
The Effect of Learning Tabletop Disaster Exercise (TDE) to Improve Knowledge among Nursing Students for Disaster Emergency Response

Mukhamad Fathoni¹, Yuyun Yueniwati Prabowowati Wadjib¹, Widya Addiarto²

¹ Faculty of Medicine, University of Brawijaya Malang

² Magister Nursing Students, Faculty of Medicine, University of Brawijaya Malang

Email address: mfathony@yahoo.com

KEYWORDS

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Abstract Today, the high incidence of disasters requires nurses to increase their role as disaster nursing in emergency response. This is in accordance with standards of the international council of nursing (ICN) that the nurse as a front line in providing treatment of disaster victims. One of the way to do in these situations is to improve the early preparedness in nursing students through disaster education, so that this plan needs a new method for effective and innovative disaster learning. One of the recommendation learning method is simulation with Tabletop Disaster Exercise (TDE). The purpose of this study was to analyze the effect of TDE learning for undergraduate nursing student's knowledge in providing the management of victims in disaster response simulations. This study uses quasy experimental with pre-post test and control group design. The samples are 36 respondents were divided into two groups there are treatment and control groups so that each consisting of 18 respondents. The treatment group were given a TDE simulation, while the control group was given standard simulation and module. The results using paired t-test significantly showed that the differences value of knowledge before and after intervention with difference Pre-test 18 respondents mean 23.89 ± 9.00 and Post test 18 respondents mean 81.67 ± 8.04 Difference Mean (CI 95%) = $57.78 (53.85-61.71)$ in each group indicated by the value ($p=0.000$). The Effect Simulation Standards Knowledge Nursing Students with difference Pre test 18 respondents mean 26.39 ± 9.04 and Post test 18 respondents mean 70.28 ± 10.07 Difference Mean (CI 95%) = $43.89 (38.59-49.18)$. The results from unpaired t-test to identify the difference of knowledge between the two groups after intervention has a significance value ($p=0.000$). This means that there is significant difference of knowledge between TDE simulation and simulation.

Introduction

Natural disasters around the world is expected to nearly every day, the greatest event in the Asia Pacific, which reached 40% of the total disasters in the world with 80% of victims came from the area (Usher & Mayner, 2011). Indonesia is one of Asia which is geographically located in disaster-prone areas.

Based on these data, in accordance with international standards of the Council of nursing (ICN) nurses demanded to serve as disaster nursing in emergency response (ICN 2009). The role puts nurses as health care providers on the front line or direct care provider who is able to play an active role in the handling of victims in disaster response

with the aim to reduce the impact of casualties that may occur (Pang, Chan & Chen, 2009). It is a challenge for nurses because the management of disaster victims on emergency response in some developing countries is not optimal, including in Indonesia (Putra, Petpichetchian and Maneewat, 2011).

One cause of the above conditions is due to nursing education institutions is not maximized in providing the knowledge and skills of nursing students in the management of disaster victims. So, most nursing graduates do not have enough knowledge and skills when they become volunteers at the time of the disaster (Hermawati, Hatthakit & Chaowalit, 2010).

Abdelalim and Ibrahim (2014) stated that at this time the right step in improving the knowledge and skills of nurses is to provide disaster early education to nursing students. The provision of early education for nursing students is expected to increase the knowledge in terms of the management of the real victims of the emergency response. To achieve this, it is required an appropriate learning method, which is the method of simulation. One simulation method that has been developed and modified using a communicative media in learning emergency response is Tabletop Disaster Exercise (TDE).

Simulation method TDE is a method of simulation using the media in the form of a map image catastrophic incident on a flat board or table (tabletop) along with disaster scenarios and comes to the implementation of role play all participants to resolve problems related to the management of victims in disaster response in accordance with scenario which have been made previously (Fyhri, Bjornskau & Ulleberg, 2004). Thus, application of TDE is very effective when applied to the emergency conditions of disaster management in providing disaster victims effectively and efficiently.

