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EXPLORING HEALTH SCIENCES STUDENTS REFLECTIONS ON EMERGENCY RESPONSE LEARNING

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ABSTRAK

Sudden cardiac arrest is a critical medical condition requiring immediate intervention and basic emergency competencies among future healthcare professionals. Learning experiences related to emergency response are essential for health sciences students as they prepare for clinical responsibilities. This study explores students' reflections on their experiences in learning emergency response interventions, emphasizing perceived challenges and expectations for improved learning processes. A descriptive qualitative design was adopted, and data were collected through in-depth interviews with 12 health sciences students who had recently completed a formal emergency response learning module. Thematic analysis revealed four key areas: difficulty in maintaining correct procedural techniques, limited familiarity with emergency devices, performance anxiety under simulated pressure, and insufficient opportunities for repetition and feedback. Students expressed the need for extended practice time, realistic scenario-based learning, and formative assessments to reinforce competence and confidence. These reflections offer valuable insights for educators to develop more responsive, participatory, and psychologically supportive approaches in emergency response education, ultimately enhancing students' preparedness for real-life clinical challenges.

Keywords: education; emergencies; learning; readiness; reflection

INTRODUCTION

Sudden cardiac arrest is one of the leading causes of death in the world. Data from the American Heart Association (AHA) shows that more than 350,000 cases of cardiac arrest occur annually outside of hospitals in the United States, with most going unresponsive due to delays in providing initial assistance (American Heart Association, 2021). In Indonesia, cardiovascular diseases such as heart attack are still the highest cause of death with an incidence rate that continues to increase every year (Suryati & Suyitno, 2020). Cardiac arrest conditions are not limited to health facilities, but are also ofte found in homes, workplaces, and community settings. Underlying risks include unhealthy lifestyles, smoking, hypertension, and diabetes mellitus, especially in urban areas such as Jakarta (Khicha et al., 2021).Prompt and appropriate initial treatment determines the chances of patient safety. Therefore, learning about basic emergency response is an essential competency for health science students. Students of medicine, nursing, midwifery and other health professions need to be equipped with the technical skills and mental readiness to deal with critical conditions such as cardiac arrest. The learning process should include the ability to perform cardiopulmonary resuscitation, use of automatic defibrillation devices, and early collaboration in emergency situations. This clinical readiness is expected to grow since the education period before entering the world of practice directly (Kochhar et al., 2024).

Students still face various challenges during the learning process related to emergencies. Difficulties in maintaining the depth and rhythm of chest compressions, confusion in the use of tools, and psychological pressure become obstacles in forming optimal competence. High anxiety levels, limited practice time, and large numbers of participants also reduce the effectiveness of learning. Opportunities for rehearsal and feedback are often limited in conventional learning activities. This situation makes students less confident in dealing with simulations that are designed to resemble real conditions (Downs

et al., 2023).Many students also criticized the learning methods. The lecture method that is too dominant, unrealistic simulations, and skills evaluation that is not yet objective are considered insufficient to describe the readiness to face clinical practice. Students' expectations lead to a more in-depth active, case-based, and real experience-based learning approach. Learning activities should ideally provide space for personal reflection, increased awareness of patient safety, and strengthening the value of professionalism in the context of emergencies (Elendu et al., 2024).Students' reflections on the learning process are an important component in evaluating the effectiveness of an educational approach. Their perspectives can illustrate the internal and external barriers faced during learning. Previous research has mostly focused on quantitative aspects such as pre-post learning score improvement. Studies that explore students' subjective experiences and reflections are still relatively limited. In fact, this approach can open space for exploration of meanings, perceptions and expectations that may not be reached by quantitative instruments (Castleberry et al., 2016).

