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Original Article

A Qualitative Study on Hybrid Learning Method in Emergency Department Triage Training During COVID-19 Pandemic

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Abstract

Background: Triage teams in the emergency room face the challenge of quickly and accurately assessing patients with limited information. The triage training program aimed to improve service performance and revitalize the role and function of triage. Continuous training is essential to enhance the decision-making confidence of triage officers, even during the COVID-19 pandemic. However, the pandemic may impact the learning process for training officers.

Objectives: This study explored perceptions of a technical evaluation for triage training and the professionalism of officers responsible for conducting assessments.

Methods: This qualitative study was conducted in the emergency room of a tertiary hospital in March 2022. The study involved 21 participants who received triage training, including five doctors, 11 nurses, and five midwives. Data were collected through semi-structured interviews in Focus Group Discussions to explore perceptions regarding triage training field practices, necessary resources, and the triage system and training evaluation. Interviews were recorded, converted into transcripts, analyzed, and coded until themes and subthemes were developed.

Results: Six themes were identified: personal readiness for training, triage role, triage errors, officer communication, triage performance, and improvements to the triage training system.

Conclusion: This study evaluated the participants' perspectives on pandemic triage training. The findings show a need for regular triage training to enhance the knowledge and skills of triage officers, even in a hybrid setting. This training should be supported by a reliable connectivity and learning system. Evaluating their triage performance is also necessary for accurate patient safety assessments.

Keywords: COVID-19; Training; Triage; Qualitative Study

Background

The emergency department provides unique health services, as it must accept patients with various medical conditions and prioritize them based on clinical urgency. This measure requires fast and precise actions despite unpredictable patient numbers and resource availability (1). Priority for treatment based on medical urgency is evaluated using a triage system (2). Accurate and timely triage decisions are crucial for efficient emergency medical services (3).

Triage teams face the challenge of assessing patients quickly and accurately with limited information (4). Triage decisions rely on officer expertise, and inappropriate decisions can result in treatment delays or worsen a patient's condition, underscoring the need for triage training, in line with a previous study suggesting that a lack of training can be related to inaccurate triaging (5). Continuous training is essential to improve the decision-making confidence of officers (6). Research conducted in Iran revealed that delivering and discussing triage training material increased triage practice scores among nurses (7).

A triage training program was held to improve service performance in the emergency room (ER) and revitalize the role and function of triage. The training was carried out amid the COVID-19 pandemic, which hampered mobility and required an online/in-person hybrid setting. Hybrid learning, a combined approach

that includes both online and face-to-face instructional methods, was widely adopted during the COVID-19 crisis due to its advantages (8). These include flexibility in terms of time and location, allowing participants to learn at their own pace and according to their learning style, convenient lecture recording, and the freedom for trainers to use a variety of effective training methods such as lectures, group discussions, simulations, and problem-based projects, as well as providing feedback mechanisms (8, 9). In research related to health programs, hybrid learning is as effective as, or more effective than, traditional learning in performance assessment and evaluation (10).

Triage and training materials were delivered online, and the practicum occurred in person while complying with applicable social-distancing rules (11). Self-evaluation continued post-training to obtain training responses through Focus Group Discussions (FGDs). FGDs are useful for collecting data by allowing participants to understand each other's thoughts and experiences to improve the quality of triage services in the ER (12). This study is expected to help evaluate the effectiveness of technical triage training and the professionalism of triage officers in carrying out assessments. The ultimate goal is to improve the future quality of ER triage services.

Objectives

This study explored perceptions of the technical evaluation for triage training and the professionalism of officers responsible for conducting assessments.

Methods

This qualitative study was conducted in a tertiary hospital ER in Jakarta, using FGDs to understand the perceptions of ER medical personnel regarding the hospital triage training that was carried out in November 2021.

Seventy-seven participants, including doctors, nurses, and midwives, took part in triage training at the hospital. The participants were recruited using purposive sampling based on the inclusion and exclusion criteria (Table 1).

