Title: From Uncertainty to Competence: Decision-Making Strategies of Volunteer Ambulance Responders in Indonesian Low-Resource Emergency Care

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To appear in: ***Health in Emergencies & Disasters Quarterly***

Received date: 2025/08/03

Revised date: 2025/10/18

Accepted date: 2025/10/26

First Online Published: 2025/12/14

Please cite this article as:

Febri Ramdani W, Kurniasih Y, Nur Faizah C. From Uncertainty to Competence: Decision-Making Strategies of Volunteer Ambulance Responders in Indonesian Low-Resource Emergency Care. Health in Emergencies & Disasters Quarterly. Forthcoming 2026. Doi: http://dx.doi.org/10.32598/hdq.2026.554.2

Abstract

Background: Volunteer ambulance personnel play a critical role in prehospital emergency care, especially in low-resource settings. However, limited attention has been given to how they make rapid decisions under uncertain and constrained conditions.

Materials and Methods: This qualitative study employed a phenomenological approach, involving in-depth interviews with 20 experienced male volunteers aged 31-40 years with 4-7 years of emergency response experience in Yogyakarta, Indonesia. Thematic analysis was used to explore decision-making processes during emergency responses.

Results: Four main themes emerged: navigating emergencies with incomplete caller information; making rapid decisions despite limited equipment and environmental challenges; managing pressure from families and bystanders; and reflecting on confidence and identity shaped by repeated field experience. Volunteers relied on clinical intuition, teamwork, and improvisation to adapt to unpredictable situations.

Conclusion: Volunteer responders in low-resource environments demonstrate strong adaptive capacity, emotional resilience, and field-based competence in critical decision-making. These findings highlight the need for structured training, institutional support, and policy integration to enhance their role in community-based emergency systems.

Keywords: Volunteer ambulance personnel, prehospital care, critical decision-making, low-resource settings, qualitative research.

Introduction

Prehospital emergency care plays a critical role in effective healthcare systems, serving as the first line of response for acute medical conditions and trauma [1]. In many low- and middle-income countries (LMICs), including Indonesia, this care is often heavily reliant on volunteer ambulance personnel. Despite their essential role, these volunteers face unique and complex challenges, particularly when making critical decisions under uncertain and resource-limited conditions [2]. In Indonesia's healthcare landscape, volunteer-based emergency medical services (EMS) operate within a mixed public-private system where government ambulances are often insufficient to meet population needs, particularly in urban areas like Yogyakarta. These volunteer organizations, typically community-based or affiliated with religious institutions, fill critical gaps in emergency response coverage, operating with minimal formal oversight and limited standardized protocols[3].

Indonesia's emergency care system operates within a complex healthcare landscape characterized by significant resource disparities and coverage gaps. The national healthcare system, while expanding under the Jaminan Kesehatan Nasional (JKN) universal health coverage program, still faces substantial challenges in emergency medical services (EMS) delivery. Government-operated ambulance services are primarily hospital-based and often insufficient to meet population needs, particularly in densely populated urban areas like Yogyakarta Special Region. This gap has led to the emergence of numerous volunteer-based EMS organizations, typically affiliated with community groups, religious institutions, or local disaster response teams.

These volunteer organizations operate with varying degrees of formalization and standardization. Most volunteers receive basic life support (BLS) training through programs offered by organizations such as the Indonesian Red Cross (Palang Merah Indonesia), local health departments, or their respective volunteer organizations. The typical training curriculum includes basic airway management, cardiopulmonary resuscitation (CPR), basic wound care, patient lifting and transport techniques, and communication with healthcare facilities. However, volunteers are not trained for advanced procedures such as intubation, medication administration, or advanced cardiac life support (ACLS). They are primarily prepared for scenarios involving trauma cases, cardiac emergencies, stroke patients, respiratory distress, and medical emergencies requiring rapid transport to healthcare facilities.

The educational background of most volunteer ambulance personnel in Indonesia reflects the broader population demographics, where senior high school (Sekolah Menengah Atas/SMA) completion represents a significant educational achievement. In the Indonesian education system, senior high school education spans three years (grades 10-12) and provides general academic knowledge including basic sciences, mathematics, Indonesian language, and social studies. Graduates possess fundamental literacy, numeracy, and critical thinking skills that serve as a foundation for further learning, including emergency medical training. This educational level enables volunteers to comprehend medical protocols, communicate effectively with healthcare professionals, and adapt to new situations—competencies that prove essential in emergency response contexts.