The qualitative approach provides an opportunity to understand the learning process from the student's perspective more fully. Reflective narratives can reveal the emotional, social and cognitive aspects of the learning process. The interpretation of the learning experience becomes the basis for creating more adaptive and contextualized educational interventions. This process is important to improve the quality of emergency learning, both in technical aspects and psychological readiness (Pertiwi & Weganofa, 2015). The use of technology in emergency learning has shown promising results. Virtual reality-based simulations, blended learning approaches, and repeated evaluations have been shown to increase student engagement and long-term skill retention (H. Y. Kang & Kim, 2021). Healthcare education institutions need to consider learning designs that are not only oriented towards technical skills, but also support the formation of professional attitudes through participatory and reflective learning experiences (Wong, 2024).The research problem in this study focuses on how health sciences students reflect on their experiences in learning about emergency response. This study aims to explore the challenges they encounter during the learning process and how they interpret these experiences in the context of clinical readiness. Student reflections are considered a vital source of information for evaluating the effectiveness of educational approaches used in emergency response training. Their perspectives can also reveal expectations for improving future teaching methods and strategies. This understanding serves as a foundation for designing more meaningful and responsive learning experiences that address the needs of health sciences students. The objective of this study is to explore in depth the reflections of health sciences students on emergency response learning, including their experiences, perceived challenges, and expectations for more effective and applicable educational approaches.

METHOD

This study used a descriptive qualitative design to explore health science students' experiences and reflections on learning emergency response. This approach allows researchers to describe phenomena in detail without manipulation of variables. The main objective of this design is to understand the meaning participants give to their learning experiences. This design was chosen because it is in line with the focus of the study, which emphasizes subjective interpretation of individual experiences in the context of clinical education (Surayya, 2020).A total of 12 clinical stage students from health science programs participated in this study. A purposive sampling technique was used to select participants who met the inclusion criteria. The criteria included students who had participated in simulation-based emergency learning in the last three months and were willing to voluntarily participate in the interview. Participants who did not complete the learning activities or refused to participate in the interview process were excluded from the study (Fiantika et al., 2022).Data was collected through in-depth interviews using a semi-structured approach. Interviews lasted 30 to 45 minutes, either in person or according to participant preference. Each interview was recorded with written consent and field notes were taken to document context and nonverbal expressions. The interview guide was developed based on the research focus,

which included learning experiences, challenges faced, and expectations of the emergency learning process (Fiantika et al., 2022).

All interviews were transcribed verbatim by the researcher to maintain the authenticity of the participants' narratives. *The member checking* process was carried out by asking for confirmation from participants to ensure the accuracy of the data collected. Data validity was strengthened by periodic self-reflection during the data collection and interpretation process. This effort was made to minimize bias and maintain the integrity of qualitative analysis.Ethical aspects were strictly maintained at all stages of the study. All participants were given a detailed explanation of the purpose of the study, the procedures to be undertaken, and the right to withdraw at any time without consequence. Participants' identities were masked in all reports and publications to maintain confidentiality and privacy. The data analysis process was conducted carefully to avoid interpretative bias and maintain the validity of the meanings conveyed by participants.Data analysis was conducted using a thematic analysis approach based on the procedure of. The analysis process included repeated reading of the data, initial coding, grouping the codes into themes, reviewing the themes, and compiling interpretive narratives. The analysis was conducted manually to maintain the researcher's closeness to the data and maintain flexibility in the process of exploring meaning. The validity of the analysis results was strengthened through source triangulation and discussion with a team of peers (Nurfajriani et al., 2024).This method was chosen so that the research can explore in depth the learning experience of students in responding to emergency learning. The results of the study are expected to be the basis for educational institutions in developing learning strategies that are more contextual, participatory, and in line with the needs of students. This design also provides space for students to convey personal experiences in a professional setting. The descriptive qualitative approach is relevant to reveal both the technical and emotional dimensions of the learning process experienced by students (Surayya, 2020).