Due to the pandemic, a hybrid approach was used for triage training, combining in-person and remote work (10). The training program was accessible online for eight days through the learning management system. It included videos covering triage topics such as the step-by-step process, trauma biomechanics, triage officer roles during resuscitation and transportation, triage therapeutic communication, International Patient Safety Goals application, and infection control.

Table 1. Inclusion and Exclusion Criteria

Inclusion	Exclusion
Doctors, nurses, and midwives in the emergency department should have at least 3 years of experience, which is relatively early in their careers, especially for professions with specific training pathways like medicine (13).	Hold a managerial position in the hospital.
Have attended prior triage training.	

In-person practicum assignments, including simulations, role-plays, case discussions, and field practice followed the program. Upon completing the training, the participants completed a self-reflection sheet utilizing the six stages of Gibbs' self-reflection cycle: description, feelings, evaluation, analysis, conclusion, and follow-up plan. An expert panel specializing in emergencies reviewed the sheet to select statements for inclusion in FGD exploration. After carefully assessing the participant statements, 21 individuals were selected for the FGD. This group included five doctors, 11 nurses, and five midwives. The general characteristics of the FGD participants are presented in Table 2.

Data were collected in March 2022 by conducting an FGD with three groups (doctors, nurses, and midwives). Before the discussion, the research team, consisting of four emergency specialist doctors, two medical doctors, and two nurses from the emergency department, re-assessed participant self-reflection sheets, prepared questions, and planned the FGD implementation. The discussion process was conducted using a semi-structured interview method, moderated by an emergency specialist doctor, and all participant statements were recorded with their permission and documented by a single note-taker.

During the discussion, participants were asked about their experiences during field practice in triage training, the necessary resources, and their evaluation of both the triage system and training. The discussion for each participant comprised six open-ended questions listed in Table 3. One FGD was conducted per group, lasting 30 minutes to 1 hour (average 44 minutes and 23 seconds). Upon completing the FGD, the session recording was transcribed and carefully reviewed multiple times for a thorough understanding of the interview. Following the interview, the interviewees were also contacted for any clarifications.

Inductive data analysis was conducted using QDA Miner Lite and SPSS Statistics 25. Data analysis and coding were performed and validated by clinicians with more than five years of experience in the emergency field. Additionally, they have been certified as triage-training facilitators. The researchers simultaneously reviewed the FGD transcripts and proceeded with open coding. Each preliminary code was read multiple times and compared to identify and categorize them based on their similarities and differences. Themes were identified, defined, and categorized from the FGD transcripts relating to participant self-reflection on the triage system implementation and training in the hospital ER. To finalize the definition of a theme, the researchers compiled several sub-themes related to the agreed theme and discussed any contentious points to reach a final agreement and consistency.

Results

The FGD involved 21 participants, including five general practitioners, 11 nurses, and five midwives. Qualitative analysis of the FGD transcripts produced six themes: personal readiness for training, triage role, triage errors, officer communication, triage performance, and improvements in the triage training system (Table 4).

Discussion

In this study, we used FGDs to explore the opinions of participants involved in triage training. They provide insights into the skills required for a triage officer to conduct an assessment and evaluate the training they had undergone. When making triage decisions, self-confidence can influence an officer's judgment. According to one study, experienced officers significantly outperformed less experienced ones in triage (14). Another study by Kriengsoontornkij showed that work experience positively correlates with triaging success (15). Sufficient experience in the emergency department can prevent death, disability, and additional healthcare costs.

Self-confidence can be related to the staff's emotional status during patient interaction. Triage nurses require strong psychological capabilities to handle stressful situations. They must remain patient, emotionally stable, and tolerant when treating patients and their families in distress in the ER. Lin et al. found that emergency staff require resilience to effectively use their clinical abilities and act in critical situations (16).

Nurses from the ER and other departments participated in this triage training program. They were eager to establish patient zoning during triage, which could have created an opportunity for team formation among participants who had not previously received triage training.

