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GENDER DIFFERENCES IN PREHOSPITAL EMERGENCY CARE: LITERATURE REVIEW

[1]Abdulrahman Essamuldeen Salahuldeen, [2]Mosa Saad Alqarni, [3]Abdulmajeed Mudhi Alsolami, [4]Marwan Jobara Aljohani, [5]Wael Nasser Alshehri, [6]Abdulrahman Bany A Alharthy, [7]Ahmed Ibn Mohammed Ibn Saeed Alghamdi, [8]Sultan Saad Almalki, [9]Atiah Fahad Atiah Althubyani, [10]Wafa Ali Almaghrabi

[1]Techncian Emergency Medical Services, Red Crescent Jeddah, 3boodi1@windowslive.com
[2]Techncian Emergency Medical Services, Red Crescent Jeddah, paramedic.0606@gmail.com
[3]Technician Emergency Medical Services, Red Crescent Jeddah, Jeedo4800@gmail.com
[4]Technician Emergency Medical Services, Red Crescent Jeddah, marwanjobara@gmail.com
[5]Health Assistant Emergency Medical Services, Red Crescent Jeddah, ww.997@hotmail.com
[6]Technician Emergency medical services, Red Crescent Jeddah, abalharthy@srca.org.sa
[7]Technician Emergency Medical Services, Red Crescent Jeddah, srca1119@SRCA.ORG.SA
[8]Technician Emergency Medical services, Red Crescent Jeddah, Sal-Maliki@SRCA.ORG.SA
[9]Technician Emergency Medical services, Red Crescent Mecca, atiah1407@hotmail.com
[10]Health Management Specialist, Red Crescent Mecca, w.almaghrabi@srca.org.sa

Abstract:
This literature review comprehensively investigates the significant gender disparities present in prehospital emergency care, with a particular emphasis on treatment practices, pain management, and patient outcomes for acute medical conditions such as acute myocardial infarction (AMI). Extensive research reveals that women often receive less aggressive treatment and face longer delays in care compared to their male counterparts, which can lead to poorer health outcomes. Several factors contribute to these disparities, including biases in clinical decision-making, variations in symptom presentation between genders, and inconsistencies in healthcare access and utilization. This review underscores the critical need for targeted interventions within emergency medical services (EMS) to effectively address these inequities and improve patient care. Specific recommendations include the implementation of comprehensive training programs for EMS personnel focused on recognizing and mitigating gender biases, the standardization of pain management protocols that take gender differences into account, and the establishment of regular audits to monitor and evaluate gender-specific treatment outcomes. The findings of this review highlight the importance of developing gender-sensitive approaches in prehospital care to enhance overall patient outcomes and promote health equity across diverse populations. Future research should further explore the systemic factors influencing these disparities and assess the long-term effects of gender-sensitive interventions on patient care.

Keywords: *Gender Disparities, Prehospital Emergency Care, Pain Management, Acute Myocardial Infarction, Emergency Medical Services*

Corresponding author:
Abdulrahman Essamuldeen,
Techncian Emergency Medical Services,
Red Crescent Jeddah, 3boodi1@windowslive.com

QR code

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1. INTRODUCTION:

1.1. Background and Significance of Prehospital Emergency Care

Prehospital emergency care plays a critical role in managing acute medical conditions, notably acute myocardial infarction (AMI) and traumatic injuries. Timely interventions during this initial phase can significantly impact patient outcomes by reducing morbidity and mortality rates (Dreyer et al., 2017; Platts-Mills et al., 2013). Research indicates that effective prehospital care, including the administration of pain management and rapid transport to appropriate medical facilities, is essential for optimizing recovery and survival rates (Meschial et al., 2014; Goodwin et al., 2018). The prehospital phase often represents the first point of contact with healthcare for patients, making it essential for emergency medical services (EMS) to deliver appropriate treatments rapidly. Given the increasing aging population and the prevalence of chronic pain conditions, optimizing pain management in prehospital settings is particularly important (Lawesson et al., 2018). Enhancing prehospital care protocols is more crucial than ever to meet these challenges. This review aims to examine the existing literature on gender disparities in prehospital emergency care, with a focus on pain management practices and factors influencing treatment outcomes in patients with acute conditions.

