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Literature Review : EBP On Fracture Stabilization Intervention in the Emergency Room

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ABSTRACT

Fracture is one of the emergency cases that requires quick and appropriate treatment in the emergency department (IGD) to prevent permanent complications. One of the nonpharmacological interventions based on *Evidence-Based Practice (EBP)* in fracture stabilization is cold compress therapy to reduce acute pain. This study aimed to identify the effectiveness of cold compress interventions on reducing pain levels in closed fracture patients in the emergency room. The method used in this study is *a literature review* by examining relevant scientific articles, including research by Pondete et al. (2025). The results showed that cold compresses can significantly lower pain intensity in fracture patients through vasoconstriction mechanisms, decreased tissue metabolism, and inhibition of pain impulse transmission. The method used in this study is literature review. The literature in 5 related articles is taken from the database, namely *Google Scholar*. Articles are selected based on the inclusion and exclusion criteria that have been set. Based on the search results, 5 articles were determined with the quantitative *design* method of Quasy Experiment with publications in the last 3 years (2022-2025) regarding articles related to fracture stabilization interventions in the emergency room. In conclusion, cold compress therapy has been shown to be effective as part of fracture stabilization interventions in the emergency room and is recommended as an evidence-based nursing measure for acute pain management.

Keyword: Fractures, Cold Compresses, Acute Pain, Evidence-Based Practice, Emergency Room

INTRODUCTION

Fractures or fractures are disturbances in bone continuity due to trauma, accidents, or severe stress. In the emergency room, fracture patients require initial stabilization to prevent bleeding, severe pain, as well as soft tissue complications (LeMone et al., 2016). Based on WHO data (2018), more than 1.35 million deaths per year are caused by traffic accidents that have the potential to cause limb fractures.

Fracture is a condition in which bone continuity is cut off due to physical trauma or strong stress. Fracture cases are one of the most common occurrences in emergency departments and can cause impaired body function, disability, and even death if not properly stabilized (WHO, 2022). According to the Indonesian Ministry of Health (2018), the prevalence of fractures in Indonesia reaches 5.8% with the main cause of traffic accidents and falls from heights.

The main principles of fracture stabilization include immobilization, pain control, and complication prevention. Nurses have an important role in reducing patient pain through pharmacological and non-pharmacological interventions. One of the nonpharmacological measures that has been shown to be effective is Cold compress therapy, which works by lowering the temperature of tissues, causing vasoconstriction, and reducing nociceptive nerve impulses to the brain (Potter & Perry, 2010).

Approach Evidence-Based Practice *(EBP)* ensure that interventions provided in the emergency room are based on the results of the latest research that has been proven to be effective and safe. Therefore, it is important to conduct a literature review regarding the application of cold compress therapy as part of fracture stabilization interventions in the emergency room.

The initial management of fracture patients in the emergency room aims to reduce pain, prevent bleeding, and maintain the stability of the injured area. The main principles of fracture stabilization in the emergency room include immobilization, pain control, and prevention of soft tissue complications (Helmi, 2021). Nonpharmacological interventions such as Cold compress therapy is part of the *Evidence-Based Nursing Practice (EBP)* which has been shown to help reduce pain intensity without pharmacological side effects (Anggrita et al., 2022).

Cold compresses work by lowering the temperature of the tissues, causing local vasoconstriction, slowing down nerve conduction, and reducing the inflammatory response so that pain is reduced (Nguyen et al., 2023). This therapy also speeds up the stabilization process by reducing swelling and microbleeding around fractured bones (Harris et al., 2023).

Based on the results of a study by Pondete et al. (2025), the administration of cold compresses significantly reduced the level of pain in patients with closed fractures of the extremities in the emergency room of Bhayangkara Kindergarten Hospital. III Manado. This reinforces the scientific evidence that cold compresses are effective and feasible to implement in emergency nursing protocols.

In emergency nursing practice, Fracture stabilization Includes pain control, shock prevention, and immobilization of the injury area. Based on *Evidence-Based Practice (EBP)*, nonpharmacological therapies such as Cold Compress and psychological interventions such as Levine's model approach can help reduce the pain and anxiety of fracture patients before further medical treatment is performed (Potter & Perry, 2010).

METHOD

Data Source

Method This research method uses a literature review *approach. Articles were obtained from the Google Scholar database with the keywords:* "fracture", "cold compress", "pain management", "emergency department", *and* "evidence-based nursing". *The selection of articles is based on specific inclusion criteria,* quasi-experimental research designs *or case studies. The* literature selection process

follows the framework *of The Preferred Reporting Items for Systematic Review and Meta-Analysis* (PRISMA) to ensure transparency and systematization in the literature review and PICO method.

Search Strategy

Article searches are carried out through a database, namely *Google Scholar*, with an electronic-based search carried out on November 6, 2025. The keywords used were Fracture, Cold Compress, Acute Pain, Evidence-Based Practice, Emergency Room.

Article selection is carried out by screening publications in the last 3 years (2022–2025) to ensure relevance to the latest scientific evidence. To ensure a systematic search, the search strategy is formulated using the PICO (*Population, Intervention, Comparison, Outcome)* format.