During the discussion, several officers said they were used to triage assessments and found training and field practice easy. A study by Abbas and Fathoni stated that experience in conducting triage assessments is an important factor for appropriate triaging (17). The study by Madani et al. recommends nurse managers select triage officers by considering the abilities and experience (18). According to the participants, triage is important in the ER as the first stage of hospital services and is crucial for initial management. In the ER, patients with various life-threatening conditions arrive and require immediate treatment. Prioritization is necessary when treating patients based on the severity of their illness (6). Although triage is used as a rapid assessment step in the ER, it can also cause delays in treatment due to a lack of resources, leading to overcrowded conditions, poor outcomes, frustrated patients, and staff fatigue and errors (6). A previous study considered several interventions to overcome long ER waiting times, including minimizing staff turnover, increasing the knowledge and abilities of staff through training, and reducing unnecessary actions such as duplicate patient documentation (7). The triage process requires rapid and accurate decisions; therefore, officers must have sufficient knowledge. Duko et al. emphasized that adequate knowledge of triage and clinical aspects of disease identification and emergency conditions are essential for effective and quality triage assessments (19).

Another study in a Tanzanian hospital found that a lack of knowledge caused assessments errors. Twenty-five percent of patients were placed in lower triage level zones and 42% in higher ones (20). Participants in our study agreed that a lack of in-depth examination during triage assessment causes errors, especially when the triage area is overcrowded and experienced triage officers are needed to quickly gather patients' medical history and perform detailed examinations. This statement aligns with a study that showed inaccurate assessments of patient complaints result from a lack of knowledge and experience in identifying diseases and complaints (21). Health services must address patient safety. Errors in triage assessments must be avoided because they can compromise patient safety (22). Errors can result in under- or over-triaging patients, placing patients at risk, or resulting in unnecessary delays. Triage training should focus on identifying the causes of these errors to minimize negative impacts. Poor collaboration between triage

officers can negatively affect the assessment results. Trust-building and conflict avoidance are crucial in the triage process. According to Welp and Manser, trust and respect among triage officers can improve patient safety and individual satisfaction at work (23). Leadership, self-confidence, and collaboration skills are essential for triage officers dealing with emergencies. Management, leadership, and coordination are crucial in supporting the collaborative abilities of emergency nurses (22). Other studies have also suggested that nurses lacking collaboration skills often struggle to handle situations effectively, particularly in crowded ERs, and tend to become hasty and anxious (11). During our FGDs, participants emphasized the significance of triage officers maintaining a professional appearance, which can instill patient confidence. According to a study by Porr et al., a good appearance can increase patient trust in triage officers (24). Most participants agreed that triage officers and medical staff should receive regular training to keep up with new developments in triage knowledge. One study found that the performance of cancer treatment staff declines after three months and thus ongoing training is needed (25, 26). Another study by Gerard stated that most nurses required regular training, as they forgot or did not practice aspects of their skills (27). Training used a web system to deliver materials and conduct tests. Online learning has been used to limit mobility during the pandemic. The web system for health science training is flexible, easy to access, and suitable for nurses (28, 29). However, connectivity issues are frequently encountered during online training, and it is important to communicate the minimum connection requirements for optimal training.This study showed that triage training can be conducted using a hybrid approach. Hybrid learning is a beneficial educational model, providing more flexibility and resilience than traditional-based instruction. The learning management system is an effective medium for triage training during the COVID-19 pandemic. Even in the post-pandemic era, many people, including health professionals, have become accustomed to the flexibility and convenience of hybrid learning during the pandemic. They may continue to prefer this mode of learning, so hybrid learning will likely continue to play an essential role in training, even after the pandemic has subsided. This study was conducted in a single hospital, which may limit the generalizability of the findings. The small sample size could also affect the ability to detect important effects. Future studies should be conducted with larger sample sizes and at multiple centers with different resources to gain a broader perspective.

Conclusion

Professionalism of the triage officer strongly affects the efficiency and accuracy of triage services. Experience and hard and soft skills reduce mis-triage incidents and increase patient safety. Regular triage training is essential for handling emergency situations effectively. Due to the limited mobility caused by the COVID-19 pandemic, a hybrid training approach was implemented to adapt to the situation and available resources, supported by reliable connectivity and a learning system. Regular triage training should be conducted to evaluate and update triage officers' skills and ultimately support their ability to conduct triage assessments.

