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Effectiveness of Warm Water Therapy on Back Pain in Pregnant Women

Rahmatul Ulya[1,2*], Santhna Letchmi Panduragan[2], Mekar Zenni Radhia[2], Idris Adewale Ahmed[2]

[1]Universitas Sumatera Barat, Indonesia
[2]School of Applied Sciences, Lincoln University College, Malaysia

***Corresponding Author's E-mail:** rahmatululya354@gmail.com

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Abstract
Introduction: Back pain during pregnancy is a pregnancy issue that has become a phenomenon worldwide today. Back pain during pregnancy is caused by hormonal, musculoskeletal, and stress changes. Back pain during pregnancy, if not addressed, will affect the quality of life and daily activities of pregnant women. Management of back pain during pregnancy can include pharmacological and non-pharmacological approaches. Non-pharmacological management of pain includes warm water therapy. Warm water therapy provides relaxation effects, vasodilation of blood vessels, elimination of unused metabolic waste, and reduction of muscle spasms. **Methods:** This study aims to identify the effectiveness of warm water therapy on back pain in pregnant women in the working area of Puskesmas Lubuk Alung. This research is a quantitative study with a non-equivalent quasi-experimental design using a one-group pre-test and post-test design. The sample of pregnant women experiencing back pain consisted of 17 individuals using a purposive sampling technique. The research instrument used in this study is the Visual Analog Scale. This research was conducted over a period of 2 months. **Results:** Statistical tests using the paired t-test on back pain before and after the intervention yielded a p-value = 0.000 (<0.05), indicating a significant effect of warm water therapy on back pain. The effectiveness value was assessed using the eta-squared test, where the eta value was 0.821 (>0.14). This result indicates a strong effectiveness of warm water therapy on back pain during pregnancy. **Conclusion:** The results of this study can be used as a reference for addressing back pain during pregnancy. It is hoped that there will be further research on other non-pharmacological techniques for back pain during pregnancy.

Keywords: Pregnancy; Back Pain; Warm Water Therapy.

Introduction

Pregnancy is a condition that is deeply remembered in a woman's life, and from the very first moment she becomes aware of her pregnancy, she will be filled with curiosity. She wants to ensure that the pregnancy goes smoothly, and safely and that the baby is born healthy (Kaneho *et al.*,

2022). Pregnancy is also a significant milestone in a couple's relationship because it encompasses the needs and hopes of both partners (Huynh *et al.*, 2022). The International Association for the Study of Pain (IASP) explains that pain, as an unpleasant subjective condition, encompasses both sensory and emotional experiences, actual or potential, indicating tissue damage. Back pain during pregnancy becomes an issue that disrupts the comfort of mothers during pregnancy (Raja *et al.*, 2020).

The National Health System (NHS) explains that most women will experience back pain during pregnancy as a symptom of discomfort. Back pain during pregnancy is caused by changes in anatomical structure, hormonal changes, and stress (Malik, 2020). Anatomical changes occur because the spine's role becomes heavier in balancing the body with the enlarging uterus and fetus. Another cause is the increase in the hormone relaxin, which makes the spinal ligaments unstable, leading to the compression of blood vessels and nerve fibers (Doan *et al.*, 2022). The back pain experienced will trigger stress and mood changes in pregnant women, leading to worsening back pain (Salari *et al.*, 2023). Back pain during pregnancy, if not properly managed, can lead to a decline in the quality of life for pregnant women (Syalfina *et al.*, 2022). Pregnant women who experience back pain will have difficulty performing activities such as standing up after sitting, getting out of bed, sitting for too long, standing for too long, putting on and taking off clothes, as well as lifting and moving objects around (Diez-Buil *et al.*, 2024). Management of back pain during pregnancy varies, including both pharmacological and non-pharmacological treatments (Rukmasari *et al.*, 2023).

The administration of analgesics such as paracetamol, NSAIDs, and ibuprofen is included in pharmacological pain management, while non-pharmacological management includes manual therapy such as massage and mobilization exercises, acupuncture, Transcutaneous Electrical Nerve Stimulation (TENS), relaxation, and warm or cold water therapy (Cashin *et al.*, 2023). Warm water therapy is part of non-pharmacological therapy that can reduce pain (Prianti & Syam, 2023). Warm water can increase blood circulation and bring oxygen to the painful area, as well as relax muscles, tendons, and ligaments (Protano *et al.*, 2023). A study in Rokan Hulu explained that warm water therapy can increase comfort and reduce back pain during childbirth (Ernamari *et al.*, 2023). Other benefits derived from warm water therapy include increasing blood flow to the treated area, enhancing nutrient flow to the treated area, eliminating unused metabolic waste, inducing muscle relaxation, reducing muscle spasms, and alleviating numbness (Wang *et al.*, 2023). Warm water therapy during pregnancy has so far been utilized to reduce pain during labor (Rocha, 2023). Warm water therapy given for 20 minutes can reduce the pain scale for pregnant women experiencing pain during labor (Didevar *et al.*, 2022). Warm water therapy was significantly effective in reducing pain intensity in the first stage of labor (standard mean difference, SMD = -1.31; 95% CI: -1.88 – -0.73; $p < .001$) (Didevar *et al.*, 2022). The administration of warm water therapy can also increase comfort and accelerate cervical dilation in preparation for childbirth (Santana *et al.*, 2022).

