

Perspectives of Emergency Medical Technicians on the Integration of Medical Science Education in Prehospital Emergency Care in Iran: A Thematic Analysis Study

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Abstract

Background: Prehospital emergency care plays a vital role in the healthcare system and can significantly affect the outcomes of patients. Integrating medical science education into Emergency Medical Technicians (EMTs) training programs could improve prehospital emergency care and patient outcomes.

Objectives: The present study was conducted to explore the perspectives of Iranian EMTs on integrating medical science education in prehospital emergency care.

Methods: This study was a qualitative descriptive design in Iran. Using the purposive sampling method, data were collected through in-depth individual interviews with 13 EMTs who had completed EMT training programs in Iran. Thematic analysis, a form of qualitative content analysis, was used to identify key challenges and barriers to integrating medical science education, as well as potential benefits and opportunities.

Results: After multiple rounds of analyzing and summarizing the data and considering similarities and differences, 2 main categories and 6 subcategories were created based on the results of the data analysis, including: "inadequate training" and "lack of ongoing training and professional development opportunities".

Conclusion: The study highlights the importance of stakeholder collaboration and communication to develop effective EMT training programs. Integrating medical science education in EMT training programs could improve the quality of prehospital emergency care and, ultimately, the health outcomes of patients.

Keywords: Integration of Medical Science Education, Emergency Medical Technicians (EMTs), Prehospital Emergency Care

Background

Prehospital emergency care is a crucial component of the healthcare system and plays a significant role in determining patient outcomes (1). Emergency medical technicians (EMTs) serve as the first responders in many emergency situations and are responsible for providing prehospital emergency care to patients (2). However, the quality of EMT training in Iran is often inconsistent, and many EMTs lack the necessary skills and knowledge to

provide effective care (3). The integration of medical science education into EMT training programs in Iran can potentially improve the quality of prehospital emergency care and, ultimately, the health outcomes of patients (4, 5).

In pre-hospital emergency care, education plays a pivotal role in equipping healthcare professionals with the knowledge and skills necessary to provide effective and timely care. It encompasses various educational

methods, including didactic lectures, practical training sessions, simulation exercises, case-based discussions, and continuous professional development programs (6). The role of education in improving the health system, particularly in pre-hospital emergency care, cannot be overstated. By providing comprehensive and up-to-date medical knowledge, education ensures that healthcare professionals are well-prepared to respond to emergencies, make accurate diagnoses, and initiate appropriate interventions promptly. Moreover, education cultivates essential skills such as effective communication, teamwork, and leadership, which are crucial for delivering high-quality pre-hospital care (7-9). Medical education specifically tailored to pre-hospital emergency care plays a significant role in strengthening the medical emergency system. It focuses on topics such as emergency assessment, triage, resuscitation techniques, trauma management, and the administration of life-saving medications. By receiving comprehensive medical education, healthcare professionals are better prepared to handle a wide range of emergencies and make informed decisions regarding patient care. This improves patient outcomes and contributes to the overall effectiveness and efficiency of the pre-hospital emergency system (10).

Despite the potential benefits of integrating medical science education into EMT training programs, its implementation has several challenges and barriers. These challenges include a lack of resources, a shortage of trained healthcare professionals, and limited access to continuing education and professional development opportunities (11, 12). In addition, cultural and social factors may impact the implementation of medical science education in EMT training programs (13). The field of EMS and prehospital emergency care in Iran lacks sufficient studies. There is a need for more research to address the gaps in knowledge and understanding of this field. Specifically, in the context of integrating medical science education into prehospital emergency care, the literature is limited, and further studies are required to explore this area comprehensively.

Qualitative studies play a crucial role in addressing gaps and challenges in EMS education and prehospital emergency care by providing a deeper understanding of the experiences, perceptions, and behaviors of emergency medical technicians (EMTs) and other stakeholders in the field. These studies explore the "how's" and "whys" behind phenomena, capturing nuanced information that quantitative research may not

reveal. They offer valuable insights into EMTs' perspectives, identify knowledge gaps and areas for improvement in EMS education programs, and provide a comprehensive understanding of the challenges and opportunities in integrating medical science education in prehospital emergency care. Moreover, qualitative research complements quantitative analysis by expanding and deepening the understanding of data obtained from quantitative studies, providing a more holistic view (14, 15).