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Table 2. Characteristics of FGD Participants

Code	Participants	Education History	Work experience (years)	Gender
D1	Doctor	Masters	5	Man
D2	Doctor	Bachelor	4	Woman
D3	Doctor	Bachelor	3	Man
D4	Doctor	Bachelor	4	Man
D5	Doctor	Bachelor	1	Woman
N1	Nurse	Diploma	16	Man
N2	Nurse	Bachelor	9	Man
N3	Nurse	Bachelor	8	Man
N4	Nurse	Diploma	13	Man
N5	Nurse	Bachelor	16	Woman

N6	Nurse	Diploma	4	Woman
N7	Nurse	Diploma	10	Man
N8	Nurse	Bachelor	16	Man
N9	Nurse	Bachelor	11	Man
N10	Nurse	Bachelor	5	Woman
N11	Nurse	Bachelor	11	Woman
M1	Midwife	Bachelor	10	Woman
M2	Midwife	Bachelor	15	Woman
M3	Midwife	Bachelor	11	Woman
M4	Midwife	Bachelor	16	Woman
M5	Midwife	Bachelor	11	Woman

Table 3. FGD Questions

Questions
How do you react or feel when carrying out triage management while on duty in the field?
In your opinion, what is the role of triage in the ED, and why?
Do you over-triage or under-triage when carrying out field duties? If it happens, what do you think is the cause?
What is the role of team communication in triaging patients?
In your opinion, what skills are needed for triage officers to carry out appropriate treatment? What currently needs to be improved?
Is regular triage training necessary? How often should it be conducted, and is it required for everyone? In your opinion, what can be done to improve the quality of triage training?

Table 4. Themes and Subthemes

Themes and subthemes	**Sample comments**	**Number of referrals***
Emotional reactions when attending training (participant)		
Lack of self-confidence	"I felt more awkward because I had never served in the triage department, especially outside the obstetrics department." (M4) "I was nervous because it was my first time practicing triage, and I felt like I had given the wrong zone categories" (N11)	8 (7)
Enthusiasm	"I have never experienced triage before, since it was my first experience, it was enthusiastic and thrilling." (N10) "When on duty at triage, we are better trained to differentiate between urgent and non-urgent patients, which makes us happy and satisfied when taking action." (M3)	6 (6)
Daily habits	"Since I have been in triage for a long time, so I am used to it, it's just that yesterday there were some theories presented, especially the principles of triage. So far I haven't done it because usually when a patient comes, we immediately do an anamnesis of the patient's complaints, without introducing ourselves and so on." (D1) "I've been on triage duty many times. It's just that because I was supervised during training, it was a bit tense, but after that, it was normal." (N6)	9 (9)
Triage role		
Patient sorting	"It's very important because triage makes it easier to divide patients, for example, if there are patients with certain criteria, we can find out the waiting time for patient treatment." (D5) "The role of triage makes it easier for us to sort patients, for example, whether the patient is in urgent or non-urgent category." (M4)	11 (11)
Resources Availability	"Carrying out triage is crucial to ensure that the limited number of facilities in the ER are not overwhelmed by too many patients." (N2)	1 (1)
Triage as the initial entry to the ER	"It's very important, because triage is the first entry point for a patient to come to the ER, if the patient doesn't make an impression at triage, usually there will be problems later." (D1) "The role of triage is very important, because triage is the front line, to select and sort patients into emergency and non-emergency categories." (N3)	8 (8)

