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# Patient Perspectives on Post-Surgical Pain Management After C-section Using Non-Pharmacological Methods

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<p>The purpose of this study was to describe the non-pharmacological methods used by patients in managing post-surgical pain after a C-section. The aim of this study was to produce more knowledge on how to improve post-surgical pain management in patients after C-section.</p> <p>The method used in this study was descriptive literature review. Data for this study was collected through different academic databases, such as CINAHL and Medline along with a manual search. A total of 12 articles were analyzed using inductive content analysis, which were included in this study. Two inductive content analysis tables were created, each containing two main categories and several generic categories that answered the research questions. The research questions were “What are the non-pharmacological methods for managing post-surgical pain after a C-section applied by patients?” and “How beneficial are the non-pharmacological methods for managing post-surgical pain after a C-section applied by patients?”.</p> <p>The result showed two main themes: The first category focused on non-pharmacological methods for managing post-surgical pain after a C-section, which were derived from 7 generic categories and 29 sub-categories, and the second category focused the benefits of those non-pharmacological methods for managing post-surgical pain after a c-section, which were derived from 12 generic categories and 50 subcategories.</p> <p>Our findings concluded that non-pharmacological methods effectively managed post cesarean pain, reduced anxiety, and supported recovery, offering cost effective and accessible options that reduced medication reliance and improved patient satisfaction. Further research is needed on non-pharmacological methods, as limited studies were found on many of these approaches.</p>	
Keywords	pain, pain management, post-surgical phase, C-section, non-pharmacological methods

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## 1 Introduction

Post-surgical pain management is a crucial part of healthcare, especially for women recovering from cesarean section (C-section). The recovery period after a c-section brings many physical, emotional, and social changes, and pain is often a main concern after surgery. This pain can impact a woman's comfort, mobility and overall well-being which affects her ability to care for herself and her newborn, highlighting the need for effective post-surgical pain management. As cesarean rates continue to rise globally, with Turkey reporting a 52% rate in 2018, there is an increasing demand for effective pain relief strategies. These strategies are essential for restoring comfort and supporting the health of both mothers and their newborns. (Güney and Uçar 2021: 1-2.)

There is growing interest in non-pharmacological approaches for managing post-surgical pain in c-section patients. The study by Zimpel et al. (2020), highlighted that complementary and alternative medicine (CAM) therapies, such as massage, music therapy, and aromatherapy, are being explored for their potential to manage pain safely without the side effects associated with medications. (Zimpel et al. 2020: 1-3.)

Despite these potential benefits, there is still limited research on patient perspectives and satisfaction with non-pharmacological methods of post-surgical pain management following a c-section. The purpose of this thesis is to describe the non-pharmacological methods used by patients to manage post-surgical pain after a c-section. The study aims to produce new knowledge on how to improve post-surgical pain management in patients after a c-section. Ultimately, this research supports the use of safe and effective complementary therapies to foster improved patient outcomes and recovery. (Fadlalmola et al. 2023: 46; Zimpel et al. 2020: 3.)

## 2 Background

### 2.1 Pain

The International Association for the Study of Pain (IASP) defines pain as an unpleasant sensory and emotional experience related to actual or potential tissue damage (Mamuroh et al. 2024: 568; IASP 2017).

Pain, from a physiological perspective, begins when sensory receptors called nociceptors detect harmful stimuli, such as extreme temperatures, pressure, or tissue injury. These nociceptors, located throughout the skin, muscles, joints, and some internal organs, are specialized to respond to potentially damaging events. When activated, they convert the harmful stimulus into electrical signals (action potentials) and send these signals via peripheral nerves toward the spinal cord and brain. (Julius and Basbaum 2001: 203-205.)

Pain, especially abdominal and pelvic is common condition experienced by women in the postpartum period. In the case of cesarean sections (c-sections), pain primarily arises from surgical wound trauma, uterine contractions, breast swelling due to inadequate lactation. Post-surgical pain is a common stressor that can affect both the physical and psychological wellbeing of a mother. Managing this pain is crucial for the mother's recovery and her ability to care for her newborn. (Dutra et al. 2019: 73; Mamuroh et al. 2024: 568-569.)

### 2.2 Cesarean section (C-section)

A Cesarean section (c-section) is a surgical procedure for delivering a baby through cuts in the mother's abdomen and uterus wall (Fadlalmola et al. 2023: 44). Cesarean section is one of the delivery options for women who need to undergo labor due to medical reasons or non-medical factors, that may complicate a natural delivery (Mamuroh et al. 2024: 569). This surgery is commonly performed worldwide, and it has been

increasingly used, both in developed and developing countries (WHO 2015). In Indonesia, for example, the prevalence of c-section reached 17.6% in 2018, according to health data. Pain is a predominant complaint, leading to challenges in the immediate puerperium, including difficulties in mobility and self-care. Recovery from c-sections often involves addressing not only the physical pain from the incision but also the psychological aspects related to childbirth and surgery. (Mamuroh et al. 2024: 568-569; Dutra et al. 2019: 73.)

### 2.3 Pain assessment tools

For patients recovering from a cesarean section (c-section), effective pain assessment is crucial to ensure comfort and support healing. Williamson and Hoggart (2005), discuss three widely used pain assessment tools: the Visual Analogue Scale (VAS), Numerical Rating Scale (NRS), and Verbal Rating Scale (VRS). Each tool has specific advantages and challenges. (Williamson and Hoggart 2005: 799-800.)

1. Visual Analogue Scale (VAS): This scale consists of a 10 cm line with "no pain" at one end and "worst pain imaginable" at the other. Patients indicate their pain level by marking a point on the line, and the distance from "no pain" is then measured. Although it offers fine sensitivity, making it useful for detailed pain tracking, the VAS can be a bit challenging for older adults or those with cognitive difficulties, and the results can vary based on whether the scale is positioned horizontally or vertically. (Williamson and Hoggart 2005: 799.)

2. Numerical Rating Scale (NRS): The NRS asks patients to rate their pain on a scale from 0 to 10, where 0 means no pain and 10 represents the worst pain possible. It is simple and easy to use, whether patients express their ratings verbally or write them down. The NRS is popular because it effectively tracks changes in pain levels. However, its reliability can sometimes suffer if the wording of the scale is inconsistent. (Williamson and Hoggart 2005: 800.)

3. Verbal Rating Scale (VRS): The VRS uses words rather than numbers, like "mild," "moderate," and "severe," to describe pain levels. This scale is straightforward and

useful for quick assessments. However, it is less sensitive than VAS or NRS and can miss small changes in pain. (Williamson and Hoggart 2005: 800-802.)

