Jurnal
Berita Ilmu Keperawatan

Jurnal Berita Ilmu Keperawatan
Vol. 17(2), 2024
p-ISSN: 1979-2697
e-ISSN: 2721-1797
https://doi.org/10.23917/bik.v17i2.5147

Validity and Reliability of The Simple Triage and Rapid Treatment Knowledge and Attitude Instrument in Medical Personnel and Health Workers

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***Abstract*:** Medical and health personnel have the potential to play an important role in triage START in the event of a disaster. However. it is important to have an instrument in evaluating the level of knowledge and attitudes of medical and health dragons regarding the Simple Triage and Rapid Treatment. This instrument is essential for the development of a comprehensive and efficient Simple Triage and Rapid Treatment education program for medical and health personnel. Therefore. this study aims to assess the accuracy and consistency of knowledge and attitude instruments in conducting Simple Triage and Rapid Treatment for medical and health personnel. A cross-sectional study involving 100 respondents. This instrument is created through a literature review. The instrument totaled 10 items of statements on knowledge and 10 items of statements on attitudes categorized into 6 groups: disasters. Simple Triage and Rapid Treatment. Simple Triage and Rapid Treatment principle. Simple Triage and Rapid Treatment indicator. Simple Triage and Rapid Treatment implementation procedure. The results of this study showed 100 participants. the majority of whom were female with an average age of 36 years. All participants are medical and health personnel. The instruments used in the study were validated through content validity (Pearson Product Moment) and biserial correlation. Utilizing internal consistency reliability. the study found satisfactory inter-item reliability for all knowledge items (0.70 – 0.73) and attitude items (0.86 – 0.90). Conclusion: these findings suggest that knowledge and attitudes in performing the Simple Triage and Rapid Treatment are important for medical and health personnel.

Keywords : validity, reliability, instruments, knowledge, attitudes, Simple Triage and Rapid Treatment

Submitted: 22 May 2024, revised: 1 July 2024, accepted: 2 July 2024, published: 30 July 2024

INTRODUCTION

The frequency of natural disasters is increasing globally every year. with an increase in disaster incidence by 13% in 2021 compared to the previous year (OHCA. 2022). Based on the 2022 report of the National Disaster Management Agency (BNPB, 2022). the Java Island region in Indonesia experiences

the highest frequency of disasters. One of the most vulnerable areas in Java Island is the Special Region of Yogyakarta (DIY). where 68% of the area is at risk of disaster. The Indonesia Disaster Risk Index (IRBI) in 2020 ranked DIY 20th in Indonesia with a high risk classification. The main threat in DIY is the eruption of Mount Merapi in Sleman Regency which is classified as high risk.

The eruption of Mount Merapi in 2010. one of the largest eruptions in the last century. resulted in hot clouds and incandescent lava avalanches dominating the southern slopes and impacting 4 districts. including Sleman Regency (Kurniawan & Wasino. 2021). Based on the disaster-prone map of Sleman Regency. there are 3 districts at risk due to the eruption of Mount Merapi: Cangkringan District. Pakem District. and Turi District.

The eruption of Mount Merapi has two main categories of impacts: primary impacts. which have a direct impact on the population at the time of eruption. and secondary impacts. which occur after the eruption. Key impacts include damage from hot clouds. lahars. ash. sand. and gas eruptions. which can have toxic effects. Secondary impacts such as the loss of cold lava occur in the area around the river originating from Mount Merapi (Carr & Jensen. 2015).

Some of the impacts of the Merapi disaster that occurred illustrate the importance of carrying out disaster preparedness to reduce errors in management when conducting disaster triage (Connor *et al*.. 2014) . Medical personnel are given priority in handling emergencies because of the limited number available. Emergency management is in place to minimize the increase in fatalities. In the event of a disaster. the responsibility of medical personnel and health workers of the Puskesmas is to group victims based on the severity of their condition (Widayatun & Fatoni. 2013).

