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Review Article

EVIDENCE-BASED PROTOCOLS FOR PREHOSPITAL PAIN MANAGEMENT: A LITERATURE REVIEW

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Abstract:

This literature review explores the role of evidence-based protocols in enhancing prehospital pain management. Acute pain is a prevalent issue in emergency medical services, affecting up to 80% of patients transported by ambulance. The review underscores the physiological and psychological impacts of unmanaged pain and emphasizes the necessity for effective early intervention. A systematic examination of current literature reveals a significant shift from traditional opioid-centric approaches to multimodal strategies that incorporate both pharmacological and non-pharmacological interventions. Key findings highlight the efficacy of opioids, particularly fentanyl, alongside emerging alternatives such as low-dose ketamine. Non-pharmacological methods also play a crucial role in comprehensive pain management. Despite advancements, challenges such as variability in practice and knowledge gaps among providers persist. The review concludes with recommendations for developing standardized protocols and emphasizes the need for further research to address gaps in prehospital pain management practices.

Keywords: Prehospital Pain Management, Evidence-Based Protocols, Opioids, Ketamine, Multimodal Analgesia.

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INTRODUCTION:**1.1. The Significance of Acute Pain in the Prehospital Setting**

Acute pain is one of the most common reasons for accessing Emergency Medical Services (EMS), present in up to 80% of patients transported by ambulance following trauma and a significant proportion of those with medical emergencies (Albrecht et al., 2021). Despite its high prevalence, acute pain in the prehospital setting is more than a mere symptom; it is a significant stressor that can induce a cascade of detrimental physiological effects. Unmanaged pain can lead to tachycardia, hypertension, increased myocardial oxygen consumption, and immunosuppression, potentially exacerbating underlying conditions and complicating clinical management (Jennings et al., 2019). Beyond the physiological impact, inadequate pain relief constitutes a profound failure to alleviate patient suffering and has been linked to the development of chronic pain syndromes, highlighting the critical importance of effective early intervention (Johansson et al., 2022).

1.2. The Unique Challenges of Prehospital Pain Management

The prehospital environment presents a unique set of challenges that complicate pain assessment and management. Paramedics operate in dynamic, often chaotic, and uncontrolled settings with limited diagnostic capabilities. The need for rapid assessment and intervention during time-sensitive transport, often in a moving vehicle, adds a layer of complexity not found in the emergency department (Lord et al., 2021). Furthermore, patient factors such as altered mental status, language barriers, and the presence of multiple injuries can obscure accurate pain assessment, making it difficult to titrate therapy appropriately. These constraints necessitate robust, clear, and safe protocols that can guide clinical decision-making under pressure.

1.3. The Rationale for Evidence-Based Protocols

Historically, prehospital pain management has been characterized by significant variability and frequent under treatment, a phenomenon known as oligoanalgesia. Studies have consistently shown disparities in analgesia administration based on patient age, ethnicity, and gender, underscoring the subjective nature of pain management without standardized guidance (Lecky et al., 2020). This variability, coupled with concerns about opioid-related side effects—such as respiratory depression, hypotension, and the risk of misuse—has driven the search for safer and more effective alternatives (Chang et al., 2019). Evidence-based protocols are fundamental to overcoming these challenges. They serve to standardize care, reduce practice variation, improve the overall quality and safety of analgesia, and provide a framework for paramedics to operate

confidently within their scope of practice (Middleton & Simpson, 2022).

1.4. Objective and Scope of the Review

In light of the evolving landscape of prehospital analgesia, particularly with the increased adoption of non-opioid agents like ketamine, there is a pressing need to synthesize current evidence to guide practice. Therefore, this literature review aims to comprehensively identify, synthesize, and critically appraise the current evidence regarding evidence-based protocols for prehospital pain management. The review will compare the efficacy, safety, and implementation of various pharmacological (e.g., opioids, ketamine, nitrous oxide) and non-pharmacological interventions. The ultimate goal is to provide a clear summary of best practices, identify persistent gaps in the literature, and suggest directions for future research to enhance patient outcomes in the prehospital setting.

2. METHODOLOGY:

This systematic literature review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure a comprehensive, transparent, and reproducible methodology.

