

## Conference Paper

# Comparison of Cold and Warm Compresses influence toward Pain in Patients with Extremity Fractures

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## Abstract

**Background:** Fracture is one of the causes of death in the world. Pain is a major symptoms reported by patients with fracture. A Non pharmacology management of pain includes stimulus and cutaneous massage, ice, and heat therapy (cold or hot compress), distraction, guided imagery, hypnosis, and relaxation techniques. **Objectives:** the purpose of this study was to determine the differences of pain sensation between cold and warm compresses intervention among patients with limb fractures at the Dradjat Prawiranegara Serang Banten hospital. **Methods:** A quasi experimental method was conducted with two group pretest and posttest design for each treatments. The study was conducted in dr. Dradjat Prawiranegara hospital Serang Banten. A total of 12 respondent has participated in this study. Pain intensity was measured using a numeric rating scale. The data analysis using univariate analysis and bivariate analysis. Bivariate analysis using T test (T-test) that is difference test of two independent mean. **Results:** The result shows that the average intensity of pain before cold compress was given was 7 and reduce 3.13 to 3.83 post intervention. While the average intensity of the pain before given an warm compress was 6 and 3.83 post intervention. ( $P = 0.000$ ). **Conclusions:** Judging from the magnitude of change in pain intensity was concluded that warm compress more effectively than cold compress to decrease pain in fracture patients.

**Keywords:** cold compress, pain fracture, warm compress

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## 1. Introduction

Fracture is a condition in which bone discontinuity occurs. The most causes of fractures are accidents, occupational illness or accident, traffic and so on. But fractures can also be done against other factors such as degenerative processes and pathology [1]. Traffic accidents are the number eight cause of death and are the leading cause of death in productive age population, those who are 15 to 29 year old population of the world and if not handled seriously by 2030 traffic accidents will increase to the fifth leading cause of death in the world [2].

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According to the data of [3], in Indonesia, the fracture that occurs caused by injuries such as falls, traffic accidents and trauma sharp or blunt. The major cause of fracture was fall accidents.

In Indonesia, the incidence of fractures or fracture incidence is quite high, based on data from the [1] obtained about eight million people experience fracture events with different types of fractures and different causes. From the result of survey of Health of the Republic of Indonesia found 25% sufferer of fracture experience death, 45% experience physical disfunction, 15% experience psychologic stress such as anxiety and depression, and 10% experience well recovery [1]. According to [2] mentioned that traffic accidents reached 120.2226 times or 72% in a year.

Pain is a form of discomfort, defined in multiple perspectives. Needs to be free from pain is one of the basic needs, which is the goal of nursing care to a patient. The role of a nurse is to help relieve pain by providing pain relief intervention using either pharmacological or non pharmacological approach [4].

there is two management to overcome the pain of pharmacology management and non pharmacological management. Pharmacological management is a collaborative management between physicians and nurses who emphasize drug delivery that eliminates pain sensation, whereas non pharmacological management is management for pain relief using pain management techniques including cutaneous stimuli and massage, ice, and heat therapy (cold or hot compress), transcutaneous electric nerve stimuli, distractions, guided imagery, hypnosis, and relaxation techniques.

[5] in his research entitled the effectiveness of cold compresses on the intensity of pain in closed fracture patients in dahlia room Arifin Achmad hospital with the results of research on 15 experimental respondents and 15 control respondents obtained that the average value of pain intensity before the cold compress was given in the experimental group was 7.00 and after being given cold compress decreased to 5.47. The mean pain intensity before in the control group was 7.27 and after a fixed rate of 7.27.

[6] examined the effect of cold compress on pain patients on closed limb fractures in Palembang hospital with 15 patients. From the results of the research, the average value of pain before the cold compress is 6.40 and the average pain scale after the cold compress is 3.53 so there is a difference between the pain before and after the application of cold compress on the closed extremity fracture patients. These results indicate the effect of cold compress on the patient on the fracture of closed extremities.

Based on [7] showed that before done warm compress half (50%) of respondents experience severe pain. After a warm compress was given half (50%) respondents had moderate pain. While before cold compress done most (71,4%) of respondents

experience severe pain. After the cold compress was given half (50%) respondents suffered moderate pain. There is a difference in the effectiveness of warm compress and cold compress on the decreasing intensity of labor pain during the active phase I.