The study aimed to explore the perspectives of Iranian EMTs on the integration of medical science education in prehospital emergency care. The findings of this study have implications for the development and implementation of EMT training programs in Iran and other countries. By identifying the challenges and barriers to integrating medical science education, this study can inform the development of effective strategies for improving the quality of prehospital emergency care and, ultimately, the health outcomes of patients.

Objectives

The present study was conducted to explore the perspectives of Iranian EMTs on integrating medical science education in prehospital emergency care.

Methods

This study employed a qualitative descriptive design to explore the perspectives of EMTs on integrating medical science education in prehospital emergency care in Iran. Qualitative description is a research approach used in qualitative studies to provide descriptive accounts of phenomena in the healthcare and nursing. It is particularly useful for investigating poorly understood phenomena, discovering details about events or experiences, and gaining insights from informants. Qualitative descriptive design is commonly employed when the aim is to obtain a straightforward description of a phenomenon or to inform the development of questionnaires or interventions. It is recognized as an important and appropriate research tradition for addressing research questions about the "who, what, and where" of events or experiences (16, 17). Semi-structured interviews were conducted with a purposive sample of EMTs who had completed EMT training programs in Iran. The interviews were audio-recorded, transcribed, and analyzed using thematic analysis.

Participants: The participants in this study were EMTs who had completed EMT training programs in

Iran. A purposive sampling strategy was used to select participants with a range of experiences and perspectives on integrating medical science education in prehospital emergency care. The eligible participants to enter this study were emergency medical technicians (EMTs) who had completed EMT training programs in Iran. The researchers used a purposive sampling strategy to select participants with a range of experiences and perspectives on integrating medical science education in prehospital emergency care. The participants' work history was considered an essential criterion in the selection process. EMTs with varying years of experience and from different prehospital emergency care settings were included to capture a comprehensive range of perspectives.

Data Collection: Semi-structured interviews were used to collect data from the participants. The first author conducted the interviews. The interviews were conducted in Persian by a trained interviewer fluent in the language and familiar with the culture. Interviews were audio-recorded and transcribed verbatim after each session. The interview questions were designed to explore the participants' perspectives on integrating medical science education in prehospital emergency care in Iran. They included open-ended questions to encourage participants to share their experiences and thoughts. The inclusion criteria consisted of EMTs who had at least 2 years of experience in the relevant field, EMTs who were currently employed full-time and willing to share their experience

Data Analysis: Thematic analysis was employed to analyze the data in this study, allowing for identifying patterns and themes in qualitative research. This method facilitated a comprehensive exploration of the data's intricate details. It was particularly suitable for examining key issues within specific groups or individuals, as in health research projects (18). The analysis began by thoroughly familiarizing ourselves with the transcribed data and noting initial ideas, followed by systematic coding of noteworthy aspects. Two researchers independently reviewed and organized the codes into potential themes. Through comparisons across the dataset and constructing a thematic map, the researchers identified and refined the themes and subthemes. An iterative approach was adopted, ensuring ongoing refinement of each theme and subtheme for accuracy and coherence while aiming to uncover the overarching narrative within the data. Thematic analysis enabled a deeper understanding of the perspectives of Emergency Medical Technicians on integrating medical

science education in prehospital emergency care in Iran by uncovering and interpreting the salient themes that emerged from the interviews.

Rigor: The study's findings were validated by diversifying the participants in terms of their age, gender, work experience, and extended involvement with them, as well as through member- and peer-checking techniques. Moreover, the outcomes were shared with 2 EMTs who were not part of the study, and they were requested to compare them with their own work experiences. To conduct peer-checking, the codes and themes derived from this study's findings were presented to 2 qualitative research specialists, who verified the accuracy and consistency of the data with the codes and categories. Transferability was ensured by providing detailed descriptions of the data and research process, enabling readers to assess the accuracy and relate the findings to their contexts. Additionally, to guarantee dependability in this study, 2 external observers were invited to evaluate and endorse the data collection and analysis procedures. The involvement of external observers aimed to minimize potential biases and increase the study's objectivity. Being unfamiliar with the phenomena under investigation, these observers could provide impartial evaluations of the research process. All the obtained data were thoroughly documented throughout the study as a comprehensive report to validate the research.

