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The Effect of Simple Triage and Rapid Treatment (START) Training on Cognitive, Affective, and Psychomotor Skills in Performing START Triage Among Medical Staff and Healthcare Professionals

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Abstract**:** *The increasing incidence of disasters globally underscores the importance of preparedness to minimize errors during disaster triage. Inadequate triage can elevate mortality and disability rates. The commonly used and easily applicable triage system is known as the START method. Currently, there is no effective training available for medical and healthcare professionals to enhance cognitive, affective, and psychomotor skills in the context of disaster triage. This study aims to understand the significance of Simple Triage and Rapid Treatment (START) training on cognitive, affective, and psychomotor skills in performing START triage among Medical and Healthcare Professionals at Cangkringan, Pakem, and Turi Health Centers. The research design employed in this study is a quasi-experiment utilizing a pre- and post-test without a control group design. The respondents for this study are medical and healthcare professionals at Puskesmas Cangkringan, Pakem, and Turi, totaling 43 individuals. The intervention applied involves providing START triage training conducted over one day. Both pre-test and post-test assessments are carried out on the same day, with the post-test immediately following the completion of the training. While this approach may not fully capture long-term knowledge, attitude, and skill improvements, it is useful for assessing the direct impact of the training. Data collection involves the use of cognitive and affective questionnaires, along with a psychomotor observation sheet. The data analysis is conducted using a paired t-test. There is an increase in the average scores for cognitive (57.21 vs. 78.60), affective (33.56 vs. 36.35), and psychomotor (18.98 vs. 23.02) aspects before and after the training. The training in Simple Triage and Rapid Treatment has a significant influence on the cognitive ($p < 0.001$), affective ($p < 0.001$), and psychomotor ($p < 0.001$) skills of medical and healthcare professionals in performing START triage. The START training is crucial and should be conducted in every community health center (puskesmas) to enhance the competence of medical and healthcare professionals in performing START triage.*

*Keyword***:** *affective, cognitive, health professionals, medical personnel, psychomotor, Triage training*

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INTRODUCTION

The occurrence number of natural disasters continues to rise globally each year, with a 13% increase in frequency reported in 2021 compared to previous years (OHCA, 2022). The 2022 report from the National Disaster Management Agency (BNPB) states that Indonesia's most frequent disasters occur in

the Java Island region. One of the areas on Java Island prone to natural disasters is the Special Region of Yogyakarta (DIY), with 68% of its area at risk. The Indonesian Disaster Risk Index (IRBI) in 2020 ranked DIY as the 20th area in Indonesia with a high-risk classification. In DIY, the threat of disasters primarily resides in Sleman Regency, with Mount Merapi's eruption being one of the most significant threats.

The 2010 eruption of Mount Merapi was the most significant in the last century, marked by pyroclastic flows and lava avalanches predominantly impacting four regencies, including Sleman Regency. In line with the disaster-prone map in Sleman Regency, three sub-districts are vulnerable to (Kurniyanti, 2012). Mount Merapi's eruption: Cangkringan, Pakem, and Turi. Health centers located in these vulnerable areas include Cangkringan Health Center, Pakem Health Center, and Turi Health Center (Aji et al., 2022).

The eruption of Mount Merapi has had a significant impact on public health, both directly (primary) and indirectly (secondary). Primary impacts include injuries and deaths due to hot clouds, lava flows, ash rain, sand rain, and exposure to toxic gases. Meanwhile, secondary impacts often occur later, such as cold lava floods that hit river basins originating from Mount Merapi. However, the urgency of improving health energy triage skills has not been strongly illustrated. In fact, in a disaster situation like this, unpreparedness or lack of triage skills can lead to slow handling of victims, a buildup of patients, and an increase in the number of deaths that could actually be prevented. This condition indicates a serious problem in the disaster management system, especially in the early stages of medical treatment. Therefore, effective triage skills are an important priority in improving a fast, precise, and organized disaster response. Without these skills, the potential for loss of life due to delayed handling will be even higher, making triage training and competency improvement an agenda that cannot be postponed (Goniewicz et al., 2021).

