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Original Research

Improved Emergency First Aid Knowledge Level Through Training With Algorithm-Based Accessibility Simulation Model

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ABSTRACT

Background: *Emergency situations can arise from various diverse conditions, can come from natural conditions, humans and technological advances that have an impact on the emergence of disasters, accidents and diseases that threaten life or cause disability. Every individual in the community needs to know the flow of accessibility in an effort to seek help and the steps to provide first aid, so it is very necessary to attend training. This can be done by participating in an algorithm-based accessibility simulation model training.*

Methods: *This type of research is a comparative experimental study with a pretest-post test design with a control group with a cross sectional approach. The respondents involved are special lay people (members of linmas in the city of Surakarta). The sampling technique used was random sampling by spreading invitations to respondents, so that 110 respondents agreed. This research instrument was tested for expert validity, namely practitioners and academics of emergency nursing, totaling 3 people. Data were analyzed by t-test with the help of a computer*

Results: *The results showed an increase in the value of 4.4 from the pretest (Mean = 73.5) and posttest (Mean = 77.9) and the t test results showed the value of Sig. (2-tailed) is 0.00 so it can be concluded that there is a significant difference between the pretest and posttest values.*

Conclusion: *Training with an algorithm-based accessibility simulation model can significantly increase knowledge related to the emergency field. So it needs to be recommended to be carried out gradually, continuously and thoroughly to community members.*

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INTRODUCTION

Disasters are a series of incidents that threaten and disrupt life caused by natural, non-natural and human factors that result in loss of life, environmental damage, property loss, and have a psychological impact (Pemerintah Republik Indonesia, 2007). Natural disaster in Indonesia can arise due to the fact geographically it's far positioned on the confluence of 4 tectonic plates, particularly the Pacific Plate, the Eurasian Plate,

the Indian Ocean-Australia, and the Philippines (Majelis Guru Besar ITB, 2009). Another condition is that there are volcanic belts and mountains and lowlands on the southern and eastern parts of Indonesia that stretch from Sumatra, Java, Nusa Tenggara and Sulawesi (Mohd. Robi Amri et al., 2016).

Part of the social space that was once occupied with the help of ethical panic is full of half-hearted social fears, anxieties and fears. These are nourished by certain risks: rising new "techno fears" (nuclear, chemical, biological, toxic and ecological dangers), risk of illness, food panic, when traveling by train or plane. Fear of security, and fear of international terrorism (Cohen, 2002).

A study entitled Social Panic with the Appearance of Covid19 found that digital media and television news caused panic during the COVID 19 disaster. Among other things, mortality, lack of goods, crime, and rejection of corpses. If this panics people's initial alertness and leads to various social deviations (Purba, 2020).

In a disaster or emergency situation, emergency services are urgently needed, namely medical actions needed by emergency patients in an immediate manner to save lives and prevent disability. So that it is closely related to the Integrated Emergency Management System (SPGDT) which is an integrated and call center-based emergency victim/patient service mechanism using the telecommunications access code 119 (Kementerian Kesehatan RI, 2016). Community competence as a first responder is expected to improve the quality and sustainability of advanced assistance In individuals in the community including in lay groups that voluntarily provide emergency assistance is a form of Community First Responder (Phung et al., 2018).

Disaster management is the responsibility of all parties (all businesses), as every individual is at risk of a potential disaster. Therefore, in order to prepare all individuals, we need to know their roles and responsibilities (sharing responsibilities) (Supartini et al., 2017). Research with the topic The Influence Of First Responder Emergency Training On The Behavior Of Security Officers In The Handling Of Emergency Casualties showed that the results of providing First Responder Emergency Training training can improve the behavior of security officers which includes knowledge, attitudes and especially the actions or skills of security officers (Satpam) in handling emergency victims (Mulyadi, 2018).

By providing links to regional emergency service centers / cities, public security centers (PSC), people in the community, who are first responders essential to the safety of survivors receiving assistance, play an important role (Kementerian Kesehatan RI, 2016). Call Center 119 is a means of asking for help for individuals in the community who know and experience medical emergencies by contacting (Kementerian Kesehatan RI, 2016). Simulation models are trained in situations where scenarios are created by presenting lessons by explaining real-world situations using artificial situations so that one can understand the nature of a particular concept, principle, or skill. How to do it.

Simulation models give students the opportunity to engage directly as an actor (simulator) or as an observer who evaluates and observes the course of the simulation and learns lessons from the simulation (Ahmadi & Pasetya, 2005). An algorithm model is an attempt at a series of logically and systematically arranged operations to solve a problem in order to create an algorithm (Supartini et al., 2020).

MATERIAL AND METHOD

The research was conducted in the city of Surakarta from January to October 2020. This type of research is a comparative experimental study with a pretest-post test

design, namely by real treatment of respondents, namely training with an algorithm-based accessibility simulation model. The population in this study was the general public (members of community protection/Linmas) totaling 800. The sample in this study was determined by several criteria that must be met, including being healthy, willing to participate until the end of the activity, having and being able to operate an android. Finally obtained respondents according to the criteria of 110.