The application of learning methods TDE will be expected that is considered in changes in newest curriculum plan of Educational Association of Nurses Indonesia (AIPNI) in 2015 which establishes the addition of subjects Disaster Management with a load of 2 credits in the 7th semester on S1 nursing (AIPNI, 2015). Changes in the nursing education curriculum, support government programs in terms of disaster risk reduction contained in the circular Ministry of National Education No. 70a/MPN/SE/2010 where it contains an appeal to universities to develop courses of disaster or education and training on disaster through extracurricular activities of students (SMEs) (PMI, 2012).

Materials and methods

This study uses quasy experimental design with pre-post test design with control group design. Respondents were divided into two groups, namely the treatment and control groups. The treatment group given simulated learning TDE, while the control group was given standard simulation module. The study was conducted in Nursing Science Program, Faculty of Medicine, University of Brawijaya. The research was conducted in June 2016.

Respondents were bachelor degree (S1) of nursing students in the 6th semester, Nursing Science Program, Faculty of Medicine, University of Brawijaya. A number of 36 respondents were taken by purposive sampling method, with the criteria of active students in the 6th semester, have followed the course of nursing emergency, and are willing to participate in the study by completing the informed consent. The instrument used in this study is a knowledge questionnaire with 20 questions. Data analysis using paired t-test and unpaired t-test and Mann Whitney.

Results and discussions

Characteristics of respondents

Respondents in this study were students of the 6th semester in Nursing Study program

(PSIK) Faculty of Medicine, University of Brawijaya in the 6th semester. Frequency distribution characteristics of respondents are presented in Table 1.

Table 1. Frequency Distribution of Respondent Characteristics

Characteristics	Control		Treatment		(%)
	f	(%)	f	(%)	
Age					
19 years old	1	6	2	11	8
20 years old	5	28	3	17	22
21 years old	8	44	10	56	50
22 years old	4	22	3	16	20
Sex					
Male	6	33	4	22	28
Female	12	67	14	78	72

Knowledge Students Before and After Intervention Simulation Standards

Table 2. Description of Student Knowledge Before and After Standard Simulation Intervention

Knowledge	Mean	SD	95% CI
Pre test	26.39	9.04	21.89 – 30.89
Post test	70.28	10.07	65.27 – 75.28

In Table 2, variable data was presented as respondents' knowledge before and after the intervention in the control group using standard simulation intervention. From the table above (Table 2), it can be seen an increase in knowledge after the intervention using given standard simulation (post test) than before given the intervention (pre-test). The average score early on during pre-test is 26.39 and then the score was increased to 70.28 after intervention in the post test.

Analysis Bivariat

Effects of Tabletop Disaster Exercise (TDE) Simulation to improve Knowledge of Nursing Students

Table 3. Average Difference of Student Knowledge Score Before and After Tabletop Disaster Exercise (TDE) Simulation Intervention

Knowledge	n	Mean ± SD	Mean Difference (CI 95%)	p
Pre-test	18	23.89 ± 9.00	57.78	0.000
Post-test	18	81.67 ± 8.04	(53.85-61.71)	

Based on the analysis using a paired t-test in Table 3, it can be seen that the differences between the mean scores of knowledge before and after the TDE intervention has significance $p = 0.000$ ($p < 0.05$). Therefore, we can conclude there are differences between the mean score

of knowledge before and after the TDE intervention in the treatment group. This may imply that the TDE simulation method can increase student knowledge (mean = 57.78) in providing treatment of victims of the disaster simulation significantly.