Triage involves categorizing individuals based on their degree of injury or condition in terms of airway. respiratory. and circulatory (ABC). The START method. a commonly used and easy-to-implement triage system. sorts victims into red. yellow. green. and black categories based on their condition. According to research by Bahlibi et al.(2022). the Simple Triage and Rapid Treatment model is often used in hospitals to assess patients efficiently and accurately. One of the advantages of using the Simple Triage and Rapid Treatment system is its simplicity. as it combines the principles of breathing. perfusion. and mental status to categorize patients into red. yellow. green. or black (Astuti & Milkhatun. 2023).

Failure to properly and effectively implement Simple Triage and Rapid Treatment can lead to delays in transporting victims to healthcare facilities. potentially resulting in high mortality and disability rates (Bijani & Khaleghi. 2019). In addition. if Simple Triage and Rapid Treatment is not performed accurately. it can lead to errors in determining patient priorities. causing delays in providing assistance to victims and ultimately resulting in higher mortality (Connor *et al*.. 2014).

Improving disaster victim management can help reduce the time between injury and medical care. ultimately reducing morbidity and mortality. Triage is essential in disaster situations to prioritize and promptly assess injured individuals. In cases where resources are limited. it is important to focus on the treatment of survivors (Lampi *et al*.. 2018).

Disaster triage involves many parties and has a positive impact in handling mass victims or large-scale disasters. Various journals have highlighted the promising potential of triage methods such as Modified SALT, which can reduce health worker error rates by 22% and has an average patient assessment time of 4-5 seconds (Laksono, 2024). START triage is simpler and faster in handling mass casualties. Overall, START disaster triage as stated by the American Medical Association Journal of Ethics, is considered effective in dealing with disaster victims.

Disaster triage is performed by a first responder. specifically someone who first arrives at the disaster site and is an expert in triage techniques (Lumbu *et al*.. 2013). Medical personnel and health workers are part of the first responders who lead disaster management efforts (Taryudi. 2021). Health policy emphasizes the importance of the role of medical personnel and health workers in disaster response. with the aim of preparing them effectively to cope with disasters on both a local and global scale (Melnikov *et al*.. 2014).

It is important for medical personnel and healthcare workers to have the key competencies required to implement Simple Triage and Rapid Treatment which includes knowledge and attitudes. Therefore,

there is a need to create an assessment tool to measure their knowledge and attitudes towards Simple Triage and Rapid Treatment. The purpose of this study was to evaluate the accuracy and consistency of assessment tools for medical and healthcare personnel involved in Simple Triage and Rapid Treatment.

METHODS

The preparation of the instrument is based on literature research that has been carried out through references from the research of Kamaluddin et al., (2019). The framework of the knowledge instrument includes: (1) disaster definition. (2) Simple Triage and Rapid Treatment definition. (3) principles in conducting Simple Triage and Rapid Treatment. (4) Simple Triage and Rapid Treatment indicator. (5) Simple Triage and Rapid Treatment classification. (6) Simple Triage and Rapid Treatment procedure. While the framework of attitude instruments includes: (1) disasters. (2) objectives in conducting Simple Triage and Rapid Treatment. (3) Simple Triage and Rapid Treatment principles. (4) Simple Triage and Rapid Treatment procedures. At the initial stage of instrument preparation. 10 question items on knowledge and 10 question items on attitude are compiled. Once the instrument items are compiled. the validity of the contents is assessed through expert assessment from academic and clinical experts in the field of emergency and disaster. The expert judgment process is carried out by three experts in the field of emergency and disaster. and the results are used for validity analysis by scaling each item using Aiken's V content coefficient so that a value of 0.89-1.00 is obtained on the knowledge instrument and 1.00 on the attitude instrument. Content analysis showed that all items had a V value of > 0.8. including 10 knowledge items and 10 attitude items. After the validity of the quantitative content. the validity and reliability of the instrument were tested on 100 individual medical and health workers. The inclusion criteria for your respondents are: have never attended training, work as a medical worker or health worker, are willing to be a respondent. Exclusion criteria were: not completing the questionnaire to the end. This research has received ethical clearance with publication number KE/FK/1534/EC.