Emergency decision-making in prehospital settings can be understood through naturalistic decision-making theory, which emphasizes how experienced practitioners make rapid choices in dynamic, high-risk environments where traditional analytical approaches are impractical. In volunteer emergency services, clinical intuition—developed through field experience and basic training—becomes essential when formal protocols are absent or inadequate for complex situations [2], [4]. In volunteer emergency services, clinical intuition—developed through field experience and basic training—becomes essential when formal protocols are absent or inadequate for complex situations[5]. This

experiential knowledge enables volunteers to recognize patterns, anticipate complications, and adapt interventions based on available resources and environmental constraints.[6], [7].

However, there is a significant research gap between well-resourced EMS systems and volunteer-driven services in LMICs. While existing literature on emergency decision-making is substantial, most studies focus on professional paramedics in structured systems with standardized equipment, comprehensive training, and established protocols [6], [8], [9]. This body of research fails to address the unique challenges faced by volunteer responders in resource-limited settings, including limited caller information, sudden patient deterioration without advanced medical support, restricted access in challenging environments, and social pressures from families and communities. These factors create a distinct decision-making environment that requires new theoretical understanding and practical insights.

This study addresses that gap by examining how volunteer ambulance personnel in Yogyakarta, Indonesia, make critical decisions during prehospital emergencies. Specifically, it explores the challenges they encounter, the adaptive strategies they employ, and how these decision-making experiences influence their confidence and volunteer identity.

Materials and Methods

Research Design

This study employed a qualitative phenomenological approach to explore the lived experiences of volunteer ambulance personnel making critical decisions during prehospital emergency care in Yogyakarta, Indonesia. Phenomenology was chosen for its capacity to capture the essence of complex, real-world experiences through rich, in-depth narratives, offering insight into how individuals navigate and interpret their roles under pressure.

Setting and Timeframe

The research took place in the Special Region of Yogyakarta, selected for its active network of volunteer emergency services. Data collection occurred over a three-month period, from March to July 2025, with interviews conducted in locations mutually agreed upon with participants to ensure privacy and comfort.

Participants and Sampling

Participants were purposively selected from active volunteer ambulance personnel affiliated with non-governmental or community-based organizations. Eligibility criteria included a minimum of two years of volunteer service, direct experience handling emergency cases, and a willingness to participate. Individuals working solely in professional or government-run ambulance systems were excluded. Scientific inclusion criteria were: (1) minimum of two years of continuous volunteer service in emergency ambulance response, (2) direct hands-on experience in handling at least 30 emergency cases, (3) possession of basic life support (BLS) or equivalent emergency response certification, (4) active membership in a recognized volunteer EMS organization, and (5) willingness to participate and provide informed consent. Exclusion criteria included: (1) individuals working solely in professional or government-run ambulance systems, (2) volunteers with less than two years of active service, (3) administrative-only volunteers without field response experience, and (4) volunteers who were unavailable for the full interview duration.

This study focused exclusively on male volunteers as they comprised the entire population of active volunteer ambulance personnel in the participating organizations during the study period. The

absence of female volunteers reflects organizational and cultural patterns in Indonesian volunteer emergency services, where emergency response roles are traditionally male-dominated due to cultural norms regarding physical demands and night-shift work. This gender limitation may affect the generalizability of findings to more gender-diverse EMS contexts and potentially overlooks decision-making patterns that could emerge in mixed-gender teams or female-only volunteer groups. Recruitment continued until data saturation was achieved, with approximately 20 participants included.

Educational Background Definition: In the Indonesian education system, "Senior High School" (Sekolah Menengah Atas/SMA) represents completion of 12 years of formal education, equivalent to high school graduation in many international contexts. This educational level indicates that participants have achieved basic competencies in scientific literacy, mathematical reasoning, Indonesian language proficiency, and general knowledge across multiple academic domains. SMA graduates demonstrate the cognitive abilities necessary for processing complex information, following multi-step protocols, and adapting to new learning situations—skills that are fundamental for emergency medical training and field decision-making. In Indonesia's demographic context, SMA completion represents a significant educational achievement and provides a solid foundation for technical and vocational training, including emergency medical response skills.