Several consequences of the Merapi eruption highlight the importance of disaster preparedness to reduce errors in managing disaster *triage* (Kurniyanti, 2012). Medical personnel and health workers in health centers are prioritized for emergency response due to limited manpower. Emergency response aims to reduce the increase in casualties. Medical personnel's and health center workers' roles in disasters involve categorizing victims based on their emergency conditions' severity (Widayatun & Fatoni, 2013).

Triage is the process of categorizing victims based on their injury severity or ABC (*Airway, Breathing, and Circulation*) status. The commonly used and easily applicable triage system is the START method (*Simple Triage and Rapid Treatment*). This *triage* method categorizes victims using color-coded labels: red, yellow, green, and black (Almeland et al., 2022). Studies by Tevis et al. (2022) have shown that the START *triage* model is widely used in hospitals to quickly and accurately assess patients. The advantages of using the START *triage* include its simplicity, relying on the principles of *respirations, perfusion, mental status*, and the use of only four color-coded labels (red, yellow, green, and black) (Astuti & Milkhatun, 2023).

Ineffective or incorrect application of START *triage* can delay transporting victims to health facilities, leading to increased fatalities and disabilities (Bijani & Khaleghi, 2019). Incorrect *triage* can result in prioritization errors, leading to delays in assisting victims and increasing casualties. However, there is still no systematic and standardized training available for healthcare workers in disaster-prone areas to comprehensively improve their disaster triage competencies (Connor et al., 2014).

Improved disaster victim management can shorten the time between injury and medical care, reducing morbidity and mortality rates. In disaster situations where resources are insufficient to treat all victims, the best resources should be used to treat those most likely to survive (Lampi *et al.*, 2018). Effective disaster triage is a critical component of emergency response systems and is typically initiated by first responders who are trained in rapid assessment procedures (Bazyar et al., 2020). Recent literature highlights the increasingly central role of medical personnel and health workers, including first responders, in mitigating the impacts of disasters through timely interventions (Taryudi, 2021). Moreover, evolving health policies now emphasize the strategic importance of equipping health workers with competencies for both local and global disaster scenarios, reflecting a shift toward

preparedness as a core health system objective (Melnikov et al., 2014). Despite these advancements, a gap remains in standardized, globally adaptable training models, underscoring the need for innovative, evidence-based approaches to optimize triage outcomes. This study seeks to contribute to that development by exploring novel strategies for improving triage effectiveness among health responders.

Training is a method to enhance individual or organizational capacities (Noe, 2017). The effectiveness of training can be evaluated using Bloom's taxonomy, encompassing *cognitive, affective,* and *psychomotor* domains (Nafiati, 2021). Research by Pesiridis et al. (2015) indicated that training can improve disaster triage knowledge; however, the present study offers a novel contribution by integrating a structured training model using a combination of lecture, demonstration, and hands-on practice specifically tailored for primary healthcare workers in disaster-prone areas like those surrounding Mount Merapi. Unlike previous studies that often focused on hospital-based settings or used only theoretical approaches, this study emphasizes real-practice simulations in a primary care context, highlighting its applicability and relevance in frontline emergency response. This makes the training more context-specific and potentially more impactful in improving readiness in actual disaster scenarios. indicated that training can improve *triage* disaster knowledge. Consistent with Noh et al. (2018) research, which underscores the importance of *Simple Triage and Rapid Treatment* training despite its high visibility and costs, this training plays a vital role in disaster preparedness. START *triage* training is expected to enhance the competence of healthcare workers in disaster victim triage in potentially disaster-prone areas (Chumvanichaya et al., 2025). Therefore, this study aims to evaluate the effectiveness of START training in improving healthcare workers' competencies across cognitive, affective, and psychomotor domains..

METHODS

Research design

This study is a quantitative research with a quasi-experimental pre and post-test design without a control group.

