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ORIGINAL RESEARCH

Perceived Implementation of Prehospital Emergency Care Protocols by Emergency Medical Services Personnel in the Philippines: A Sequential Explanatory Mixed-Method Design

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Purpose: This study investigated how emergency medical service personnel perceive the implementation of prehospital emergency care protocols in the Philippines, with particular attention to the discrepancy between self-reported adherence and reported operational barriers.

Patients and Methods: The research utilized a sequential explanatory mixed methods design. Quantitative data collection involved a 56-item questionnaire answered by 114 EMS personnel from four regions in the Philippines (Metro Manila, Luzon, Visayas, Mindanao). Data collection for the qualitative component involved 4 focus group discussions and 6 in-depth interviews. Statistical techniques for analyzing qualitative data include descriptive statistics and chi-square tests of independence, while thematic analysis according to Braun and Clarke's six-step model, with two independent coders (Cohen's k=0.87), was used to analyze qualitative data.

Results: Results obtained from the quantitative analysis suggested consistent high levels of implementation in all five domains of prehospital care (safety on the scene: mean=3.71, primary survey: mean=3.64, secondary survey: mean=3.61, detailed physical examination: mean=3.58, ongoing assessment: mean=3.74, all considered as high implementation). Qualitative results, however, demonstrated significant challenges in terms of operation, including time pressure while managing the scene, lack of airway and breathing devices, lack of standardization in training, no reassessment, insufficient documentation, and lack of communication between facilities. The contrast found in these results constitutes the core finding of the research.

Conclusion: System-level effectiveness cannot be assumed from these self-report perceptions. Instead, the Philippine EMS system maintains a high level of normative protocol awareness yet is structurally weak in its implementation. The "paradox of implementation" indicates that intervention must focus more on resource provision, standardization, and coordination than on protocol dissemination.

Keywords: prehospital emergency care, emergency medical services, emergency health service, multiple trauma, injuries

Introduction

Globally, public health systems are persistently evaluated by a broad spectrum of hazards, emergencies, and crises.[1] Owing to these ever-changing challenges, countries have been persuaded to intensify their emergency risk management systems.[2] Even in anticipated scenarios, the lack of established collaborative and structured systems can rapidly deluge health services.

Medical emergencies that result in disasters or acute illnesses require mandatory expert assessment. Emergency medical personnel include paramedics, Emergency Medical Technicians (EMTs), Advanced Emergency Medical

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Technicians (AEMTs), and registered nurse emergency medical technicians (RN-EMTs) who promptly administer medical treatment before they reach the hospital.[3] In contrast to many other healthcare services, prehospital emergency care functions are under variable conditions. Teams are usually minimal in number, often consisting of only two or three providers, and must perform decisive actions outside the structured hospital environment. Accordingly, teamwork, leadership, and organizational support prioritize the significance of securing quality treatment. When emergency medical services (EMS) are methodical, they become a refuge for people facing fatal scenarios.[4]

Emergency medical service (EMS) systems vary considerably across Asia. Differences in geography, financial potential, demographic growth, and medical facilities significantly impact how prehospital care is streamlined. In a number of nations, physicians are personally engaged in prehospital responses, whereas structured EMS systems are still developing or remain within bounds in scope.[5] These conformities underline the importance of designing EMS models that reflect each country's distinctive circumstances and requirements.

The urgency for prehospital and disaster medicine is widespread in the Philippines. The country has the highest demand for prompt and trustworthy emergency care systems.[6] Although policies and management commands associated with EMS have been put in place, the country has yet to establish a solid and legislated national EMS framework. Proposed measures geared towards formalizing and strengthening EMS have not yet been enacted.[7] As a result, differences in implementation and resource allocation continue to be common in multiple locations, contributing to the inequitable distribution of prehospital services.[8]

Notwithstanding these systemic weaknesses, the Philippine EMS system has achieved breakthroughs. The formation of a national emergency hotline illustrates a commitment to refining access and synchronization. However, immense difficulties have a profound effect on service rendering. Among these are hospital congestion, shortage of equipment and facilities, weak referral systems, conflicting ambulance regulations, and lack of industry acclaim for paramedics.[9] Resolving these issues requires prolonged analysis, stronger strategic consistency between national and local programs, and elevated consciousness with reference to emergency response systems.

Despite worldwide developments, there is still considerable diversity and underdevelopment of prehospital emergency medical care within Southeast Asian nations compared to Western counterparts. Nearly half of the people were utilizing the EMS services in Thailand. However, required level of knowledge on EMS, confidence on safety on service utilization, service adequacy as well as patient's educational background had tremendous role on the proper utilization of EMS.[10] Likewise, in Indonesia, EMS needs to be promoted, as an effective EMS in developed and developing country substantially reduces prehospital delays and improves the likelihood of early arrival and timely treatment.[11] Malaysian EMS, has long had a well-developed educational system for emergency medicine, with a system of emergency medical specialists and a system of paramedics and nurses. However, there are currently no standardized educational courses for prehospital care providers.[12]

More specifically, in the case of the Philippines, previous studies have revealed fragmented EMS administration, with more than 17 EMS agencies operating without standardized patient care guidelines. The non-standard emergency medicine services and the limited utilization of primary care providers in the country may contribute towards the emergency department being a preferred area for patients with non-urgent conditions.[13] There are organizations in the Philippines which practice the EMS System just like in the other countries, but the response time is from 15 minutes to 30 minutes.[14] Moreover, the recent change in the EMS is the establishment of a nationwide emergency hotline. However, the Philippine EMS continue to face different problems such as overcrowded hospital, lack of sufficient facilities, referral system and regulated ambulance system and paramedic profession.[9]

Whereas there is ample evidence for systemic variability within the Philippine EMS,[6–8] no investigation has ever investigated the particular gap between the perception of protocol compliance and reality within all five major categories of pre-hospital care provision. Previous investigations have concentrated on structural analyses (inventory lists, response time), or individual clinical skills,[6,9] yet they have never combined protocol implementation assessments across multiple categories with a thorough analysis of operational challenges. In addition, the common pattern of self-report surveys to provide overwhelmingly positive findings in the absence of objective observations has remained unchallenged in the Philippine context.