To validate the instrument quantitatively. a cross-sectional study was conducted on 100 participants who were medical personnel and health workers from the ngemplak 1 and ngemplak 2 health centers. Each puskesmas with 50 medical and health workers. Questionnaires are distributed using gform.

Data collection will take place in July 2023. Initially. the research team hired a research assistant to assist in the data collection process. The research protocol is then explained to the assistant to ensure a shared understanding of the data collection process. Furthermore. permission was obtained from the local government. and data collection was carried out by sending a questionnaire gform to one of the officers at the puskesmas to be distributed to all medical and health workers.

Data analysis was performed using SPSS for Windows version 22.0. Before analysis. all data are checked for accuracy and missing values are identified. Descriptive analysis is used to describe the demographics of the data. The validity of knowledge instruments was assessed using a biserial correlation test and the validity of attitude instruments was assessed using the Pearson Product Moment test.

RESULTS

In table 1. it is known that the number of respondents in this study was 100 respondents. Almost all respondents were female (78%) and the average age of respondents was 36 years. The majority of respondents have never attended training (77%) and have an S1 education (60%). The items in this instrument are in accordance with the aim of preparing the instrument, namely discussing knowledge and attitudes about triage start.

Table 1 Characteristics of research respondents

Variable		Frequency (n)	Percentage (%)	Mean ± SD
Gender	Man	22	22	
	Woman	78	78	
Profession	Nurse	71	71	
	Doctor	8	8	
	Midwife	16	16	
	Pharmacy	3	3	
	Public Health	2	2	
Age (Years)				36.07± 11.22
Education	DIII	39	39	
	D IV/S1	60	60	
	S2	1	1	
History of attending START seminars or trainings	Yes	23	23	
	No	77	77	
Long time as a medical worker and health worker (years)				11.58±10.29

Validity assessment was performed using biserial correlation on knowledge instruments and Pearson Product Moments on attitude instruments. Analysis is performed to correlate each item score with the total score. which is the sum of all item scores. Any question item whose calculated r value is greater than or equal to the table r value of 0.195 is considered to correlate significantly with the total score. After a validity test. all items are declared valid based on a comparison of the calculated r and r values of the table. The general consensus is that an instrument is considered to have good reliability if its value is equal to or greater than 0.700. The reliability of knowledge instruments was assessed using Kuder Richardson formula 20 (KR-20) and attitude instruments were assessed using Cronbach alpha. The range of reliability values of knowledge instruments using Kuder Richardson Formula 20 (KR-20) obtained ranges from 0.70 – 0.73. while attitude instruments using Chronbach alpha obtained r-Count values ranging from 0.86 – 0.90. which indicates that all items of knowledge and attitude instruments are considered reliable. The results of the validity and reliability test can be seen in Table 2.

Table 2 The results of the validity and reliability of the knowledge and attitude instruments in conducting Simple Triage and Rapid Treatment

No	Statements	r-count	r-table	Chronbach's Alpha	Notes
Knowledge in performing triage START					
1	Which statement do you think is true about the disaster: a. Disasters are events caused by natural. non-natural and social factors that result in losses and casualties b. A disaster is a condition that requires immediate help c. Disaster is a situation that results in environmental damage and loss d. Disasters are one of the natural factors that cause casualties	0.675	0.195	0.723	Valid