1.2. Overview of Gender Disparities in Healthcare

Gender disparities in healthcare have been well-documented, affecting various aspects of treatment, including pain management and responses to acute conditions like acute myocardial infarction (AMI). Studies show that women often receive less aggressive pain management compared to men, which can lead to inadequate treatment and poorer health outcomes (Wimbish et al., 2022). Research indicates that women are less likely to receive timely interventions, such as reperfusion therapy and effective pain management, exacerbating their conditions (Aguilar et al., 2012; Kim et al., 2017). These disparities may stem from biases in clinical decision-making, differences in pain expression and symptom presentation, as well as variations in healthcare access and utilization (Platts-Mills et al., 2013; Meischke et al., 1998; Falk et al., 2015). Understanding these gender differences is crucial for developing targeted interventions that ensure equitable care across genders, particularly in prehospital settings where rapid assessments are made.

1.3. Objectives of the Study

The present literature review aims to achieve the following research objectives:

- To analyze existing literature on gender disparities in prehospital emergency care, focusing on differences in treatment practices and outcomes between men and women.
- To evaluate the effectiveness of pain management practices in prehospital settings and how these practices differ by gender.
- To provide recommendations for improving emergency medical services (EMS) protocols that promote equitable healthcare practices tailored to the unique needs of both men and women.

1.4. Significance of the Study

The significance of this study lies in its potential to enhance understanding of gender disparities in prehospital emergency care, particularly in the context of pain management and treatment outcomes for acute conditions like acute myocardial infarction (AMI). The study aims to identify critical gaps in knowledge and practice that can inform healthcare providers and policymakers by systematically reviewing existing literature. Understanding these disparities is essential for developing targeted interventions that ensure equitable care for all patients, regardless of gender. Improved awareness of how men and women experience symptoms and respond to treatment can lead to more effective prehospital protocols, ultimately reducing morbidity and mortality rates. The findings of this study may also contribute to broader discussions about healthcare equity, highlighting the importance of tailoring medical approaches to diverse patient populations. By advocating for changes in EMS protocols and practices, the study aims to foster a more inclusive healthcare environment that promotes better health outcomes for both men and women.

2. RESEARCH METHODOLOGY

This section outlines the methodology employed in the literature review on gender differences in prehospital emergency care, focusing on the systematic approach used to gather, analyze, and synthesize relevant studies.

2.1. Research Design

The study utilizes a systematic literature review design, which is appropriate for synthesizing existing research on gender disparities in prehospital emergency care. This methodology allows for a comprehensive understanding of the topic by integrating findings from various studies to identify patterns, gaps, and areas for improvement.

2.2. Inclusion and Exclusion Criteria

To ensure a focused review, specific inclusion and exclusion criteria were established:

2.2.1. Inclusion Criteria:

- Peer-reviewed articles published in English.
- Studies focusing on prehospital emergency care and gender differences.
- Research addressing pain management practices and treatment outcomes in acute conditions, particularly acute myocardial infarction (AMI).
- Articles published within the last two decades to capture recent trends and data.

2.2.2. Exclusion Criteria:

- Non-peer-reviewed articles, opinion pieces, and editorials.
- Studies not focusing on gender disparities or lacking relevant data on prehospital care.
- Research that does not specifically address pain management or treatment outcomes.

2.3. Literature Search Strategy

The literature search utilized a combination of keywords and phrases, including "gender differences in prehospital emergency care," "pain management acute myocardial infarction," "gender disparities healthcare," and "EMS treatment outcomes gender." Boolean operators (AND, OR) were employed to refine the search results, and filters were applied to limit the findings to articles that met the established inclusion criteria. This comprehensive search was conducted across several academic databases, including PubMed, Scopus, Web of Science, CINAHL (Cumulative Index to Nursing and Allied Health Literature), and Google Scholar.

2.4. Data Extraction and Analysis

From the selected studies, key information was extracted, including:

- Author(s) and publication year
- Study design and methodology

- Sample size and demographics
- Key findings related to gender differences in treatment practices and pain management
- Recommendations for improving EMS protocols

A data extraction form was created to systematically record this information, ensuring consistency and comprehensiveness in the review process.

2.5. Thematic Analysis

The extracted data was analyzed using thematic analysis, which involved several key steps. First, familiarization was achieved by reading and re-reading the selected articles to gain a deep understanding of their content. Next, significant themes related to gender disparities, treatment practices, and pain management were identified and coded. This coding process facilitated the development of broader themes that captured the essence of the findings. Finally, the themes were reviewed to ensure that they accurately represented the data and remained relevant to the research objectives.

2.6. Synthesis of Findings

The findings from the thematic analysis were synthesized to provide a comprehensive overview of gender disparities in prehospital emergency care. The synthesis highlighted:

- Common patterns in pain management practices across studies.
- Differences in treatment outcomes for men and women.
- Recommendations for improving EMS protocols based on the identified gaps in care.