Errors in triage		
Lack of experience	"Knowledge and experience; because we will determine based on what we know, if we have both, we will be able to triage correctly because all we have to do is complete the triage format, ask for complaints briefly, and most importantly the discriminator." (D4) "Lack of knowledge or experience of officers can lead to cases of under-triage orover-triage…" (M5)	3 (3)
Lack of in-depth examination	"This could be due to rushing to evaluate the patient's condition and can't gather a detailed history." (M4) "Mistakes such as over triage, usually because we see it directly in a hurry because the patient is panicking and have not examined it properly, also because of lack of knowledge, or under triage errors because the patient looks calm, but it turns out we are lacking in the examination. So our accuracy and ability in the examination are very influential." (N5)	15 (15)
Unwanted event	"A fatal condition that may arise is the possibility of the patient passing away." (M4) "…. patient was placed in the yellow zone, but then the patient had to be moved to the red zone because he was restless and his consciousness suddenly decreased..." (M3)	3 (2)
Overcrowded emergency room	"Usually when there are a lot of patients, the process just speeds up." (N2) "Under triage or over triage errors can occur due to overcrowded patients, and triage teams that sometimes do not focus enough on the patient's clinical situation also play a role." (N9)	2 (2)
Communication between officers		
Preventing delays	"Communicating with fellow triage officers means helping each other, such as educating patients whose conditions are not classified as an emergency to go to the polyclinic, so that we can provide quick treatment for truly emergency cases." (N2)	1 (1)
Patient safety	"...Because if there is miscommunication, it will have an impact on patient safety." (N1) "Regarding communication, this is very important, because our impression when receiving a patient at triage will affect the patient's condition later when they are inside to receive treatment based on the disease and its severity." (N10)	2 (2)
Communication and Collaboration	"For teamwork, it is very important, especially for collaboration, there are those who have and don't have experience, so cooperation and collaboration are very important in a team." (M3) "Communication is very important and needs to be improved along with cooperation, use it to complement each other, know each other's strengths." (D3)	15 (15)
Triage performance		
Knowledge	"Basic principles are knowledge, communication, emotional matters, attitude, courage and self-confidence, and if anyone is in doubt, have a short discussion to get more focused." (D4) "Through our knowledge and critical thinking, we can find out what disease the patient is suffering from and we can determine whether immediate treatment is needed or not." (N11)	19 (17)
Communication skills	"Good communication, so patient acceptance will be good. Because if communication is bad then conflicts with the patient's family will often occur. …" (D1) "The most important thing is knowledge and communication skills to deal with patients and their families. If our knowledge is lacking in diagnosing and seeing the patient's prognosis, under triage can occur." (M3)	15 (15)
Emotional skills	"Emotional management skills, complaint management, how to deal with certain situations, how not to get carried away by emotions when the patient is angry." (M2) "Anger management, because it's very stressful in the triage, when we face a panicked family, we have to maintain calm, if we are not calm it will affect our triage process." (N7)	12 (11)
Self-confidence and Leadership	"Apart from communication, leadership skills, confidence, and attitude are needed, because in triage you don't have to stand alone, there are also nurses and security, so leadership ability is important to manage the conditions there." (D3) "Even though we have the knowledge and certification, if we still feel nervous, anxious during practice, and lack confidence, this can affect triage performance." (M5)	12 (7)
Physical appearance	"... If the patient and their family perceive our appearance to be in good condition, they will feel more confident that we are providing the best and most appropriate service." (N9)	1 (1)
Improved triage training system		
Offline training	"I had face-to-face training before, yesterday was online. After comparing, it is better offline, so when we are given material, during the question and answer session, we can ask questions and they will be answered at that time." (N6)	7 (7)

	"In my opinion, training is better done offline because we can understand the training better, if we only watch videos we can only imagine. However, if there is still a pandemic, it is better to add a little more time to the face-to-face training session." (M4)	
Training management	"...It also includes material from various departments, such as pediatrics, obstetrics, psychiatry, and their emergency services." (N7) "...In practice, perhaps the facilities could be improved, for example, yesterday we carried out triage but there was no triage form. In the future, we must be better prepared." (N1)	40 (20)
Web-based system optimization	"...but at that time there were a few crashes in the online section, sometimes the server went down, so sometimes when we worked on it, the post-test didn't saved." (D5)	1 (1)

*The first number shows the number of mentions of the theme or subtheme when participants commented; the number in parentheses shows the number of participants who mentioned the theme or subtheme (participants could mention the same theme or subtheme several times).