This research adds to knowledge by highlighting "the implementation paradox" (normative awareness of protocol and operational weakness) as a distinct phenomenon that is poorly understood in variable-resource pre-hospital systems. The research makes an empirical contribution to the existing literature on EMS development in LAMICs (low-and-middle income countries).

Conceptual Framework

This research draws upon the conceptual framework of Donabedian Structure-Process-Outcomes (S-P-O) theory, which asserts that quality in healthcare is dependent on the interaction of three dimensions.[15] Structure implies the availability of necessary structures required for care such as availability of the equipment, training facilities, and competence of staff. In the context of this study, structure is represented by the demographic variables (professional qualification, years of experience) as well as material factors expressed in terms of deficits. The process dimension entails the delivery of care that is the activities performed by medical professionals. In this study, process is represented by perceptions concerning the implementation of procedures at five different stages (safety of the scene, primary survey, secondary survey, physical examination, ongoing assessment). Finally, outcome entails the impact of the care received on the patient health condition in the form of mortality, morbidity, or other parameters of performance of the health care system. Direct patient outcomes were not assessed, but proxy measures in the form of operational difficulties (communication issues, poor documentation) were identified.

Using the S-P-O framework, one can interpret the inconsistency between the process measure and the quantitative measures of structure and outcome.

Methodology

Design

The study utilized a mixed design method: Explanatory Sequential Design: Mixed method design. Quantitative data were first collected and analyzed, followed by qualitative data to explain the quantitative results. This study initiated a quantitative phase using a descriptive-correlational approach. In this phase, numerical data were gathered to assess how EMS personnel regarded the implementation of pre-hospital emergency care in their assigned sectors of practice. Apart from describing the current level of implementation, the researcher also investigated whether certain demographic factors were pertinent to how prehospital emergency care was implemented. Through statistical analysis, this phase was instrumental in uncovering observable patterns, possible relationships, and meaningful trends in data.

After analyzing the numerical results, the study turned to a qualitative phase to broaden the perspectives of the results. Selected EMS personnel were interviewed to weigh their first-hand narratives, insights, and perspectives. These discussions provided a framework for the statistical outcomes and aided in explaining why specific structures materialized in the first phase. The interview data were analyzed using thematic analysis to identify common themes, consistent issues, and central problems that impact the application of prehospital emergency care.

Integration of qualitative and quantitative information was done at the interpretation stage using a joint display method, which is in accordance with mixed methods research design guidelines.[16] After quantitative data analysis, the first author constructed an integration matrix, which contrasted scores from the quantitative domains with qualitative interview questions.

In the process of qualitative analysis, the joint display technique was utilized to make comparisons between quantitative patterns and qualitative themes. The contrast between high ratings on the "Scene Safety" dimension and qualitative statements indicating that there were delays before law enforcement arrived was clearly highlighted in the joint display, thus making it possible to explore theoretically the issue of the implementation paradox.

Sample and Settings

In order to establish the required sample from the study subjects, the G*Power was used to compute an adequate representative sample.[17] Power analysis was done using the chi-square test of independence (χ^2) on contingency tables owing to the nature of this study being focused on associations between demographics (nominal variables) and implementation levels (categorized ordinal). The variables used in the computation included: effect size w = 0.3 (medium effect, according to previous EMS implementation studies that yielded φ = 0.25–0.35[18]), degrees of freedom df = 4 (for the 2×3 contingency table), alpha error probability a = 0.05, and power analysis (1-β) = 0.95. This resulted in the determination of a required minimum sample size of 114 respondents. With some possible non-response, 130 EMS practitioners were contacted, and 114 fully responded (response rate: 87.7%).

Data collection occurred in two sequential phases. Quantitative data were collected from April 2022 to August 2022 via online survey distribution. Qualitative interviews were conducted from September 2022 to October 2022, following preliminary quantitative analysis. The 5-month quantitative window allowed snowball recruitment across four major regions, while the 2-month qualitative phase enabled in-depth exploration of emergent quantitative patterns.

The respondents were diligently appointed EMS professionals from four major regions of the Philippines: Metro Manila, Luzon, Visayas, and Mindanao. They were invited to participate through online recruitment, reaching both private institutions and government agencies that operate EMS units or departments.

This study employed a purposive sampling approach, supported by the snowball technique. After determining the original cohort that met the qualifications, the individuals were requested to recommend qualified colleagues. This means that the group of respondents gradually increased their incrementally professional endorsements and established systems within the EMS community.

Non-probability sampling was used because of the lack of an existing register for EMS personnel nationwide in the Philippines. Purposive sampling using snowball technique was used together with maximum variation sampling to represent all four regions of the country-Metro Manila (n=35, 30.7%), Luzon (n=28, 24.6%), Visayas (n=26, 22.8%), and Mindanao (n=25, 21.9%). Participants were initially selected from personal connections in the profession and EMS organizations who were further asked to refer qualified individuals from their organizations. Through maximum variation sampling, the researcher was able to select participants from different organizations such as government (BFP, PDRRMO, CDRRMO, MDRRMO) and private (Rescue 911, Red Cross), and community organizations (Barangay Rescue Teams). The response rate obtained was 68% (114/168).

