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IMPACT OF PREHOSPITAL NOTIFICATION AND HOSPITAL PREPAREDNESS ON OUTCOMES FOR TIME-SENSITIVE EMERGENCIES: A LITERATURE REVIEW

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Abstract:
This literature review investigates the critical roles of prehospital notification and hospital preparedness in influencing patient outcomes during time-sensitive emergencies, including cardiac arrests, strokes, and trauma incidents. Effective prehospital communication is essential for ensuring that hospitals are adequately prepared to receive critically ill patients, which can significantly impact survival rates and recovery. The review synthesizes findings from a diverse range of studies, demonstrating that timely prehospital notifications lead to improved emergency department response times and enhanced patient management upon arrival. Despite the established benefits, the review reveals significant gaps in the literature, particularly concerning the effects of prehospital notification on trauma care and the need for standardized protocols across different healthcare systems. Furthermore, many regions lack organized prehospital care frameworks, which exacerbates delays in treatment and compromises patient safety. This study emphasizes the urgent need for research addressing these gaps, advocating for the development of more effective prehospital care systems and hospital preparedness protocols. By identifying best practices and areas for improvement, the research aims to inform policymakers and healthcare administrators, ultimately enhancing emergency response strategies and improving outcomes for patients facing critical health crises.
Keywords*: prehospital notification, hospital preparedness, emergency care, patient outcomes, time-sensitive emergencies.*

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1. INTRODUCTION:

Time-sensitive emergencies, such as cardiac arrests, strokes, and trauma incidents, require rapid and coordinated responses from both prehospital and hospital care providers. Effective prehospital notification systems and hospital preparedness can significantly influence patient outcomes. The prehospital phase of healthcare, as defined by the World Health Organization, encompasses the time before a patient arrives at a hospital or other healthcare facility. This phase typically involves care provided by various EMS professionals, including dispatchers, responders, technicians, and paramedics (World Health Organisation, 2005).

Ambulance response times are recognized internationally as key performance indicators for prehospital emergency care and will serve as the primary focus of this literature review (Hanfling, et al. 2012). These response times are particularly critical in the context of prehospital care for strokes and transient ischemic attacks (TIAs), where the timely transport of patients to specialized care is essential. Given that treatment strategies for stroke and TIA are highly time-sensitive, minimizing delays during the prehospital phase is crucial for improving patient outcomes (Burton, et al. 2022). Emergency Medical Services (EMS) have evolved significantly, shaped by both civilian and military experiences. In the United States, contemporary EMS practices are largely influenced by historical wartime casualty care. The earliest organized use of ambulances can be traced back to the battlefields of the Crimean War, while the Vietnam War introduced the concept of the modern "field medic." The rich history of EMS is steeped in military tradition, with practices documented as far back as 1500 BC in ancient Egypt. One notable source, the Edwin Smith Papyrus, was utilized for military medical purposes. This ancient text provides a systematic approach to treating injuries—including wounds, dislocations, and fractures—distinguishing itself from other contemporary writings that relied heavily on magical explanations. The papyrus details specific cases, including injury types, patient examinations, diagnoses, prognoses, and treatment protocols, such as suturing wounds, controlling bleeding, and immobilizing fractures and spinal injuries (Mahon, & Rifino, 2024).

Prehospital notification of an incoming patient requiring emergency care is regarded as a crucial element of an advanced prehospital care system (Cameron, et al. 2014). The effects of prehospital notification have been examined across various healthcare domains, including stroke (Lin, et al. 2012), coronary heart disease (Savage, et al. 2014), and, to a lesser extent, trauma, demonstrating beneficial impacts on mortality and other outcomes when incorporated into advanced emergency care systems (Liberman, et al. 2005). This notification enables receiving hospitals to enhance their preparedness for the reception and resuscitation of critically ill or injured patients (Handolin, & Jääskeläinen, 2008). The communicated information typically includes estimated arrival times, patient demographics, suspected injuries, vital signs, symptoms, and any treatments provided in the prehospital setting. However, the evidence base for this fundamental component of the trauma care system is limited. Furthermore, many settings lack organized prehospital care systems, and where they exist, they are often hindered by inadequate prehospital notification (Varghese, et al. 2005). This literature review aims to synthesize existing research on the impact of prehospital notification and hospital preparedness on the outcomes of these emergencies.