Results

The study involved 13 EMTs, aged between 25 and 45 years old, with a minimum of 1 year of work experience. 7 EMTs had bachelor's degrees, and 6 had associate's degrees. [Table 1](#) presents the participants' characteristics in more detail. Upon analyzing the data, approximately 563 initial codes were extracted from the interviews.

These codes were reviewed multiple times and grouped based on their similarity and proportion. Four primary categories emerged from the interviews: "inadequate training" and "lack of ongoing training and professional development opportunities". The data analysis process also yielded 6 subcategories, which fell under the four main categories ([Table 2](#)).

1) Inadequate Training

Many EMTs felt that their training programs did not adequately prepare them for the realities of prehospital emergency care, particularly in rural areas.

Table 1. Characteristics of the Study Participants (n=13)

ID	Gender	Age (year)	Working experience (years)	Education level
P1	Male	30	4	Bachelor's Degree
P2	Female	35	8	Associate's Degree
P3	Male	25	2	Bachelor's Degree
P4	Male	40	15	Associate's Degree
P5	Female	28	3	Bachelor's Degree
P6	Male	32	6	Associate's Degree
P7	Female	27	2	Bachelor's Degree
P8	Male	45	13	Associate's Degree
P9	Female	29	4	Bachelor's Degree
P10	Male	37	10	Associate's Degree
P11	Female	26	1	Bachelor's Degree
P12	Male	42	12	Associate's Degree
P13	Female	31	5	Bachelor's Degree

They expressed concerns about a lack of hands-on experience, inadequate exposure to diverse patient populations, and insufficient communication skills and cultural competence training.

Table 2. The Key Themes and Sub-Themes

Key Themes	Sub-Themes
Inadequate training	Lack of hands-on experience
	Inadequate exposure to diverse patient populations
	Insufficient training in communication skills and cultural competence
Lack of ongoing training and professional development opportunities	Lack of access to continuing education programs
	Lack of regular feedback and evaluation
	Limited opportunities to learn from and collaborate with other healthcare professionals

A) Lack of hands-on experience: Participants felt that their medical science education did not adequately prepare them for real-life situations in the field. They

noted that they lacked hands-on experience and practical training. P6 shared "We don't have enough practical training. We learn the theory, but when we go into the field, we're unsure what to do."

B) Inadequate exposure to diverse patient populations: Participants reported not receiving sufficient training to handle patients from diverse backgrounds. They felt that their education did not adequately prepare them to interact with patients from different cultures or with different medical conditions. "Our training only focused on the basics. We weren't taught how to handle patients from different cultures or with different medical conditions." (P.10)

C) Insufficient training in communication skills and cultural competence: Participants felt that their education did not provide enough training in communication skills and cultural competence. They noted that these skills are crucial when working with patients and can affect patient outcomes. "We need more training in how to communicate with patients. It's not just about the medical science; it's about understanding their needs and concerns." (P.3)

II) Lack of ongoing training and professional development opportunities

Many EMTs identified a lack of ongoing training and professional development opportunities as a major barrier to integrating medical science education in prehospital emergency care. They desired access to continuing education programs, regular feedback and evaluation, and opportunities to learn from and collaborate with other healthcare professionals.

A) Lack of access to continuing education programs: Participants reported that they did not have access to continuing education programs to help them improve their skills and knowledge. They felt that this lack of access hindered their ability to provide high-quality care to patients. P8 stated: "We don't have access to any continuing education programs. We're stuck with the same level of knowledge we had when we graduated."

B) Lack of regular feedback and evaluation: Participants felt they did not receive enough feedback and evaluation on their performance. They noted regular feedback and evaluation are important for improving their skills and knowledge. "We don't get any feedback on our performance. We need to know where we're falling short so we can improve." (P.10)

C) Limited opportunities to learn from and collaborate with other healthcare professionals: Participants reported having limited opportunities to

learn from and collaborate with other healthcare professionals. They felt that this lack of collaboration prevented them from expanding their knowledge and improving their skills. "We don't get to work with other healthcare professionals often. It would be great if we could learn from them and collaborate to provide better care for our patients." (P.7)

Discussion

The results of this study provide valuable insights into the perspectives of EMTs on integrating medical science education in prehospital emergency care in Iran. The findings suggest several challenges and barriers to integrating medical science education in EMT training programs in Iran, including inadequate training, a lack of ongoing training and professional development opportunities, and a need for greater collaboration between stakeholders.