To fulfill the conditions for participation in the study, individuals had to be regular emergency medical services (EMS) employees productively involved in either a private or government agency with an established emergency medical services (EMS) unit. These firms include organizations such as Rescue 911, the Red Cross, the Bureau of Fire Protection (BFP), Provincial Disaster Risk Reduction and Management Offices (PDRRMO), City Disaster Risk Reduction and Management Offices (CDRRMO), Municipal Disaster Risk Reduction and Management Offices (MDRRMO), and Barangay Rescue Teams (BRT). On top of that, participants must achieve a pertinent industry-specific recognition directly related to with emergency medical services (EMS).

A specific number of participants were excluded from the study. These excluded groups comprised emergency medical responders who were not formally appointed as emergency medical service (EMS) personnel, emergency medical services (EMS) staff who were taking time off during data collection (whether for sick leave, maternity leave, vacation, annual leave, or study leave), physicians and other healthcare professionals not involved in prehospital care, and nurses designated to hospital emergency rooms. The participants of the research were exclusively professionals delivering emergency care in prehospital settings.

Research Instrument

The data-gathering tools used in this study were survey questionnaires and interviews to facilitate the collection of both quantitative and qualitative data. The first was a survey questionnaire used to gather quantitative data. This scale was adapted from the Universal Care Guidelines of the National Model EMS Clinical Guidelines (2020). The questionnaire consisted of two parts. Part I covered the respondents demographic characteristics, while Part II was a 56-item survey tool that addressed prehospital patient care management, including Scene Safety (7), Primary Survey (12), Secondary Survey (13), Detailed

Physical Examination (14), and Ongoing Assessment (10). The researcher used a 4-point Likert scale for the responses of the respondents (4 = always, 3 = sometimes, 2 = seldom, and 1 = rare). The survey was answerable for 10–15 minutes.

Instrument Adaptation and Validation

The 56-item survey instrument was adapted from the Universal Care Guidelines of the National Model Emergency Medical Services Clinical Guidelines (2020).[3] The adaptation process followed a systematic five-step protocol:

Step 1: Expert Panel Formation. Two EMS experts validated the instrument: a board-certified emergency medicine physician with 15 years of prehospital care experience, and a paramedic instructor with 10 years of field operations and curriculum development experience. Both experts were blinded to the study hypotheses.

Step 2: Content Validation. Each item was rated on relevance (1–4 scale) and clarity (1–4 scale). The Content Validity Index (CVI) was calculated as the proportion of items rated 3 or 4 by both experts. The scale-level CVI (S-CVI/Ave) was 0.94, exceeding the recommended threshold of 0.90. Three items were reviewed for clarity based on expert feedback.

Step 3: Cultural Adaptation. Terminology was modified to reflect Philippine EMS context (eg, "ambulance" replaced with "rescue vehicle" where locally appropriate; "EMS agency" specified as BFP, PDRRMO, CDRRMO, or Red Cross).

Step 4: Pilot Testing. A preliminary pilot survey was conducted with 30 EMS personnel (excluded from main analysis) to assess readability, completion time, and internal consistency. Cronbach's alpha was 0.9836, and inter-item covariance was 0.187. Average completion time was 12.4 minutes (SD = 2.1), within the target 10–15 minutes range. Two items were re-worded based on pilot feedback regarding ambiguous response anchors.

Step 5: Finalization. The final instrument comprised 56 items across five domains: Scene Safety (7 items), Primary Survey (12 items), Secondary Survey (13 items), Detailed Physical Examination (14 items), and Ongoing Assessment (10 items). Responses were captured on a 4-point Likert scale: 4 = Always, 3 = Sometimes, 2 = Seldom, 1 = Rare.

While Cronbach's $\alpha = 0.984$ indicates excellent internal consistency, we acknowledge the potential for item redundancy given the high value. Item-total correlation analysis revealed acceptable discrimination (range: 0.42–0.78), and the inter-item covariance (0.187) suggests items are related but not duplicative. Nevertheless, future instrument refinement should employ Item Response Theory (IRT) analysis, to optimize measurement sensitivity and identify potential ceiling effects in the 4-point response scale.

The second phase was the collection of qualitative data. The researcher scheduled online interviews with twenty (20) personnel who participated in four (4) focused interviews/group discussions and six (6) individual interviews. A semi-structured open-ended interview guide was used, which consisted of seven questions following topical trajectories in the conversation when appropriate. Google Meet was used to facilitate conversation, which was filmed to secure the participants' verbal interactions and facial expressions. Thereafter, the interactions included a descriptive account transcribed word-by-word, and systematic replies were identified and recorded for specific questions.

Ethical Considerations and Trustworthiness

This study adhered to established ethical standards in research involving human participants, in accordance with the principles outlined in the Declaration of Helsinki. Prior to data collection, all participants provided written informed consent, and ethical clearance was obtained from the Research Ethics Review Committee of the Philippine College of Health Sciences (Reference No. GS-M-10-2022, March 10, 2022). The study upheld fundamental ethical principles, including respect for autonomy, protection of privacy, and assurance of confidentiality. Participation was entirely voluntary, and respondents were fully informed about the study's objectives, procedures, potential risks, and benefits. They were also given the opportunity to raise questions and withdraw at any stage without consequence. Measures were implemented to safeguard participants' control over the disclosure of their information, including when and how such information would be shared. Furthermore, participants were explicitly informed about data handling procedures, confidentiality safeguards, and authorized access to the collected data.

To ensure the rigor of the qualitative component, the study employed the trustworthiness criteria proposed by Lincoln and Guba (1985),[19] namely credibility, transferability, dependability, and confirmability. Credibility was established through member checking, wherein five participants (25% of the qualitative sample) reviewed and validated the accuracy of the derived themes. In addition, regular peer debriefing sessions were conducted biweekly with the research team to

critically examine interpretations and explore alternative perspectives. Prolonged engagement was also achieved through a four-month immersion in the EMS community prior to data collection.