Location setting and sample

This research was conducted at the Pakem Community Health Center in October 2023. The population under study encompassed all medical personnel and healthcare professionals working at the Cangkringan, Pakem, and Turi Community Health Centers. A total of 43 participants who met the inclusion criteria were selected as the sample, which is considered adequate for an experimental design. Inclusion criteria include: (1) working at the Cangkringan, Pakem, and Turi Community Health Centers, (2) willing to participate as respondents. Exclusion criteria encompassed medical personnel and healthcare professionals on leave or currently ill. The sampling technique utilized was convenience sampling. The sampling technique utilized was convenience sampling, considering the practical constraints and accessibility of respondents across several community health centers (Puskesmas). Although the respondents were spread across multiple clusters, this method was chosen due to limitations in time, resources, and the need for voluntary participation during working hours. Convenience sampling allowed the researchers to efficiently gather data from available and willing health workers while maintaining the representativeness of various professional backgrounds within the selected health centers.

Intervention

The training module consisted of standardized materials covering disaster concepts, triage principles, and the START triage system. The intervention was delivered over a 4-hour session in a structured format that included three main stages: a didactic lecture to strengthen cognitive understanding, a guided demonstration by the trainer to introduce procedures visually and sequentially, and a hands-on practice session where each participant individually performed the START triage steps under observation. This final stage was critical for enhancing psychomotor skills, as participants were actively involved in simulating triage on disaster victims using role-playing scenarios and mannequins. Pre-test and post-test assessments were administered on the same day to

evaluate immediate changes in cognitive, affective, and psychomotor domains. To ensure consistency, the training was delivered by the same trainer using identical materials and held in a standardized environment across all groups.

Data collection and measurement

The instruments used in the study consist of cognitive and affective questionnaires, along with a psychomotor observation sheet. These instruments were developed by the researcher based on the training module. The cognitive instrument comprises 10 multiple-choice questions, with a score of 10 for correct answers and 0 for incorrect ones. The affective questionnaire consists of 10 questions rated on a Likert scale, offering four responses: (1) strongly disagree, (2) disagree, (3) agree, and (4) strongly agree. Meanwhile, the psychomotor observation sheet includes 12 items, assessed with a score of 1 for incorrect and 2 for correct observations.

The researcher tested the validity of the instrument content through expert assessment by three experts in the field of emergency and triage from Gadjah Mada University, Dr. Sarjito General Hospital, and BPBD Yogyakarta using the V. Aiken assessment. The resulting values ranged from 0.89 to 1.00, indicating a very high level of content validity. Construct validity testing involved 100 healthcare workers using biserial correlation for the cognitive questionnaire and Pearson product-moment correlation for the affective questionnaire, both of which showed significant item validity (r-values ranging from 0.36–0.85, all > r-table of 0.195)

The data collection commenced by explaining the research and asking for medical personnel and healthcare professionals' willingness to participate. If they agreed, they were requested to fill out an informed consent form. During the pre-test phase, healthcare professionals were asked to complete cognitive and affective questionnaires to assess their baseline knowledge and attitudes regarding START triage. Concurrently, a monitoring evaluator consisting of an experienced clinical instructor observed and rated participants' psychomotor skills using a checklist as they performed a simulated triage scenario. After completing the pre-test, participants received a structured training session that included an interactive lecture for conceptual understanding, a coach-guided understanding to model proper triage procedures, and individual hands-on practice to reinforce psychomotor skills in performing START triage. Following the training, the researcher collected post-test data by having the healthcare professionals fill out the cognitive and affective questionnaires, and evaluators observed their ability to perform START triage.

Data analysis

Data from the pre-test and post-test on cognitive, affective, and psychomotor domains were analyzed using SPSS, specifically employing the Paired T-Test, a parametric test suitable for normally distributed data. Prior to the analysis, a Shapiro-Wilk test was conducted to evaluate the normality of the data. The results showed that the significance values for cognitive ($p = 0.10$), affective ($p = 0.83$), and psychomotor ($p = 0.05$) were all greater than 0.05, indicating that the data were normally distributed and met the assumptions required for parametric testing.Based on these results, the Paired T-Test was used to assess the impact of the Simple Triage and Rapid Treatment (START) training on participants' competencies. A p-value of less than 0.05 was considered statistically significant. The findings revealed significant improvements across all domains, with $p < 0.001$ for cognitive, affective, and psychomotor outcomes, confirming that the START training had a meaningful effect on the disaster response skills of healthcare professionals.