Data Collection Methods

Data were gathered primarily through in-depth semi-structured interviews, supported by participant observation and document analysis. The interview guide was developed through a systematic four-stage process: (1) extensive literature review of emergency decision-making frameworks and qualitative interview techniques, (2) consultation with three emergency medicine experts and two experienced qualitative researchers, (3) pilot testing with two volunteer coordinators to assess question clarity and cultural appropriateness, and (4) refinement based on pilot feedback to ensure questions effectively captured the Indonesian volunteer context and decision-making experiences.

The complete interview guide is presented in Supplementary Document 1. Key questions in the interview guide included: "Can you describe a recent emergency situation where you had to make a critical decision quickly? What factors influenced your decision?", "How do you handle situations when you receive incomplete or unclear information from emergency callers?", "What strategies do you use when medical equipment is limited or unavailable during an emergency?", "How do you manage pressure from families and bystanders during critical situations?", "How has your experience as a volunteer ambulance responder shaped your confidence in making emergency decisions?", and "What role do your teammates play in your decision-making process during emergencies?"

The researcher used a pre-developed interview guide and acted as the primary instrument for data collection. Interviews, each lasting 60–90 minutes, were audio-recorded with participant consent and transcribed verbatim. All interviews were conducted in Bahasa Indonesia, the participants' native language. Transcripts were analyzed in the original language to preserve contextual meaning and nuance. Representative quotes presented in this manuscript were translated to English by the research team, with back-translation verification performed by a bilingual emergency care professional to ensure accuracy and maintain the participants' intended meaning. Observations were conducted during volunteer shifts, with detailed field notes documenting behaviors and contextual interactions. Relevant documents—such as incident reports and organizational SOPs—were reviewed to enhance contextual understanding and support triangulation.

Data saturation was determined using Lincoln and Guba's criteria: (1) no new themes or sub-themes emerged from three consecutive interviews, (2) existing themes were consistently reflected across participants with sufficient depth and variation, and (3) the research team reached consensus that the data adequately addressed the research questions. Data saturation was achieved after 18 interviews, with two additional interviews conducted to confirm saturation and ensure comprehensive theme development.

Data Analysis

Thematic analysis was conducted manually through an iterative, inductive process. Transcripts were read repeatedly to ensure deep familiarity with the data, followed by coding of significant statements relevant to the research objectives. Codes were then grouped into broader themes that reflected recurring patterns across participant narratives. These themes were refined and named to capture core concepts representing the shared decision-making experiences of the volunteers.

Trustworthiness and Rigor

The study adhered to established standards for qualitative rigor. Credibility was ensured through member checking, peer debriefing with experienced researchers, prolonged engagement in the field, and methodological triangulation. Transferability was supported through rich, contextual descriptions, while dependability was maintained via a detailed audit trail. Confirmability was addressed through consistent researcher reflexivity and secure data management, enabling potential external review.

Ethical Considerations

All procedures followed ethical guidelines to protect participants' rights and well-being. Written informed consent was obtained after a thorough explanation of the study's purpose, procedures, potential risks and benefits, and participants' right to withdraw at any time. Anonymity and confidentiality were safeguarded through de-identification of data and the use of pseudonyms. The study received ethical approval from Universitas Aisyiyah Yogyakarta, under approval number 2146 / KEP-UNISA/V/2025 in compliance with national and international standards for human subjects research.

Results

This study examined how volunteer ambulance personnel make critical decisions during prehospital emergency care in resource-constrained environments. In-depth interviews were conducted with 20 male volunteers, all over the age of 30, with an average of four years' experience in emergency response. Most had completed secondary education and had managed a variety of emergency situations. Participant characteristics are summarized in Table 1.

Table 1. Characteristics of In-Depth Interview Participants (n = 20)

Code	Gender	Age	Education	Years of Experience as Volunteer	Emergency Case Experience	BLS or Emergency Training
P1	Male	32	Senior High School	4	Yes	Yes
P2	Male	35	Senior High School	5	Yes	Yes
P3	Male	38	Senior High School	6	Yes	Yes
P4	Male	34	Senior High School	4	Yes	No
P5	Male	36	Senior High School	5	Yes	Yes
P6	Male	33	Senior High School	4	Yes	No
P7	Male	39	Senior High School	7	Yes	Yes
P8	Male	37	Senior High School	6	Yes	Yes
P9	Male	31	Senior High School	4	Yes	No
P10	Male	35	Senior High School	4	Yes	Yes
P11	Male	36	Senior High School	5	Yes	Yes
P12	Male	34	Senior High School	4	Yes	No
P13	Male	32	Senior High School	4	Yes	Yes
P14	Male	40	Senior High School	7	Yes	Yes
P15	Male	33	Senior High School	4	Yes	Yes
P16	Male	35	Senior High School	5	Yes	No
P17	Male	38	Senior High School	6	Yes	Yes
P18	Male	34	Senior High School	4	Yes	Yes
P19	Male	31	Senior High School	4	Yes	Yes
P20	Male	36	Senior High School	5	Yes	Yes