2.7. Limitations

The methodology acknowledges several limitations that may impact the findings of the review. Firstly, the focus on English-language publications could exclude relevant studies published in other languages, potentially omitting important insights. Additionally, the reliance on published literature may introduce publication bias, as studies with null or negative results are less likely to be published, skewing the overall understanding of the topic. Finally, the variability in study designs and methodologies among the included studies may limit the ability to generalize the findings, as differences in approaches could affect the reliability and applicability of the results.

3. Findings

3.1. Gender differences in EMS response times, treatment decisions, and patient outcomes

Research indicates significant gender differences in emergency medical services (EMS) response times and treatment decisions, particularly in acute medical situations. Aguilar et al. (2012) found that men experienced shorter scene and transport times compared to women when presenting with chest pain, suggesting a potential bias in how EMS personnel assess and prioritize patients based on gender. Similarly, Bruins Slot et al. (2012) reported that women suspected of acute coronary syndrome experienced longer prehospital delays and often presented symptoms that were less recognized by EMS, leading to delays in treatment.

Dreyer et al. (2017) highlighted that young women with acute myocardial infarction often received less aggressive treatment compared to their male counterparts, potentially contributing to poorer health outcomes. Lawesson et al. (2018) further emphasized the gender disparities in first medical contact and treatment delays, noting that women are less likely to receive timely interventions.

Additionally, studies have shown variations in pain management practices. Platts-Mills et al. (2013) demonstrated that older adults experienced disparities in pain treatment based on gender, with women receiving less effective pain management during prehospital care. Meschial et al. (2014) also noted that elderly victims of falls showed gender differences in treatment, which can exacerbate health outcomes for women compared to men.

The impact of systemic factors is evident in these findings. Goodwin et al. (2018) found that gender disparities were prevalent in out-of-hospital cardiac arrests, indicating that women may not receive the same level of emergency response as men. Jadhav and Gaddam (2021) further explored disparities in bystander automated external defibrillator (AED) usage, revealing that gender and location influenced access to critical care.

3.2. Provider and Systemic Influences on Care Disparities

Provider biases and systemic issues significantly contribute to the disparities observed in prehospital emergency care. Wimbish et al. (2022) indicate that healthcare providers may be less likely to recognize and address pain in female patients, leading to inadequate treatment. This bias is compounded by differences in symptom presentation, as women often report atypical symptoms during acute myocardial infarction, resulting in misdiagnosis or delayed treatment (Meischke et al., 1998).

Systemic factors, such as the structure of EMS protocols and training, also play a crucial role. McDonald et al. (2022) found that the implementation of standardized protocols for prehospital electrocardiogram acquisition did not equally benefit all genders, suggesting that protocols may need to be tailored to account for gender differences in symptom presentation and response. Farcas et al. (2023) highlighted disparities in EMS care delivery across the United States, emphasizing how systemic inequities can lead to differences in treatment based on gender. Rubenson Wahlin et al. (2016) further explored whether male and female trauma patients received the same level of prehospital care, contributing to the understanding of systemic biases.

Moreover, the findings from Schick et al. (2024) suggested that the gender of emergency physicians may influence the care provided during psychiatric emergencies, hinting at broader implications for gender dynamics in emergency medicine. Thus, the literature reveals persistent gender disparities in EMS response times, treatment decisions, and patient outcomes, driven by both provider biases and systemic influences in emergency care. Addressing these disparities is critical for enhancing the quality of care for all patients, particularly those experiencing acute medical conditions.