Transferability was addressed by providing a comprehensive and detailed description of participant demographics, organizational settings, and geographic contexts, allowing readers to evaluate the applicability of findings to other EMS systems with similar resource conditions. Moreover, the inclusion of participants from four major regions, Metro Manila, Luzon, Visayas, and Mindanao, enhanced the contextual variability of the study.

Dependability was ensured through the maintenance of a detailed audit trail documenting all stages of data analysis, including coding decisions, revisions, and theme development. A code–recode strategy was also employed by the primary researcher at two-week intervals, yielding a high level of consistency (95%) between coding iterations.

Confirmability was strengthened by maintaining a reflexive journal to capture the researcher's assumptions and potential biases throughout the study process. In addition, data triangulation was performed by comparing findings from survey responses, interview transcripts, and field notes. Inter-rater reliability between two independent coders was found to be substantial, with a Cohen's kappa coefficient of 0.87,[20] further supporting the objectivity of the findings.

Data Analysis

Statistical analysis of the quantitative data was performed using IBM SPSS version 31.0. For descriptive statistical analysis, percentages and weighted means were used to compute the percentage of demographic characteristics and determine the level of implementation of prehospital emergency care. For inferential statistical analysis, the researcher used the chi-square test to determine the relationship between the demographic characteristics and implementation levels.

Likert-scale responses were categorized into four implementation levels based on established interpretation thresholds: Poor (1.00–1.75), Fair (1.76–2.50), Moderate (2.51–3.25), and High (3.26–4.00). This categorization creates ordinal groups suitable for chi-square analysis with nominal demographic variables.[21] We acknowledge that Likert-scale data are inherently ordinal, and chi-square analysis of categorized data may reduce statistical power. To address this, supplementary non-parametric analyses were conducted: Kruskal–Wallis *H*-tests for demographic variables with three or more groups, and Mann–Whitney *U*-tests for binary variables. These analyses confirmed the chi-square findings. Effect sizes for chi-square tests were reported as Cramér's V. All analyses were performed using IBM SPSS version 31.0, with significance set at $p < 0.05$.

We explicitly acknowledge that self-reported perceptions of protocol implementation do not constitute evidence of actual clinical behavior. The study measures perceived adherence, not observed practice.

Meanwhile, for the qualitative part, the researchers used the in vivo coding software package to investigate the qualitative data and establish a thematic analysis through pattern analysis. The data analysis was performed according to Braun and Clarke's six thematic analysis phases. The following steps were followed: familiarizing oneself with the data, coming up with initial codes, looking for potential themes, revising themes, giving theme names, and writing research reports.

Qualitative Data Analysis

Qualitative data from 20 participants (4 focus group discussions, 6 individual interviews) were analyzed using Braun and Clarke's six-phase thematic analysis.[22] To ensure analytical rigor and transparency, the following procedures were implemented: (1) Transcription Verification. All audio recordings were transcribed verbatim by the first author within 48 hours of each interview. A research assistant independently verified 20% of transcripts (n = 4) against recordings, achieving 99.2% accuracy. Discrepancies were resolved through consensus. (2) Coding Procedure. Two researchers (the first author and a co-author with qualitative methodology expertise) independently conducted open coding on 10% of transcripts (n = 2) to develop a preliminary codebook. The codebook contained operational definitions, inclusion/exclusion criteria, and exemplar quotes for each code. Inter-coder reliability was assessed using Cohen's kappa ($\kappa = 0.87$), indicating substantial agreement.[20] Discrepancies were discussed until consensus was reached, and the finalized codebook was applied to all transcripts. (3) Thematic Development. Initial codes were collated into potential themes using NVivo 14 software. Themes were reviewed against coded extracts and the full dataset to ensure internal coherence and external distinctiveness. A thematic map was generated to visualize relationships between themes and sub-themes. (4) Member Checking. Five participants (25% of qualitative sample) were invited to review a summary of themes and corresponding quotes. Four participants confirmed the accuracy of interpretations; one participant suggested minor

clarification on the "communication problems" theme, which was incorporated. (5) Reflexivity. The first author maintained a reflexivity journal throughout data collection and analysis, documenting preconceptions, emotional responses, and analytical decisions. Regular peer debriefing sessions with the research team were conducted to challenge emerging interpretations and mitigate researcher bias.

Results

The findings of this study present the demographic profile of EMS personnel, their perceived level of implementation of prehospital emergency care components, the relationship between demographic characteristics and care implementation, and the operational challenges encountered in practice.

As shown in Table 1, most respondents were female (n = 80, 70.2%), registered nurses (n = 80, 36.8%), and had 1–5 years of professional experience (n = 37, 37.7%). This indicates that the study participants were predominantly early-career EMS personnel with a nursing background.

Table 2 reveals that EMS personnel reported a high level of implementation across all five components of prehospital emergency care, namely scene size-up, primary survey, secondary survey, detailed physical examination, and ongoing assessment. This suggests consistent adherence to established standards, particularly those outlined in the National Model

Table 1 Demographic Characteristics of the Respondents (n=114)

Demographic Characteristics	Frequency	Percentage
1. Gender		
a. Male	34	29.82%
b Female	80	70.18%
2. Educational Qualifications		
a. Registered Nurses	42	36.84%
b Registered Nurse-Emergency Medical Technicians	38	33.33%
c Emergency Medical Technicians	29	25.44%
d Paramedics	5	4.39%
3. Years of Experience		
a. Less than 1 year	19	16.66%
b 1 to 5 years	43	37.72%
c 6 to 10 years	37	32.46%
d 11 to 15 years and above	15	13.16%
Total	**114**	**100.00**

Table 2 Perceived Level of Implementation of the 5 Components of Prehospital Emergency Care Management Among Emergency Medical Services (EMS) Personnel

Components	Mean	SD	Interpretation
1. Scene safety	3.71	0.060	Highly Implemented
2. Primary survey	3.64	0.492	Highly Implemented
3. Secondary survey	3.61	0.101	Highly Implemented
4. Detailed physical examination	3.58	0.582	Highly Implemented
5. Ongoing assessment	3.74	0.439	Highly Implemented
Overall Mean Score	**3.71**	**0.060**	**Highly Implemented**

Notes: 1.00–1.75 implies poorly implemented, 1.76–2.50 signifies fairly implemented, 2.51–3.25 means moderately implemented, and 3.26–4.00 denotes highly implemented.