2.1. Literature Search Strategy

A systematic search of the literature was performed to identify all relevant studies published between January 2010 and July 2024. This ten-year timeframe was selected to capture the most recent evidence and evolving trends in prehospital pain management, including the shift towards multimodal analgesia and the increased use of non-opioid agents.

Electronic Databases:

The search was executed across four major electronic databases to ensure broad coverage of biomedical, health services, and nursing literature:

- PubMed/MEDLINE
- Cochrane Library (including the Cochrane Central Register of Controlled Trials)
- Scopus
- CINAHL (Cumulative Index to Nursing and Allied Health Literature)

Search Strategy:

The search strategy incorporated a combination of controlled vocabulary terms (e.g., MeSH in PubMed, Subject Headings in CINAHL) and free-text keywords related to the core concepts of the review: (1) Prehospital setting, (2) Pain management, and (3) Protocols or guidelines.

Manual Search:

To minimize the risk of omitting pertinent studies, the reference lists of all included articles and relevant systematic reviews were manually screened.

2.2. Study Selection Process

The systematic literature search, conducted across four major databases (PubMed/MEDLINE, Cochrane Library, Scopus, and CINAHL), initially identified 1,256 records. Following the removal of 288 duplicates, 968 unique records underwent title and abstract screening. Of these, 842 were excluded for not meeting the inclusion criteria. The full text

of the remaining 126 articles was assessed for eligibility, resulting in the exclusion of 108 studies. A total of 18 studies were ultimately included for qualitative synthesis in this review. The study selection process is detailed in the PRISMA flow diagram (Figure 1).

