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Improving Communication Accessibility to Public Safety Center 119 Through Integrated Simulation

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Accessibility; Communication; Integrated Simulation ; Public Safety Center 119

ABSTRACT
Emergencies caused by disasters, accidents, and diseases carry risks ranging from disability to death. Rapid emergency assistance is essential to mitigate these risks, with first responders playing a vital role. The Public Safety Center (PSC) 119 serves as a key access point for emergency response, yet public awareness and understanding of how to access it remain limited, particularly among heterogeneous communities. Integrated simulation has emerged as a promising strategy to improve communication accessibility to emergency services. This research aims to analyze the improvement of communication accessibility to Public Safety Center 119 through integrated simulation. The research employed an experimental design with a pretest-posttest model. A total of 217 participants from the general public in Surakarta City, including members of the Volunteer Corps, health cadres, and neighborhood security (Linmas), were involved. Data were collected using questionnaires and analyzed via t-test. Statistical analysis revealed a significant increase in communication accessibility scores following the integrated simulation, with a Sig. (2-tailed) value of 0.00. The mean pretest score of 73.5 (medium category) rose to 77.9 (high category) in the posttest, reflecting an improvement of 4.4 points. Integrated simulation effectively enhances communication accessibility to Public Safety Center 119. It is recommended as a practical and impactful approach to raise public awareness, improve emergency access, and strengthen community preparedness in emergency response systems.

INTRODUCTION

Emergencies everywhere are influenced by vulnerability to disasters, accidents, and illness. The risks of these events range from disability to death. A concrete step that can be taken to reduce these risks is the rapid arrival of assistance. First responders play a vital role in disaster relief efforts (Baldini et al., 2013; Yu et al., 2018).

The existence of Public Safety Centers (PSC) 119 in each region is a key access point for emergency response services, facilitating access to health services (Astuti Ramadhana et al., 2019). However, not all members of the public, especially the general public, are aware of their existence, so it is crucial to find ways to ensure public awareness of their existence and access. Therefore, appropriate outreach is essential for community human resources to be able to respond in the event of an emergency (Amin et al., 2023; Kamesyworo et al., 2024; Sunarto &

Harnanto, 2021). Integrated simulations are one option that can be implemented, but further study and research are needed to determine their potential impact (BNPB, 2014).

Previous studies have highlighted the effectiveness of simulation-based training in improving emergency response skills and knowledge (Abbas et al., 2023; Hamdi & Al Thobaity, 2023; Hu et al., 2022). For instance, simulation in nursing education has been shown to significantly enhance psychomotor skills and confidence (Kim, Park, & Shin, 2016). Similarly, Tawalbeh & Tubaishat (2014) demonstrated that simulation improves knowledge retention and confidence in Advanced Cardiac Life Support (ACLS). In the context of disaster preparedness, Wingen et al. (2018) found that simulation training improves non-technical skills such as communication and teamwork, which are critical in emergency situations. However, there remains a gap in research focusing specifically on the use of integrated simulation to improve communication accessibility to public safety centers such as PSC 119.

The results of a preliminary study conducted in Surakarta City showed that most respondents were unaware of PSC 119 and lacked understanding of how to access it (Angki, 2025; Irwanto et al., 2023). This indicates an urgent need for interventions that can enhance public knowledge and accessibility regarding emergency services (Moslehi et al., 2022). Integrated simulation, which combines training, socialization, and live demonstration, offers a promising approach to address this gap.

The objective of this research is to analyze the improvement of communication accessibility to Public Safety Center 119 through integrated simulation, by measuring the level of public knowledge and awareness before and after the training, evaluating the effectiveness of integrated simulation in enhancing communication access, and identifying key components of simulation that contribute to improved emergency response. This study is expected to provide theoretical contributions to the development of simulation-based public safety literacy, as well as practical benefits for local governments and disaster management agencies in designing effective training programs to enhance community preparedness, accelerate emergency response, and reduce the risk of mortality due to delayed treatment.