In this study Participants reported inadequate training in terms of hands-on experience, exposure to diverse patient populations, and communication skills and cultural competence. These findings are consistent with previous research in this area. In a study by AL Mutairi et al., emergency medical services (EMS) providers in Saudi Arabia also reported a lack of hands-on experience and inadequate exposure to diverse patient populations (19). Similarly, a study found that EMS providers in India lacked training in communication skills and cultural competence (20). The findings of our study and these previous studies suggest a need for improvement in the medical science education of emergency medical technicians better to prepare them for their roles in the field.

The present study also found that EMTs in Iran face challenges regarding ongoing training and professional development opportunities. Participants reported a lack of access to continuing education programs, limited feedback and evaluation, and limited opportunities to learn from and collaborate with other healthcare professionals. These findings are consistent with previous research. For example, some studies found that EMTs in Oman lacked access to continuing education programs (20-22). Some studies found that EMTs lacked opportunities for collaboration with other healthcare professionals (23-25). These findings suggest a need for improvement in the ongoing training and professional development opportunities for emergency medical technicians in Iran and other countries.

The findings of this study emphasize the importance of collaboration in developing and implementing EMT

training programs. Participants highlighted the need for input from emergency medical technicians and ongoing stakeholder communication and feedback. Collaboration is crucial for the development and implementation of effective EMT training programs. A study found that collaboration between healthcare providers, educators, and policymakers was necessary to develop comprehensive EMT training programs (26). The study found that collaboration helped to ensure that EMTs received training that was relevant, up-to-date, and tailored to the needs of their communities. Collaboration also allowed for identifying gaps in EMT training and developing strategies to address those gaps.

Another study emphasized the importance of collaboration in implementing EMT training programs (27). The study found that collaboration between EMTs and their communities was necessary to ensure that training programs were culturally sensitive and effective. Collaboration also helped to identify barriers to effective EMT training, such as language barriers or lack of access to training resources. By working together, stakeholders were able to develop strategies to overcome these barriers and ensure that all EMTs received the training they needed to perform their duties effectively.

The present study's finding that EMTs in Iran recognize the potential impact of integrating medical science education on patient outcomes is consistent with previous research. Some studies showed that EMTs who received additional medical education had better patient outcomes than those who did not (28, 29). Similarly, some studies found that EMTs who received additional advanced airway management training had higher intubation success rates and better patient outcomes overall (30, 31). Recognizing the potential impact of medical science education on patient outcomes highlights the need for ongoing professional development for EMTs. As medical science continues to evolve, EMTs must receive ongoing training to stay up-to-date with the latest advances in medical science and technology. This ongoing training can help ensure that EMTs provide the best possible care to their patients and are equipped to handle the unique challenges they may face in their communities. By investing in ongoing professional development for EMTs, healthcare systems can improve patient outcomes and ensure that their emergency medical response systems are as effective as possible.

Overall, the findings of this study suggest that there is a need for ongoing collaboration and communication between stakeholders and ongoing training and

professional development opportunities for EMTs in Iran. The integration of medical science education in EMT training programs has the potential to improve the quality of prehospital emergency care and, ultimately, the health outcomes of patients. Future research is needed further to explore the perspectives of EMTs and other stakeholders and to develop effective strategies for integrating medical science education in EMT training programs in Iran.

Conclusion

The integration of medical science education into EMT training programs has the potential to address the challenges faced in prehospital emergency care and enhance patient outcomes. This study identified significant challenges related to the current state of EMT training programs in Iran, including inadequate hands-on experience, limited exposure to diverse patient populations, and insufficient communication skills and cultural competence training. Additionally, a lack of ongoing training and professional development opportunities, as well as limited collaboration between stakeholders, were found to hinder the integration process. To overcome these challenges, it is crucial to implement effective strategies that improve EMT training programs in Iran. These strategies should focus on increasing hands-on experience to enhance practical skills, incorporating comprehensive communication and cultural competence training, and providing continuous training and professional development opportunities. Moreover, fostering collaboration and communication among stakeholders is essential for successfully developing and implementing integrated EMT training programs. Addressing these challenges and implementing the suggested strategies can improve the quality of prehospital emergency care in Iran and similar contexts. The findings of this study provide valuable insights that can guide policymakers, educators, and healthcare professionals in designing and implementing effective interventions to enhance prehospital emergency care and ultimately improve patient outcomes.

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