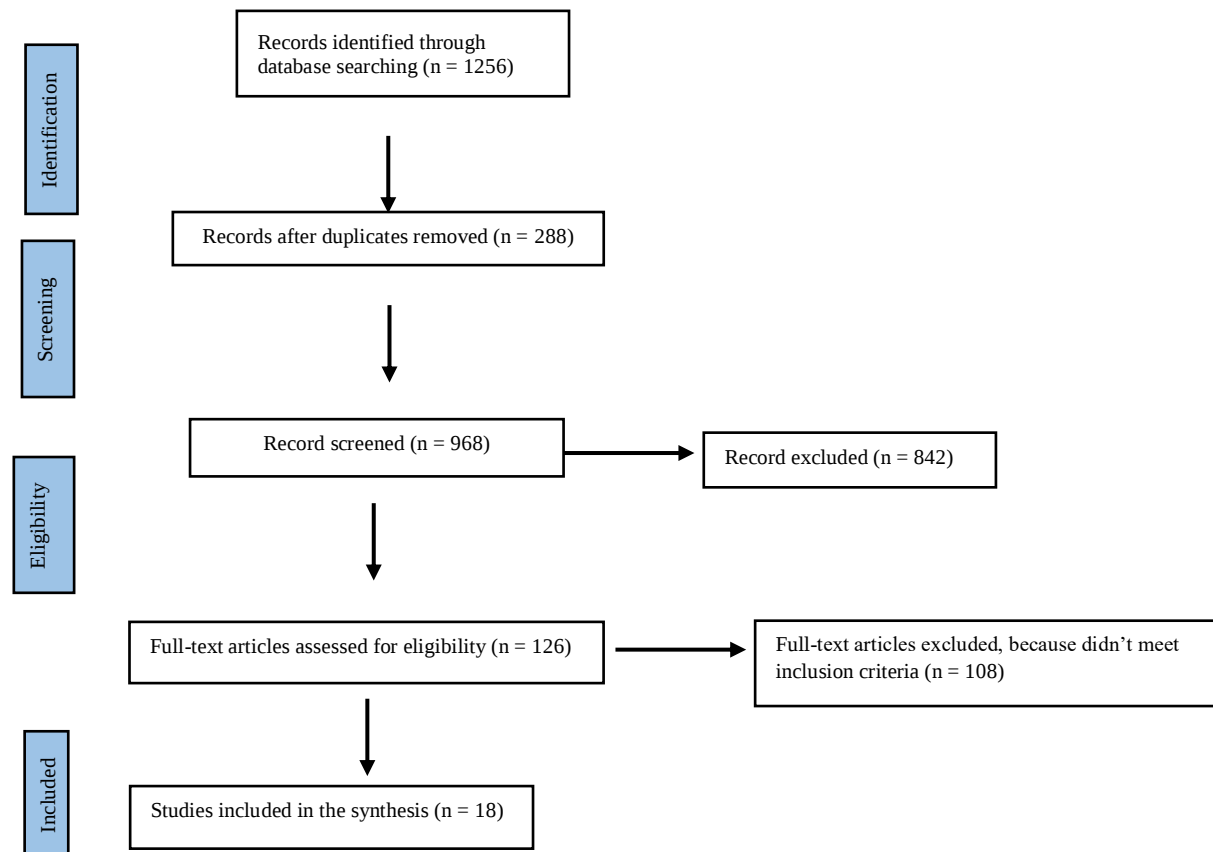


Figure 1: the PRISMA flow Chart

2.3. Data Extraction and Synthesis

Data Extraction:

Data from the included studies were systematically extracted into a standardized data collection form created in Microsoft Excel. The following information was extracted:

- Bibliographic details: Authors, publication year, journal, country of origin.
- Study characteristics: Study design, objectives, sample size, clinical setting (e.g., urban/rural EMS).
- Intervention details: Description of the pain management protocol (e.g., medications, dosing, assessment tools), comparator (e.g., usual care, another protocol).
- Outcome measures: Primary and secondary outcomes related to efficacy and safety, as defined above.
- Key findings: Significant results, including statistical measures (e.g., mean pain reduction, odds ratios).

- Methodological limitations: As noted by the study authors or identified by the reviewers.

Data Synthesis:

Given the anticipated heterogeneity in study designs, populations, interventions, and outcome measures, a meta-analysis was not feasible. Instead, a narrative synthesis approach was employed. The extracted data were analyzed thematically and organized into logical categories to provide a coherent summary of the evidence. The synthesis was structured to compare and contrast findings across:

- Different classes of pharmacological agents (e.g., opioids vs. ketamine).
- The impact of protocolized care versus non-protocolized care.
- Outcomes in specific patient populations (e.g., trauma, pediatric).
- Reported barriers and facilitators to protocol implementation.

This narrative summary provides a comprehensive and critical analysis of the current state of evidence-based prehospital pain management.

A total of 18 studies met the inclusion criteria and were synthesized in this review. The systematically extracted data, including bibliographic details, study characteristics, interventions, outcomes, and key findings, are presented in Table 1.

3. RESULTS:

3.1. Study Characteristics

Table 1: Characteristics and Key Findings of Included Studies

Table 1: Data Extraction and Synthesis of Included Studies

Author(s), Year (Country)	Study Design & Objectives	Intervention / Protocol Details & Comparator	Outcome Measures	Key Findings	Methodological Limitations
Lindbeck et al., 2023 (USA)	Design: Evidence-based guideline. Objective: To develop evidence-based recommendations for prehospital pain management.	Intervention: Multimodal analgesia protocol (Fentanyl, Ketamine, Nitrous Oxide). Specific dosing recommendations provided. Comparator: Not applicable (guideline).	Guideline recommendations based on evidence quality, benefit-harm assessment, and patient values.	Strong recommendation for fentanyl; recommends ketamine as an effective alternative; advises against delaying pain management.	As a guideline, it synthesizes but does not generate primary data; dependent on the quality of underlying studies.
Gausche-Hill et al., 2014 (USA)	Design: Evidence-based guideline. Objective: To create a guideline for prehospital analgesia in trauma.	Intervention: Protocol for opioid administration (Fentanyl preferred over Morphine). Pain assessment tools. Comparator: Prior unstructured practice.	Feasibility of protocol implementation; pain reduction.	Established fentanyl as a preferred opioid due to its safety profile. Provided a framework for standardizing trauma analgesia.	Focused solely on trauma, limiting generalizability to medical pain.
Brown et al., 2014 (USA)	Design: Prospective implementation study. Objective: To implement and evaluate a statewide evidence-based pain protocol.	Intervention: Standardized pain management protocol. Comparator: Pre-implementation practice.	Rate of analgesia administration; reduction in pain scores; protocol adherence.	Significant increase in analgesia administration (from 30% to 65%) post-implementation. Median pain score reduction improved.	Unblinded study design; potential for Hawthorne effect; lack of a control group.
Yousefifard et al., 2019 (Iran)	Design: Systematic review. Objective: To review and synthesize proposed prehospital pain management guidelines.	Intervention: Analysis of existing guidelines. Comparator: Variations between different guidelines.	Consistency of recommendations across guidelines.	Found consensus on opioid use but significant variability in recommendations for other analgesics like ketamine.	Included guidelines of varying methodological quality; limited to published proposals.
Martin-Gill et al., 2023 (USA)	Design: Systematic review of guidelines. Objective: To systematically review evidence-based guidelines for prehospital care.	Intervention: Analysis of guideline recommendations related to pain. Comparator: Not applicable.	Strength and consistency of recommendations.	Supported strong recommendations for pain assessment and opioid use for severe acute pain.	Focus on guideline-level evidence, not primary patient outcomes.