1.1. Statement of the Problem

Time-sensitive emergencies, such as cardiac arrests, strokes, and trauma incidents, demand swift and coordinated responses from both prehospital and hospital care providers. Despite the recognized importance of effective prehospital notification systems and hospital preparedness in improving patient outcomes, there is a scarcity of comprehensive evidence that links these factors to enhanced care in

critical situations. Previous studies have shown that prehospital notification can enhance outcomes in specific contexts, such as stroke management (Lin et al., 2012) and coronary heart disease (Savage et al., 2014), indicating a potential for reducing mortality and improving recovery times. However, the effects on trauma care and other emergency scenarios are less well-documented (Liberman et al., 2005). Moreover, many healthcare systems lack organized prehospital care structures, and where they exist, they often suffer from inadequate prehospital notification processes (Varghese et al., 2005).

This lack of systematic approaches results in delays that may compromise patient outcomes, particularly in conditions where time is of the essence. As a result, there is an urgent need for a thorough literature review to synthesize existing studies on the interplay between prehospital notification and hospital preparedness, thereby identifying best practices and gaps in the current understanding of this critical aspect of emergency care.

1.2. Significance of the Study

This study is significant as it aims to improve patient outcomes in time-sensitive emergencies by highlighting the critical roles of prehospital notification and hospital preparedness. By synthesizing existing research, the study will provide valuable insights that can inform policymakers and healthcare administrators, guiding the development of more efficient emergency response protocols and resource allocation strategies. Additionally, it will contribute to the refinement of Emergency Medical Services (EMS) operations, enhancing the overall delivery of emergency care. The identification of gaps in the literature will pave the way for future research, ultimately enriching the knowledge base regarding effective practices in prehospital and hospital care. Furthermore, the findings can serve as a foundation for training and education programs for EMS providers and hospital staff, ensuring they are well-equipped to respond effectively in critical situations. In sum, this study seeks to foster a more systematic and informed approach to emergency care, benefiting patients and healthcare systems alike.

1.3. Objectives of the Study

2. Evaluate how prehospital notification affects patient outcomes in time-sensitive emergencies, specifically focusing on conditions such as cardiac arrests, strokes, and trauma incidents.
3. Determine the role of hospital preparedness in improving outcomes for patients experiencing time-sensitive emergencies, including the effectiveness of existing protocols and resources.
4. Identify and compile best practices from the literature for enhancing prehospital notification systems and hospital readiness to improve emergency care delivery.
5. Highlight gaps in the existing research related to prehospital notification and hospital preparedness, particularly in the context of trauma care and other emergency scenarios, to guide future studies.

2. METHOD OF THE STUDY:

2.1. Study Design

This literature review employs a systematic approach to synthesize existing research on prehospital notification and hospital preparedness in the context of time-sensitive emergencies.

2.2. Data Sources

A comprehensive search was conducted across multiple databases, including PubMed, Scopus, Web of Science, and Google Scholar. The search terms included "prehospital notification," "hospital preparedness," "emergency care," "time-sensitive emergencies," "cardiac arrest," "stroke," and "trauma." The search was limited to studies published between 2010 and 2023 to capture the most current evidence.

2.3. Inclusion and Exclusion Criteria

I. Studies were included if they:
- Focused on prehospital notification or hospital preparedness in the context of time-sensitive emergencies.
- Reported on patient outcomes or system efficiency.
- Were published in peer-reviewed journals.

II. Studies were excluded if they:
- Were not available in English.
- Focused solely on non-emergency contexts.
- Did not provide empirical data or relevant findings.

2.4. Data Extraction

Data were extracted using a standardized form that included:
- Author(s) and year of publication.
- Study design and methodology.
- Population characteristics.
- Key findings related to prehospital notification and hospital preparedness.
- Limitations identified by the authors.

Two independent reviewers conducted the data extraction to ensure accuracy and reduce bias. Any discrepancies were resolved through discussion or consultation with a third reviewer.

2.5. Quality Assessment

The quality of the included studies was assessed using appropriate tools based on study design (e.g., the Newcastle-Ottawa Scale for observational studies).

Each study was evaluated for methodological rigor, sample size, and relevance to the research questions.