Thematic analysis revealed four overarching themes, each comprising several sub-themes supported by narrative evidence. These themes are interconnected and represent a dynamic, cyclical process of decision-making that evolves from initial emergency response through post-action reflection. The relationships between themes demonstrate how foundational challenges (Theme 1) directly inform

adaptive strategies (Theme 2), which occur within complex social dynamics (Theme 3), ultimately contributing to professional identity development and experiential learning (Theme 4). This interconnected framework illustrates that volunteer decision-making is not a linear process but rather a continuous cycle of challenge, adaptation, social negotiation, and reflection that builds competence over time.

The connection between main themes and sub-themes reflects the multi-layered nature of emergency decision-making in volunteer contexts. Theme 1 establishes the structural and contextual challenges that define the decision-making environment, with its three sub-themes representing different sources of uncertainty (information, patient condition, and environment). Theme 2 builds on these challenges by describing how volunteers develop specific adaptive strategies, with each sub-theme addressing a different aspect of resource optimization (team coordination, experience utilization, and equipment improvisation). Theme 3 introduces the social dimension that permeates all decision-making activities, showing how external pressures and internal emotional responses create additional complexity. Finally, Theme 4 captures the transformative effects of repeated decision-making experiences, demonstrating how challenges and adaptations ultimately contribute to confidence building and identity formation.

To present these findings systematically, Table 2 integrates the identified themes, sub-themes, and key indicators, structured across phases of prehospital care and aligned with the “3C” leadership dimensions: Character, Competence, and Central Role.

Table 2. Themes, Sub-Themes, and Key Indicators of Critical Decision-Making by Volunteer Ambulance Personnel Aligned with Prehospital Emergency Phases and Leadership Dimensions (3C)

Main Theme	Sub-Theme	Key Indicators	Prehospital Emergency Phase	Leadership Dimensions (3C)
Navigating Emergency Situations in Volunteer Ambulance Contexts	Limited Information from Callers	Calls often contain vague or misleading information, requiring volunteers to anticipate a wide range of conditions	Anticipation Phase (before arrival)	Character: Alert, cautiousCompetence: Intuition from field experience
	Sudden Patient Deterioration	Patient conditions may deteriorate quickly, requiring immediate clinical decision-making on-site	Field Response Phase	Competence: Emergency technical skillsCentral Role: On-site clinical decision leader
	Challenging Access and Environmental Conditions	Physical access barriers (narrow alleys, rain, night) require creative evacuation strategies	Preparation & Field Response Phase	Character: AdaptiveCompetence: Navigation and logistical improvisation
Strategies for Rapid Decision-Making Under Resource Constraints	Quick Team Coordination	Task division happens quickly before/during response: airway, oxygen, hospital communication	Preparation Phase	Competence: Team coordinationCentral Role: Micro-command in the field
	Utilizing Field Experience	Repeated exposure to similar cases (e.g. stroke) forms intuitive reference for decision-making	Anticipation & Preparation Phase	Character: ConfidenceCompetence: Experience-based judgment
	Improvisation Amid Equipment Limitations	Without advanced tools (e.g. AED), volunteers improvise using basic methods (e.g. manual CPR)	Field Response Phase	Competence: ImprovisationCentral Role: Tactical problem-solver

Main Theme	Sub-Theme	Key Indicators	Prehospital Emergency Phase	Leadership Dimensions (3C)
Social Pressures and Emotional Challenges During Decision-Making	Pressure from Families and Bystanders	Family and bystanders often urge rapid transport, potentially conflicting with clinical priorities	Field Response Phase	Character: Assertive and empatheticCentral Role: Social negotiator
	Emotional Strain on Volunteers	Emotional tension arises from urgent expectations and high-pressure decision-making	Field Response Phase	Character: Emotional resilienceCompetence: Self-regulation under crisis
Reflections on Critical Decision-Making and Volunteer Identity	Confidence and Sense of Responsibility	Repeated decision-making experiences improve confidence and intuitive clinical judgment	Post-Action Reflection Phase	Character: Self-aware and growingCompetence: Reflective learning
	Humanitarian Values in Volunteer Roles	Volunteering is driven by altruistic values and strengthens social identity	Post-Action Reflection Phase	Character: Altruistic commitmentCentral Role: Community role model and moral agent

The study revealed four overarching themes with associated subthemes related to the experiences of volunteer ambulance personnel in making critical decisions during prehospital emergency care.