Abebe et al., 2021 (Norway)	Design: Systematic review. Objective: To review the effectiveness and safety of pediatric prehospital pain management.	Intervention: Pharmacological interventions (e.g., intranasal Fentanyl, Ketamine). Comparator: Placebo or other agents.	Pain score reduction; incidence of adverse events.	Intranasal fentanyl and ketamine are safe and effective for children. Identified frequent undertreatment in pediatric populations.	High heterogeneity among included studies; limited number of high-quality RCTs.
Scholten et al., 2015 (Netherlands)	Design: Before-and-after study. Objective: To compare pain management practice against a new guideline.	Intervention: Implementation of a new pain management guideline for trauma. Comparator: Usual care before guideline implementation.	Analgesia administration rate; time to analgesia; pain scores.	Guideline implementation significantly increased analgesia administration (OR=2.5) and reduced time to treatment.	Single-center study; unblinded design.
Friesgaard et al., 2022 (Multinational)	Design: Systematic review. Objective: To review the evidence for opioids in prehospital acute pain.	Intervention: Opioid analgesics (Morphine, Fentanyl, others). Comparator: Placebo or non-opioid analgesics.	Pain relief; incidence of adverse effects (nausea, vomiting, respiratory depression).	Opioids are effective for pain reduction but show a high risk of adverse effects like nausea and vomiting.	High heterogeneity in dosing and outcome reporting among studies.
Li et al., 2024 (USA)	Design: Review of protocols. Objective: To analyze variability in prehospital pain management protocols across the U.S.	Intervention: Analysis of existing EMS protocols. Comparator: Variations between protocols from different regions.	Availability of medications; dosing ranges; protocol restrictions.	Found extensive variability in medication options (e.g., ketamine availability ranged from 20-80% of services) and dosing.	Relied on publicly available protocols; may not reflect actual clinical practice.
Adelgaiss et al., 2019 (USA)	Design: Qualitative study. Objective: To identify barriers and enablers to statewide guideline implementation.	Intervention: Implementation of a prehospital evidence-based guideline. Comparator: N/A	Thematic analysis of interviews with stakeholders.	Key barriers: cost, regulatory challenges, resistance to change. Key enablers: strong leadership, stakeholder engagement, dedicated funding.	Qualitative nature limits generalizability; findings may be specific to the studied states.
Fishe et al., 2018 (USA)	Design: Systematic review. Objective: To review the literature on implementing prehospital guidelines.	Intervention: Various implementation strategies for guidelines. Comparator: N/A	Identification of barriers and facilitators to implementation.	Common barriers: provider knowledge, protocol inflexibility. Common enablers: education, protocol integration into workflow, continuous feedback.	Focused on implementation processes rather than clinical efficacy outcomes.