## 2.4 Non-pharmacological methods

The pain that women feel after c-section needs to be treated immediately using easy and safe methods. These methods include both pharmacological and non-pharmacological methods. While pharmacological methods are very effective at controlling pain, these methods can cause side effects on the body. Complementary and alternative therapies can be considered as a safe way of reducing pain after c-section without adverse effect. (Mamuroh et al. 2024: 569; Zimpel et al. 2020: 3.)

As highlighted in a literature review by Mamuroh et al. (2024), non-pharmacological methods are often preferred to manage post-surgical pain, as they provide effective relief without the use of medication. Common non-pharmacological methods used in post-cesarean pain management includes acupuncture, lavender aromatherapy, benson relaxation techniques, massage therapy. These methods help reduce pain perception, promote comfort, and empower patients with a sense of control over their recovery process. (Mamuroh et al. 2024: 569.)

Lavender oil is usually used in aromatherapy so that the aroma of the essential oil from the flowers is inhaled. Lavender aromatherapy is found to be effective in managing post-surgical pain after inhaling lavender essence. Benson's relaxation technique, a simple, meditative practice focused on deep breathing and repetition of calming words or phrases, helps reduce stress and anxiety, which helps activate the body's relaxation response and reduce pain. Massage techniques for managing pain after a cesarean section include gentle hand and foot massages and deep tissue massage (DTM). Studies have shown that massaging the hands and feet for about 20 minutes, as well as performing DTM with the patient in a side-lying position, helps reduce pain intensity significantly. Acupuncture involves inserting tiny needles or applying pressure to specific points on the skin to relieve pain. Benson's relaxation technique involves sitting comfortably, closing the eyes, and focusing on calm breathing and relaxation for about 15

minutes. The technique is a guided way to let go of tension and helps reduce anxiety and physical discomfort. (Mamuroh et al. 2024: 573-574; Zimpel et al. 2020: 24.)

### **3 Purpose, aim and research questions**

Purpose:

The purpose of the study is to describe the non-pharmacological methods used by patients in managing post-surgical pain after a C-section.

Aim:

The aim of the study is to produce more knowledge on how to improve post-surgical pain management in patients after C-section.

Research questions:

1. What are the non-pharmacological methods for managing post-surgical pain after a C-section applied by patients?
2. How beneficial are the non-pharmacological methods for managing post-surgical pain after a C-section applied by patients?

## 4 Methodology and methods

### 4.1 Data collection method

The data collection method for this study will be a descriptive literature review. This approach involves using a descriptive review to systematically gather and analyze existing research. A descriptive review is a method used to collect, examine, and summarize research in a particular field. It is commonly used to provide an overview of current knowledge or to identify key themes and patterns within literature. Within the framework of health and social care, a descriptive review offers a broad view of the research available on a given topic, without performing detailed statistical analysis or critically evaluating each individual study. It aims to provide a clear and concise summary of the research landscape. (Aveyard 2019: 1-90.)

According to Aveyard (2019), a descriptive review serves several purposes, including identifying gaps in the literature, synthesizing current research findings, and highlighting emerging trends in a given field. Unlike systematic reviews, which aim to answer a specific research question using rigorous inclusion criteria, descriptive reviews allow for a broader exploration of topics and research designs, making them particularly useful in health and social care where interdisciplinary research is common. (Aveyard 2019: 1-90.)

### 4.2 Data search and selection

A PEO (Population, Exposure, Outcomes) tool was utilized to structure the study strategy, ensuring a clear definition of each component. In this descriptive literature review, nurses represent the population, with the exposure focused on post-surgical pain management through non-pharmacological methods following c-sections. The desired outcomes include improved pain relief with fewer side effects.

Table 1: PEO tool:

P	Population	Nurses
E	Exposure	Post-surgical pain management by non-pharmacological methods after C-section
O	Outcomes	Enhanced pain relief with fewer side effects.

To gather relevant information, academic databases like CINAHL and Medline were used. The aim was to find research articles and journals that directly addressed the topic of post-surgical pain management by non-pharmacological methods after C-section. Keywords such as "Nurses", "C-section", "pain management" were used to find suitable sources. Additionally, only articles published after 2014 and with full text available are included in our study.

The following search sentences will be used to conduct the data search. ("nurs\*" OR "registered nurs\*") AND (("caesarean" OR "caesarean delivery" OR "cesarean section")) AND (("pain management" OR "pain control" OR "pain reduct\*" OR "manag\*" OR "pain" OR "analges"). Boolean operators "AND" and "OR" were applied to retrieve the relevant research articles required for the review. Record results from the database search can be found in Appendix1.

The inclusion and exclusion criteria were designed to ensure relevant and accurate findings for the research questions. The search will focus on full-text articles written in English, peer-reviewed articles with accessible abstracts, published between 2014 and 2024.

Table 2: Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Studies focused on Registered nurses.	Studies that focus on doctors or other healthcare professionals not directly involved in routine postpartum care.
Studies conducted in hospitals during postpartum care.	Non-healthcare settings, non-clinical environments.
Primary studies	Reviews
Article published in English language.	Article published in other languages.
Research articles done in 2014 to 2024.	Research articles done before 2014.
Peer reviewed articles	Non- peer reviewed articles.

The PRISMA flow chart (Figure 1) illustrates how we selected articles from the databases. The main database used for the search was CINAHL, with an additional search in Medline, which provided the majority of the articles. The search results, shown in a Prisma chart, initially identified 832 articles for screening from CINAHL and Medline, and the manual search produced 6 additional records based on the inclusion criteria. A total of 765 articles were excluded due to ineligibility or not meeting the exclusion criteria, based on their titles. In the screening phase, 73 articles were selected for their relevance to the topic. Out of these, 7 duplicates were removed, and 66 articles were chosen based on title. Among which 14 articles were excluded based on abstract which resulted to 52 eligible articles. Finally, 38 articles were removed out of 52 which did not answer our research questions, there were review articles, and some were not accessible, so they were excluded, which resulted in 14 articles being selected for further review.