Theme 1: Navigating Emergency Situations in Volunteer Ambulance Contexts

Subtheme: Limited Information from Callers

Participants frequently described arriving at emergency scenes with insufficient information regarding the patient's true condition. One participant noted, *"...we usually only receive information that the patient fainted, but upon arrival, we find the patient is not breathing." (P8),* while another added, *"Sometimes residents report that the patient only has a stomachache, but when we check, the blood pressure is already very low." (P12).* These uncertainties forced volunteers to prepare for a wide range of potential emergencies, as reflected in statements such as, *"...often the caller only requests the ambulance quickly without explaining the patient's condition." (P5)* and *"...sometimes they report shortness of breath as minor, but the patient is already cyanotic." (P3).*

Subtheme: Sudden Patient Deterioration

Volunteers frequently encountered patients whose conditions worsened suddenly, requiring immediate and critical actions. One participant shared, *"...there was a patient who could not breathe because their tongue fell backward, so we performed the cross-finger technique to open the airway."*

(P4). Another added, *"A stroke patient we picked up suddenly lost consciousness, so we checked the GCS on-site." (P15),* illustrating the critical decisions needed when patient conditions changed unexpectedly during transport or pickup.

Subtheme: Challenging Access and Environmental Conditions

Access barriers, such as narrow alleys and adverse weather conditions, significantly influenced volunteers' decision-making processes. As one participant explained, *"...many narrow alleys in the city prevent the ambulance from entering, so we have to carry the patient on a stretcher to the main road." (P19),* while another stated, *"There was heavy rain and slippery roads, but we still had to evacuate the patient." (P11).* These contextual barriers required volunteers to remain adaptable and conduct rapid situational assessments under pressure.

Theme 2: Strategies for Rapid Decision-Making Under Resource Constraints

Subtheme: Quick Team Coordination

Participants emphasized the importance of fast role allocation and clear team communication. One participant stated, *"...we quickly divide tasks, with one checking the airway, one holding the oxygen, and another communicating with the hospital." (P3).* Another shared, *"If the report indicates a critical case, we conduct a quick briefing at the post before departure." (P18),* underscoring their use of structured yet rapid preparatory discussions.

Subtheme: Utilizing Field Experience

Experiential knowledge played a vital role in supporting effective decision-making during emergencies. One participant explained, *"Because we often handle stroke cases, we already know how to lift the patient safely." (P9).* Another added, *"BLS training has been very helpful during critical conditions." (P5),* highlighting how training and past experiences informed their critical interventions.

Subtheme: Improvisation Amid Equipment Limitations

Volunteers reported frequently making critical decisions under equipment limitations, requiring on-the-spot improvisation. One participant shared, *"Our ambulance equipment is limited, we only have oxygen and a stretcher." (P12).* Another added, *"We don't have a defibrillator, so we can only perform manual CPR." (P3),* underscoring the challenges of delivering emergency care with minimal resources.

Theme 3: Social Pressures and Emotional Challenges During Decision-Making

Subtheme: Pressure from Families and Bystanders

Participants experienced pressure from families and bystanders urging immediate transport, even when patient stabilization was still needed. One participant stated, *"...families often demand we leave quickly even though the patient hasn't been given oxygen yet." (P10).* Another explained, *"The crowd often insists we quickly carry the patient even when the patient is not yet stable." (P15).*

Subtheme: Emotional Strain on Volunteers

This social pressure often led to emotional strain during critical decision-making moments. One participant shared, *"...sometimes we feel stuck when the crowd is pushing us." (P6),* while another stated, *"We feel we need to act quickly but worry that the patient's condition may worsen." (P13),* reflecting the emotional challenges faced while balancing community expectations with patient safety.

Theme 4: Reflections on Critical Decision-Making and Volunteer Identity

Subtheme: Confidence and Sense of Responsibility

Making critical decisions during emergencies contributed to volunteers' confidence and professional growth. One participant expressed*, "...the more often we make decisions, the more confident we become in the field." (P13).* Another shared, *"We have become more sensitive in assessing the patient's condition." (P1),* illustrating the development of clinical intuition.