Samuel et al., 2015 (Israel)	Design: Systematic review. Objective: To review evidence on prehospital pain management for injured children.	Intervention: Pharmacological and non-pharmacological methods. Comparator: N/A	Rates of analgesia use; pain assessment; reported barriers.	Pain in injured children is frequently undertreated. Highlighted a need for protocolized approaches and specific training.	Limited by the small number and quality of primary studies on the topic.
Pak et al., 2015 (Australia)	Design: Literature review. Objective: To review non-pharmacological interventions for pain in paramedicine.	Intervention: Non-pharmacological methods (distraction, splinting, TENS). Comparator: N/A	Reported efficacy and feasibility.	Non-pharmacological interventions are valuable, under-utilized adjuncts. Distraction and proper splinting are most supported.	Not a systematic review; evidence base for many modalities is limited in the prehospital context.
Ebben et al., 2013 (Netherlands)	Design: Systematic review. Objective: To review adherence to guidelines in prehospital and emergency care.	Intervention: Analysis of guideline adherence. Comparator: N/A	Rates of adherence to guidelines and protocols.	Found generally low adherence to prehospital guidelines. Adherence influenced by guideline design, provider factors, and organizational culture.	High heterogeneity in the methods of measuring adherence across included studies.
Hennes et al., 2005 (USA)	Design: Cross-sectional survey. Objective: To compare paramedic perceptions and practices in pain management.	Intervention: Survey on knowledge and practice. Comparator: Self-reported practice vs. perceived ideal practice.	Discrepancies between knowledge and practice; cited barriers.	Significant gap between knowledge and practice. Top barriers: fear of side effects, concern over masking symptoms.	Self-reported data is subject to bias; older study may not reflect current practices.
Dijkstra et al., 2014 (Netherlands)	Design: Review. Objective: To review pharmacological pain management in Dutch prehospital trauma care.	Intervention: Analysis of medication use (Morphine, Fentanyl, Ketamine). Comparator: N/A	Patterns of analgesic use; reported efficacy and safety.	Morphine was the cornerstone, but use of other opioids and ketamine was emerging. Highlighted the need for more standardized protocols.	Narrative review, not systematic; may not have captured all relevant evidence.
Lourens et al., 2019 (South Africa)	Design: Scoping review. Objective: To map evidence on acute pain management in the African prehospital setting.	Intervention: Analysis of current practices and challenges. Comparator: N/A	Identification of themes related to practice, barriers, and resources.	Major challenges: resource scarcity, lack of formal protocols, limited medications. Calls for context-specific, resource-appropriate guidelines.	Limited primary research from the African context, reflecting a evidence gap.

Almajnuni et al., 2025 (Saudi Arabia)	Design: Literature review. Objective: To review the role of paramedics and current practices in prehospital pain management.	Intervention: Review of current trends and paramedic roles. Comparator: N/A	Synthesis of practices and recommendations.	Discusses the evolving role of the paramedic and the shift towards multimodal analgesia. Emphasizes safety and protocol adherence.	Not a systematic review; potential for selection bias in cited literature.
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3.2. Synthesis of Evidence by Intervention Type

3.2.1. Pharmacological Protocols

Opioid Analgesics:

Evidence confirms that opioids, particularly fentanyl and morphine, remain foundational in prehospital protocols for moderate to severe pain. Fentanyl is increasingly favored over morphine due to its rapid onset of action (approximately 2-5 minutes), shorter duration, and more stable hemodynamic profile, making it suitable for the dynamic prehospital environment (Lindbeck et al., 2023; Gausche-Hill et al., 2014). A systematic review by Friesgaard et al. (2022) affirmed the efficacy of opioids in significantly reducing pain scores, though it highlighted concerns regarding variable dosing and the risk of adverse effects like respiratory depression and hypotension, underscoring the need for careful titration and monitoring.

Non-Opioid Analgesics:

The review identified strong and growing support for non-opioid agents, with low-dose ketamine (LDK) emerging as a primary option. Multiple guidelines recommend ketamine as a safe and effective analgesic for both adult and pediatric populations, especially in cases of traumatic pain or where opioid use is contraindicated (Lindbeck et al., 2023; Abebe et al., 2021). Its favorable safety profile, with a lower incidence of respiratory depression compared to opioids, is a significant advantage. Other non-opioids, such as nitrous oxide and NSAIDs (e.g., intranasal ketorolac), are also recommended, particularly for mild to moderate pain or as part of a multimodal approach, though their availability in prehospital protocols varies widely (Yousefifard et al., 2019; Li et al., 2024).