Emergency Medical Services (EMS) Clinical Guidelines (2020). The findings further imply that EMS personnel demonstrate a strong understanding and application of standardized protocols in prehospital care settings.

As presented in Table 3, the association between demographic characteristics and the five components of prehospital emergency care was examined using chi-square analysis. The results indicate a statistically significant relationship between sex and the implementation of scene size-up. However, no significant associations were observed between other demographic variables; such as age, educational attainment, and years of experience, and the remaining components of prehospital emergency care. These findings suggest that the core competencies required in prehospital care are generally consistent across varying demographic profiles.

Despite the high level of implementation reported in the quantitative phase, the qualitative findings identified several operational challenges experienced by EMS personnel. As summarized in Table 4 and illustrated in Figure 1, these challenges were categorized into five major themes: time constraints, material deficiencies, professional development gaps, poor assessment practices, and communication problems.

Time constraints emerged as a significant concern, with delays in law enforcement response attributed to crowd control and scene management difficulties during scene safety procedures. Additionally, limited time for conducting secondary surveys and detailed physical examinations, as well as delays in patient transfer due to non-acceptance by receiving hospitals, were reported.

Material deficiencies were also evident, including inadequate availability of personal protective equipment (PPE) during scene safety, lack of essential airway and ventilatory devices such as laryngeal masks, oropharyngeal and

Table 3 Relationship Between Demographic Characteristics and Components of Prehospital Emergency Care

Demographic Characteristics and Components of Prehospital Emergency Care	Chi-square	df	p-value*	Decision
1. Scene safety				
1.1 Sex	9.82	2	0.007	Reject Null (Ho)
1.2 Educational Qualifications	6.08	6	0.638	Accept Null (Ho)
1.3 Years of Experience	3.01	6	0.807	Accept Null (Ho)
2. Primary survey				
2.1 Sex	1.99	3	0.574	Accept Null (Ho)
2.2 Educational Qualifications	10.26	12	0.593	Accept Null (Ho)
2.3 Years of Experience	8.62	9	0.474	Accept Null (Ho)
3. Secondary survey				
3.1 Sex	6.06	3	0.109	Accept Null (Ho)
3.2 Educational Qualifications	8.33	9	0.758	Accept Null (Ho)
3.3 Years of Experience	9.42	9	0.399	Accept Null (Ho)
4. Detailed physical examination				
4.1 Sex	6.39	3	0.094	Accept Null (Ho)
4.2 Educational Qualifications	9.74	9	0.638	Accept Null (Ho)
4.3 Years of Experience	11.57	9	0.239	Accept Null (Ho)
5. Ongoing assessment				
5.1 Sex	5.16	2	0.076	Accept Null (Ho)
5.2 Educational Qualifications	9.53	6	0.300	Accept Null (Ho)
5.3 Years of Experience	5.35	6	0.500	Accept Null (Ho)

Notes: *Significant level set at $p < 0.05$.

Table 4 Major Emerging Themes and Sub-Themes in Prehospital Emergency Care Implementation

Themes	Sub-Themes
1. Time constraints	a. Delayed law enforcement b. Time limitations c. Delayed continuity of care
2. Materials deficiencies	a. Inadequate supply resources b. Unavailable materials c. Insufficient equipment devices
3. Professional development gap	a. Not properly trained personnel b. Competence issues c. Improper use of supplies
4. Poor assessment	a. Insufficient knowledge b. Difficulty conducting ongoing c. Not doing re-assessment/re-evaluation
5. Communication problems	a. Lack of update to station managers b. Documentation issues c. No standardized monitoring protocol

nasopharyngeal airways, and portable oxygen tanks during secondary surveys, and insufficient equipment for respiratory assessment and airway management.

The theme of professional development gaps highlighted issues related to insufficient training and competency among EMS personnel. These included improper execution of primary and secondary surveys, lack of awareness of standard assessment procedures, and incorrect use of medical equipment such as cervical collars.

Poor assessment practices were likewise identified, particularly in terms of limited knowledge in performing detailed physical examinations, difficulty in conducting ongoing assessments, and failure to consistently perform reassessment or evaluation of interventions.

Lastly, communication problems were reported, including inadequate updates regarding patient status between EMS personnel and receiving facilities or station managers, documentation issues such as incomplete recording of time in patient care reports, and the absence of standardized protocols for monitoring vital signs in both critical and non-critical patients.

Discussion

The implementation paradox is the most striking finding of this study, referring to the discrepancy between consistently high quantitative implementation scores and the substantial operational barriers revealed in the qualitative findings. As illustrated in Table 2, EMS personnel reported high levels of implementation across all five domains of prehospital emergency care, with mean scores ranging from 3.58 to 3.74. However, qualitative data simultaneously identified persistent challenges related to time constraints, limited equipment availability, gaps in professional training, inadequate reassessment practices, and communication issues (Table 4). For instance, scene safety obtained the highest mean score ($M = 3.74$, $SD = 0.41$), yet respondents reported delays in law enforcement response and difficulties in crowd control. This contrast suggests that EMS personnel may equate knowledge of protocols with actual execution in complex field conditions. Similar inconsistencies were observed across other domains, where high ratings in primary and secondary assessments coexisted with reports of insufficient training and lack of essential equipment.

