *role play* and *brainstorming*. Through this approach, participants can better understand the flow of communication, victim sorting, and referral routes in disaster management. The simulation helped them envision real field conditions, which significantly improved their practical skills and preparedness for disaster situations. Comparison with conventional methods showed that the use of TDE provided better results, as participants not only learned from the module, but were also directly involved in simulations depicting real situations.⁶

In a study conducted by Husna et al., 2020, TDE conducted on nursing students can significantly improve mindsets and attitudes which make them more prepared and responsive in dealing with disasters. This is also evidenced by the results of the *pretest* and *posttest* scores where the attitudes and knowledge aspects of students have increased, but uniquely the attitudinal aspects of students have a higher increase than their knowledge. Direct experience in conducting TDE increases students' attitudes to be more responsive to disasters significantly. The simulation gives them a vibrant first experience, learning about disaster scenarios first-hand, and being trained to be self-aware and prepared for disasters. Thus, this simulation will have a good impact through increasing students' confidence in handling emergency situations both in the community and in the hospital. The effectiveness of training with the TDE method can open opportunities for various other educational institutions to apply this method to students to instill a disaster response mindset from the start, because Indonesia is an area prone to disasters. This urgency can later become a policy recommendation to encourage educational institutions in Indonesia to conduct TDE as part of knowledge system management in disaster management education, especially in educational institutions related to health programs.⁷

TDE itself has several advantages that make it more interesting and more effective to implement. First, the simulation used is scenario-based which allows participants to experience first-hand how to respond to emergency situations. Secondly, it provides a stress-free training environment where participants can discuss the scenario without worrying about the pressure of a real situation. Third, TDE can help participants to recognize their strengths and weaknesses in disaster management, so that they can develop

the necessary skills to respond effectively.⁷ Fourthly, TDE is not costly as it only requires a board or table, paper, and a facilitator.⁹ And finally, it can bring together various professions that have never worked together before.⁸ Besides these advantages, TDE also has disadvantages, namely that the experience gained by each participant may not be identical because there are various roles that will be performed in TDE.⁹

However, training with simulation methods such as TDE that involves the role of the five senses such as hearing, vision, and action involvement as a form of direct learning of the knowledge that has been learned has proven to have a strong influence on changes in one's competence to do something. This is different from the general educational approach that only looks at a person's cognitive level, which is not optimal if it has to apply it directly to the case.¹⁰

Conclusions

Based on the exposure of various literature above, it can be concluded that the *Tabletop Disaster Exercise* (TDE) training method can significantly improve the competence of medical personnel who take part in the training. Where these medical personnel will be able to hone and also improve their ability to collaborate, and communicate to determine appropriate disaster management strategies in accordance with the emergency response situation experienced. This is also evidenced by the increase in the average score of the respondents after being given the TDE intervention. So that in the future, this TDE method can be recommended as one of the training methods in disaster management.

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