Methods

This research is a quasi-experimental quantitative study aimed at determining the effect of warm water therapy on back pain in pregnant women in the working area of Lubuk Alung Health Center. In this study, a sample size of 17 respondents was used. The assessment of back pain used a universal instrument employed in pain assessment, namely the Visual Analog Scale. (VAS).

Performing a warm water therapy intervention for 15 minutes. Assessing pain using the Visual Analog Scale.

Results

Bivariate Analysis was conducted to test the research hypothesis regarding the effectiveness of warm water therapy on back pain during pregnancy. The hypothesis testing was carried out by analyzing the difference in the mean pain scale before and after warm water intervention in pregnant women experiencing back pain. Hypothesis testing to assess the effectiveness of warm water therapy on back pain during pregnancy was first conducted using a paired t-test to see the effect of the intervention on the pain scale before and after the intervention with a significance level of 95% (alpha 0.05). After the paired t-test values were obtained, the effectiveness of warm water therapy was analyzed using the Eta-Squared Test, where an Eta value is said to have a strong relationship if Eta ≥ 0.14, a moderate relationship if Eta ≥ 0.06 – 0.13, and a weak relationship if Eta ≥ 0.01-0.05.

Table 1 explains the influence of warm water therapy on the level of pain in pregnant women experiencing back pain. Warm water therapy is concluded to have an effect as seen from the P-Value where warm water therapy for back pain in pregnant women has a P-Value <0.05. (0,000).

Table 1 Results of the Paired t-Test Data Analysis

Pain Scale	Mean	Difference	SD	P Value	T
Pre Test	5.06	2.71	1.088	0.000	8.832
Post Test	2.35		1.498		

Discussion

The results of the analysis of back pain scale data during pregnancy show a difference in the average between before and after the warm water therapy intervention. The statistical analysis results of warm water therapy indicate a significant effect of warm water therapy on the pain scale before and after the intervention. This significant effect is similar to research on warm water therapy given to pregnant women experiencing back pain entering the first stage of labor (Goswami *et al.*, 2022). A similar study was conducted to determine the effect of warm water therapy on reducing spinal pain in pregnant women at the Antang Health Center, Makassar City in 2022 (Prianti & Syam, 2023).

The analysis is consistent with previous research that showed heat treatment can be utilized as a non-pharmacological labor pain management strategy and effectively reduces the intensity of labor pains while also reducing the length of the first stage of labor (Goswami *et al.*, 2022). Another

study explained that during the early stage of labor, heat therapy with an infrared belt lessened the intensity of the discomfort (Dastjerd *et al.*, 2023).

The analysis results regarding the effectiveness of warm water therapy were proven by calculations using the Eta squared test. The Eta squared test results showed a very strong Eta value. This analysis indicates that warm water therapy has a very strong effectiveness in reducing pain scale. The conclusion drawn is that warm water therapy using warm water bottles can reduce the pain scale in the lower back of pregnant women—not only limited to those entering the first stage of labor, but also for pain caused by osteoarthritis, gout arthritis, or dysmenorrhea (Goswami *et al.*, 2022).

The effectiveness of warm water therapy occurs because warm water therapy inhibits pain by vasodilating the surrounding blood vessels being treated, increasing the flow of nutrients, and facilitating the disposal of metabolic waste in the treated area (Amin *et al.*, 2022). Warm water therapy using warm bottles has several advantages. First, warm water therapy using warm bottles acts as a heat conductor, which can relax muscles and reduce pain. Second, the effect of hydrokinesis allows water to reduce the influence of gravity and the discomfort caused by pressure on the spine, which becomes heavier due to the enlarging uterus (Didevar *et al.*, 2022).

Conclusion

The intervention of warm water therapy is very effective for pregnant women experiencing back pain. This result is concluded from the obtained Eta value of 0.821 ($\geq$ 0.14).

Author Disclosure

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