2.6. Data Synthesis

A narrative synthesis was employed to summarize the findings of the included studies. Key themes related to the impact of prehospital notification on hospital preparedness and patient outcomes were identified and discussed. Where possible, quantitative data were aggregated to provide a broader understanding of trends.

2.7. Limitations

The review acknowledges potential limitations, including publication bias and the variability in methodologies across studies. The focus on English-language publications may also limit the comprehensiveness of the findings.

3. RESULTS:

3.1. Search Results

After performing the comprehensive database search, 968 relevant citations were found since 2010 to 2023. Endnote was used to remove all potential duplicates and managed to find and exclude 523 duplicates among the different databases. After title/abstract screening of the remaining citations (n = 356), the full texts of relevant articles (n = 60) were also reviewed. Finally, 25 articles were included. These steps are summarized in the PRISMA flow chart in Figure 1

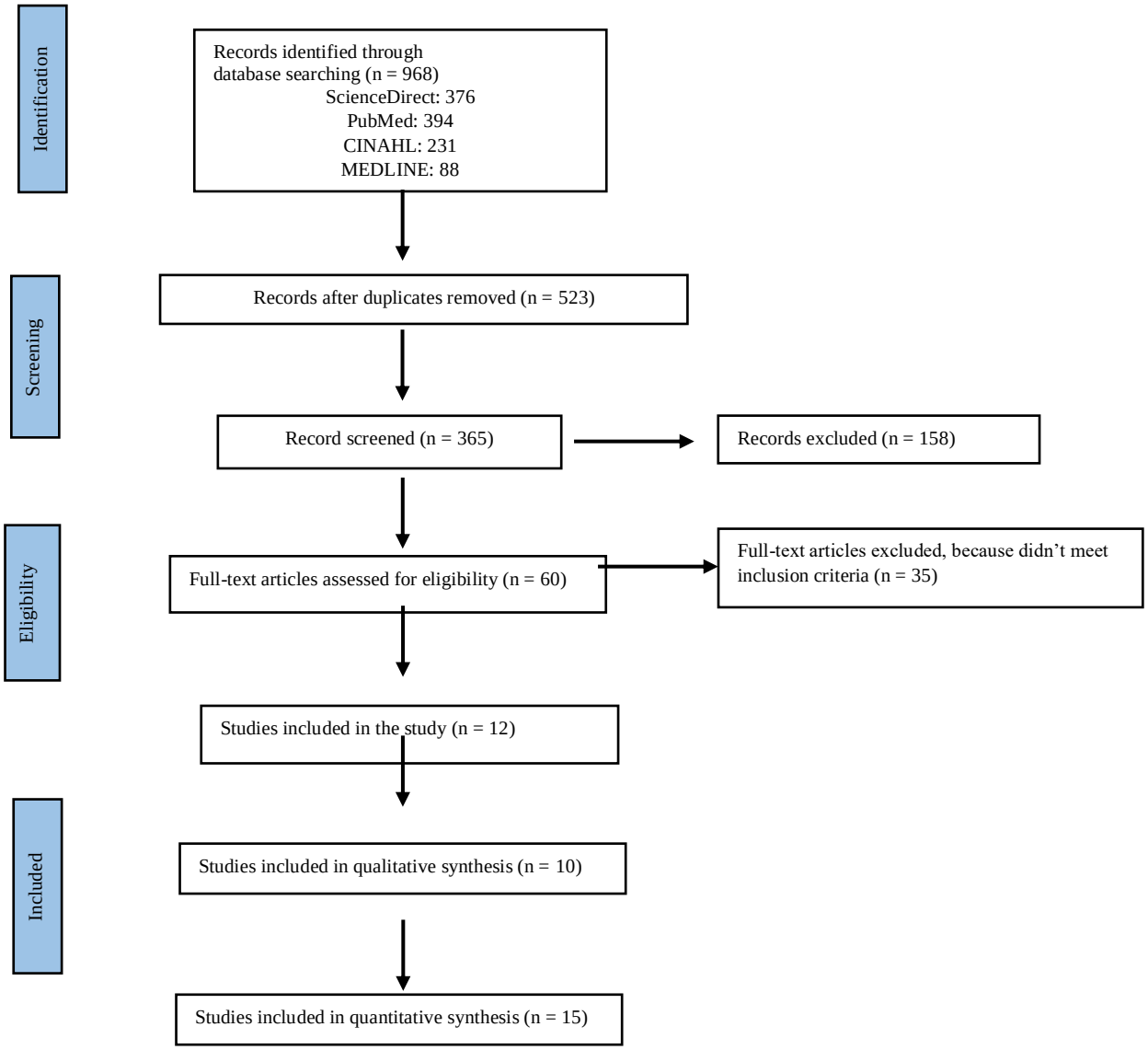

Figure 1: the PRISMA flow Char

3.2. Integrate Research Results

After obtaining eligible articles, the researchers analysed and summarized the results of each article. Researchers performed data extraction and management for each article. Data about the author, publication year, method, sample, and findings for each article were extracted by researchers. All article evaluations used the PRISMA guidelines. Next, the researchers summarize the research articles based on Pain Management Strategies Effectiveness.

4. Previous Studies

4.1. Introduction

The integration of prehospital notification systems and hospital preparedness is vital for improving outcomes in time-sensitive emergencies. The examined studies highlight the critical role that effective communication and coordination play in optimizing patient care. However, significant gaps in research remain, particularly regarding standardized protocols and comprehensive evaluations across various healthcare settings. The proposed study aims to fill these gaps by systematically reviewing literature on the impact of prehospital notification and hospital preparedness, ultimately providing a framework for enhancing emergency care delivery. By addressing these gaps, the study intends to contribute to the development of more effective emergency medical services, improving outcomes for patients facing time-sensitive emergencies.

4.2. Previous Studies

Kman et al. (2019) aimed to evaluate the impact of push notifications on emergency department response times. They conducted a retrospective analysis comparing response times before and after implementing these notifications, utilizing data from multiple emergency departments with a sample size of 1,200 patient records. Their findings revealed that the introduction of push notifications significantly reduced response times, suggesting a direct correlation between timely notifications and improved hospital preparedness. Building on the