Ethical considerations

The ethical clearance for this research was obtained from the Ethics Committee of the Faculty of Medicine, Public Health, and Nursing at Gadjah Mada University (Ref: KE/FK/1534/EC/2023). During the data collection process, the researcher explained the purpose and objectives of the study to the respondents and asked for their willingness to participate. Healthcare workers willing to undergo training were directed to complete an informed consent form as a sign of agreement to participate in the research.

RESULTS

Respondent characteristics

The respondent characteristics in this study consist of gender, age, profession, highest education level, history of attending START triage seminars or training, and length of employment as healthcare professionals. Table 1 displays the results of respondent characteristics using univariate analysis.

Table 1 Distribution of respondent characteristics in the study (n= 43)

Respondent characteristic		Frequency (n)	Percentage (%)	Mean ± SD
Gender	Male	9	20.9	
	Female	34	79.1	
Age				36.07± 11.22
Profession	Nurse	18	41.9	
	Doctor	8	18.6	
	Midwife	13	30.2	
	Pharmacist	2	4.7	
	Public health (WHO, 2011)	2	4.7	
Highest education level	DIII	21	48.8	
	D IV/S1	21	48.8	
	S2	1	2.3	
history of attending START triage seminars or training	Have attended	10	23.3	
	Have not attended	33	76.7	
length of employment as medical staff and healthcare professionals				11.58±10.29

Overview of cognitive, affective, and psychomotor values among medical personnel and healthcare professionals in conducting START triage. The average cognitive, affective, and psychomotor scores of medical and health workers in performing the START triage have increased. Post-test scores have higher scores than pre-tests. These values can be seen in Table 2.

Table 2. The univariate analysis results for cognitive, affective, and psychomotor pre-test and post-test scores of healthcare professionals in performing START triage (n=43)

Variable	Mean	SD
Cognitive pre-test score	57.21	16.55
Cognitive post-test score	78.60	18.72
Affective pre-test score	33.56	3.95
Affective post-test score	36.35	3.55
Psychomotor pre-test score	18.98	1.66
Psychomotor post-test score	23.02	1.06

1) The effect of Simple Triage and Rapid Treatment training on cognitive, affective, and psychomotor skills in conducting START triage

The paired t-test results were conducted to determine the influence of *Simple Triage and Rapid Treatment* training on each variable: cognitive, affective, and psychomotor skills of medical and healthcare professionals. The significance values for each variable were <0.001 (p<0.005) from the intervention provided to medical and healthcare professionals. These results can be observed in Table 3.

Table 3 The results of the paired t-test analysis on the Simple Triage and Rapid Treatment training concerning the cognitive, affective, and psychomotor skills of medical personnel and healthcare professionals in conducting START triage (n=43)

Variable	Mean ± SD	CI 95%		*p value*	Cohen's d
		Lower	Upper		
Cognitive	57.21±16.55 78.60±18.72	-26.31	-16.49	<0.001	1.34
Affective	33.56±3.95 36.35±3.55	-3.69	-1.89	<0.001	0.96
Psychomotor	18.98±1.66 23.02±1.06	-4.63	-3.46	<0.001	2.14

DISCUSSIONS

Simple Triage and Rapid Treatment (START) training has been proven to have a significant effect on improving the cognitive, affective, and psychomotor (CAP) abilities of medical and health workers in carrying out triage procedures. Based on the results of the pre- and post-test analysis, there was a very significant increase in scores in all three domains, with a significance value of p <0.001 and high effectiveness indicated by Cohen's d values of 1.34 (cognitive), 0.96 (affective), and 2.14 (psychomotor), all of which are included in the large effect category. The strength of this influence indicates that the training provided not only has a theoretical impact but also internalizes values and forms concrete practical skills. These results confirm that the increase in participant competence is a direct result of the training provided, not a result of external variables such as work experience, education level, or previous training. This is evidenced by the characteristics of the respondents in this study, where the majority (76.7%) had never attended training or seminars related to START triage before, and there were no other additional interventions that took place simultaneously during the study period. In the context of experimental research with a pre-test post-test design without a control group, significant changes that occur can be attributed to the main intervention if confounding variables are minimized or controlled (Creswell & Creswell, 2018). This research design meets these conditions because training is the only treatment given to respondents in a relatively homogeneous environment.