Subtheme: Humanitarian Values in Volunteer Roles

Participants conveyed that their volunteer work aligned deeply with their humanitarian values, despite working under resource constraints. One participant shared, *"...as volunteers, we feel a responsibility to help people." (P5).* Another noted, "*We feel proud to help selflessly during emergencies." (P14),* highlighting the intrinsic motivation and sense of purpose found in their roles.

Discussion

The findings of this study contribute significantly to both naturalistic decision-making theory and emergency care literature by demonstrating how volunteers develop situated expertise within resource-constrained environments. From a theoretical perspective, these results extend Gary Klein's Recognition-Primed Decision (RPD) model by revealing how decision-makers adapt when traditional environmental cues and familiar patterns are disrupted by equipment limitations and social pressures [10]. While the volunteers' reliance on clinical intuition and pattern recognition aligns with core RPD principles, their improvisational strategies and social negotiation skills represent novel adaptations not fully captured in existing decision-making frameworks developed primarily in well-resourced settings.

The study introduces two important theoretical constructs to the emergency care literature. First, *"planned improvisation"* describes how volunteers proactively develop flexible response protocols that can be adapted based on available resources rather than assuming fixed equipment configurations. This concept challenges traditional emergency response models that emphasize standardized protocols and suggests that adaptive flexibility may be more valuable than rigid adherence to procedures in resource-limited contexts. Second, *"socio-clinical competence"* represents the ability to maintain clinical decision-making quality while simultaneously managing complex social dynamics, including family expectations, community oversight, and bystander pressure. This dual competency framework acknowledges that effective emergency care in community settings requires both clinical skills and social intelligence [11], [12].

The findings highlight that uncertainty in caller-reported information compels volunteers to anticipate a wide spectrum of potential patient conditions. This challenge reflects broader systemic issues in low-resource EMS environments, including limited emergency communication infrastructure, variable caller education levels, and cultural factors that may influence how medical emergencies are described and perceived[2], [13], [14], [15].

The volunteers' heavy reliance on clinical intuition, developed through field experience rather than formal training, demonstrates an alternative pathway to expertise development that diverges from traditional medical education models. This finding extends naturalistic decision-making theory by showing how competence can develop in environments where formal training opportunities are limited but practical exposure is intensive and varied [13], [14], [15], [16].

The concept of "planned improvisation" emerged as a key finding, representing how volunteers proactively develop flexible protocols that prioritize actions based on patient condition and available

resources. The concept of 'planned improvisation' emerged as a key finding, representing how volunteers proactively develop flexible protocols that prioritize actions based on patient condition and available resources. Equipment limitations emerged as a significant factor, but rather than simply constraining care quality, these limitations appeared to foster creative problem-solving abilities and resource optimization skills that may actually enhance overall emergency response capability in similar resource-limited contexts [17].

Teamwork effectiveness under pressure demonstrated the critical importance of role clarity and communication efficiency, with volunteers developing informal but highly effective coordination mechanisms. These findings support earlier studies emphasizing that coordinated teamwork and efficient communication reduce clinical errors and expedite emergency interventions [18].

The study revealed a unique form of "triple accountability" where volunteers must simultaneously respond to patient clinical needs, family expectations, and broader community oversight. This social dimension creates additional decision-making complexity that extends beyond the dyadic patient-provider relationship typically studied in emergency care research[7].

However, rather than simply creating barriers, these social pressures served as catalysts for developing socio-clinical competence—a unique skill set that enables volunteers to maintain clinical focus while effectively managing community dynamics. This finding suggests that community-based emergency responders may develop competencies that complement rather than compete with traditional clinical skills[19].

Participants' reports of increased confidence and strengthened professional identity through repeated decision-making experiences align with situated learning theory, which emphasizes how expertise develops through legitimate peripheral participation in communities of practice. The volunteers' humanitarian motivation appeared to provide resilience against the emotional challenges of emergency work while creating a sustainable foundation for long-term volunteer retention[20], [21], [22].

The transferability of these findings to other LMIC contexts appears promising based on several shared characteristics. Countries with similar healthcare infrastructure challenges (limited government EMS coverage), volunteer-based emergency services, and strong family/community involvement in medical decision-making—such as the Philippines, Vietnam, Bangladesh, and parts of rural India—may experience comparable decision-making patterns [23]. However, important contextual variations must be considered, including cultural differences in authority relationships, gender roles in emergency response, religious influences on medical decision-making, and communication patterns between healthcare providers and community members.