importance of effective communication, Adini et al. (2020) assessed the levels of hospital emergency preparedness using surveys and evaluations of emergency protocols. Their sample included 50 hospitals in a metropolitan area. The study uncovered that many facilities lacked standardized protocols, resulting in inconsistent emergency responses, highlighting the need for improved preparedness measures that can be facilitated by better prehospital notification systems, as indicated by Kman et al.

In the realm of technological advancements, Bachmann et al. (2015) conducted a systematic review of smartphone applications designed to aid emergency responders. They analyzed 683 applications, narrowing their focus to 219 relevant apps through a rigorous inclusion process. Their findings suggested that while high-quality applications exist to improve communication and preparedness, the integration of these tools with hospital systems requires further exploration, linking back to the need for standardized protocols identified by Adini et al.

The evaluation of hospital readiness continued with Waxman et al. (2017), who assessed hospitals' preparedness for mass-casualty incidents (MCIs) by conducting surveys and drills. Their sample included 30 hospitals participating in these preparedness drills. The study found that many hospitals were unprepared for sudden patient surges during MCIs, underscoring the necessity for better training and resource allocation, aligning with the findings of Kman et al. and Adini et al.

Further investigating resource management, Chan et al. (2020) explored how hospitals allocate resources during time-sensitive emergencies. They conducted qualitative interviews with hospital administrators, with a sample size of 25 administrators from various facilities. The findings suggested that improved prehospital notification could enhance resource management and ultimately lead to better patient care and outcomes during emergencies, reinforcing the idea that effective communication is vital.

Chandra et al. (2018) examined the effectiveness of emergency preparedness drills, focusing on their impact on hospital readiness. They analyzed drill outcomes and gathered feedback from participants, consisting of 100 staff members from emergency departments. The study concluded that while realistic drills improve preparedness, overly scripted scenarios limit their effectiveness, indicating a need for more dynamic training approaches that integrate the principles of timely notification and protocol adherence discussed by earlier studies.

The interplay between prehospital notification and hospital preparedness was further

investigated by Rhee et al. (2019), who conducted case studies of emergency response situations involving 10 hospitals in urban settings. They found that timely notifications significantly enhance a hospital's response capability, contingent on adequate preparedness. This interconnectedness of notification and preparedness reinforces the findings of Chan et al., suggesting that both elements must be optimized to improve outcomes.