Table 1 Research Questions *(*PICO *Framework)*

Components	Description
P (population)	Fracture patient in the emergency room
I (intervention)	Cold compress therapy and Levine-model interventions
C (comparison)	No compresses or standard therapy
O (outcome)	Decreased pain levels and early stabilization of the patient's fracture and anxiety

Selection Criteria

A study can be included if it meets the following inclusion criteria: (a) has a quasi-experimental design; (b) engage the patient and (c) be available in full-text article form. The exclusion criteria include: (a) articles that do not contain all the main components, such as abstracts, introductions, methods, results, discussions, implications, and bibliographies, or articles that are considered to be of poor quality; (b) articles that are literature review (review); and (c) articles with content that is not relevant to the research topic.

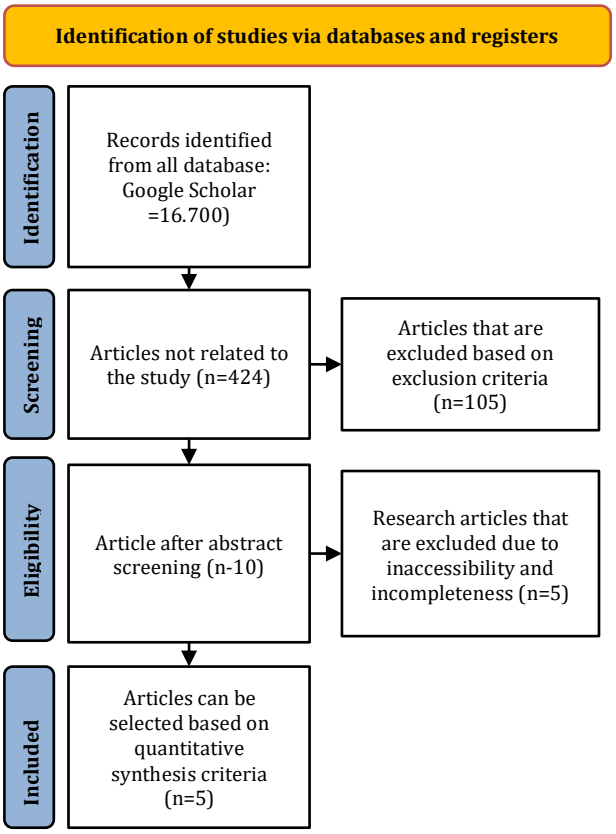

Figure 1 PRISMA Flow Diagram

Search Results

The search results were obtained from five articles with descriptive quantitative methods and quasi-experimental design or case studies. Data extraction was carried out by analyzing information based on the author's name, title, purpose, research method, and research results. The results of such data extraction are presented in the following table.

RESULT

Table 2. Data Extraction Results

No	Researcher	Types of Interventions	Subject	Duration	Results
1.	Marlyn Anggelina Pondete et al. (2025)	Cold compress therapy	Patients with closed fractures of the extremities	15 Minutes	Moderate reduction in pain before intervention (68.8%) to mild pain after intervention (56.3%)
2.	Chrisna Wahyu Ramadhan et al. (2025)	Application of Cold Compresses	Tibia fracture patients	3 Days	The pain scale was reduced from 6 to 1 after 3 days of intervention
3.	Wahyuni Sekadini et al. (2024)	Cold Compress	Postoperative femur fracture patients	3 days of treatment and duration of 15 minutes per action	Pain decreased from a scale of 8 (Severe) to 4 (Moderate) and 3 (Moderate)
4.	Anggrita Malorung et al. (2022)	Application of Cold Compresses/Ice Kirbats	Patient post op nasal fracture	3 Days	Pain drops from a scale of 6 (Moderate) to 2 (Mild)
5.	Friska Rizky Dewi Anggraini et al. (2022)	Cold Compress	Patient post op ORIF tibia fracture	3 Days, 2x a day	The pain scale dropped from 7 (the first day) to 1 (the third day).

DISCUSSION

Cold compress therapy has been shown to be effective as an Evidence-Based Practice (EBP)-based nonpharmacological intervention for the management of acute pain in fracture patients in the emergency room and postoperatively. The main principles of fracture stabilization include immobilization and pain control. Cold compresses work by triggering local vasoconstriction and a decrease in tissue temperature, which directly reduces swelling, microbleeding, and slows down tissue metabolism. In addition, cold compresses inhibit transmission

pain impulses to the brain, thereby reducing the intensity of pain felt by the patient. Results from a review of five articles (2022-2025) showed a consistent decrease in pain scales after cold compress administration, with the duration of the intervention varying between 15 minutes per action to 3 days of treatment. This evidence reinforces that cold compress therapy is recommended as a safe and effective evidence-based nursing measure as an important part of fracture stabilization protocols in the emergency room.

CONCLUSION

Based on the results of a review of five journals, it can be concluded that cold compress trapi has proven to be effective and significant in reducing the intensity of acute pain in fracture patients, both in closed fractures in the emergency room and in postoperative patients with fracture surgery. Cold compresses work through local

vasoconstriction mechanisms, a decrease in temperature and tissue metabolism, as well as an inhibition of the transmission of pain impulses to the brain, which contributes to pain reduction and early stabilization of fractures.

Evidence-Based Application (EBP) Cold compress therapy is recommended as an Evidence-Based Practice (EBP) nonpharmacological nursing measure for acute pain management and as an important part of fracture stabilization interventions in Emergency Departments (ERDs).

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