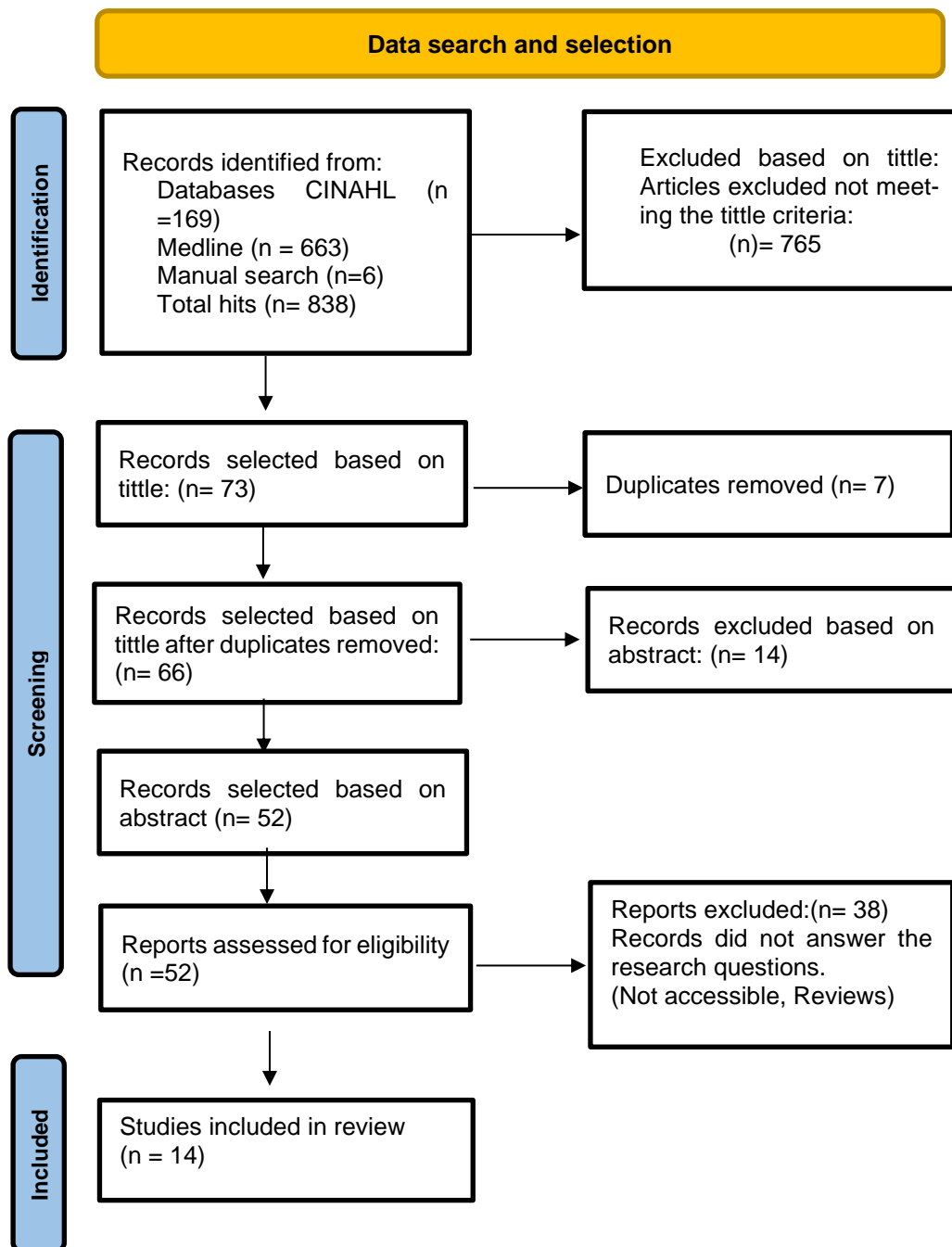


Figure 1: Prisma Flow Chart

### 4.3 Data analysis methods

#### Inductive content analysis

The data analysis for the current research study will utilize inductive content analysis. This method involves deriving data from various sources, such as articles and journals, and interpreting it in a clear and comprehensible manner. Inductive content analysis is a qualitative research method employed to analyze textual data by allowing themes and patterns to emerge originally from the data itself. This approach is particularly effective for investigating new or complex phenomena without relying on pre-existing theories or frameworks. Inductive content analysis is a useful method for gaining deeper understanding of complex and diverse subjects in social and health care research. The process of inductive content analysis typically involves several key phases: familiarization with the data, open coding, developing categories, and identifying themes. (Aveyard 2019: 1-90.)

Two separate inductive content analysis tables were created to organize data for each research question. Data was gathered from 12 out of 14 scientific articles that focused on non-pharmacological methods and their benefits in managing post-surgical pain after a c-section. We have also included a few medical articles in our study since they were relevant to our topic. Articles 5 and 6 were excluded during the analysis phase because, although they were relevant to our study topic and provided some information for the background section, they did not directly address our research questions. After carefully reviewing the selected articles, key pieces of information, called meaning units, were identified. Each meaning unit was labelled with a short phrase, or "code," that clearly describes the main idea of the data. These codes were placed in one of the columns in the analysis table. Codes with similar themes were grouped together into subcategories, which were then condensed into generic categories. Several generic categories were further grouped into main categories to answer the research questions.

Two main categories were created, one for each research question. The process of analyzing the data, including the meaning units, codes, subcategories, generic categories, and main categories, is shown in Illustrations 1, 2, and 3, with each step presented in its own column.

Meaning Unit	Codes
Acupressure was used as a complementary approach for symptom management.	Acupressure as complementary approach Symptom management
The effect of P6 and LI4 acupressure on post-caesarean pain was examined.	Effect of P6 and LI4 acupressure

Illustration 1. Sample of a meaning unit and its extracted codes

Coding	Sub-category	Generic category
Acupressure as complementary approach	Complementary therapy	Complementary therapies for pain relief
Symptom management	Symptom relief	
Effects of P6 and L14 acupressure	Acupressure effect	

Illustration 2. Codes summarized into sub-categories then into one generic category.

Sub-category	Generic category	Main category
Post caesarean pain reduction effectiveness	Effectiveness of pain management and health benefits	Benefits of non-pharmacological methods for managing post-surgical pain after a C- section
Medication use and side effect reduced		
Economic and health benefit		
Pain reduction with Su Jok and aromatherapy	Combination therapy effectiveness	
Effectiveness of combined therapy		
Pain and discomfort reduction with binder	Binder benefits for pain relief and comfort	
Enhanced functional support and advantage		
Comfort and support during physical activities		

Illustration 3. Sub-categories and generic categories into a main category.

Illustrations 1, 2, and 3 demonstrate the process of inductive content analysis, beginning with meaning units, followed by codes, sub-categories, and generic categories, leading to the final main category. Each of the two main categories aligns with one of the research questions.

## 5 Results

Twelve articles were carefully selected for this descriptive literature review (Appendix 2). These peer-reviewed studies were published in English between 2014 and 2024 and conducted across 12 countries: three from Turkey, two from the United States, two from Iran, and one each from Israel, Germany, Islamabad, Indonesia, and Egypt. All studies were obtained from the following databases: CINAHL (n=169), MEDLINE (n=663), and a manual search (n=6).

