

Effects of Non-Pharmacological Methods on Reduction Labor Pain among Primiparous Women: A Review

Isabel Lawot¹, Dr. Pawan Kumar Sharma²

Ph.D. Scholar¹, Professor, HOD²

Sharda School of Nursing Science and Research, Sharda University

Abstract:

Introduction: Childbirth pain is among the most severe pains in humankind in terms of severity, and it is a common and unavoidable experience. It is a worldwide problem to make childbirth easier. Numerous non-pharmacological methods have been developed to manage labor pain, enhance delivery, and increase pregnant women's comfort.

Objectives: to examine the literature in order to assess the effectiveness of non-pharmacological methods in relieving labor pain.

Methods: A comprehensive review of published literature and journal articles from PubMed, Medline, EBSCO, Cochrane and Epistemonikos, and Google Scholar databases was done by following a specific search strategy for each database. Initial 200 titles were retrieved and after screening 10 articles were selected for a full test screening. Finally, 10 articles were selected based on the inclusion criteria. **Results:** Parturient mothers who utilized non-pharmacological methods for managing labor pain, such as birthing ball exercise, back massage, cold application to the sacral area, reflexology, and heat packs during the initial stage of labor, reported a reduction in the intensity of pain. The findings demonstrated a statistically significant distinction between the pain levels of the two groups. **Conclusion:** Based on the findings, it can be inferred that the studies have consistently demonstrated the safety and reliability of non-pharmacological methods in relieving labor pain.

Keywords:- Non-pharmacological, Reflexology, Heat Cold Massage Therapy.

I. INTRODUCTION

Each person has a unique birthing experience. Pain is a highly subjective experience (Crider, 2020). Childbirth pain is among the most severe pains in humankind in terms of severity, and it is a common and unavoidable experience (1).

It is a worldwide problem to make childbirth easier. Numerous methods have been developed to manage labor pain, enhance delivery, and increase pregnant women's comfort. Different medical interventions have had varying effects on pregnant women's pain (2). Non-pharmacological methods for managing labor pain gaining popularity, and involves helping women achieve some relaxation and minimizing pain sensation as much as possible, all without relying on medication(3).

Reflexology, a widely employed non-pharmacological approach to pain management, was found to effectively reduce pain intensity within 30,60 ,and 120 minutes following the application of foot reflexology (4). Another technique identified as ice application has been advocated as a viable, secure and non-intrusive supplementary method for alleviating pain during the first phase of childbirth (5). In Turkey, a study report focused on labor pain discovered that following sacral massage 6.7% of the participants reported experiencing labor pain that was milder than anticipated while 73.3% of the experimental group expressed that their labor pain was within the normal range(3). According to a different study, the majority of mothers encountered intense pain (48.4%) followed by moderate pain (44.4%) and small percentage experienced very severe pain (3.2%). However, after receiving back massage the majority of the women reported experiencing moderate pain (71%), while a smaller portion felt mild pain(16%) and a few had severe pain(13%)(6). Similarly, an investigation aimed at evaluating the impact of utilizing a birthing ball during labor demonstrates that among first-time pregnant mothers in the control group, 70% reported experiencing the most intense pain while 30% reported severe pain. In contrast in the experimental group, only 16.7% described their pain as the most intense, while 83.3% reported severe pain(7). Heat therapy is one of the proposed method for labor pain relief. Infrared is one of the methods of heat therapy (8).

II. AIM

The primary aim of the study is to examine the literature in order to assess the effectiveness of non-pharmacological method in relieving labor pain.

III. METHODS

Intensive scrutiny was carried out on articles obtained from electronic and other sources, focusing on the topic of interest. The purpose of this review was to identify studies that investigated the impact of non-pharmacological methods on reduction labor pain experimental and control groups in various healthcare settings. Electronic databases such as PubMed, Medline, EBSCO, Cochrane and Epistemonikos, and Google Scholar were meticulously examined as part of the review. The selected articles were sourced from relevant healthcare science journals. MESH search parameters were utilized to identify studies published between 2011 and 2023, with full access to article content, and meeting the inclusion and exclusion criteria. These studies specifically

demonstrated the effectiveness of non-pharmacological methods in alleviating labor pain.