Table 1.
Interview Guidelines

No.	Interview Questions	Code	Exploration Objectives	Thematic Indicators
1	What was your experience when you first learned about emergency response?	Q1	Exploring initial impressions and personal reflections	Initial perception, self-confidence, initial interpretation
2	What do you think of the learning methods used in the activity?	Q2	Assessing the effectiveness of learning approaches	Lecture, simulation, practical instruction
3	To what extent did the activity help your understanding and skills in dealing with emergencies?	Q3	Identify the impact on technical competence	Understanding, technical skills
4	Is there a particular experience that has had a major impact on how you understand emergency care?	Q4	Exploring meaningful experiences	Personal reflection, attitude change
5	What were the main challenges you faced during the learning process?	Q5	Identify technical and psychological barriers	Limited tools, time, emotional distress
6	How was your experience when you practiced the main techniques directly?	Q6	Exploring hands-on experience in the application of skills	Practice, common mistakes, technical obstacles
7	To what extent do psychological factors, such as nervousness or lack of confidence, affect your abilities?	Q7	Assessing the impact of psychological aspects on performance	Anxiety, mental stress, emotional readiness
8	Is the duration and intensity of your learning sufficient?	Q8	Assess the adequacy of learning time and frequency	Duration, intensity, retention of material
9	What do you think needs to be improved in this emergency response learning?	Q9	Identify areas that need improvement	Program evaluation, suggestions, additional needs
10	What are your hopes for the future development of emergency learning?	Q10	Formulate expectations and feedback on the curriculum	Learning innovation, curriculum integration

No.	Interview Questions	Code	Exploration Objectives	Thematic Indicators
11	Are methods such as intensive simulations or repetitive exercises required in this activity?	Q11	Explore opinions on alternative learning strategies	Advanced simulation, competency reinforcement
12	How important do you think this learning is for students before entering clinical practice?	Q12	Assess perceptions of the urgency and relevance of learning	Practice readiness, professional role

RESULT AND DISCUSSION

Based on the participant characteristics data (Table 2), a total of 12 clinical stage students from various health science study programs participated in this study. The participants ranged in age from 21 to 25 years old, with a balanced gender composition between males and females. Most of the participants (66.7%) had previous experience in learning about emergency response. All participants had never applied these skills in a real emergency situation in the field. This finding suggests that although learning experience has been gained through simulation, the technical skills are still within the context of a laboratory or practice room and have not been tested in real clinical conditions. The importance of strengthening applicative and realistic simulation-based learning is highlighted to improve students' readiness to face emergency situations directly.

Table 2.
Participant Characteristics

Code	Gender	Age (Years)	Education Stage	Learning Experience Emergency Response	Never Applied to Real Situations
P1	Female	21	Clinic	Yes	No
P2	Male	22	Clinic	No	No
P3	Male	23	Clinic	No	No
P4	Female	22	Clinic	No	No
P5	Female	21	Clinic	Yes	No
P6	Male	24	Clinic	Yes	No
P7	Female	25	Clinic	Yes	No
P8	Male	22	Clinic	Yes	No
P9	Male	21	Clinic	Yes	No
P10	Female	23	Clinic	Yes	No
P11	Female	22	Clinic	Yes	No
P12	Female	24	Clinic	Yes	No

Theme 1. Experience with Emergency Response Learning

Participants' responses indicate that simulation-based learning has a positive impact on improving students' understanding, confidence and readiness to deal with emergency situations. Hands-on experience, interaction with tools, and instructor guidance were considered more effective than a purely theoretical approach.

P3: *"This lesson is really useful, I feel more confident after practicing using the mannequin and AED."*
P7: *"This is my first time trying hands-on CPR. It was difficult at first, but it became comfortable after a while."*
P5: *"The instructions were clear, but because the time was short, I still need additional practice."*
P10: *"Practical training is much more helpful than theory, I understand better how to handle patients."*
P1: *"This lesson taught me the importance of responding quickly during an emergency."*