General comments: consider to rewrite the introduction focus with your key variable and try to link to develop the hypothesis of this study!

## 2. Methods

### 2.1. Design and sample

A quasi experimental method with two group pretest posttest design approach was conducted from February to March 2018 in dr. Dradjat Prawiranegara Hospital, Serang Banten. The sampling technique used in this study was total sampling. as 12 respondents were recruited after fulfilling inclusion and exclusion criteria. The inclusion criteria in this study:

1. All patients of close extremity fracture that complain of pain with a minimal scale of mild pain
2. Aged patients  $\geq$  15 years old
3. Patients treated within 12-24 hours post trauma,
4. Patients are not in the influence of analgesic drugs
5. Willing to be a respondent by signing the approval sheet as respondent

While the criteria exclusion in this research:

1. The patient has an open fracture

### 2.2. Instrument

#### 2.2.1. Measurement

Demographic and patient characteristic

#### 2.2.2. Pain

Numeric rating scale was used to measure pain intensity before and after an intervention.

## 2.3. Data analysis

### 2.3.1. Analysis

Data analysis technique using univariate analysis and bivariate analysis. Univariate analysis is used to know the frequency distribution such as age and sex. Bivariate analysis using T test statistic test (T-test) that is difference test two independent mean

## 2.4. Sample Data collection procedure

This study gives patients the freedom to decide whether to participate in or reject research (autonomy). Respondents who agreed to participate as research subjects were given informed consent of preparing an agreement form signed by the respondent

## 3. Results

### 3.1. Demographic and Patient Characteristic

**The results of this study show that the majority of respondents were male (56%) with the average of age was ... years old.**

The results of this study can be seen that the average age of patients who experience a closed fracture in dr. Dradjat Prawiranegara hospital Serang is 38 years with the youngest age is 18 years old, and the oldest age is 65 years with a standard deviation of 19.89. As for the duration of experiencing pain from the first time experiencing fractures until the assessment of the average of 5 days with the longest pain is felt at the longest 14 days. The majority of respondents are male sex that is equal to 58% while the respondent female gender 42%. This is because men tend to be more active in the activity so that the possibility of fracture is greater in men than women

TABLE 1: Scale of Pain Before Being Given a Warm Compress on Patients with Extremity Close Fracture.

| No | Range of pain | F | %  |
|----|---------------|---|----|
| 1  | Mild          | 0 | 0  |
| 2  | Medium        | 2 | 33 |
| 3  | Severe        | 4 | 67 |

Based on table 1 shows that prior to the warm compress intervention 33% of respondents experienced moderate pain and 67% experienced severe pain.

TABLE 2: Scale of Pain After Being Given a Warm Compress on Patients with Extremity Close Fracture.

| No | Range of pain | F | %  |
|----|---------------|---|----|
| 1  | Mild          | 4 | 67 |
| 2  | Medium        | 2 | 33 |
| 3  | Severe        | 0 | 0  |

Based on table 2 above shows that after being given warm compress all or 87% of respondents had mild pain and a small part or 13% had moderate pain

TABLE 3: Scale of Pain Before Being Given a Cold Compress on Patients With Extremity Close Fracture.

| No | Range of Pain | F | %  |
|----|---------------|---|----|
| 1  | Mild          | 0 | 0  |
| 2  | Moderate      | 4 | 67 |
| 3  | Severe        | 2 | 33 |

Based on Table 3 shows that before cold compress was given 67% of respondents experienced moderate pain and 33% of respondents had severe pain

TABLE 4: Scale of Pain After Being Given a Cold Compress on Patients With Extremity Close Fracture.

| No | Range of Pain | F | %  |
|----|---------------|---|----|
| 1  | Mild          | 0 | 0  |
| 2  | Moderate      | 5 | 83 |
| 3  | Severe        | 1 | 17 |

Table 4 shows that after being given a cold compress more than half or 83% of respondents had mild pain and 17% of the severe pain

TABLE 5: Differences in The Effectiveness of Warm Compress and Cold Compress on Patients with Extremity Close Fracture.