IV. ANALYSIS AND DATA EXTRACTION

The literature search inclusion criteria focused on randomized control trial and quasi-experimental quantitative studies conducted in healthcare centers. Literature related to women receiving non-pharmacological methods such as back massage, cold therapy, heat therapy, reflexology and birthing balls during labor for pain relief was considered, provided that it was written in English. Studies examining the effects

of non-pharmacological methods on mothers with other medical conditions were deliberately excluded. Initially, the search yielded a total of 200 studies on the topic of reducing pain during labor through non-pharmacological methods. Among these, 123 studies were excluded due to unavailability of the full text, and an additional 113 research studies were eliminated based on the predetermined inclusion and exclusion criteria. Ultimately, 10 studies were included in the review, ensuring that each selected study's outcome measurement was related to the impact of non-pharmacological methods on labor pain (Figure 1)

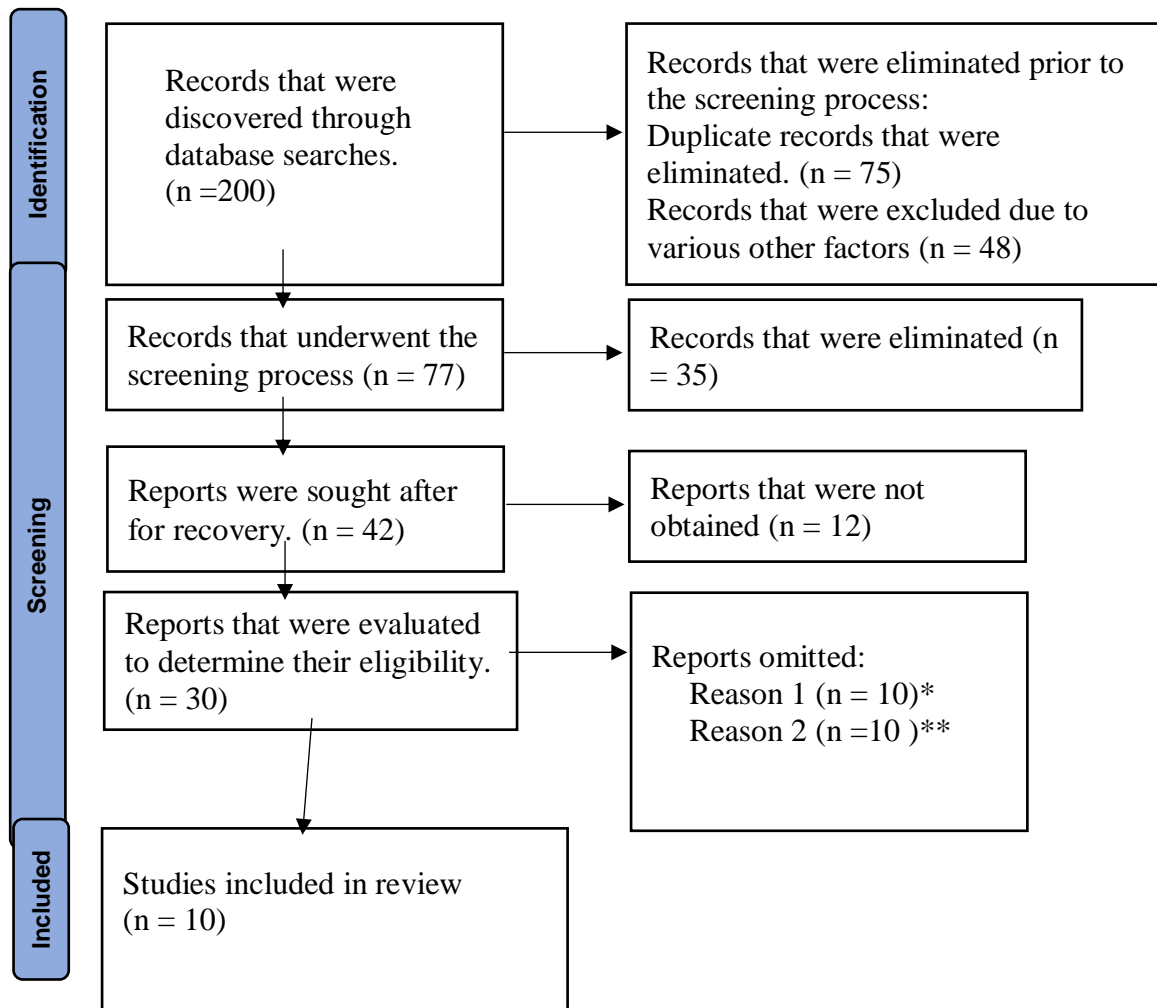


Fig. 1: Prisma Flow Chart

*=different tool

**= variation in method

V. QUALITY APPRAISAL CRITERIA

The researchers employed a standardized visual analog scale as a tool to evaluate labor pain. This instrument was utilized in both pre-test and post-test control group and case control studies. The use of this standardized instrument adds credibility to the study, as the findings were found to be valid and statistically significant (p<0.05). Furthermore, existing

literature supports the effectiveness of massage in reducing labor pain.

VI. RESULTS

Based on the inclusion criteria, 10 articles published were closely relevant were included in the present review. Details of the studies are given below; total 10 research studies which used 9 randomized control trial and 1Quasi experimental research design were included.

Table 1: Results

Si No And Author	Aim	Method	Sample Size Setting	Instrument	Sampling Technique	Data Analysis	Result
(7)	To evaluate how birthing ball exercises affect the pain and success of labor in primigravida parturients at a tertiary care institution	quasi-experimental design	60 primigravida with 30 each in the control and experiment groups Jodhpur India	visual analog scale (VAS)	Consecutive sampling.	Unpaired t-test	The VAS score in the control group was 9.4 ± 1.13 experiment group 8.36 ± 0.97 . Unpaired t-test using $p < 0.05$ was observed in the level of labor pain was concluded that first-time pregnant mothers who utilized the birthing ball during the initial phase of labor experienced a decrease in the intensity of labor pain..