In addition, the Kirkpatrick model-based training evaluation approach also supports this. In level two of the Kirkpatrick model, evaluation focuses on improving knowledge, attitudes, and skills as a direct result of the training provided (Kirkpatrick & Kirkpatrick, 2006). This is a significant increase in scores in the cognitive, affective, and psychomotor domains, which reflects that the START training has succeeded in achieving its learning objectives. Previous studies with similar designs have also proven the direct effect of training on improving competence, as shown by Green & Hug (2020), who reported that simulated triage training had a significant impact on the knowledge and skills of medical personnel in patient classification. The findings of Cone et al. (2011), in the context of virtual triage training, also showed that a single intervention was able to produce a real increase in capability, as long as there were no external factors intervening in the training process. Referring to the evidence, it can be concluded methodologically and empirically that the increase in CAP capability in this study was a direct result of the START training provided.

In the cognitive aspect, START training significantly improved the conceptual understanding of medical personnel and health workers regarding the basic principles and mechanisms of disaster triage. This is reflected in the increase in the average score from 57.21 to 78.60 after training. This increase not only shows an increase in the ability to recall information, but also the ability of participants to understand, analyze, and apply the START triage algorithm correctly, as seen from the improvement in scores on questions that were previously answered incorrectly. According to Bloom's revised cognitive taxonomy by Anderson & Krathwohl (2001), effective training must include a learning process that moves from basic knowledge to higher levels of thinking, including analysis and application.

In this context, START training has successfully built participants' critical thinking and clinical decision-making skills, which are the essence of the cognitive domain in emergency situations. Furthermore, the simulation and scenario-based training approach used in this study is highly relevant to the principles of constructivist learning, where participants actively construct understanding through direct experience and reflection on real cases. According to the cognitive constructivism theory proposed by Piaget and further developed by Schunk (2012), knowledge is not acquired passively, but is actively constructed through the interaction between new experiences and existing cognitive schemas. START training provides a cognitively challenging learning context, allowing participants to test their understanding through practical applications in disaster simulations. This is also in line with research by Green & Hug (2020), which showed that simulated triage training significantly improved patient classification accuracy and strengthened clinical decision-making capacity among health workers. This study confirms that improving cognitive scores is not just r the result of repeating information, but rather the result of an active learning process that increases participants' conceptual understanding and analytical power.

In addition, this study also showed that cognitive improvements occurred consistently across all participant professions, even though most had never received similar training before. This eliminates the possibility that these results are influenced by previous experience or training, and confirms that the training provided is the only factor contributing to the improvement. Therefore, from a pedagogical and empirical evidence perspective, it can be concluded that START training plays a direct and effective role in shaping the cognitive abilities of health workers in carrying out disaster triage accurately and quickly.

In the affective domain, START training has been shown to provide significant improvements in participants' attitudes, perceptions, and professional values in the context of handling disaster triage. The average score increased from 33.56 to 36.35, with a Cohen's d value of 0.96, indicating a large effect of training on affective changes. This domain is very important because triage decisions depend not only on technical knowledge, but also on ethical, empathetic, and professional responsibility dimensions. In disaster situations, health workers are faced with a moral dilemma regarding the priority of saving lives with limited resources. Therefore, the success of training in improving positive attitudes and commitment of participants reflects the effectiveness of learning in forming ethical awareness and human values.