METHOD

This research implemented a comparative experimental study with a pretest-posttest design, allowing the results to be obtained after the integrated simulation treatment. The sample consisted of the public specifically in Surakarta City. The sampling method used random sampling through the distribution of invitations to the public, specifically members of the Voluntary Corps, Health Cadres, and Linmas Kelurahan throughout Surakarta City. Of the 300 invitations distributed, 217 members of the public agreed to participate in the data collection activities. The research instrument used was a questionnaire. Content validity was established by consulting with three practitioners in the field of pre-hospital emergency care to assess the suitability of the instrument with the research objectives and respondent characteristics, and the questionnaire was recommended for use in this study. The analysis technique applied was a difference test. Ethical approval for this study was obtained from the Health Research Ethics Commission of Dr. Moewardi Hospital with number 827/VI/HREC/2020 on June 30, 2020.

RESULTS AND DISCUSSIONS

The results of the study show that the distribution of respondent characteristics is as follows:

Table 1. Frequency Distribution of Respondent Characteristics

	Frequency	%
Gender		
Man	137	63.1
Woman	80	36.9
Age		
<20 years	13	6.0
20-30 years	148	68.2
31-40 years	30	13.8
41-50 years	18	8.3
> 50 years	8	3.7
Work		
Community Protection	110	50.6
Students	72	33.1
civil servant	21	9.6
Housewife	10	4.9
Self-employed/Trader	4	1.8
First Aid Training		
Have you ever had first aid training?	156	71.9
Never had first aid training	61	28.1

Source: Primary Data (2020)

Table 1 shows that the majority of respondents were men aged 20-30, educated and employed. Most respondents had attended first aid training.

Table 2. Accessibility Score

	Frequency	%
Pretest		
Tall	93	42.9
Currently	106	48.8
Low	18	8.3
Posttest		
Tall	145	66.8
Currently	67	30.9
Low	5	2.3

Source: Primary Data (2020)

Based on table 2, there was an increase in the average number of respondent groups with accessibility values. high between *pretest* and *posttest*

Table 3. Results of Differential Test

Mean Pretest	Mean *Posttest*	Difference increase	t value	Sig. (2-tailed)
73.5	77.9	4.4	126.6	0.00

Source: Primary Data (2020)

Table 3 shows that the P value is 0.00. Therefore, it can be concluded that there is a clear difference between the pretest and posttest results.

Pretest results showed that the value of communication accessibility with PSC 119 services was in the medium category (Mean = 73.5) and there was an increase after the simulation of 4.4 points to 77.9 in the high category. The components of the sub-variable of communication accessibility with PSC 119 services that were measured were the perception of the general public specifically in believing in the benefits of first aid for the safety of victims or survivors, ease in carrying out help communication, confidence in requesting services, the importance of the role of first responders in providing first aid, PSC 119 coaching services for the community in implementing SPGDT and procedures for requesting first aid if the first responder finds a survivor or victim. Meanwhile, an integrated simulation is a simulation that involves cooperation between the public specifically as partners of PSC 119 who must prepare themselves as first responders with PSC 119 management as the provider of first and further aid services for survivors or victims who experience emergency conditions reported by the public specifically. The simulation technique is through joint training, instructors from PSC 119 conduct socialization related to service management, types and limitations as well as the scope of services to the general public specifically. The simulation is equipped with a live demonstration of how to communicate with PSC 119 if you find survivors or victims and what first responders should do at that time. waiting for PSC 119 service to arrive (Putri et al., 2020)

Based on the analysis, there was a significant improvement between the pretest and posttest. This indicates that the integrated simulation activity was very successful in achieving satisfactory results. The integrated simulation method is a teaching method that can be applied in group learning. Furthermore, in the simulation method, students are invited to participate in several behaviors deemed relevant to the learning objectives. (Huber et al., 2021) . Patient safety is a common reason for conducting simulations, and simulation is a preferred teaching modality. Furthermore, research has shown that appropriately constructed simulation learning objectives and scenarios are as effective, and in many cases, more effective, than traditional teaching methods used in healthcare provider education (Pandian et al., 2020) .

The research results produced by Tawalbeh & Tubaishat, (2014) show that this research provides additional evidence supporting that the use of simulation has a major impact on students' understanding and confidence in applying Advanced Cardiac Life Support (ACLS) knowledge.