(9)	to evaluate the impact of birthing ball use on labor pain, the frequency and length of contractions, and other aspects of labor	Randomized controlled trial	60 primiparous women 30 each in the control and experiment groups in Iran	Visual analog scale.	Simple Random	Chi-Square test	When compared to the control group pain level 8.50 ± 1.83 , 8.93 ± 1.31 and 9.29 ± 1.10 after 30, 60, and 90 minutes, the woman in the birthing ball group experienced significantly less pain 6.93 ± 1.61 , 6.97 ± 1.58 , 7.57 ± 1.69 ($P = .001$, $P < .001$ and $.001$). The control group's mean score for labor pain intensity was substantially higher than the birthing ball group's.
(3)	to evaluate the sacral massage on labor pain and anxiety	Randomized controlled experimental	60, primiparous women 30 each in the control and experiment group in Turkey	Visual analog scale.	Simple Random	Student's t test Chi-Square test	The labor pain levels at active and transition stages (7.03 ± 1.5 and 8.83 ± 1.78) of the massage group were found to be statistically significantly lower than those of the control group ($P < .05$) therefore sacral massage during labor decreased labor pain.
(10)	To assess the effects of massage and acupressure on pain level.	Randomized controlled trial	120 primiparous	Visual Analog Scale	Simple Random	t-test, Chi-Square test	The massage group had a VAS score of 7.23 ± 0.96 compared to a control group of 9.40 ± 0.77 during the active phase of labor. The experience of labor pain has reduced during all phases of labor.
(11)	To Assessing the impact of localized cold on the intensity of labor pain.	Randomized-controlled clinical trial	64 pregnant women Iran	Visual Analog scale,	Simple random	Chi-Square test,	The pain intensity was compared with the control group of cold therapy during 5-6 cm, 6.09 ± 1.55 and 7.93 ± 1.41 ($p = 0.0001$), 7-8cm 6.21 ± 1.47 and 8.84 ± 1.32 ($p = 0.0001$) and 9-10 cm 6.50 ± 1.64 and 9.25 ± 1.10 ($p = 0.0001$) of cervical dilatation
(12)	To evaluate the impact of applying cold to the sacral area during the active	Randomized controlled Trial	100 women Primiparous and multiparous	Visual Analog Scale	Simple Random	t-test, Chi-Square test	Cold application to the sacral area of pregnant women in the early stage of labor lowers labor pain and shortens labor time, as demonstrated by the