Data gathered in response to the research questions were analyzed and classified into two main categories using inductive content analysis. This process resulted in the formation of 19 generic categories, 79 sub-categories, and two main categories. The main categories were: (1) non-pharmacological methods for managing post-surgical pain after a c-section, derived from 7 generic categories and 29 sub-categories (Appendix 3),

and (2) the benefits of these non-pharmacological methods for managing post-surgical pain after a c-section, derived from 12 generic categories and 50 sub-categories (Appendix 4).

## 5.1 Pain assessment tools used in the studies

The tools that were used to collect data in these studies were different. To evaluate the level of pain patients experiencing various pain measurement scales were utilized. To assess the level of pain patients were experiencing, several pain measurement scales were used. The Visual Analogue Scale (VAS) was used in six studies. (Saatsaz et al. 2016: 93; Ghana et al. 2017: 272; Solehati and Rustina 2015: 2; Akgun and Boz 2020: 610; Degirmenci and Aksoy 2024: 2; Simsek and Alpar 2022: 3.)

Numeric Rating scale (NRS) was used in two studies by (Tussey et al. 2019: 312; Ain et al. 2018: 33). Johansson Pain -O- Meter Scale (JPOM) and Chamber Price Pain Rating Scale (CPPRS) were used by Basyouni et al. (2018: 4). JPOM was used to measure the intensity of sensory and affective components of pain, while CPPRS was used to measure the behavioral responses to pain (Basyouni et al. 2018: 4). Verbal Rating Scale (VRS) was used in one study by Hesse et al. (2016: 16).

To measure anxiety levels STAI (State and Trait Anxiety) score was used by Burgess et al. (2022: 87). Pedometers (Digital step counters) were used in one study by Herman et al. (2020: 2). To measure the comfort levels PCS (Post-partum comfort scales) was used by Degirmenci and Aksoy (2024: 2). Also, SDS (Symptom Distress Scale) was used by Ghana et al. (2017: 272) to assess distress and hemoglobin and hematocrit levels.

## 5.2 Non-pharmacological methods in managing pain after c-section

The analyzed data determined that non-pharmacological methods are effective in reducing pain after a C-section from patient perspectives. Within the 12 research articles the most used non-pharmacological methods are acupressure, su jok therapy and aromatherapy, use of abdominal binders, massage therapy, physiotherapy, acupuncture, lavender aromatherapy, benson relaxation techniques and reflexology. (Akgun and Boz 2020; Simsek and Alpar 2022; Tussey et al. 2019; Ghana et al. 2017; Saatsaz et al. 2016; Herman et al. 2020; Hesse et al. 2016; Burgess et al. 2022; Ain et al. 2018; Solehati and Rustina 2015; Basyouni et al. 2018; Degirmenci and Aksoy 2024.)

### 5.2.1 Complementary therapies for pain relief

The use of acupressure points P6 (point on wrist) and L14(point on hand) was explored for symptom management showing promise in reducing post-cesarean pain (Akgun and Boz 2020: 613-616). Lavender oil emerged as the most popular essential oil choice among patients (43.4%), and aromatherapy administered through inhalation provided rapid effects due to direct access to the brain via the nasal cavity. Lavender aromatherapy was particularly helpful in cesarean births, as it helped manage pain and anxiety, reducing the need for stronger medications like opioids. (Simsek and Alpar 2022: 3-7.) Su Jok was described as a technique to unblock and promote energy flow, effectively reducing pain scores when used alone or in combination with aromatherapy (Simsek and Alpar 2022: 3-7). Foot reflexology was identified as a beneficial non-pharmacological approach, with demonstrated effects in lowering post-cesarean pain levels (Basyouni et al. 2018: 17). Benson relaxation techniques combine relaxation with an individual belief system by focusing on repeating a calming word or phrases such as the names of God, in a slow and rhythmic manner while practicing deep breathing (Solehati and Rustina 2015: 2-4).

### 5.2.2 Binder effectiveness and health assessment

Abdominal binders are wide, stretchy compression bands that are wrapped around the patient's abdomen after surgery. Women using an abdominal binder post-cesarean reported significantly reduced pain during ambulation. Patients not using a binder were advised to use a splint (e.g. a small pillow) to support the abdomen during activities such as coughing or sneezing. (Tussey et al. 2019: 313-316.)

Abdominal binders were useful as they compress the abdomen, restricting the movement of the abdominal muscles, promoting blood flow, and decreasing inflammation at the incision site. A controlled trial on abdominal binders showed effectiveness in reducing pain, discomfort, and bleeding for women who had undergone non-emergency cesareans. (Ghana et al. 2017: 273-276.)

### 5.2.3 Manual therapy

Massage therapy demonstrated a significant reduction in post-cesarean pain intensity (Saatsaz et al. 2016:94-95). Hand and foot massages offered comfort benefits, with intervention group participants experiencing improved scores on the physical, psychospiritual, and sociocultural comfort scales compared to controls group (Degirmenci and Aksoy 2024: 2).

Massage therapy was considered a safe, cost-effective intervention with less side effects which is recommended option for reducing pain and anxiety (Saatsaz et al. 2016: 96-97).

### 5.2.4 Mobility enhancement and pain management

Encouraging patients to move around soon after surgery is known to improve recovery. Early ambulation post-surgery was well-accepted, leading to greater overall mobility and enhanced movement opportunities. Extending iv analgesics for a longer duration (48 hours instead of 24) supported this approach. (Herman et al. 2020: 4-8.)

The extended pain relief allowed patients to take more steps, reflecting improved mobility. Additionally, extended analgesia led to a reduction in the need for breakthrough pain medication. (Herman et al. 2020: 4-8).

#### 5.2.5 Patient engagement and positive patient experiences

Patients showed a positive response to acupuncture, with many patients stating their willingness to receive additional treatments for future pain management after cesarean deliveries (Hesse et al. 2016: 16-18).

High patient enjoyment was reported in the aromatherapy group, with 91.7% expressing satisfaction with the treatment experience (Burgess et.al 2022: 88).

#### 5.2.6 Physiotherapy for pain management and mobility enhancement

Physiotherapy techniques, including mobility exercises, breathing exercises, and posture management, were found to be effective in reducing post-cesarean pain and improving overall physical comfort (Ain et al. 2018: 33-35).

Breathing exercises were found to effectively enhance circulation and promote healing by inducing mild muscular activity in the abdominal area, thereby it facilitates relaxation. Additionally, physical therapy was considered a crucial intervention that should have been initiated early in the post-surgical period following a cesarean section to reduce pain and improve the mobility of patients. (Ain et al. 2018: 33-35.)