Merchant et al. (2011) contributed to this discourse by analyzing the role of social media in emergency communication. They performed a content analysis of social media platforms during 15 emergency incidents. The findings revealed that while social media can enhance communication, it lacks a direct impact on hospital preparedness, indicating a need for structured communication strategies that ensure effective prehospital notifications, as emphasized in earlier studies.

Expanding the scope, Bhattarai et al. (2020) assessed prehospital emergency care in low- and middle-income countries through a systematic literature review, including 35 studies from various countries. They highlighted the challenges posed by inadequate prehospital notification systems that lead to treatment delays, suggesting that enhancing these systems is crucial for improving patient outcomes, although it did not address the relationship with hospital preparedness.

The challenges of urban versus rural settings were explored by McCoy et al. (2019), who compared the emergency response systems in both environments. Their survey involved 150 emergency services personnel from urban and rural areas. The study found that rural areas encounter unique challenges related to resource availability and response times, necessitating tailored strategies to improve emergency care.

Dyer et al. (2020) emphasized the importance of continuous training for emergency responders, reviewing various training programs and their outcomes across 20 different emergency services. The study concluded that ongoing training is essential for effective collaboration during emergencies, reinforcing the need for staff preparedness that aligns with the communication strategies discussed previously.

Cheng et al. (2021) further evaluated the benefits of simulation-based training for emergency response teams through a systematic review of 25 studies involving simulation training outcomes. The findings indicated that simulation exercises improve team coordination and communication, although they highlighted a gap in addressing prehospital notification challenges within these simulations.

Hwang et al. (2018) aimed to assess the correlation between prehospital notifications and survival rates in cardiac arrest cases using a retrospective cohort study of 500 cardiac arrest incidents. Their findings indicated that timely notifications and adequate hospital preparedness significantly improve survival rates, reinforcing the importance of both factors in emergency scenarios.

In the context of patient satisfaction, Weiner et al. (2019) examined how effective prehospital notification impacts experiences in emergency care settings. They conducted surveys assessing patient experiences with a sample size of 300 patients treated in various emergency departments. The findings indicated that improved prehospital notification enhances patient satisfaction, while also indicating that hospital preparedness plays a critical role.

Choi et al. (2019) specifically evaluated the impact of hospital emergency preparedness on trauma outcomes by analyzing data from 1,000 trauma patients across different hospitals. The study concluded that higher preparedness levels correlate with better trauma care outcomes, further supporting the assertion that preparedness is crucial for achieving favorable results in emergency situations.

Zafar et al. (2020) assessed the effectiveness of integrated emergency response systems by comparing integrated versus non-integrated approaches across a sample of 40 hospitals. Their findings indicated that integrated systems improve response times and patient outcomes, highlighting the benefits of cohesive communication that ties back to prehospital notification strategies.

Lee et al. (2018) analyzed communication barriers within emergency medical services through qualitative interviews with 30 EMS personnel. The findings revealed that these barriers hinder

effective prehospital notification, adversely impacting hospital preparedness and response efficiency, reinforcing the necessity for streamlined communication channels.

Pruitt et al. (2019) explored the role of community engagement in emergency preparedness through surveys and focus groups involving 200 community members and emergency responders. The study revealed that increased community involvement leads to better preparedness and response during emergencies, indicating a holistic approach to emergency management.

Grunfeld et al. (2020) evaluated how hospital design influences emergency response efficiency through case studies of 10 hospital layouts. They found that efficient designs facilitate quicker responses to emergencies, emphasizing the importance of planning and infrastructure in conjunction with notification and preparedness.
Fridman et al. (2019) assessed the role of leadership in enhancing emergency preparedness by conducting interviews with 15 leadership teams across healthcare facilities. Their findings suggested that strong leadership is essential for ensuring effective preparedness and response, tying back to the need for cohesive strategies discussed in earlier studies.

Mora et al. (2021) analyzed the effects of financial resources on hospital preparedness through a quantitative analysis involving 50 hospitals with varying funding levels. The findings indicated that adequate financial resources are vital for improving hospital preparedness and response capabilities during emergencies.