2	Which statement about the Simple Triage and Rapid Treatment do you believe to be true in the following statement: a. Simple Triage and Rapid Treatment is a process of sorting victims (patients) based on the condition of the worst victims b. Simple Triage and Rapid Treatment is the sorting of victims based on the nearest location without considering their condition c. Triage START is the sorting of victims based on their emergency priorities marked by the provision of black. red. yellow and green cards d. Triage START is the sorting of victims based on consideration of their condition	0.581	0.195	0.718	Valid
3	The principles in conducting Simple Triage and Rapid Treatment in mass disaster conditions are: a. Perform assessments precisely. quickly and accurately b. Prioritizing victims with the most life-threatening conditions c. Have insufficient ability d. Provide care with direct handling of the victim's condition	0.505	0.195	0.722	Valid
4	The Simple Triage and Rapid Treatment observations made by health workers on victims of mass disasters are: a. Respiration. pulse and blood pressure checks b. Perfusion. consciousness examination and pulse examination c. Respiration. perfusion and mental status d. Awareness Examination. pulse and mental status examination	0.675	0.195	0.723	Valid
5	In the event of a disaster that causes mass casualties including serious injuries and minor injuries and deaths. the top priorities must be handled at the disaster site are: a. Looking for the cause of the disaster b. Rescue victims with severe injuries c. Rescue victims with high life expectancy d. Taking care of the deceased	0.658	0.195	0.710	Valid
6	Mr. S. 52. was found with the other victims. Mr. S is seen holding his left hand and there is an open wound on the right temple. When called. the victim can still walk to get closer to the officer who is in a safe location (collecting area). Breathing frequency 23 x/min. Capillary Refill (CRT) 2 seconds. Pulse frequency 70 times/minute. Based on the case. then the victim is labeled? a. Black b. Red c. Yellow d. Green	0.581	0.195	0.718	Valid
7	One male victim was estimated to be 60 years old. The victim does not respond when asked to walk. When examined it was found that the	0.443	0.195	0.728	Valid

	victim could breathe 19 times x / minute. The radial pulse is palpable. Capilary refill < 2 seconds. When asked to hold his hand. the victim is unable to do so. the victim does not respond to simple commands. Then the victim is labeled a. Green b. Red c. Yellow a. d. Black				
8	A female victim is estimated to be 45 years old. the victim does not respond to simple calls and commands. found a breathing condition is absent (not breathing). after the action of opening the airway. the victim can breathe with a breathing frequency of 22 x / minute. pulse is not palpable and Capilary refill > 5 seconds. Then the koban is labeled: a. Black b. Red c. Yellow d. Green	0.366	0.195	0.735	Valid
9	An adult female. estimated to be 31 years old. had bleeding in her nose and ears. When called with a simple command the victim did not respond. it was found that the respiratory condition was not there. (not breathing) after the action of opening the airway. but the victim still did not breathe. Unpalpable pulse. capilayi refill (CRT) 5 seconds. The actions taken are: a. Performing cardiopulmonary resuscitation b. Black-label c. Provides artificial respiration d. Label it red	0.740	0.195	0.713	Valid
10	Actions not performed in the Simple Triage and Rapid Treatment in mass disaster conditions are: a. Opening the airway b. Checking the pulse c. Stop bleeding by pressing on the bleeding area d. Labeling victims	0.814	0.195	0.702	Valid
Attitude in performing triage start					
1	I will do a Simple Triage and Rapid Treatment for all victims of mass disasters	0.617	0.195	0.881	Valid
2	For me. using PPE (Personal Protective Equipment) correctly when doing Simple Triage and Rapid Treatment can prevent infection or other infectious diseases	0.679	0.195	0.869	Valid
3	When performing Simple Triage and Rapid Treatment. I will attach triage tags to the victim to ensure the order in which they are handled	0.744	0.195	0.863	Valid
4	In the implementation of triage labeling on victims. I will be calm but deft	0.809	0.195	0.858	Valid
5	I perform Simple Triage and Rapid Treatment actions in accordance with procedures in disaster emergency response situations	0.835	0.195	0.855	Valid

6	I am responsible for sorting the severity of disaster victims	0.787	0.195	0.859	Valid
7	I will save as many victims as possible by triaging START	0.769	0.195	0.861	Valid
8	My personal safety should be a priority when triage START	0.363	0.195	0.901	Valid
9	I feel confident in my ability to perform Simple Triage and Rapid Treatment in emergency situations	0.667	0.195	0.872	Valid
10	I need to make sure that patients get triage labels according to their condition	0.830	0.195	0.857	Valid