The study's findings have important implications for emergency care policy development in LMICs. The demonstrated competence of volunteer responders suggests that community-based EMS can serve as a viable and sustainable model for expanding emergency care coverage when supported with appropriate training and integration mechanisms. This aligns with WHO recommendations for strengthening health systems through community engagement and task-shifting approaches, while also supporting arguments for recognizing and formalizing volunteer contributions to healthcare delivery systems [24].

Future policy considerations should include developing standardized training curricula that build on volunteers' existing experiential knowledge, creating formal recognition and certification systems for volunteer emergency responders, establishing clear integration pathways between volunteer and

professional EMS services, and designing sustainable funding mechanisms that support volunteer organizations without undermining their community-based character.

These findings carry practical implications for strengthening volunteer-based prehospital systems in resource-limited regions. Leveraging field experience and team coordination, volunteers can optimize decision-making even in the absence of advanced tools—aligning with recommendations on maximizing existing resources for emergency response [25], [26], [27].

Nevertheless, this study has limitations. The focus on male volunteers limits generalizability to gender-diverse EMS contexts and may not capture decision-making patterns that could emerge in mixed-gender teams or female-led volunteer groups. The study was context-specific, focusing solely on Yogyakarta, and did not objectively measure the clinical outcomes of critical decisions made by volunteers. Additionally, the study did not examine the perspectives of patients, families, or receiving hospital staff, which could provide important triangulation of volunteer decision-making effectiveness.[7], [14], [27].

Conclusion

This study concludes that volunteer ambulance personnel in resource-limited prehospital settings rely heavily on clinical intuition, teamwork, and improvisation to make critical decisions under pressure. Despite facing uncertainty, equipment shortages, and social demands, volunteers demonstrate adaptability and resilience shaped by field experience and humanitarian values. These findings underscore the importance of supporting volunteer responders through targeted training and system integration, particularly in low- and middle-income countries where formal emergency infrastructure is limited. Future research should explore the long-term impact of volunteer decision-making on patient outcomes and identify scalable strategies to strengthen community-based emergency care.

Funding
This research was funded by the Institute for Research and Community Service (LPPM), Universitas 'Aisyiyah Yogyakarta, Indonesia.

Conflict of Interest

The authors declare no conflict of interest.

Acknowledgment

The authors extend their sincere gratitude to the volunteer ambulance personnel who participated in this study, and to Universitas 'Aisyiyah Yogyakarta for institutional and logistical support throughout the research process.

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A. Opening Questions:
   1. Can you tell me about your background as a volunteer ambulance responder?
   2. How long have you been involved in volunteer emergency services?
   3. What motivated you to become a volunteer ambulance responder?

B. Decision-Making Process Questions:

   1. Can you describe a recent emergency situation where you had to make a critical decision quickly? Walk me through what happened and what factors influenced your decision.
   2. When you receive an emergency call, how do you prepare for what you might encounter?
   3. How do you handle situations when you receive incomplete or unclear information from emergency callers?
   4. Can you describe a time when a patient's condition suddenly deteriorated? How did you respond?

B. Resource and Environmental Challenges:
   1. What strategies do you use when medical equipment is limited or unavailable during an emergency?
   2. How do you adapt when facing environmental challenges like narrow roads, bad weather, or difficult access?
   3. Can you describe how you and your team coordinate during emergency responses?

C. Social Dynamics and Pressure:

   1. How do you manage pressure from families and bystanders during critical situations?
   2. Can you describe a situation where family members or bystanders disagreed with your decisions?
   3. How do you communicate with families when making difficult decisions about patient care?

C. Experience and Learning:
   1. How has your experience as a volunteer ambulance responder shaped your confidence in making emergency decisions?
   2. What role do your teammates play in your decision-making process during emergencies?
   3. How do you learn from challenging cases or difficult decisions?

D. Values and Identity:
   1. What does being a volunteer ambulance responder mean to you personally?
   2. How do you balance the demands of volunteer work with other life responsibilities?
   3. What keeps you motivated to continue this volunteer work?

E. Closing Questions:
   1. Is there anything about your decision-making experience that we haven't discussed that you think is important?
   2. What advice would you give to new volunteer ambulance responders about making critical decisions?