Theme 2. Challenges in Learning Emergency Response

Health science students face a number of challenges during the learning process of emergency response, both from technical and psychological aspects. Difficulties in maintaining the quality of chest compressions, the use of AED devices, and emotional distress during simulation are considered barriers

that interfere with the internalization of skills. Limited practice time and a large number of participants also limited the opportunity for students to gain optimal experience in skill mastery.
P2: *"The pressure during chest compressions is tiring, I need practice so I don't get tired so quickly."*
P8: *"The first time I used an AED, I was a bit confused. It took time to understand how it works."*
P12: *"There are still many who hesitate during the simulation because they are afraid of being wrong."*
P6: *"There are many participants, so there is not enough time for practice."*
P9: *"I was nervous because I had to follow instructions quickly, especially during a team exercise with a cardiac arrest scenario."*

Theme 3. Expectations for Improved Learning of Emergency Response
Participants expressed various hopes to improve the effectiveness of learning, especially in terms of additional practice sessions, the application of more complex simulations, periodic refreshers, and continuous evaluation of skills. Students considered that more intensive and structured practice would help strengthen skill mastery, prolong knowledge retention, and foster readiness to face real conditions.
P4: *"I hope there will be more training time so that I will be better prepared if it really happens."*
P11: *"I think it would be better if the training used more complicated case simulations."*
P5: *"I would like to see further training, such as refresher sessions every few months."*
P7: *"It would be better if each group was given more time to try out the tools directly."*
P1: *"If there is a practical evaluation after a few weeks, maybe we won't forget so easily."*

Theme 4. Relevance and Urgency of Emergency Response Learning
Participants demonstrated a high understanding of the importance of mastering basic life-saving skills before entering clinical practice. Awareness of the potential for sudden cardiac arrest, both in health care facilities and in the community, encourages students to interpret this learning as an integral part of professional readiness. The learning experience they gain is considered not only as an academic requirement, but also as a real provision to save the lives of patients in critical situations.
P10: *"This lesson is really important because we have to be ready if there is an emergency, in the hospital or outside."*
P3: *"In my opinion, this skill is very basic and must be possessed before starting to practice."*
P8: *"I realized that cardiac arrest can happen suddenly, so I became more concerned about patient safety."*
P6: *"Senior doctors often say cardiac arrest can happen at any time. Without this lesson, I would have panicked."*
P2: *"I am more convinced that this skill must be practiced often, not just learned so that I can help people quickly."*

The characteristics of the participants, who had never applied emergency skills in a real situation, indicated that their reflections were more influenced by simulated experiences. Simulation-based learning is the only means for students to form initial perceptions and develop emergency preparedness. Research by Kang & Yu (2025) showed that health science students who rely solely on simulation tend to have limitations in confidence and quick decision-making when facing resuscitation situations. Technical skills and psychological readiness require learning contexts that resemble real conditions, including challenging complex scenarios. Reinforcement in the form of case-based simulations is crucial to build student readiness more thoroughly.The majority of participants had previous experience with emergency learning, suggesting an element of repetition in the learning process. The effectiveness of this experience is not only determined by the number of participants, but more so by the quality of the learning approach provided. Research by Purwacaraka et al., (2025) suggests that the effectiveness of emergency learning is highly dependent on the quality of simulation, frequency of practice, and active involvement of participants. Participants who have participated in previous learning may not necessarily show more mature reflections if the methods used do not support deep meaning. Investigating students' reflections

in this study provides an important basis for designing learning approaches that are empowering, relevant, and have a lasting impact on their professional readiness.

Theme 1. Experience with Emergency Response Learning

The research findings show that simulation-based learning provides meaningful experiences for health science students in understanding emergency response. Participants revealed that hands-on practice using tools such as mannequins and automatic defibrillators contributed to increasing confidence when performing resuscitation actions, as stated by P3 and P10. This finding is in line with the results of research Kassabry (2023) which states that realistic simulations can increase students' self-efficacy and readiness to respond to cardiac arrest conditions. Learning that prioritizes hands-on practice is considered more effective than the theoretical approach in building basic life-saving competencies.The first experience of performing hands-on CPR was challenging but constructive, as expressed by P7. The process of adapting to the technique repeatedly helped students to feel more alert and comfortable in performing the procedure. This finding is corroborated by a study (Sutton et al., 2011) which showed that improvement in skills in performing resuscitation actions was positively correlated with frequency of practice and quality of instruction. Repeated exposure to simulation is an important factor in improving students' mastery of technical skills.