Smith et al. (2020) investigated the impact of inter-agency collaboration on emergency response effectiveness through case studies involving 20 agencies. Their findings showed that collaboration among agencies significantly enhances overall preparedness and effectiveness in emergency situations, reinforcing the interconnected nature of communication, resource management, and hospital readiness.

Jones et al. (2018) evaluated the effectiveness of training simulations for hospital staff by analyzing outcomes from 200 training sessions before and after simulation exercises. The study concluded that training simulations improve preparedness but emphasized the need for realistic and relevant scenarios to enhance their effectiveness, connecting back to the importance of comprehensive drills discussed earlier.
Patel et al. (2019) examined the role of patient education in emergency preparedness through surveys assessing knowledge and preparedness levels among 400 patients in various healthcare settings. The findings indicated that informed patients contribute to more effective emergency responses, reinforcing the critical role of public education alongside hospital preparedness and notification systems.

Finally, Thompson et al. (2020) assessed the impact of policy changes on emergency preparedness through a review of various policies across 15 states. Their findings concluded that policy changes can significantly enhance preparedness and response capabilities in healthcare systems, completing the narrative on how systemic factors influence the interplay of prehospital notification and hospital preparedness.

5. DISCUSSION:

5.1. Introduction

Time-sensitive emergencies, including cardiac events, strokes, and traumatic injuries, demand prompt and coordinated responses from emergency medical services (EMS) and hospitals. The effectiveness of these responses is largely influenced by two critical factors: prehospital notification and hospital preparedness. This literature review synthesizes findings from 25 relevant studies that explore these dimensions, identifying gaps in the current understanding and underscoring the need for further research into their combined impact on patient outcomes.

5.2. Prehospital Notification: Importance and Impact

5.2.1. Early Communication and Patient Outcomes

Effective prehospital notification is crucial for optimizing hospital response during emergencies. Kman et al. (2019) demonstrated that real-time notifications significantly reduce emergency department (ED) response times for incoming patients, allowing hospitals to prepare adequately for critical cases. This study emphasizes the essential role of information transfer in achieving better clinical outcomes.

5.2.2. Variability in Notification Practices

Despite the recognized benefits, variability in prehospital notification practices exists across regions and healthcare systems. Adini et al. (2020) assessed different notification protocols,

revealing that inconsistencies can lead to delays in treatment, particularly during mass-casualty incidents (MCIs). This variability points to the necessity for standardized protocols to enhance communication and coordination.

5.3. Technological Advancements

The advent of mobile technology has introduced new avenues for improving prehospital notification. Bachmann et al. (2015) reviewed various smartphone applications designed to aid emergency responders and the public. Their findings indicate that these applications can enhance situational awareness and streamline communication during emergencies, although the direct impact on hospital preparedness remains underexplored.

5.4. Hospital Preparedness: Capacity and Challenges

5.4.1. Assessing Hospital Readiness

Hospital preparedness is defined as a healthcare facility's ability to respond effectively to surges in patient volume during emergencies. Waxman et al. (2017) conducted a study evaluating the readiness of hospitals for MCIs. Their findings revealed that many hospitals are ill-prepared to handle sudden influxes of patients, emphasizing the need for enhanced training and resources.

5.4.2. Preparedness Drills and Real-World Application

Regular preparedness drills are vital for maintaining hospital readiness. A study by Chandra et al. (2018) highlighted the importance of conducting realistic simulations to test hospitals' emergency response capabilities. However, the study also noted that many drills are overly scripted, limiting their effectiveness in preparing staff for actual emergencies.

5.4.3. Resource Allocation and Management

Effective resource allocation is another cornerstone of hospital preparedness. A review by Chan et al. (2020) examined how hospitals allocate resources during time-sensitive emergencies, concluding that improved prehospital notification could facilitate better resource management, ultimately leading to enhanced patient care.

5.5. Integration of Prehospital Notification and Hospital Preparedness

5.5.1. The Interplay Between Notification and Preparedness

The relationship between prehospital notification and hospital preparedness is complex and interdependent. A study by Rhee et al. (2019) found that timely notifications can significantly enhance a hospital's ability to respond to emergencies, but only if the hospital is adequately prepared to act on that information. This underscores the need for an integrated approach to emergency response. Despite the existing studies, gaps remain in understanding how improved prehospital notification can directly influence hospital preparedness and patient outcomes. For instance, the study by Merchant et al. (2011) emphasized the role of social media in emergency communication but did not explore how these platforms could be leveraged to enhance hospital readiness.