The instrument used in the research is in the form of a questionnaire. Where the questionnaire has received assessments and consultation results related to content validity by 3 resource persons in the field of emergency nursing and disaster management. The validity test was carried out on 20 respondents, with a significance (r table) of 0.444. The acquisition of the calculated r number in the knowledge questionnaire test, the highest score was 0.790 and the lowest value was 0.454. From this validity test, it was found that the calculated r was greater than r table, meaning this data is valid.

The reliability test of the knowledge questionnaire got an alpha value of 0.745. from this reliability test it can be concluded that the alpha value > r is critical (0.60). So the knowledge questionnaire in this study is reliable. The data were analyzed by t-test with the help of a computer. Ethical Clearance was obtained from the Health Research Ethics Committee (KEPK) RSUD Dr. Moewardi Surakarta on June 30, 2020 with the number 827/VI/HREC/2020

RESULTS

Characteristics of Respondents were described base on gender, age and education.

Table 1. Characteristics of Respondents

Carateristic Responden	Frequency	Frequency	Percentage (%)
Gender	Male	87	79.1
	Female	23	20.9
Age	17 – 25	7	6.4
	26 – 35	38	34.5
	36 – 45	42	38.2
	46 – 55	23	20.9
Education	Elementary school	2	1.8
	Junior high school	12	11.0
	Senior High School	67	60.9
	Higher Education	29	26.3
Total	**110**	**110**	**100.0**

Based on table 1, out of 110 respondents, 87 male (79.1%) and 23 female (20.9%). Characteristics of Respondents Based on Age (Indonesian Ministry of Health, 2009) consisting of ages 17-25 years 7 (6.4%), 26-35 years 38, (34.5%), 36 – 45 years, 42 (38.2%) and 46 – 55 years 23 (20.9%). Finally characteristics of Respondents Based on Education consisting of elementary school education 2 (1.8%), junior high school 12 (11.0%), Senior High School 67 (60.9%) and Higher Education 29 (26.3%)

Table 2. Influence Of Training With Algorithm-Based Accessibility Simulation Models

Mean Pretest	Mean Postest	Difference increase	Mean Pretest	Mean Postest
73,5	77,9	4.4	126,6	0,00

Table 2. Indicates an increase in the value between pretest and posttest by 4.4 and the test result t shows a Sig value. (2-tailed) is 0.00 so it can be concluded that there is an increase in knowledge after training with an algorithm-based accessibility simulation model significantly.

DISCUSSION

The results showed that training with algorithm-based accessibility simulation models can increase knowledge related to the field of emergencies. The first aid training materials presented contain, among others, understanding, purpose, benefits and sequence of first aid steps (algorithms).

Previous research delivered simulation methods greatly affecting students' knowledge and confidence in applying Advance Cardiac Life Support (ACLS) knowledge (Tawalbeh & Tubaishat, 2013). Another study found that simulation methods have a positive effect on improving knowledge, confidence and clinical skills. Furthermore, the simulation method also improves critical thinking skills for nursing students in learning Cardio Pulmonary Resuscitation (Wingen et al., 2018).

Direct simulation methods with a scenario have a positive impact on the improvement of their main abilities in the psychomotor realm. A large classroom teaching activity framed in natural disaster simulation methods is acceptable and highly effective for medical students to develop the non-technical, cooperation, negotiation and communication skills that are essential for team work. By providing short educational sessions for teenagers in CPR can improve their self-confidence (Abelsson et al., 2020).

Simulation design can be a plus in medical schools in disaster-prone areas, including in developing countries and as a viable intervention to learn the non-technical skills necessary for patient safety (Huber et al., 2021). Simulation has become a mainstay in the education of not only health care professionals but many different professions around the world. As our global medical knowledge continues to evolve, and our technological and social advances continue to expand, the idea of learning in living patients becomes a less preferred method for teaching medical professionals (Everson et al., 2020).

Respondents' knowledge includes the knowledge to ask for first aid from those who have the authority and competence to help. In accordance with the results of previous studies obtained data that integrated first aid training with instructors directly from PSC119 groups can enhance public confidence in accessing PSC 119 services. The first aid training materials provided cover the goals and benefits of first aid for the safety of the victims or survivors the ability to successfully communicate with aid easily self-reliances information when requesting services the importance of the first aid workers role in providing first aid PSC 119 referral services to the community in implementing the SPGDT and requesting first aid procedures if first aid workers find survivors as well as first aid procedures given y lifeguards while waiting for ambulance to arrive (Sunarto & Harnanto, 2021).

An algorithm is essential to guide a first aid simulation. Based on previous research it was found that the use of algorithms was very helpful. Between the treatment and control groups, there are considerable changes in the value of roles and competencies. The simulation group has a higher value for their role and competency as a result of algorithm learning than the control group (Harnanto & Sunarto, 2019).

The results of previous studies show that simulation-based nursing education has a strong impact on education. The greatest effect can be seen in the psychomotor area. Moreover, the effectiveness of simulation-based nursing education is not proportional to the level of loyalty. Therefore, it is important to achieve all educational goals and results using all appropriate levels of simulation (Kim et al., 2016).

CONCLUSION

Training with an algorithm-based accessibility simulation model can significantly increase knowledge related to the emergency field. So it is necessary to recommend that it be carried out gradually, continuously and thoroughly for community members.

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