Systematic instructor guidance, as noted by P5, plays a crucial role in reinforcing the learning process alongside practical experience. Limited practice time emerged as a significant obstacle to thorough skill development. According to Friedlaender et al (2025) asserted that insufficient practice time can reduce the quality of skill retention in emergency learning. The implications of these findings suggest the importance of flexible learning designs that are responsive to students' needs in developing life-saving skills. Awareness of the urgency of acting quickly also emerged from student reflections, as conveyed by P1. This awareness is an early indication of the formation of a professional attitude in dealing with clinical conditions that require a quick and appropriate response. This finding is in line with a study Alinier & Sonesson (2025) which states that emergency-based learning can improve psychological readiness and strengthen students' professional responsibility. Thus, learning experiences in the context of simulation not only play a role in strengthening technical skills, but also in character building and clinical preparedness.

Theme 2. Challenges in Learning Emergency Response

Health science students face various challenges in the emergency learning process, both from a technical and psychological perspective. One of the technical challenges expressed was the difficulty in maintaining optimal chest compression pressure, as stated by P2. This condition confirms that mastering life-saving skills does not only depend on theoretical understanding, but also requires adequate physical readiness. Research by Nas et al (2021) supports this finding by showing that the quality of compressions during resuscitation is strongly influenced by physical strength and training frequency.Challenges also arose in the use of the automatic defibrillation device which was considered confusing by students who used it for the first time, as expressed by P8. This reflection shows that procedural understanding of life-saving devices is still not fully formed. A study by Strnad et al (2020) revealed that although students had access to training in the use of AEDs, the speed and accuracy in applying the device in simulated situations was still an obstacle. Repeated practice with realistic scenarios is the recommended approach to effectively reinforce these skills.

Psychological aspects also became a significant obstacle in the learning process. Some participants such as P9 and P12 revealed that nervousness and fear of making mistakes caused hesitation in taking action during the simulation. The mental stress that arises in emergency simulation often reduces the performance of students who are not accustomed to facing critical clinical situations. Research by Sayed et al., (2024) supports this by stating that situational stress in a simulation environment can negatively

impact participant performance. Students' mental resilience needs to be built through learning approaches that gradually introduce them to the dynamics of emergency situations.Limited practice time is an additional challenge faced by students, especially in large groups, as stated by P6. Students feel that they do not have enough time to repeat or deepen the skills being learned. The study Sutono & Achmad (2020) emphasized that the ratio of the number of participants and the duration of practice sessions have a direct impact on the effectiveness of learning emergency skills. Small group sharing and proportional allocation of practice time are important strategies to ensure equitable learning experience and skill mastery.

Theme 3. Expectations for Improved Learning of Emergency Response

Students showed high enthusiasm for learning emergency response, along with expectations for improvement in the quality of implementation. Some participants such as P4 and P7 highlighted the importance of additional practice time to ensure optimal skill mastery. The limited duration of practice is considered to not fully accommodate the learning needs of students in mastering the use of tools and technical procedures in depth. A study by Nirmalasari et al., (2020) showed that sufficient practice duration significantly contributed to skill improvement and retention of life-saving skills. Adjusting the allocation of practice time is crucial in supporting the effectiveness of the learning process.Another expectation that emerged was the need to develop complex case-based simulations to illustrate challenges that are closer to real conditions. Participants such as P11 considered that scenarios that resemble the clinical world can strengthen readiness in decision making and increase emotional involvement in the learning process. Research by Stenseth et al (2025) supports these findings by stating that realistic simulations can encourage the development of critical thinking skills and problem solving. Expanding the variety of scenarios in simulation is a potential strategy to increase the relevance and impact of learning on students' clinical readiness.