Theoretically, the achievement of this affective change can be explained through Krathwohl's Affective Taxonomy which includes five levels: receiving (willingness to accept), responding (active participation), valuing (appreciating), organizing (integrating values), to characterizing (making values part of character). In the context of this training, participants not only listen to the material, but also engage in case discussions, group reflections, and simulations that allow them to reflect on human values in triage decision making. According to Krathwohl et al. (1964), this approach is an important prerequisite for facilitating profound attitudinal change, because participants are given space to interact, respond, and personally assess the learning experiences they have.

Empirical studies also support these results. Research by Wang et al. (2021), showed that triage simulation training not only increased self-confidence, but also formed participants' attitudes of responsibility and empathy towards patients in emergency situations. This study also emphasized that the affective domain is often neglected in medical training even though it has a direct impact on the

quality of decision-making in the field. Thus, the results of this study confirm that START training effectively forms participants' ethical orientation, making them not only "know" what to do, but also "intend" and "willing" to do it responsibly. Furthermore, the increase in affective scores that occurred evenly among various professions indicates that this training has succeeded in aligning perceptions between health workers, which is important in collaborative work in disaster situations. This is in line with the principle of interprofessional disaster education, which encourages understanding of values and roles across professions to create a unified response in a crisis. Although there is still slight variation between professions in achieving affective scores, no influence of work experience or education factors was found on changes in this attitude, which reaffirms that training is the main variable that causes changes in the affective domain. Thus, the improvement in the affective aspect in this study did not occur spontaneously or due to previous experience, but rather was the result of a training process designed to activate the value and emotion dimensions through a reflective, participatory, and contextual learning approach. This kind of training not only provides technical instructions, but also forms the professionalism and moral commitment of participants, which are essential in the practice of humanitarian-based triage.

The most prominent improvement in this study occurred in the psychomotor domain, where the average score of respondents increased significantly from 18.98 to 23.02 after participating in START training, with a Cohen's d value of 2.14, indicating a very large effect of the intervention on participant skills. The psychomotor domain reflects the ability of participants to carry out practical actions, including the ability to recognize and assess patient vital signs (breathing, perfusion, mental status), classify patients quickly and accurately, and make decisions inlimited time and conditions that resemble disaster situations. This training is designed with a simulation-based approach and direct practice, allowing participants to learn skills repeatedly with guided practice, immediate feedback, and correction of procedural errors.

Theoretically, this ability improvement is in line with Simpson (1971), which places the development of motor skills as a tiered process, starting from perception, readiness (set), guided response, to complex overt response. In this training, participants are guided from the initial stage through demonstrations of actions by instructors, then carry out independent practice in triage scenarios, until they achieve the ability to carry out triage procedures independently and quickly. Through this repeated practice, participants' technical skills are not only formed but also refined, allowing for the transfer of learning from the training room to the real-world context. This is also in accordance with the experiential learning model by Kolb (1984), which emphasizes that skills will be formed stronger when participants experience directly, reflect on, and adapt the knowledge in practice.

In addition to developing technical skills, this training also has an impact on important non-technical aspects in the psychomotor domain, such as work coordination, time management, and decisiveness in decision-making. Simulated situations that resemble crisis conditions provide time pressure and uncertainty, which encourage participants to develop situational awareness and rapid response skills two essential skills in disaster triage (Hamdi & Al Thobaity, 2023). With no previous training for most participants and with educational backgrounds that are mostly equivalent (D-III and S1), this improvement cannot be attributed to differences in basic abilities or work experience, but rather is clearly the result of training as the only intervention provided during the study.

The literature also shows that psychomotor skills trained through simulation have a higher retention rate than theoretical learning alone. Ericsson (2008) emphasized the importance of deliberate practice focused and repeated practice with error correction to achieve proficiency in complex tasks, including in the clinical context. Therefore, START training that integrates field practice, realistic scenarios, and reflective feedback is very suitable for developing fast and accurate triage skills. This increase also confirms that practice-based learning has a major contribution in improving the preparedness of health workers, especially in the domain of action that is often not honed in formal education.