Combination and Adjunctive Therapies:

Multimodal analgesia is a central theme in recent evidence-based guidelines. Combining medications with different mechanisms of action, such as fentanyl with low-dose ketamine or an NSAID, has been shown to provide superior pain relief while allowing for lower doses of each individual drug, thereby reducing the risk of side effects (Lindbeck et al., 2023; Almajnuni et al., 2025). This approach is advocated to optimize the risk-benefit ratio of prehospital analgesia.

3.2.2. Non-Pharmacological Interventions

While pharmacological interventions are prominent, non-pharmacological methods are recognized as essential components of a comprehensive pain management strategy. Physical methods such as proper splinting, immobilization of fractures, and positioning are consistently highlighted as first-line interventions that can significantly reduce pain (Pak et al., 2015; Ahn et al., 2011). Psychological techniques, including distraction and reassurance, are particularly valuable in pediatric care (Samuel et al., 2015). However, the evidence for other modalities like Transcutaneous Electrical Nerve Stimulation (TENS) in the prehospital setting remains limited, and their implementation is not yet widespread in formal protocols (Pak et al., 2015).

3.3. Special Populations and Considerations

Pediatric Pain Management:

The undertreatment of pain in children remains a significant concern. Evidence-based guidelines stress the importance of using age-appropriate pain assessment tools and emphasize that pharmacological choices for children are similar to those for adults, with meticulous weight-based dosing (Abebe et al., 2021; Samuel et al., 2015). Intranasal fentanyl and ketamine are highlighted as excellent options due to their efficacy and ease of administration in pediatric patients.

Geriatric Pain Management:

Older adults present unique challenges due to altered pharmacokinetics, polypharmacy, and a higher prevalence of comorbidities. Guidelines recommend cautious dosing of analgesics, particularly opioids, starting at the lower end of the dosing range and titrating slowly to avoid adverse events (Lindbeck et al., 2023).

Management in Patients with Substance Use Disorder:

Managing acute pain in patients with opioid tolerance or substance use disorder is a complex area. Evidence suggests that these patients often receive inadequate analgesia due to provider bias or fear of exacerbating addiction. Recommendations include using standard pain assessment, not withholding opioids when indicated, and considering adjunctive agents like ketamine to provide effective relief while mitigating the risk of misuse (Lindbeck et al., 2023).

3.4. Barriers to Effective Prehospital Pain Management

Provider-level Barriers:

Persistent barriers include knowledge gaps, misconceptions about pain assessment, and fear of adverse drug events, particularly respiratory depression from opioids (Hennes et al., 2005; Adelgaiss et al., 2019). A recurring theme is the "oligoanalgesia mindset," where providers underestimate pain or overestimate the risks of treatment.

System-level Barriers:

Significant variability and restrictions in prehospital protocols themselves act as a major barrier (Li et al., 2024). Other system-level challenges include the limited availability of certain medications (e.g., ketamine), logistical issues, and a lack of integrated quality improvement programs to audit and provide feedback on pain management practices (Fishe et al., 2018; Adelgaiss et al., 2019). The implementation of new guidelines is often hindered by a lack of resources for training and protocol dissemination (Brown et al., 2014).

4. DISCUSSION:

4.1. Interpretation of Key Findings

The review highlights significant advancements in prehospital pain management, particularly concerning the comparative efficacy and safety of various pharmacological agents. Opioids, especially fentanyl, remain foundational due to their rapid action and effectiveness in managing moderate to severe pain (Lindbeck et al., 2023; Gausche-Hill et al., 2014). However, concerns regarding opioid-related adverse effects, such as respiratory depression and hypotension, have underscored the need for careful titration and monitoring (Friesgaard et al., 2022).

The emerging role of ketamine is particularly noteworthy. As a non-opioid analgesic, low-dose ketamine has demonstrated efficacy in pain management, especially in trauma cases, and has a favorable safety profile that minimizes the risk of respiratory depression (Abebe et al., 2021; Lindbeck et al., 2023). The review supports the growing trend towards multimodal analgesia, which combines different classes of medications to enhance pain relief while reducing individual drug dosages (Almajnuni et al., 2025). This approach not only optimizes therapeutic outcomes but also aligns with contemporary recommendations for a patient-centered care model.

Moreover, non-pharmacological interventions, such as proper splinting and psychological techniques like distraction, are recognized as valuable adjuncts in managing pain (Pak et al., 2015; Samuel et al., 2015). Their incorporation into prehospital protocols can provide comprehensive pain management that

addresses both physiological and psychological dimensions of pain.