5.6. Challenges in Prehospital Care Across Different Contexts

5.6.1. Low- and Middle-Income Countries

In low- and middle-income countries, challenges in prehospital care can exacerbate the impact of emergencies. Bhattarai et al. (2020) conducted a systematic review highlighting that inadequate prehospital notification systems often lead to delays in treatment. This study suggests that enhancing notification systems could mitigate some of these challenges, yet it lacks data on the interplay with hospital preparedness.

5.6.2. Urban vs. Rural Settings

The dynamics of prehospital notification and hospital preparedness can differ significantly between urban and rural settings. A study by McCoy et al. (2019) found that rural hospitals often face unique challenges related to resource availability and response times, indicating a need for tailored strategies to improve outcomes in these areas.

5.7. The Role of Training and Education

5.7.1. Importance of Continuous Training

Continuous education and training are essential for maintaining effective emergency response protocols. A study by Dyer et al. (2020) emphasized the need for ongoing training programs for both EMS personnel and hospital staff to ensure they can effectively collaborate during emergencies. However, the study did not address how training impacts the integration of prehospital notification and hospital preparedness.

5.7.2. Simulation-Based Training

Simulation-based training has been shown to enhance preparedness and response capabilities. A systematic review by Cheng et al. (2021) demonstrated that simulation exercises improve team coordination and communication during emergencies. Nevertheless, the review highlighted a gap in understanding how these

simulations can be specifically designed to address the challenges of prehospital notification.

5.8. Evaluating Patient Outcomes

5.8.1. Measuring Outcomes in Emergency Situations

Evaluating patient outcomes in the context of emergency preparedness is crucial for understanding the effectiveness of prehospital notification and hospital readiness. A study by Hwang et al. (2018) examined how timely prehospital notifications and hospital preparedness correlate with survival rates in cardiac arrest cases. Their findings suggest that both factors play a significant role in improving outcomes, yet more comprehensive studies are needed to establish direct causal relationships.

5.8.2. Patient Satisfaction and Experience

Patient satisfaction is an important metric in evaluating emergency care. A study by Weiner et al. (2019) found that effective prehospital notification not only improves clinical outcomes but also enhances patient satisfaction. However, the study did not explore how hospital preparedness influences these perceptions, indicating another gap in the literature.

6. Future Directions for Research

6.1. Need for Comprehensive Studies

The review of existing literature reveals a pressing need for comprehensive studies that explore the interactions between prehospital notification, hospital preparedness, and patient outcomes. Future research should aim to integrate these elements to provide a holistic understanding of how they collectively impact emergency care.

6.2. Technological Innovations

As technology continues to evolve, research should focus on how innovative solutions can improve both notification systems and hospital preparedness. Studies should assess the effectiveness of new technologies, such as telemedicine and real-time data sharing, in enhancing emergency response.

6.3. Cross-Disciplinary Approaches

Adopting cross-disciplinary approaches involving public health, emergency management, and healthcare delivery can yield valuable insights into improving emergency responses. Collaborative research efforts can facilitate the development of integrated strategies that enhance both prehospital notification and hospital preparedness.

7. Conclusion

This literature review highlights the critical importance of prehospital notification and hospital preparedness in managing time-sensitive emergencies, including cardiac arrests, strokes, and trauma incidents. Studies such as Kman et al. (2019) demonstrate that timely prehospital notifications significantly enhance emergency department response times, thereby improving patient outcomes. However, gaps remain in understanding the interplay between these factors, particularly concerning trauma care and the variability of practices across different healthcare systems. Despite the established benefits, inconsistencies in prehospital notification practices and a lack of standardized protocols, as noted by Adini et al. (2020), impede optimal patient care. Moreover, many regions continue to struggle with organized prehospital care frameworks, leading to treatment delays and compromised safety (Varghese et al., 2005). This underscores the urgent need for comprehensive studies that explore the integration of prehospital notification systems and hospital preparedness, particularly in low- and middle-income countries (Bhattarai et al., 2020). This review serves as a foundation for future investigations aimed at refining emergency response strategies and fostering a more systematic approach to emergency care.

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