	phase of labor on pain						experimental group's statistically significantly low scores of pain on the 40 th (p=0.041), 100 th (p 0.001), and 160 th (p=0.014) minutes of labor.
(13)	To evaluate the impact of reflexology on the course of labor in primiparous women.	Randomized controlled trial (RCT)	60 Primiparous	Visual Analog Scale	Simple Random	Mann Whitney U test, Spearman's rank correlation coefficient	The reflexology practice reduces the pain of pregnant women in labor at 5-7, 8-10 cm dilatation 4.3 ± 0.7 , 9.1 ± 0.9 compare to 6.7 ± 1.1 , 9.8 ± 0.3 respectively
(14)	To find out if reflexology has any impact on level of labor pain.	Randomized controlled trial (RCT)	240 Iranian primiparous	Visual analog scale	Simple Random	T-test, and Mann-Whitney U-test.	The mean level of pain in the intervention group was lower than the control group in the 3-4, 5-7, and 8-10 cm dilatations. The Mann-Whitney U-test revealed a statistically significant difference between the two groups' pain levels at 5-7 and 8-10 cm dilatations (P=0.01)
(15)	Identify the effects of hot-pack applications on labor pain perceptions during the first stage of labor.	Randomized controlled trial (RCT)	120 women consented Turkey	Visual analog scale	Simple Random	t-test, Chi-Square test	hot-pack applications reduced pain experience in the active stage of labor 4.95 ± 1.63 compare to control group 8.20 ± 1.28 and transition phase 7.60 ± 1.63 compare to 9.75 ± 1.59 . The use of heat packs is a safe and reliable nursing intervention for the relief of labor pain.
(16)	To Analyze the effectiveness of hot patches for pain reduction during the active stage of first stage labor.	Randomized controlled trial (RCT)	58 Pregnant woman Thailand	Visual analog scale	Simple Random	Student t-test, Chi-Square test	The mean pain score of the hot patch group was significantly less than the control group at 1, 2, 3, 4, and 5 hours after intervention (4.4 ± 1.9 vs. 6.4 ± 1.8 , 5.6 ± 2.2 vs. 7.4 ± 1.3 , 5.4 ± 1.8 vs. 8.1 ± 0.8 , 5.7 ± 2.2 vs. 8.4 ± 0.7 , 8.0 ± 0.0 vs. 8.7 ± 0.5 , $p < 0.001$, respectively). During the early stage of labor, a heated patch placed on the lower back greatly decreased labor discomfort.

VII. SUMMARY OF THE MAJOR FINDINGS

The available literature refined to get 10 quantitative experimental research design were selected. Two research studies have found that first-time pregnant women who utilized a birthing ball during the initial phase of labor experienced a decrease in the severity of labor pain. In two additional studies where back massage was employed during labor, the group that received the massage exhibited statistically significant lower levels of pain compared to the control group. Likewise, two more studies conducted on pregnant women in the initial stage of labor showed that applying cold to the sacral area resulted in a reduction in labor pain and a shorter duration of labor. This was evidenced by the experimental group, which had significantly lower pain scores. Additionally, two additional studies examining the effects of reflexology practice on labor pain in pregnant

women found a notable reduction in pain levels. The results revealed a statistically significant difference between the pain levels of the two groups. Lastly, two more studies have indicated that the application of heat packs is a secure and dependable approach for alleviating labor pain.

VIII. CONCLUSION

Based on a comprehensive review of multiple studies, it can be inferred that various interventions have been examined, leading to a better understanding of how to implement more effective measures for reducing labor pain. All of the studies consistently conclude that non-pharmacological methods are effective in reducing pain during labor for first-time mothers, as supported by quantitative data from different countries. This review provides reliable evidence supporting the effectiveness of

non-pharmacological approaches in alleviating labor pain. Therefore, the utilization of birthing balls, massage therapy, cold application, reflexology, and heat packs can be recommended for all women experiencing labor pain.

IX. LIMITATIONS

Data search for true experimental design was limited.

Although the study design focused on RCTs, most researchers did not describe methods for assessing adverse reactions, leading to information gaps on adverse effects of the studied techniques.

X. RECOMMENDATIONS

To draw definitive conclusions regarding the clinical relevance of various non-pharmacological methods for other types of pain, it is crucial to conduct further studies that explore their capabilities and effectiveness. Additional research is required to replicate the beneficial outcomes of non-pharmacological approaches on a larger and more diverse sample.

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