#### 5.2.7 Efficacy of combined treatment

Aromatherapy was used as a non-pharmacological method which involves the use of essential oils to promote and enhance physical and mental well-being. Studies showed that it helped relieve stress, fatigue, anxiety, heart rate, blood pressure, and both chronic and acute pain, including post-cesarean pain. Su Jok therapy was also used as another non-pharmacological method which involves applying treatment to the hands

and feet, targeting areas that correspond to different parts of the body. In Korean language, Su Jok meant "hand and feet", and this method helped stimulate specific points to support healing and pain relief. (Simsek and Alpar 2022: 2.)

The combination of Su Jok and aromatherapy was particularly effective in reducing mean pain scores in patients, highlighting the potential for enhanced results through combined complementary therapies (Simsek and Alpar 2022: 2-7).

### 5.3 Benefits of non-pharmacological methods in managing c-section pain

#### 5.3.1 Effectiveness of pain management and health benefits

Acupressure reduced post-cesarean pain significantly, both clinically and statistically, in comparison to control and placebo groups. Additionally, it reduced analgesic consumption, improving infant and maternal health by minimizing possible drug side effects and promoting cost-effectiveness. (Akgun and Boz 2020: 613-616.)

Massage significantly reduced post-cesarean pain and anxiety, improved sleep, and increased the frequency of breastfeeding (Saatsaz et al. 2016: 94-97).

Patients who received acupuncture reported lower pain intensity on movement and expressed willingness to use acupuncture for future analgesia after c-sections, indicating its acceptability and effectiveness in pain reduction (Hesse et al. 2016: 16-18).

#### 5.3.2 Combination therapy effectiveness

Su Jok therapy and aromatherapy both significantly decrease in average pain scores for patients who received Su Jok therapy and aromatherapy, whether used individually or in combination (Simsek and Alpar 2022: 3-7).

The moderate effect size indicated that combining these therapies effectively lowered pain levels, offering a non-pharmacological approach to managing post-surgical pain (Simsek and Alpar 2022: 3-7).

### 5.3.3 Binder benefits for pain relief and comfort

Women who wore abdominal binders experienced reduced pain during ambulation and decreased distress when coughing or sneezing. Binders provided support, enabling women to handle their newborns more comfortably, improving their ability to manage postpartum tasks. (Tussey et al. 2019: 313-316.)

Use of binders was associated with improved hemoglobin and hematocrit levels and lower blood loss, showing the binder's effectiveness in reducing pain, discomfort, and symptom distress scores (SDS) (Tussey et al. 2019: 313-316; Ghana et al. 2017: 273-276).

### 5.3.4 Physiological and psychological benefits

Massage reduced pain, anxiety, and flatulence times, and normalized vital signs in post-cesarean women. It also enhanced well-being, comfort levels, and breastfeeding satisfaction confirming its effectiveness as a non-pharmacological intervention. (Saatsaz et al.2016: 94-97; Degirmenci and Aksoy 2024: 5-10.)

Reflexology reduced post-cesarean pain, improved patient comfort, and decreased stress, anxiety, and restless behaviors. It was seen as a cost-effective, independent nursing intervention with a positive impact on the post-cesarean experience. (Basyouni et al. 2018: 6-18.)

### 5.3.5 Improved functional recovery

Enhanced mobility was achieved through earlier ambulation, which was well-tolerated and led to reduced need for additional analgesics and improved mobility post c-section.

This approach showed no increased risk for immediate postpartum complications. (Herman et al. 2020: 4-8.)

Physiotherapy interventions, including mobility and breathing exercises, improved ambulation, well-being, and reduced pelvic girdle pain. These were effective for enhancing functional recovery and pain relief. (Ain et al. 2018: 33-35.)

### 5.3.6 Effectiveness and cost efficiency of lavender aromatherapy

Lavender aromatherapy demonstrated notable effectiveness in reducing pain and anxiety in various clinical settings, including maternity care. The calming, anxiolytic, and pain-reducing properties of lavender made it a viable non-pharmacological option, particularly in post-surgical care, where it helped reduce reliance on opioids after surgery. (CDC 2020.)

Lavender aromatherapy improved patient comfort with minimal risk and cost, making it a feasible addition to non-pharmacologic options in postpartum care especially for women recovering from, cesarean section (Burgess et al. 2022: 87-90).

### 5.3.7 Comprehensive benefits of physiotherapy for pain and well-being

Physiotherapy, including postural care and mobility exercises, enhanced mobility, reduced pain, and improved both well-being and physical recovery in postpartum women. This approach also reduced depressive symptoms. (Ain et al. 2018: 33–35.)

Mobility exercises helped improve movement and reduce stiffness while breathing exercises enhance circulation, promote healing, and induce relaxation by engaging the abdominal muscle. Early physiotherapy was effective in addressing both physical and emotional recovery. (Ain et al. 2018: 33–35.)

### 5.3.8 Accessible and effective pain reduction through benson relaxation techniques

Benson relaxation technique effectively reduced anxiety levels, including both mental and physical anxiety as well as mood disturbances and physical discomfort which helped to relieve pain (Solehati and Rustina 2015: 4).

Benson relaxation significantly reduced pain intensity in post-cesarean patients, providing an accessible and inexpensive technique that nurses can apply to enhance pain management (Solehati and Rustina 2015: 4).

### 5.3.9 Outcomes of reflexology in pain management

Post-cesarean section pain intensity was evaluated in the study group before and after foot reflexology. Participants showed a clear reduction in feelings of fear, dread, and severe discomfort. A considerable portion of the study sample who initially described their pain as severe reported a significant decrease in pain levels after the application. (Basyouni et al. 2018: 7.)

Foot reflexology significantly reduced pain intensity and improved patient comfort and well-being. The therapy was well-accepted and showed promise as an independent, cost-effective intervention for managing post-cesarean pain. (Basyouni et al. 2018: 6–18.)

### 5.3.10 Benefits of massage therapy in health and recovery

Massage therapy provided to women during the postpartum period had a positive impact on their psychological well-being. Hand massage helped stimulate blood and lymph circulation, supporting in the removal of harmful substances from the muscles. It also reduced lactic acid buildup in muscle fibers, which leads to alleviating pain, anxiety, muscle discomfort, fatigue, and stress. Additionally, it promoted feelings of happiness, calmness, relaxation, and overall well-being in patients recovering from a c-section. (Degirmenci and Aksoy 2024: 2.)

In addition, massage therapy improved vital signs, and enhanced comfort in post-cesarean patients. It also shortened flatulence times, promoted breastfeeding satisfaction, and improved sleep, highlighting its positive impact on health and recovery. (Saatsaz et al. 2016: 94-97; Degirmenci and Aksoy 2024: 5-10.)