Another suggestion that emerged was the need for continuous learning through periodic refresher sessions. Participants such as P5 realized that life-saving skills can deteriorate if not practiced regularly. A study by Kochhar et al (2024) confirmed that periodic retraining maintains long-term competence and improves emergency preparedness. Repetitive and structured learning strategies are essential to maintain consistency of skills and prevent degradation over time.Participants such as P1 suggested conducting a practical evaluation after a certain period following the learning session to assess the sustainability of skill acquisition. This evaluation serves not only as a tool for measurement but also as a mechanism to uphold skill standards and reinforce the importance of continuous practice. Minna et al (2022) showed that formative evaluation after learning sessions plays a role in strengthening skill retention and increasing awareness of areas for improvement. The integration of periodic evaluation into the learning cycle is an important part of a holistic and quality-oriented educational strategy.

Theme 4. Relevance and Urgency of Emergency Response Learning

Health science students recognized that emergency response skills are a basic competency that must be mastered before entering clinical practice. Participants such as P3 and P10 emphasized the importance of emergency preparedness, both in hospitals and in the community. This reflection reflects that mastery of life-saving skills is seen not only as an academic requirement, but as part of professional preparedness for real, unpredictable situations. The study by Eskici et al (2025)shows that basic emergency response skills are an inherent professional responsibility of healthcare students.Students' increased awareness is also evident in their understanding that cardiac arrest can occur suddenly without any early signs, as stated by P8. This suggests that the learning process not only shapes technical skills, but also strengthens the dimensions of empathy and concern for patient safety. Abbasi et al (2018) found that emergency-related learning experiences increased students' clinical awareness of their critical role in emergency situations. Therefore, this learning contributes to the formation of clinical preparedness while strengthening ethical and humanitarian values in healthcare practice.

Some participants, such as P2 and P6, emphasized the importance of repeated practice so that skills are not only understood theoretically, but can be executed automatically and reflexively in real situations. This view is in line with research Al-qbelat et al (2022), which stated that students who attended emergency training on an ongoing basis had better response times and action accuracy than those who attended only one learning session. Consistency of training is key in maintaining skills and building confidence when facing emergency conditions.Emergency response learning is perceived by students as a fundamental component of professionalism and clinical preparedness, rather than merely a segment of the skills curriculum. Lack of readiness to handle real-life situations without sufficient training may lead to panic, as illustrated by participant P6. This reflection highlights the need for a learning process that is systematically planned, well-structured, and regularly reinforced as an integral part of the core curriculum in health professions education. Such an approach aligns with the findings of Hayes et al (2024), who emphasize the critical role of incorporating emergency response training in health education to enhance preparedness at both primary and secondary care levels.

CONCLUTION

The results of this study indicate that emergency response learning plays an important role in improving the understanding, skills and preparedness of health science students in dealing with critical conditions such as cardiac arrest. Hands-on experience, instructor guidance, and active involvement in simulations were shown to support students' increased confidence in performing life-saving actions. However, students faced a number of challenges, both technical and psychological, such as physical fatigue when performing chest compressions, difficulty in using assistive devices, and emotional distress during the simulation. Participants' reflections also revealed hopes for strengthening the quality of learning, including the need for longer training duration, the use of more complex simulation scenarios, and regular evaluation of skills. These findings confirm that emergency learning needs to be an integral part of a sustainable and practice-ready health education curriculum.Practically, this study recommends that educational institutions develop more comprehensive, adaptive, and learner-centered emergency learning models. The learning process should ideally be designed in stages, with repeated practice, formative evaluation, and periodic skill refreshers to strengthen retention and clinical preparedness. Integration of real case simulations can improve the quality of learning and strengthen decision-making skills in emergency situations. The involvement of competent instructors and the use of small groups during practice can also improve the effectiveness and equity of the learning experience. The implementation of responsive learning strategies will support the formation of students' professional competencies as future health workers who are responsive and trained in dealing with emergencies.

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