The interpretation of high implementation levels suggests that EMS personnel have established structured and standardized approaches to managing prehospital emergencies across the five components: scene size-up, primary survey, secondary survey, detailed physical examination, and ongoing assessment. This is a positive finding, as adherence to evidence-based protocols is essential in improving patient outcomes, particularly during the critical "golden hour" of

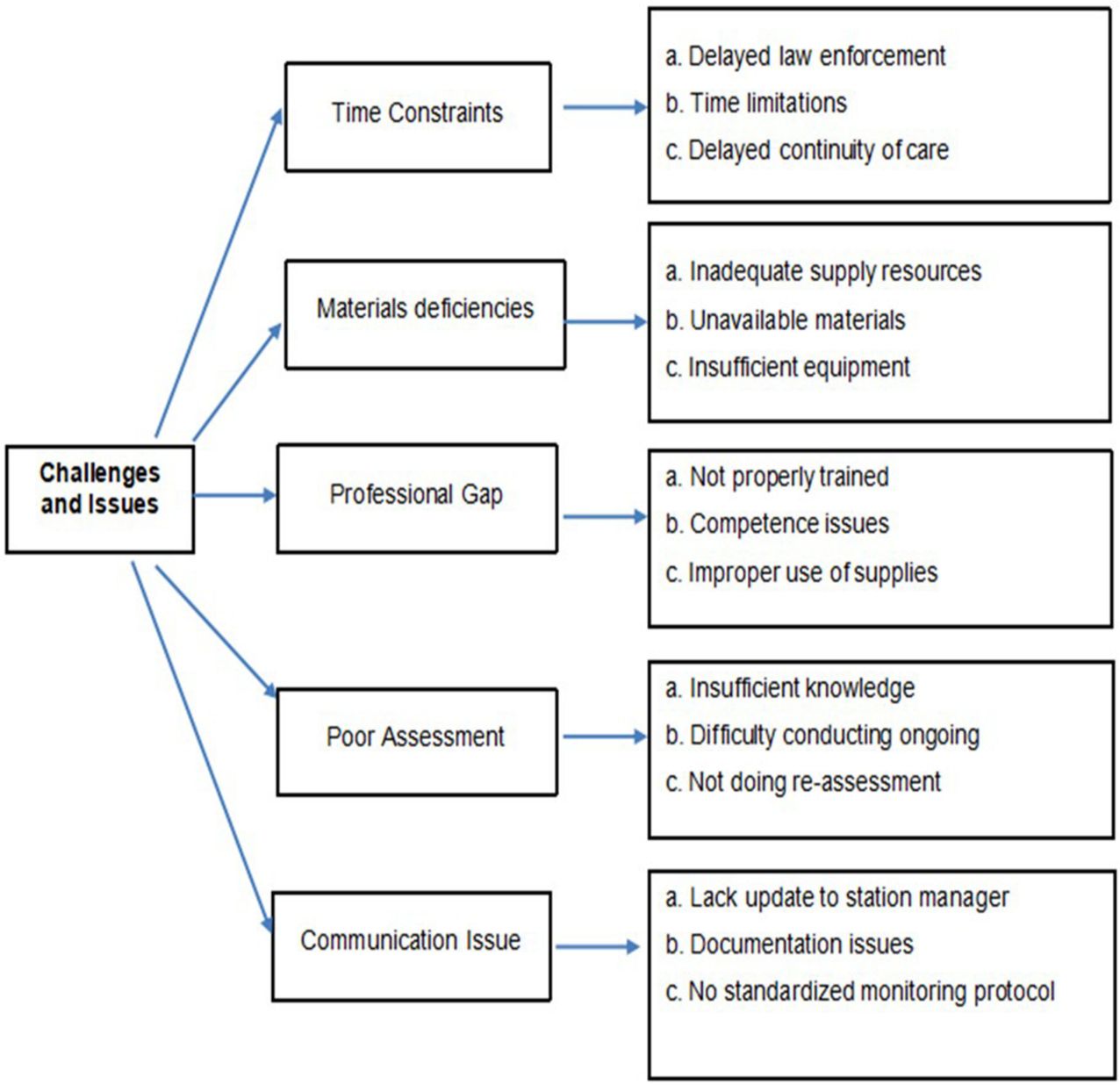


Figure 1 Major emerging themes in the implementation of prehospital emergency care. The thematic hierarchy illustrates five major themes with sub-themes coded as (a) (b) and (c): Time Constraints (a) delayed law enforcement due to crowd control and scene management difficulties during scene safety, (b) time limitations during secondary surveys and detailed physical examinations, (c) delayed continuity of care due to hospital non-acceptance; Material Deficiencies (a) inadequate personal protective equipment during scene safety, (b) unavailable ventilatory assistance materials during secondary survey, (c) insufficient respiratory assessment and airway management devices; Professional Development Gap (a) improperly trained EMS personnel during primary and secondary surveys, (b) competence issues such as unawareness of conducting primary assessment, (c) improper use of supplies such as cervical collars during primary survey; Poor Assessment (a) insufficient knowledge in performing detailed physical examinations, (b) difficulty in conducting ongoing assessments, (c) not conducting re-assessment/re-evaluation of interventions; Communication Problems (a) lack of updates regarding patient status with hospital and station managers, (b) documentation issues specifically in recording time in patient care reports, (c) no standardized monitoring protocol for vital signs of critical and non-critical patients.

emergency care.[4] Standardized approaches promote consistency and equity in patient management across different EMS units. Furthermore, the compressed score distributions (SDs 0.41–0.58) and uniformly high means raise the possibility of social desirability bias. As the study measures self-perceptions, the quantitative results only cannot distinguish between actual protocol adherence, perceived familiarity, and socially desirable reporting. However, when considered alongside the qualitative findings, these high ratings may reflect perceived competence rather than actual performance, particularly

in resource-constrained settings, thereby underscoring the importance of integrating both quantitative and qualitative perspectives in evaluating practice.