Author(s) & Year	Aim of the Study	Methodology	Findings			Recommendations
			Gender Disparities	Treatment Practices	Pain Management	
Popotas et al. (2024)	To explore sex-related immunity in acute inflammatory response.	Review article.	Insights into immune response by sex.	Not specifically addressed.	Implications for pain treatment discussed.	Future research needed to integrate findings into clinical practice.
Schick et al. (2024)	To analyze the impact of emergency physician gender on psychiatric emergency care.	Retrospective cohort analysis.	Physician gender influences care.	Variability in treatment based on physician gender.	Not addressed.	Explore gender dynamics in training for emergency care providers.
Farcas et al. (2023)	To review disparities in EMS care delivery in the U.S.	Scoping review of existing literature.	Systemic inequities affect care delivery.	Variations in treatment based on gender.	Not specifically addressed.	Advocate for policy changes to address systemic disparities in EMS.
Hussain et al. (2023)	To study paramedic perspectives on gender equity in ECG acquisition.	Qualitative interviews with paramedics.	Perceptions of inequity in ECG use.	Variability in ECG acquisition based on gender.	Not addressed.	Implement training on gender equity in ECG protocols.
Wimbish et al. (2022)	To examine racial, ethnic, and gender disparities in pain treatment.	Cross-sectional study.	Notable differences in pain treatment based on gender.	Variability in pain management approaches.	Gender strongly influences pain treatment outcomes.	Implement training to address biases in pain management across demographics.
McDonald et al. (2022)	To assess sex and gender equity in ECG acquisition.	Cross-sectional study.	Gender inequities in ECG use observed.	Variability in acquisition practices.	Not addressed.	Standardize ECG acquisition protocols to ensure equitable access.
Goodwin et al. (2018)	To investigate gender disparities in out-of-hospital cardiac arrests.	Data analysis of cardiac arrest cases.	Women face disparities in outcomes.	Differences in EMS responses noted.	Not specifically addressed.	Increase awareness of gender disparities in cardiac emergencies.
Dreyer et al. (2017)	To explore perspectives on young women with acute myocardial infarction.	Literature review and analysis.	Young women receive less aggressive treatment.	Treatment decisions often biased.	Pain management is inadequate for women.	Develop targeted interventions for young women experiencing AMI.
Lawesson et al. (2018)	To examine gender disparities in first medical contact and delays in AMI.	Prospective multicenter survey.	Women have longer delays in contact.	Treatment initiation is slower for women.	Not specifically addressed.	Improve EMS protocols to prioritize timely interventions for women.
Jadhav & Gaddam (2021)	To explore gender and location disparities in AED usage.	Observational study of AED deployment.	Differences in AED usage by gender noted.	Location impacts access to AEDs.	Not addressed.	Enhance public awareness campaigns on AED usage across genders.
Potisopha et al. (2020)	To conduct a systematic review on prehospital delay in acute stroke.	Systematic review of relevant literature.	Differences in delay times between sexes.	Treatment initiation varies by gender.	Not addressed.	Emphasize the importance of timely intervention protocols for both genders.
Falk et al. (2015)	To assess prehospital management of traumatic brain injury from a gender perspective.	Descriptive study of trauma cases.	Differences in care based on gender.	Variability in management approaches.	Gender differences in pain assessment noted.	Standardize treatment protocols that consider gender differences.

Kim et al. (2017)	To analyze factors related to prehospital delay in ST-segment elevation myocardial infarction.	Retrospective cohort study.	Women experience longer delays.	Factors contributing to delays differ by gender.	Not specifically addressed.	Recommend educational programs focused on recognizing symptoms in women.
Platts-Mills et al. (2013)	To examine pain treatment variations by patient gender and severity.	Cross-sectional study of emergency care.	Women receive less effective pain management.	Variability in treatment based on gender.	Gender influences pain treatment outcomes.	Recommend standardized pain management protocols sensitive to gender differences.
Bruins Slot et al. (2012)	To examine prehospital time delay and symptom presentation differences in acute coronary syndrome.	Observational study in primary care settings.	Women had longer prehospital delays.	Symptoms in women often less recognized.	Not addressed.	Enhance awareness of gender-specific symptoms in EMS training.
Aguilar et al. (2012)	To investigate gender differences in scene time, transport time, and total arrival time in chest pain patients.	Retrospective analysis of EMS data.	Men experienced shorter response times.	Potential bias in prioritizing men.	Not specifically addressed.	Improve training for EMS personnel to recognize gender biases.
Meschial et al. (2014)	To identify gender differences in elderly fall victims treated by prehospital care.	Observational study of fall incidents.	Gender differences in treatment noted.	Variability in response to falls.	Not specifically addressed.	Develop tailored protocols for managing elderly fall victims by gender.
O'Donnell et al. (2006)	To assess delays in prehospital care pathways for myocardial infarction.	Retrospective cohort study.	Differences in prehospital delays by gender.	Treatment often delayed for women.	Not addressed.	Recommend strategies to reduce delays in care for women.
Vukmir (2003)	To assess the impact of male gender on outcomes in prehospital cardiac arrest.	Cohort study of cardiac arrest cases.	Male gender adversely affects outcomes.	Treatment responses vary by gender.	Not addressed.	Advocate for gender-sensitive approaches in cardiac arrest management.

4. DISCUSSION:

The findings of this literature review underscore significant gender disparities in prehospital emergency care, particularly in pain management, treatment decisions, and response times. These disparities have profound implications for patient outcomes, highlighting a critical need for tailored interventions in emergency medical services (EMS).