#### 5.4 Patients' perspectives towards non-pharmacological methods

In the studies patients had shared positive experiences and expressed a willingness to use the non-pharmacological methods in future. The study by Hesse et al. (2016: 16-17), found that patients expressed interest in using acupuncture as an additional method for post-surgical pain relief after cesarean Section. They were satisfied with their overall pain management, which included acupuncture, and reported very low scores on the Verbal Rating Scale (VRS). The study by Burgess et al. (2022: 87-88), reports that patients who received lavender aromatherapy reported noticeably greater levels of comfort. Those who received the aromatherapy reported that they enjoyed using it. Basyouni et al. (2018: 16-18) reported that foot reflexology significantly reduced pain intensity, the therapy was well-accepted by the patients as their pain rating index were significantly decreased after the intervention and it was considered as a cost-effective intervention for managing post-cesarean pain, which can improve the overall quality of post-cesarean experience for women.

Benson Relaxation techniques with their healing effects, were shown to reduce anxiety levels in both cognitive and physical, along with mood disturbances and bodily discomfort, ultimately reaching levels that were effective in alleviating pain. Patients in the Intervention Group (IG) reported significant differences in pain intensity following the intervention, according to Solehati and Rustina (2015: 2-4.) The study by Solehati and Rustina (2015: 4), patients had reported that non-pharmacological pain management methods tend to reduce pain to varying degrees, influenced by factors such as environment, and cultural background. Tussey et al. (2019: 315) had patients reporting that they had lower post-ambulation pain levels when wearing an abdominal binder compared to those who walked without a binder. Patient who received abdominal binders reported less pain, significant decrease in SDS (Symptom distress score), reduced blood loss and higher hemoglobin and hematocrit levels as reported by Ghana et al.

(2017: 273-275.) There were methods that were found to be cost-effective, feasible and associated with fewer side effects like massage therapy, acupuncture, lavender aromatherapy (Saatsaz et al. 2016: 96-97; Akgun and Boz 2020: 615; Burgess et al. 2022: 90).

## **6 Discussion**

### **6.1 Ethics and validity**

Ethics is crucial throughout the research process, from selecting the topic to analysing and sharing findings. Key principles such as quality, authenticity, and truthfulness are essential for ensuring the integrity of qualitative research. (Holloway & Galvin 2017: 55-305.)

Following ethical guidelines helps maintain professional standards and ensures that research practices are scientifically rigorous. In qualitative research, ethical considerations emphasize honesty and transparency in managing, analysing, and reporting data. Proper citation of sources and accurate attribution are crucial for preserving the study's validity and reliability. Clearly explaining research methods enhances the overall credibility and trustworthiness of the findings. (Holloway & Galvin 2017: 55-305.)

Additionally, ethics ensures that researchers adhere to national and international standards, promoting public welfare. To maintain validity in qualitative research, criteria like credibility, transferability, dependability, and confirmability are used to assess the accuracy and reliability of findings. Methods like triangulation, detailed documentation, and methodological transparency further strengthen the accuracy and reliability of the research results. (Holloway & Galvin 2017: 55-305.)

The articles used in this thesis were obtained from reputable nursing databases and academic journals. They were selected based on research questions to avoid bias. A

systematic search was conducted using CINAHL and MEDLINE databases, with specific search terms and inclusion criteria, ensuring only recent articles (within the last ten years) were included. Ethical approval was not required, as no participants were involved, and all sources were properly cited. Metropolia written guideline (2024) were followed, ensuring that in-text citations and references were written correctly. Citations were placed in a correct format, making it easy for the reader to find the original authors and related articles. Turnitin was used to ensure originality. This ensures the ethical integrity and validity of the research process.

## 6.2 Discussion of the results

The purpose of our study was to describe the various non-pharmacological methods used by patients in managing post-surgical pain after a c-section as well as how beneficial are these non-pharmacological methods in managing post-surgical pain after c-section from patient perspectives. The collected and analyzed data identified several non-pharmacological techniques utilized by patients such as acupuncture, acupressure, su jok therapy and aromatherapy, use of abdominal binders, massage therapy, physiotherapy, lavender aromatherapy, benson relaxation techniques and foot reflexology. (Hesse et al. 2016; Akgun and Boz 2020; Simsek and Alpar 2022; Tussey et al. 2019; Ghana et al. 2017; Saatsaz et al. 2016; Degirmenci and Aksoy 2024; Ain et al. 2018; Burgess et al. 2022; Solehati and Rustina 2015; Basyouni et al. 2018; Herman et al. 2020.)

The most commonly studied methods included hand and foot massage, abdominal binders, aromatherapy. The effectiveness of these various non-pharmacological pain management methods varied, with impacts noted on both pain intensity and physiological and psychological factors. However, the majority of studies found these methods to be effective in significantly reducing pain intensity levels. (Saatsaz et al. 2016; Degirmenci and Aksoy 2024; Tussey et al. 2019; Ghana et al. 2017; Burgess et al. 2022; Simsek and Alpar 2022.)

For instance, aromatherapy which uses essential oils to promote and enhance physical and mental well-being, was shown to be effective in pain management (Akgun and Boz

2020: 613-616). The combination of su Jok therapy and aromatherapy also significantly reduced pain scores in patients who received these treatments, individually and in combination (Simsek and Alpar 2022: 3-7).

In terms of psychological effects, most of the non-pharmacological pain management methods not only helped reduce pain but also lowered patients' anxiety. Studies include benson relaxation techniques (Solehati and Rustina 2015), massage therapy (Degirmenci and Aksoy 2024), aromatherapy (Simsek and Alpar 2022), reflexology (Basyouni et al. 2018), abdominal binders (Tussey et al. 2019; Ghana et al. 2017).

The use of effective non-pharmacological pain management methods resulted in various positive outcomes, including a reduced need for analgesic (Herman et al. 2020: 4-8). Massage therapy was found to improve vital signs, and enhance comfort for post-cesarean patients, while also improving sleep (Saatsaz et al. 2016: 94-97; Degirmenci and Aksoy 2024: 5-10). Physiotherapy was reported to help alleviate depressive symptoms, supporting both physical recovery and overall wellbeing (Ain et al. 2018: 33–35). Additionally, Benson relaxation technique was found to reduce muscle tension (Solehati and Rustina 2015:1). According to Moghadam et al. (2021), hand and foot massage also positively impacted nausea, vomiting and bowel movements after surgery. Also, Abdelaziz et al. (2017), reported that massage reduced blood pressure and pulse rate but had no effect on respiration rate.