4.2. The Evolution of Pain Management Protocols

The shift from traditional opioid-centric models to multimodal, patient-tailored approaches marks a significant evolution in pain management protocols. Historically, prehospital pain management has relied heavily on opioids, leading to variable practices and frequent under-treatment of pain (Lecky et al., 2020). Current evidence emphasizes the importance of protocolized care, which standardizes treatment and reduces practice variability. Such standardized protocols have been shown to improve pain reduction and enhance patient outcomes (Brown et al., 2014). Studies indicate that implementing these protocols can lead to higher rates of analgesia administration and improved pain scores, as seen in the work of Brown et al. (2014) and Lindbeck et al. (2023).

4.3. Clinical Implications and Recommendations for Protocol Development

To develop effective evidence-based pain management protocols, several key components should be prioritized. First, the protocols must include a range of pharmacological options, emphasizing both opioids and non-opioid agents like ketamine and NSAIDs, complemented by non-pharmacological methods. Training for paramedics on the appropriate use of these agents, pain assessment techniques, and the psychological aspects of pain management is crucial (Adelgaiss et al., 2019; Hennes et al., 2005). Continuous quality improvement initiatives should also be integrated to monitor adherence to protocols and outcomes, fostering an environment of ongoing education and refinement.

4.4. Limitations of the Reviewed Evidence

Despite the valuable insights gained from this review, several methodological limitations persist in the existing literature. Common issues include a lack of blinding, small sample sizes, and variability in study designs, which hinder the reliability of findings (Friesgaard et al., 2022). Additionally, the generalizability of results is often limited, as many studies focus on specific populations or settings, potentially not reflecting broader practice environments. For instance, studies conducted in urban EMS settings may not translate effectively to rural contexts where resources and protocols differ (Li et al., 2024).

4.5. Directions for Future Research

Future research should prioritize high-quality randomized controlled trials (RCTs) that compare specific protocolized interventions to determine their relative effectiveness in various prehospital settings. Moreover, further investigation into non-pharmacological methods, such as the use of distraction techniques or TENS, is warranted to establish their efficacy and integration into standard

practice. Long-term studies examining the impact of prehospital analgesia on the development of chronic pain are also essential, as they can inform protocols that not only alleviate immediate pain but also improve long-term patient outcomes. By addressing these gaps, future research can contribute to the continuous evolution of evidence-based practices in prehospital pain management.

5. CONCLUSION:

This literature review comprehensively examined the role of evidence-based protocols in enhancing prehospital pain management. The findings underscore the critical importance of addressing acute pain effectively, given its prevalence in emergency medical settings and its potential to lead to significant physiological and psychological consequences if left unmanaged (Albrecht et al., 2021; Johansson et al., 2022).

The review highlights a notable shift from traditional opioid-centric approaches to multimodal, patient-tailored strategies that incorporate both pharmacological and non-pharmacological interventions. Opioids, particularly fentanyl, continue to play a key role in managing severe pain, but the emerging evidence supporting the use of low-dose ketamine and other non-opioid agents offers promising alternatives that may mitigate the risks associated with opioid use (Lindbeck et al., 2023; Abebe et al., 2021). Furthermore, non-pharmacological methods, such as splinting and psychological support, are vital adjuncts that enhance the overall pain management strategy (Pak et al., 2015; Samuel et al., 2015).

Despite the progress made, several challenges remain, including variability in practice, knowledge gaps among providers, and the need for robust training and ongoing quality improvement initiatives (Adelgais et al., 2019; Hennes et al., 2005). The existing literature reveals methodological limitations that must be addressed in future research to ensure the generalizability and applicability of findings across diverse prehospital settings (Friesgaard et al., 2022; Li et al., 2024).

In conclusion, advancing prehospital pain management requires a commitment to developing and implementing standardized, evidence-based protocols that prioritize patient safety and comfort. Future research should focus on high-quality trials to evaluate the effectiveness of specific interventions and explore the long-term impacts of prehospital analgesia on patient outcomes. By addressing these issues, the field can move towards more effective, consistent, and compassionate pain management practices in the prehospital environment.

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