*The Effect Simulation Standards Knowledge Nursing Students***Table 4. Mean Difference Score of Student Knowledge Before and After Standard Simulation Intervention**

Knowledge	n	Mean ± SD	Mean Difference (CI 95%)	p
Pre-test	18	26.39 ± 9.04	43.89	0.000
Post-test	18	70.28 ± 10.07	(38.59-49.18)	

Based on the analysis using a paired t-test in Table 4, it can be seen that the differences between the mean scores of knowledge before and after the standard intervention has significance $p = 0.000$ ($p < 0.05$). Therefore, we can conclude there are differences between the mean score of knowledge between before and after the standard simulation intervention in the treatment group. This may imply that the standard simulation methods can also increase student knowledge (mean = 43.89) in providing treatment of victims in the disaster simulation significantly, although it is not as higher as TDE simulation (mean = 57.78).

The Effect of TDE on Students' Knowledge in Giving Victim Management to a Disaster Emergency Response Simulation

Based on the results of research presented in Table 4 mentioned that the value of knowledge variables between before and after given TDE intervention were increased in the treatment group. The difference of mean score of knowledge before and after intervention with paired t-test in treatment group has p value = 0.000. This shows that there are significant differences in knowledge scores before and after intervention. In other words, it can be concluded that the provision of TDE intervention affects the significant increase of student knowledge.

According to Loveleace et al., (2010) tabletop exercise is a simulated learning method performed together with the use of a pictorial media board along with a complete scenario illustrating actual disaster events in an affected area. TDE simulations serve to

improve understanding of a particular condition in the disaster area through discussion or brainstorming together. From the description of the exposure, the participants of the TDE simulation will try to run their respective performances. So, it is hoped that after discussion with participants of TDE discussion, the participants can understand the material well (PAHO, 2011).

The results of the study in table 4 above, is in accordance with the results of research conducted by Chung (2013) in his research involving 175 respondents who were given intervention in the form of tabletop role playing games in the treatment group and electronic games in the control group. 85% of participants with tabletop role playing games had significantly more knowledge increase than respondents with electronic games intervention of 77%. Retention of knowledge is also better in the group of respondents with the intervention of tabletop role playing games.

This increase is due to the game with tabletop role playing games involving individuals actively to participate in simulation together, so get feedback from fellow actors role in the simulation. This feedback will provide an easier picture to be understood or understood by the participants. While the electronic games only involve the individual to learn independently without playing the role together in two directions. Another study was similar to the above results according to Dyson, Chang, Chen, Hsiung, Tseng and Chang (2015) which used an experimental quasy design with

40 respondents divided into control and treatment groups. After getting role play intervention using creativity tabletop respectively significant responder increased in treatment group. Creativity can increase significantly because the cognitive abilities of respondents also increased. This is because with the media of tabletop exercises the respondents are able to imagine (imagine) the real events that occur in accordance with the scenario scenario that has been made before, so that participants easily understand and accept the material easily.

The results of a recent study by Pate, Bratberg, Robertson and Smith (2016) which used respondents of 113 pharmacy students who were given an Emergency Preparedness Exercise tabletop for 3 hours per week for 1 month. The result is the increase of respondents' knowledge about disaster preparedness and the pharmacy role in the emergency response phase reaches 73%-75%. In addition, respondents also experienced increased awareness level and willingness to participate in emergency response by 85%.

Conclusion

Conclusions

1. There was an increase in the value of knowledge between before and after intervention in the TDE treatment group. Increased knowledge gained between before and after treatment has a significant difference.
2. There is a significant difference in values increase in the knowledge variables

Recommendations

1. Use of Tabletop Disaster Exercise (TDE) can be an input for the institution about the use of simulation methods in space that are effective and attractive to increase the knowledge and skills and preparedness of nursing students in emergency response.

2. TDE Media can be used as one of the complementary methods used as an effort to realize the implementation of the 'Disaster Nursing' curriculum which is the implementation of the AIPNI program to prepare nurse students who are sensitive and responsive to the disaster.
3. Need further research on the effect of TDE on nurses in disaster prone areas to assess nurse knowledge and skills and nurse preparedness in the area in emergency response management.
4. Further research is needed related to TDE simulation using victim close to real condition in the field.

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