In the studies, patients reported positive experiences with non-pharmacological methods for post-cesarean c-section pain management and expressed a willingness to use these methods in the future. Hesse et al. (2016: 16-17) found that patients were satisfied with post-surgical pain treatment. Similarly, Burgess et al. (2022: 87-88) reported that patients who received lavender aromatherapy experienced significantly higher comfort levels and expressed enjoyment in using this method. Basyouni et al. (2018: 16-18) highlighted foot reflexology as an effective, well-accepted, and cost-efficient approach for reducing pain intensity post c-section contributing to improved patient experiences and quality of recovery. Other cost-effective methods like massage therapy, acupressure, and lavender aromatherapy, were noted for being practical, having fewer side effects, and being feasible for use (Saatsaz et al.2016; Akgun and Boz 2020; Burges et al. 2022).

### 6.3 Conclusion and recommendations

In our study, we examined various non-pharmacological methods for managing pain after cesarean sections, focusing on their effectiveness and benefits from the patient perspectives. The alternative methods significantly reduced pain levels, decreased anxiety, and aided recovery for women following c-sections. Non-pharmacological methods such as acupuncture, acupressure, su jok therapy and aromatherapy, use of abdominal binders, massage therapy, physiotherapy, lavender aromatherapy, benson relaxation techniques and foot reflexology. (Hesse et al. 2016; Akgun and Boz 2020; Simsek and Alpar 2022; Tussey et al. 2019; Ghana et al. 2017; Saatsaz et al. 2016; Degirmenci and Aksoy 2024; Ain et al. 2018; Burgess et al. 2022; Solehati and Rustina 2015; Basyouni et al. 2018; Herman et al. 2020.)

For instance, lavender aromatherapy was found to be a popular and cost-effective option, delivering quick relief with few side effects. The use of abdominal binders and early ambulation were also beneficial, as they improved mobility, reduced discomfort, and supported physical recovery. Physiotherapy exercises, which included mobility and breathing techniques, contributed to better physical comfort and well-being while addressing postpartum pain. Massage therapy and reflexology also showed positive outcomes, helping to lower pain and anxiety while enhancing sleep, breastfeeding satisfaction, and overall comfort. By using these non-pharmacological methods, patients could reduce their reliance on medications, which can have side effects, thereby benefiting both mothers and their infants (Burgess et al. 2022: 87-90; Tussey et al. 2019: 313-316; Ain et al. 2018: 33-35; Saatsaz et al.2016: 94-97; Degirmenci and Aksoy 2024: 5-10; Basyouni et al. 2018: 6-18).

Additionally, combining therapies, such as Su Jok with aromatherapy, provided enhanced pain relief, highlighting the value of integrated approaches. Overall, our findings emphasize the usefulness of non-pharmacological methods in improving patient comfort, supporting quicker recovery, and increasing satisfaction. (Simsek and Alpar 2022: 3-7.)

In conclusion, non-pharmacological methods offer effective, accessible, and cost-efficient options for managing pain after cesarean sections. These approaches can serve as useful alternatives or additions to pharmacological pain management, helping to create a more comprehensive standard of care for new mothers.

Although this study was conducted in countries such as Turkey, Iran, the United States, Israel, Indonesia, Germany, Islamabad, Palestine, and Egypt. These non-pharmacological pain relief methods explored could also be valuable in Finland. Implementing these approaches in Finland could help new mothers manage pain after a c-section, giving them greater control over their recovery.

We recommend incorporating lavender aromatherapy, a cost-effective method that uses essential oils to enhance both physical and mental well-being. This can be a practical and beneficial addition to post-cesarean care, promoting recovery and emotional well-being for new mothers. Additionally, massage therapy, including foot and hand massages, has been shown to have a positive impact on patients' psychological well-being and could be beneficial in reducing stress and anxiety. The use of abdominal binders can also provide physical support, helping women manage postpartum tasks and handle their newborns more comfortably.

These methods not only reduce the need for analgesic consumption but also align with holistic care principles, promoting better patient outcomes and benefiting both mothers and their babies. Nurses can play a key role in supporting these approaches, ensuring comprehensive care for post-cesarean patients.

Our study can serve as a guide for future research, encouraging further exploration of effective non-pharmacological pain management strategies for women after cesarean sections. New mothers will significantly benefit from learning about these alternative methods, as this knowledge empowers them to take an active role in their recovery, ultimately enhancing their comfort and satisfaction. Additionally, nurses facilitated improved patient outcomes and reduced reliance on medication by adopting these practices.

## 6.4 Limitations

A limitation of this study was a shift in the research focus during the study. Initially, the aim was to explore post-operative pain management after c-sections using non-pharmacological methods from a nursing perspective. The research questions, aims, and search strategy were based on this focus. However, after reviewing the literature, we found that most studies concentrated on patient perspectives rather than nursing perspectives. As a result, the focus of the study was changed to patient perspectives on post-surgical pain management after c-section using non-pharmacological methods. This change may have influenced the findings, as the literature available primarily addressed patient views rather than those of nursing professionals.

In this thesis, the authors clearly defined their study questions, which helped keep the research focused. However, since the authors were nursing students with no prior research experience, they faced some challenges. To overcome this, they asked for help from supervising teachers and classmates which gave them useful guidance. They also read books and references to learn more about research methods and improve their work.

The literature review was limited by the number of research articles used as sources. Some relevant articles were removed because they required a purchase to access. Also, the limited time for the thesis meant they could not explore the topic in as much depth. Despite these challenges, the authors were able to improve their research with support from supervisors and good resources.

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## Appendices

### Appendix 1: Database search result

Data base/Data/ Limit	Search phrases	Total numbers of hits/citations	Papers/records included based on title*	Papers/records included based on abstract*	Papers/records included based on full text*
CINAHL/ 26 <sup>th</sup> September 2024. 2014-2024 English language Abstract available	((("nurs*" OR "registered nurs*")) AND (("caesarean" OR "caesarean delivery" OR "caesarean section")) AND (("pain management" OR "pain control" OR "pain reduct*" OR "manag*" OR "pain" OR "analges")))	169	27	20	6
Medline/ 26 <sup>th</sup> September 2024. 2014-2024 English language. Abstract available.	((("nurs*" OR "registered nurs*")) AND (("caesarean" OR "caesarean delivery" OR "caesarean section")) AND (("pain management" OR "pain control" OR "pain reduct*" OR "manag*" OR "pain" OR "analges")))	663	40	28	4
Manual search		6	6	4	4
Records in total		838	73	52	14