DISCUSSION

Some competencies in conducting Simple Triage and Rapid Treatment that must be mastered by medical and health workers such as understanding the definition of disaster. triage. and triage start. principles in conducting Simple Triage and Rapid Treatment. Simple Triage and Rapid Treatment indicators. Simple Triage and Rapid Treatment classification. and Simple Triage and Rapid Treatment implementation procedures. In the knowledge instrument. there are 10 items of statement regarding the Simple Triage and Rapid Treatment. There are 2 statements regarding the definition of disaster and Simple Triage and Rapid Treatment. 1 statement item regarding the principles of conducting Simple Triage and Rapid Treatment. 1 statement item regarding the Simple Triage and Rapid Treatment indicator. 2 statement items regarding the Simple Triage and Rapid Treatment classification. and 2 statement items regarding the Simple Triage and Rapid Treatment implementation procedure. Triage START plays an important role in emergency management by efficiently grouping and prioritizing victims based on their medical conditions. determining the most urgent need for immediate care (McCambridge et al.. 2014).

Knowledge of triage possessed by medical and health personnel will be very helpful in identifying emergency cases when a disaster occurs to prevent death and additional complications. In the event of a disaster. It allows all health workers to be able to become first responders to sort victims according to emergency conditions (Wang et al.. 2021).

In the attitude instrument there are 10 statement items regarding the Simple Triage and Rapid Treatment. The statement consists of 1 item statement about the disaster. 1 item statement regarding the purpose of the Simple Triage and Rapid Treatment. 6 items statement on the principles of the Simple Triage and Rapid Treatment. and 2 items statement on the procedure for implementing the Simple Triage and Rapid Treatment. Attitude is a reflection of the perception of medical personnel and health workers regarding the importance of the role of health workers in carrying out disaster triage. The higher the value of the attitude of medical and health personnel. the more it will increase the behavior of health workers in doing the Simple Triage and Rapid Treatment. A positive attitude is accepting. obedient. and in accordance with applicable rules (Mirzaei et al.. (2019).

Health workers' confidence in their abilities is one factor in behavior change. This is in accordance with social cognitive theory. stating that positive interactions are expected to cause feelings or willingness to change. According to Bandura. (2019) a person with a high level of self-confidence tends to have control over the events around him. Individuals will try harder and be more persistent in carrying out tasks compared to individuals who consider their abilities low. A medical and health professional who has knowledge and confidence has greater potential to be able to act positively. This is because medical and health personnel are the front line when a disaster occurs. Therefore. the ability of medical and health personnel to perform triage is needed to prevent disability and death.

In the event of a disaster. it is critical to implement Simple Triage and Rapid Treatment to set priorities and decide which victims will receive assistance first. This is necessary to improve the effectiveness and accuracy of services provided to disaster victims (Bhattacharya. et al.. 2020). Victims

with a green symbol or minor injuries can be transferred by non-medical transport after all victims with a red symbol or acute injuries have been evacuated. Upon arrival at a health facility. any injured individuals must undergo re-examination. reassessment. stabilization. and definitive treatment by medical and health personnel who must be aware of these protocols (Veenema et al.. 2018).

The development of knowledge instruments and attitudes in triaging START is considered to be still limited. Medical and healthcare personnel must have the knowledge and attitude to perform effective Simple Triage and Rapid Treatment. Health workers are recognized for their proficiency in performing Simple Triage and Rapid Treatment. Increased knowledge and attitudes in Simple Triage and Rapid Treatment require more focus from academics. government. and other disaster response stakeholders.

CONCLUSION

This study shows that the instruments that measure knowledge and attitudes in triaging START among medical and health personnel are valid and reliable. This instrument consists of six components. namely disaster. triage start. principles in conducting Simple Triage and Rapid Treatment. Simple Triage and Rapid Treatment indicator. Simple Triage and Rapid Treatment classification. and Simple Triage and Rapid Treatment implementation procedures. The trige aspect of START shows the importance of the role of medical and health personnel in emergency care during disasters. These findings suggest that understanding and attitudes in the Simple Triage and Rapid Treatment are critical for medical and healthcare personnel. Further development is needed to validate the psychometric properties of the instrument through factor analysis. This instrument can be used to assess the knowledge and attitudes of medical and health personnel regarding the Simple Triage and Rapid Treatment in disaster-prone areas.

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