| No | Range of Pain | F | Mean | SD    | Beda SD |
|----|---------------|---|------|-------|---------|
| 1. | Cold compress | 6 |      |       |         |
|    | -Pre test     |   | 7.00 | 0.894 | 0.141   |
|    | -Post test    |   | 3.83 | 0.753 |         |
| 2. | Warm compress | 6 |      |       |         |
|    | -Pre test     |   | 6.00 | 0.894 | 0.578   |
|    | -Post test    |   | 5.17 | 1.472 |         |

Nilai sig (2-tailed) = 0,000

Based on table 5 shows the results of T-Independent test analysis to find out the difference of effectiveness of warm compress and cold compress obtained value P = 0.000 at significant level p = 0,005. So it can be concluded that H1 is accepted, meaning there is a difference of giving warm compresses with a cold compress to decrease

pain of patient fracture where warm compresses are more effective than giving cold compresses to reduce pain.

## 4. Discussion

Start with univariate findings that important to be discussed, then bivariate. Do NOT repeat the results of this study in discussion section, paraphrase the results of this study that you would like to discuss then compare with supporting literature.

The result of the research in Table 1 before being given warm compress, 33% of respondents had moderate pain, and 67% had severe pain. This is in line with the research of [8] on the effectiveness of warm compress in the lumbar area on decreased post-limb pain lower extremity fractures at Arifin Achmad Riau hospital showed that the average pain scale before being given warm compress intervention at 15 of respondents was 6.53 which means that moderate to severe pain.

after being given warm compress almost all of respondents had mild pain and some of respondent still experienced moderate pain. Research from [8] on the effectiveness of warm compresses in the lumbar area on post-surgical decrease in pain of lower extremity fractures shows that the average of pain scale before the warm compress intervention in 15 respondents was 2.24, which means that mild pain.

Based on Table 3 shows that before cold compress was given 67% of respondents had moderate pain and 33% of respondents had severe pain. Pain prior to cold compress on closed limb fracture patients at Dr Mohammad Hoesin Palembang hospital in 2012, the average pain obtained before the cold compress is 6.40. It is believed that 95% of average pain before cold compress is between 5.85 to 6.95 with moderate to severe pain [6]. Another study showed that the scale of pain before being given cold compress in fracture patients at Ungaran hospital showed that the number of respondents who experienced moderate pain on a scale of 4 to 6 were 21 respondents [9].

Table 4 shows that after a cold compress was given more than half or 83% of respondents had mild pain and a small or severe 17% of the pain. Pain after cold compress on closed limb fracture patients got average pain after cold compress was 3.53. It was concluded that 95% believed that the average pain before the cold compress was between 2.81 and 4.25, which means that mild to moderate pain [6]. Another study by [9] showed that frequency of pain scale after being given cold compress on fracture patient at Ungaran hospital showed that respondents who experienced mild pain (scale 1-3) were 19 (90,5%) and respondents which says no pain (scale of 0 as much as 2 or 9.5%).

Table 5 shows the result of T-Independent test analysis to know the difference of effectiveness of warm compress and cold compress got value  $P = 0.000$  at significant level  $p = 0,005$ . So it can be concluded that H1 is accepted, meaning there is a difference of giving warm compress with cold compress to decrease pain of patient fracture. Where warm compress are more effective than giving cold compress to reduce pain.

This is reinforced by [10] who say that the heat from the jar will move into the body causing dilation of blood vessels that can increase blood flow, and relieve pain by getting rid of inflammatory products, such as bradykinin, histamine, and prostaglandins that cause local pain. The heat will stimulate the nerve fibers that close the gate so that the transmission of pain impulses to the spinal cord and to the brain is inhibited and the pain is reduced. Warm compresses are also caused by a stimulus on the skin that can distract the patient so that the patient focuses on tactile stimuli and ignores the pain sensation, which can ultimately decrease the perception of pain [11].

Warm compress are one of the traditional treatments commonly used to relieve pain and pain [12]. Warm compress are also called thermotherapy which is the application of heat to the body to reduce the symptoms of acute and chronic pain, this therapy is also effective to reduce pain associated with muscle tension, sprain, and strain [13].

## 5. Conclusion

Warm compresses are more effective than giving cold compresses to reduce pain. Suggestions in this study is expected to continue the researcher can do research about the right pain management on fracture.

## Conflict of Interest

The authors have no conflict of interest to declare.

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