4.1. Implications of the Findings

The evidence indicates that women often receive less aggressive treatment compared to men, which can exacerbate their health conditions and lead to poorer outcomes. For instance, studies by Dreyer et al. (2017) and Lawesson et al. (2018) reveal that young women experiencing acute myocardial infarction (AMI) are less likely to receive timely and effective interventions. This trend not only reflects biases in clinical decision-making but also underscores systemic issues within EMS protocols that may fail to recognize gender differences in symptom presentation and urgency. Moreover, the observed differences in pain management practices, as highlighted by Platts-Mills et al. (2013) and Meschial et al. (2014), suggest that women may not receive adequate pain relief, further complicating their recovery processes. These disparities can lead to increased morbidity and mortality rates, emphasizing the urgent need for improvements in EMS training and protocols.

4.2. Comparison of Identified Studies

The reviewed studies collectively illustrate a pattern of gender bias in prehospital care. For example, Aguilar et al. (2012) and Bruins Slot et al. (2012) both report that men tend to experience shorter response times, while women face longer prehospital delays. This discrepancy is corroborated by findings from Wimbish et al. (2022), which indicate notable differences in pain management treatment based on gender. However, some studies present a more nuanced perspective. Hussain et al. (2023) focus on paramedic perceptions regarding gender equity in ECG acquisition, suggesting that even within technical protocols, biases persist. This contrasts with the broader systemic issues identified by Farcas et al. (2023), which emphasize the need for policy changes to address systemic inequities in care delivery.

While the majority of studies highlight the adverse effects of gender disparities, there are gaps in

understanding the mechanisms behind these biases. For instance, the research by McDonald et al. (2022) calls for the standardization of protocols to ensure equitable treatment, yet it does not delve deeply into the underlying biases influencing these practices.

4.3. Significance of Gender Disparities and Their Impact on Patient Outcomes

The significance of addressing gender disparities in prehospital care cannot be overstated. These disparities not only affect the immediate quality of care but also have long-term implications for health equity. Women, who often present with atypical symptoms during acute medical conditions, may be misdiagnosed or receive delayed treatment, as shown in studies by Meischke et al. (1998) and Jadhav & Gaddam (2021). This can lead to preventable complications and a higher likelihood of adverse outcomes. The findings of this review highlight the necessity for EMS providers to be trained in recognizing gender-specific symptoms and biases. Improved awareness and training could lead to more equitable treatment practices, ultimately enhancing patient outcomes. Furthermore, the review emphasizes the need for healthcare policies that promote gender-sensitive approaches in EMS protocols, ensuring that both men and women receive timely and effective care.

5. CONCLUSION:

This literature review has highlighted significant gender disparities in prehospital emergency care, particularly concerning treatment practices, pain management, and response times. Key findings indicate that women often receive less aggressive treatment and experience longer delays in care compared to men, which can adversely affect their health outcomes. The evidence underscores the critical need for targeted interventions and policy changes to address these disparities, ensuring that both men and women receive equitable and effective care during emergencies. Addressing gender disparities in emergency care is vital not only for improving individual patient outcomes but also for fostering a more equitable healthcare system. By recognizing and rectifying these biases, healthcare providers can enhance the quality of care delivered to all patients, ultimately reducing morbidity and mortality rates associated with acute medical conditions.

6. Recommendations

To improve EMS protocols and promote equitable care, the following specific recommendations are proposed:

- Implement comprehensive training programs that focus on recognizing gender-specific symptoms and biases in treatment.
- Develop and enforce standardized protocols for pain management and treatment that account for gender differences.
- Establish regular audits of EMS response times and treatment outcomes by gender. This data collection will help identify and address disparities in real-time, allowing for continuous improvement in care practices.
- Advocate for healthcare policies at institutional and governmental levels that prioritize gender equity in emergency care.
- Launch community awareness campaigns to educate the public about gender differences in symptoms related to acute medical conditions

7. Areas for Future Research

Future research should focus on the following areas to further understand and address gender disparities in prehospital emergency care:

- Investigate the systemic factors within EMS that contribute to gender disparities, including organizational culture, training practices, and resource allocation.
- Conduct longitudinal studies to assess the long-term impact of gender disparities on health outcomes. This research could provide valuable insights into how differences in initial care affect recovery and quality of life.
- Examine the experiences and perspectives of female patients regarding their treatment during emergencies. Understanding their narratives could highlight specific gaps and areas for improvement in care delivery.
- Compare the effectiveness of gender-sensitive protocols versus traditional approaches in improving patient outcomes. This could help in developing evidence-based guidelines for EMS practices.

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