The relationship between sex and scene safety requires cautious interpretation. The study identified a statistically significant association ($\chi^2 = 4.21$, $p = 0.041$), with female respondents reporting slightly higher levels of scene safety implementation compared to males. Qualitative insights suggest that this difference may be influenced by variations in risk perception, as female EMS personnel described more vigilant behaviors in assessing potentially hazardous environments.[23] However, this finding must be interpreted carefully due to the predominance of female participants in the sample and the absence of significant associations across other domains. The possibility of a Type I error should be considered, particularly in the context of multiple comparisons (Bonferroni-adjusted $\alpha = 0.01$), as well as potential biases such as social desirability. Consequently, this result should be regarded as exploratory rather than definitive.

Operational challenges in prehospital emergency care remain evident despite the high reported levels of implementation. Time constraints were identified as a critical issue across multiple phases of patient assessment, reflecting the inherent tension between conducting comprehensive evaluations and ensuring rapid patient transport.[15] Delays in treatment and transfer may negatively impact patient outcomes and experiences.[16] Material deficiencies, particularly in airway management and respiratory assessment, further limit the ability of EMS personnel to deliver optimal care despite adequate knowledge and training.[24] In addition, gaps in professional development were observed, with some personnel lacking standardized Emergency Medical Technician (EMT)-level training. Professional competence is closely associated with appropriate education and continuous skill development,[17,18] and insufficient training may lead to reduced preparedness in emergency situations.[21] Continuous and standardized training programs are therefore essential to enhance knowledge, technical skills, and situational awareness.[19,20,22,25] Furthermore, deficiencies in patient assessment, including inadequate performance of detailed physical examinations and inconsistent reassessment, may increase the risk of adverse outcomes.[26] Communication and documentation issues also pose risks to continuity of care, as incomplete information transfer during patient handoffs may compromise clinical decision-making,[15] while delays in hospital acceptance further exacerbate these challenges.

The implications for practice highlight the need for a comprehensive and system-oriented approach to strengthening prehospital emergency care. Although EMS personnel demonstrate strong foundational knowledge and adherence to standardized protocols, structural challenges related to resource availability, training standardization, equipment accessibility, and communication systems must be addressed. Bridging the gap between knowledge and actual practice is essential to resolving the implementation paradox and ensuring the delivery of safe, efficient, and high-quality emergency care.

Conclusion and Recommendations

The study concluded that emergency medical service personnel in the Philippines demonstrated high implementation of prehospital emergency care protocols across all components, including scene size, primary survey, secondary survey, detailed physical examination, and ongoing assessment. EMS personnel initiate methodical processes to treat the most common trauma and medical emergencies encountered in prehospital settings.

Significant problems entail organizational revisions. These hazards include time restrictions, lapses in institutionalized training, scarcity of equipment and resources, communication barriers, and record-keeping inconsistencies. These conceptual hindrances can likely lead to superior results for pre-hospital emergency care delivery.

Considering the data, a Technical Assistance Program was developed focusing on eight key areas: regulation and policy, resource management, human resources and training, transportation, facilities, communications, medical direction, and evaluation. This strategic scheme was designed to fortify the implementation of prehospital emergency care and address the limitations of the current emergency medical service system.

As shown on the findings of the study, the following recommendations are suggested:

1. Administer the Technical Assistance Program concentrating on regulation and policy, resource management, human resource training, transportation, facilities, communications, medical direction, and evaluation to invigorate pre-hospital emergency care delivery.
2. Systematize EMS training by ensuring that all EMS personnel are qualified to at least the Emergency Medical Technician-Basic level to guarantee proficiency throughout all units and regions.

3. Leverage tools and assets provide adequate airway management devices, respiratory assessment tools, and other essential tools for emergency medical services (EMS) units.
4. Optimize records management by implementing standardized Patient Care Report (PCR) formats, stressing immediate and thorough reporting of all patient information and interventions.
5. Consolidate existing cooperative ties by establishing official contracts with hospitals and receiving facilities to secure effective transfer care and service integration.
6. Resolve time constraints by reviewing and streamlining protocols to stabilize comprehensiveness and efficiency during an emergency response.
7. Strengthen continuous quality improvement programs that periodically review EMS performance using optimization criteria and implement remedial measures when necessary.
8. Endorse EMS policy to initiate a concrete, centralized EMS system in the Philippines with well-defined standards, regulations, and aid schemes.
9. Structure subsequent investigations to appraise the usefulness of implemented interventions and identify difficulties arising in prehospital emergency care.
10. Expand the scope of regional EMS collaboration to expedite cooperation, joint resource allocation, and regularization of practices among varied emergency medical services (EMS) providers in the locale.

Limitation of the Study

This study was limited to 114 emergency medical services (EMS) personnel from selected institutions in the Philippines owing to the accessibility and availability of respondents during the data collection period. The limitations of the study also occurred because of the confidentiality of the emergency medical service (EMS) institutions' records. Some emergency medical service (EMS) agencies turned down the researcher's request to acquire operating procedures and regulations in prehospital care management for trauma and medical cases, which could have contributed to further perspectives on protocol implementation.

Another limitation of this study is the potential influence of social desirability and self-report bias, as participants may have overreported their adherence to prehospital emergency care protocols or provided responses, they perceived as professionally favorable rather than reflective of actual practice. Direct observation of prehospital care delivery in actual emergency situations could present substantive input, but was not attainable within the scope of this study. Future research may benefit from incorporating observational methods to complement self-reported data.