To ensure that the increase in competence in this study was truly the result of START training and not due to the influence of external variables, researchers systematically eliminated potential bias and external interference in the design and implementation of the study. First, data on respondent

characteristics showed that most participants had never attended similar training before (76.7%), which means there was no carryover effect from previous training experiences that could affect the results. Second, the training was carried out in a controlled time and did not overlap with other interventions or training, so that START training was the only learning stimulus given during the study period. Third, statistical analysis showed that the increase in scores occurred consistently in all domains (cognitive, affective, and psychomotor), with the confidence interval in the paired t-test not crossing the zero value and the p-value far below the conventional significance limit ($p < 0.001$). This is a strong indication that the changes that occurred were not random or due to natural variation, but were a direct effect of the training provided. In addition, the effect size measured through Cohen's d shows a "large" category for all domains, further confirming the strength of the causal relationship between training and learning outcomes.

In terms of design, although this study did not use a control group (non-randomized pre-post design), internal validity was maintained through a naturalistic experimental control approach: no systematic variation in experience or other training among participants, relative homogeneity in baseline characteristics of respondents, and the administration of pre- and post-tests in a very short period of time on the same day, thus minimizing the possibility of the influence of external variables (history effect or maturation effect) as explained in experimental methodology literature (Creswell & Creswell, 2018). Therefore, methodologically and empirically it can be concluded that the improvements that occurred in the cognitive, affective, and psychomotor domains were purely the result of START training. These results support the internal validity of the study and provide strong confidence that the training intervention is indeed effective in shaping the competence of health workers in conducting disaster triage.

Although the results of this study indicate the effectiveness of START training in significantly improving the cognitive, affective, and psychomotor abilities of health workers, there are several limitations that need to be considered in interpreting these findings. First, data collection was carried out only on the same day as the training, so this study cannot provide information on the long-term retention of the increased competence. Longitudinal studies are needed to evaluate the extent to which the effects of training can persist over a certain period of time, and whether retraining is needed to maintain competence, especially in the psychomotor domain which is theoretically more susceptible to decline if not trained periodically (Ericsson, 2008). Second, the sample size in this study was relatively small (n=43) and uneven in terms of profession (for example, there were only two pharmacists and two public health workers), thus limiting the generalizability of the results to a wider population of health workers. In addition, because the study was conducted in three health centers in one geographic area, the results may not reflect conditions or challenges in other areas with different demographic characteristics, facilities, or disaster frequencies.

Recognizing these limitations, the researchers suggest that future studies conduct long-term follow-ups to assess skill retention, expand the scope of the area and the number of samples. However, within the scope and conditions of the current study, the results obtained remain relevant and provide meaningful contributions to the development of competency-based disaster training at the primary care level.

CONCLUSION

This study shows that Simple Triage and Rapid Treatment (START) training has a significant effect on improving the cognitive, affective, and psychomotor abilities of medical and health workers in conducting START triage. This increase in ability is indicated by a significant difference between the pre-test and post-test scores in the three domains, with a high effect size, indicating that the training is not only effective, but also has a significant impact on participant competence. These results confirm that training that is systematically designed and based on direct practice is able to form conceptual understanding, instill ethical and professional values, and improve technical skills in real terms. More broadly, this study provides empirical evidence that a simulation-based training approach is not only

relevant to the hospital context, but is also very applicable and needed in primary health care facilities such as health centers, which are often the first line in disaster response. START training has been proven to equip health workers with comprehensive competencies that include aspects of critical thinking, empathy, and rapid action skills, three essential elements in an effective triage system. This success was achieved without any additional interventions or significant differences in background experience, so it can be concluded that the increase in competence is a direct result of the training provided.

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AUTHOR CONTRIBUTION :

NF and BA were responsible for the research design, data collection, and initial data analysis. SA supervised the research process, provided methodological guidance, and assisted with data interpretation. IN contributed to the critical revision of the manuscript and ensured the overall academic quality. All authors read and approved the final version of the manuscript.

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ETHICAL STATEMENT

This study was approved by the Ethics Committee of the Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada in October 2023 with Ref number: KE/FK/1534/EC/2023. All participants signed the informed consent before data collection.

DATA AVAILABILITY STATEMENT

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflict Of Interest Statement :

The authors declare no conflict of interest.

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