The results of this study support previous findings showing that the use of live simulation methods with specific scenarios has a positive impact on skill development, especially in psychomotor aspects. Teaching activities in large classes implemented using natural disaster simulation methods have proven to be acceptable and highly effective for medical students in improving non-technical skills, cooperation, negotiation, and communication, all of which are crucial for teamwork (Blaikie et al., 2014; Mendonça et al., 2016). Simulation designs can provide added value to medical educational institutions in

disaster-prone areas, including developing countries, and serve as a viable method for learning non-technical skills needed for patient safety. (Wingen et al., 2018) .

Research by Kim, J., Park, J., & Shin, S. (2016) shows that simulation-based nursing education has a significant impact on learning. A significant impact is seen in psychomotor aspects. In addition, the influence of simulation-based nursing education is not proportional to the existing level of compliance. Therefore, it is very important to use various levels of appropriate simulation so that all educational goals and outcomes can be achieved. The Institute of Medicine reported that in the paper "To Err is Human" it was stated that simulation is recognized as one way to improve safety in the medical sector, similar to how flight simulation is applied to improve safety in the aviation industry. However, although there is evidence that simulation can improve the ability to perform tasks, there is little evidence to show that simulation actually has an impact on patient outcomes. Similarly, currently simulation is also used as a model of team skills and communication to manage disasters and emergency situations, but there is little research or evidence to show that simulation can improve disaster response or facilitate communication between systems. Simulations include the use of standardized patient interactions, robot-mannequins, and computer-controlled virtual environments. Thus, the field of simulation encompasses a wide variety of interactions, from encounters between patients and medical personnel to encounters with larger systems and institutions.

In a literature review conducted by Kim et al. **(** 2013) , a total of 52 studies were included. Twenty-one quasi-experimental studies and 25 studies used simulation. These studies examined knowledge and problem-solving skills in the cognitive domain; self-efficacy, learning satisfaction, interpersonal relationships and communication, and self-confidence in the affective domain; and evaluation of clinical performance abilities and learning achievement in the psychomotor domain. This systematic literature review revealed that simulation is useful in nursing education but found gaps in the literature related to the transfer of knowledge to performance and how to learn from cognitive reflection. Simulation has become a mainstay in the education of not only healthcare professionals but many different professions worldwide. As our global medical knowledge continues to grow, and our technological and social advancements continue to expand, the idea of learning on live patients becoming a less preferred method for teaching medical professionals is necessary (Everson et al., 2020) .

Participants who participate in simulation training are more confident and able to quickly identify diagnoses and initiate emergency care. Using simulation to train students to perform better in emergencies and improve their decision-making is promising, but further quantitative studies are needed (Everson et al., 2020) .

The entire premise of simulation is to provide students with a library of experiences to draw upon so that when a particular situation is encountered during real-time patient care, it is not the first time the student has encountered a similar situation. Simulation allows students to gain experience, comfort, and proficiency without having to evaluate patients with specific, rarely encountered pathologies or scenarios. Furthermore, simulation is an excellent avenue for

maintaining procedural, clinical, and non-clinical skills and can be used throughout one's professional career (Davis & Warrington, 2020) .

Limitations

The researchers acknowledge several limitations in conducting this research, including observations conducted only during data collection and the lack of long-term observation. The sample size was limited to Surakarta City, making it unable to reflect the broader situation. However, these results could potentially be applied across Indonesia.

CONCLUSION

This study demonstrates that integrated simulation effectively improves communication accessibility to Public Safety Center 119 in Surakarta City, as shown by significant increases in posttest scores reflecting enhanced public awareness, knowledge, and confidence in accessing emergency services. The results support prior research indicating simulation's positive impact on both technical and non-technical emergency response skills, including communication and teamwork. Limitations include its focus on a single geographic area and lack of long-term follow-up to measure knowledge retention. It is recommended that local governments, disaster management agencies, and PSC 119 management institutionalize such simulation programs within community preparedness training. Future research should extend to diverse regions in Indonesia and employ longitudinal designs to assess sustained effects on real-world emergency responses. Exploring digital or hybrid simulation formats could also improve accessibility and engagement, particularly among younger, tech-savvy populations, enhancing public safety and potentially saving more lives.

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