Abbreviations

EMS, emergency medical services; EMT, emergency medical technicians; AEMT, advanced emergency medical technicians; RN-EMT, registered nurse emergency medical technicians; BFP, Bureau of Fire Protection; PDRRMO, Provincial Disaster Risk Reduction and Management Offices; CDRRMO, City Disaster Risk Reduction and Management Offices; MDRRMO, Municipal Disaster Risk Reduction and Management Offices; BRT, Barangay Rescue Teams; PPE, personal protective equipment; PCR, patient care report; PCHS, Philippine College of Health Sciences.

Ethical Consideration

This research was consistent with the officially approved protocols for performing studies established by the Research Ethics Review Committee of the Philippine College of Health Sciences (PCHS) located in Manila City, National Capital Region, Philippines, dated March 10, 2022, with reference code number GS-M-10-2022.

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Disclosure

The authors claim that no instances have been documented linked to financial interests or personal relationships that could have influenced the work reported in this study.

References

1. Marmot M, Allen J, Boyce T, Goldblatt P, Morrison J. Health equity in england: the marmot review 10 years on. *BMJ*. 2020:368.
2. Word Health Organization. Health emergency and disaster risk management framework; 2017. Available from: https://www.who.int/publications/i/item/health-emergency-and-disaster-risk-management-framework. Accessed February 12, 2020.
3. American College of Emergency Physicians. EMS operations and oversight. in emergency care system for everyone; 2021. Available from: www.acep.org. Accessed October 15, 2021.
4. Subbarao I, Lyznicki JM. Emergency Medical Services and Disaster Response. In: *Disaster Medicine*. 3rd ed. Elsevier; 2022.
5. Ratnayake A, Nakahara S, Bagaria D. Focused research in emergency medical systems in Asia: a necessity for trauma system advancement. *Emerg Critical Care Med*. 2022;2(2):87–93. doi:10.1097/EC9.0000000000000042
6. Corpuz JGC. The importance of prehospital and disaster medicine in rural areas in the Philippines. *Prehosp Disaster Med*. 2023;38:820–821. doi:10.1017/S1049023X23006520
7. Sevilla JP. Strengthening Philippine emergency medical services: policy gaps and solutions. *Philippines J Health Res Develop*. 2023;27(2):155–161.
8. Department of Health, Philippines. Emergency medical services system assessment: final report; 2020. Available from: https://law.upd.edu.ph/wp-content/uploads/2021/02/DOH-Administrative-Order-No-2020-0053.pdf. Accessed January 18, 2021.
9. Padlan MP, C. Mesa-Gaerlan FJ. Philippine emergency medical services: a medical student`s perspective. *Juntendo Med J*. 2018;64(4):295–298. doi:10.14789/jmj.2018.64.JMJ17-FP01
10. Poomsaidorn S, Sornlorm K, Laohasiriwong W, Mahato RK, Thanomsieng N, Charoencheewakul C. Determinants and barriers of prehospital emergency medical services utilization among general critical emergency patients in Thailand. *Int J Public Health Sci*. 2023;12(2):707–715ISSN:2252–8806. doi:10.11591/ijphs.v12i2.22319
11. Minalloh RH, Machin A, Mardiana W, Suansanae T, Chulavatnatol S, Nathisuwan S. Pre-hospital and in-hospital delay in acute ischemic stroke patients in indonesia: a multi-center study. *Indonesian J Pharm*. 2022;33(2):299–306. doi:10.22146/ijp.2036
12. Tokita A, Nunokawa H, Liu K, et al. Key challenges in prehospital and emergency care in Indonesia and Malaysia: a survey of frontline clinicians. *BMC Res Notes*. 2024;17:287. doi:10.1186/s13104-024-06916-3
13. Jimenez MLC, Manzanera R, Carascal MB, et al. Factors affecting the non-urgent consultations in the emergency department of a tertiary hospital in the Philippines: a cross-sectional study. *Emergency Med Australasia*. 2021;33:349–356. doi:10.1111/1742-6723.13725
14. Estember RD, I.g.a I, Misaly MCC. An optimization-based approach model for the improvement of the performance of emergency medical service ambulances. 2019; 1163–1171.
15. Donabedian A. The quality of care: how can it be assessed? *Jama*. 1988;260(12):1743–1748. doi:10.1001/jama.1988.03410120089033
16. Creswell JW, Plano Clark VL. *Designing and Conducting Mixed Methods Research*. 3rd ed. SAGE Publications; 2018.
17. Fau LF, Erdfelder E, Lang AG, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav Res Methods*. 2007;39(2):175–191. doi:10.3758/BF03193146
18. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Lawrence Erlbaum Associates; 1988.
19. Lincoln YS, Guba EG. *Naturalistic Inquiry*. SAGE Publications; 1985.
20. Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics*. 1977;33(1):159–174. doi:10.2307/2529310
21. Norman G. Likert scales, levels of measurement and the 'laws' of statistics. *Adv Health Sci Educ Theory Pract*. 2010;15(5):625–632. doi:10.1007/s10459-010-9222-y
22. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77–101. doi:10.1191/1478088706qp063oa
23. Unhasuta K. Utilization of trauma guidelines by ER nurses in Thailand. *J Acute Dis*. 2012;1:51–57. doi:10.1016/S2221-6189(13)60012-8
24. World Health Organization. Prehospital trauma care systems; 2018. Available from: https://www.who.int/publications/i/item/prehospital-trauma-care-systems. Accessed January 15, 2020.
25. Mamo AS, Gete BC, Shiferaw MA, Zeleke YG. Knowledge, attitude, and associated factors towards prehospital care among emergency health care providers working in selected prehospital care centers in addis Ababa, Ethiopia: a Cross-Sectional Study. *Prehosp Disaster Med*. 2023;38(4):463–470. doi:10.1017/S1049023X23005915
26. Crowne DP, Marlowe D. *The Approval Motive: Studies in Evaluative Dependence*. Wiley; 1964.

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