## Appendix 2: Details of the selected article

Author/s, Year, Country	Topic/Title	Aim	Sample	Methodology and methods	Major findings
Akgun, M.&Boz, I.2020, Turkey	The effects of acupressure on post-cesarean pain and analgesic consumption: a randomized single-blinded placebo-controlled study	To assess the impact of acupressure on post-cesarean pain and the consumption of analgesics.	132 women who had undergone cesarean delivery, divided into three groups (44 acupressure, 44 placebos, 44 control).	Randomized, single-blinded, placebo-controlled study	The acupressure group experienced significantly lower pain levels and required less analgesic consumption compared to the placebo and control groups.
Simsek, H.E& Alpar, S.E 2022, Turkey	The effect of aromatherapy and Su Jok interventions on post-cesarean pain	To examine the effects of aromatherapy and Su Jok therapy on post-cesarean pain.	120 women undergoing cesarean section, divided into four groups: aromatherapy, Su Jok, both, and control.	Randomized controlled trial	Aromatherapy and Su Jok interventions significantly reduced post-cesarean pain, with the combination of both therapies showing the best results.
Tussey et al. 2019, United States.	Reducing Discomfort After Cesarean Birth Using Abdominal Binders	To assess the effectiveness of abdominal binders in reducing post-cesarean discomfort.	68 women who had undergone cesarean section, randomized into intervention (binder) and control groups.	Randomized controlled trial (RCT).	The abdominal binder group reported lower pain scores and quicker recovery.
Ghana et al. 2017, Iran.	Randomized Controlled Trial of Abdominal Binders for Postoperative Pain, Distress, and Blood Loss After Cesarean Delivery	To assess the effects of abdominal binders on pain, distress, and blood loss following cesarean delivery.	178 women, randomized into intervention (binder) and control groups.	Prospective randomized controlled trial (RCT).	The use of binders significantly reduced pain and distress, but no significant difference in blood loss was found.
Elsous et al. 2018, Gaza Strip, Palestine.	Post-Operative Pain after Cesarean Delivery: Initial Assessment for Quality Improvement	To evaluate post-operative pain management after cesarean delivery and identify areas for improvement.	207 women who had undergone cesarean section	Hospital based cross-sectional study.	Inadequate pain management practices were identified, highlighting the need for quality improvement initiatives.

Hardiyanti, T 2022. Indonesia	Nursing Care with Aromatherapy Implementation for Acute Pain in Patients Post Sectio Caesarea	To investigate the effectiveness of aromatherapy in managing acute post-cesarean pain within nursing care.	Women undergoing cesarean section.	Implementation study focusing on nursing care.	Aromatherapy proved effective in alleviating acute pain and improving comfort in patients following a cesarean section.
Saatsaz et al. 2016, Iran.	Massage as Adjuvant Therapy in the Management of Post-Cesarean Pain and Anxiety: A Randomized Clinical Trial	To investigate the effect of massage on pain and anxiety after cesarean section.	156 women undergoing cesarean section, randomized into massage and control groups.	Single-blind randomized clinical trial.	Massage significantly reduced post-cesarean pain and anxiety.
Herman et al. 2020, Israel.	Enhancing Patient Mobility Following Cesarean Delivery – The Efficacy of an Improved Postpartum Protocol Assessed with Pedometers	To assess the efficacy of a postpartum mobility protocol using pedometers in enhancing recovery post-cesarean.	201 women, with half assessed before and after implementation of a new mobility protocol.	Randomized clinical trial with a pre-protocol and post-protocol comparison.	Increased mobility was associated with reduced analgesic use and fewer post-operative complications.
Hesse et al. 2016, Germany.	Acupuncture for Pain Control after Caesarean Section: A Prospective Observational Pilot Study	To evaluate acupuncture's effectiveness in managing post-cesarean pain.	20 women who had undergone cesarean section.	Prospective observational pilot study.	Acupuncture reduced post-cesarean pain and improved patient satisfaction.
Burgess et al. 2022, United States.	A Pilot Randomized Control Trial to Assess the Impact of Lavender on Anxiety and Comfort After Cesarean Birth and the Barriers Encountered	To evaluate the effects of lavender aromatherapy on anxiety and comfort following cesarean birth.	48 women undergoing cesarean section, randomized into aromatherapy and placebo groups.	Pilot randomized control trial.	Lavender significantly reduced anxiety and improved comfort post-cesarean.

Ain et al. 2018, Islamabad.	Ease in Pain and Functional Activities following Caesarean Delivery by Post Natal Exercises (Pilot Study)	To assess the effectiveness of postnatal exercises on pain reduction and improvement in functional activities post-cesarean.	20 women who had undergone cesarean delivery.	Randomized controlled trial; intervention group performed postnatal exercises; control group received routine care. Pain and functional activities were assessed.	Postnatal exercises were found to reduce pain and enhance functional activities in cesarean patients.
Solehati, T., & Rustina, Y. 2015, Indonesia	Benson Relaxation Technique in Reducing Pain Intensity in Women After Cesarean Section	To evaluate the effectiveness of the Benson Relaxation Technique in reducing pain intensity following a cesarean section.	60 women who had undergone cesarean section, randomized into intervention (Benson Relaxation Technique) and control groups.	quasi-experimental design with pre- and post-test control groups	The Benson Relaxation Technique significantly reduced post-cesarean pain compared to the control group.
Basyouni et al. 2018, Egypt	Effect of Foot Reflexology on Post-Cesarean Pain	To examine the impact of foot reflexology on pain after a cesarean section.	70 women who had undergone cesarean section, divided into intervention (reflexology) and control groups.	Quasi-experimental design.	Foot reflexology significantly decreased post-cesarean pain in comparison to the control group.
Degirmenci, S., & Aksoy, Y.E 2024 Turkey	Effects of Hand Massage on Women's Pain, Comfort Levels, and Flatulence Times After Cesarean Section: A Randomized Controlled Study.	To assess the effects of hand massage on pain, comfort levels, and flatulence times following a cesarean section.	A total of 182 women who underwent cesarean sections were randomly assigned to either the intervention group (hand massage) or the control group.	In this randomized controlled trial, the intervention group received hand massage, while the control group received standard care. Pain, comfort levels, and flatulence times were evaluated.	Hand massage significantly alleviated pain, enhanced comfort levels, and reduced the time required to relieve flatulence.

### Appendix 3. Result of the content analysis (Research Question 1)

Sub-category	Generic category	Main category
Acupressure relief	Complementary therapies for pain relief	Non-pharmacological methods for managing post-surgical pain after a C-section.
Aromatherapy preferences		
Aromatherapy mechanism		
Su Jok therapy		
Reflexology for Pain Relief		
Implementation of relaxation techniques		
Participation in aromatherapy		
Evaluation of reflexology effectiveness		
Pain reduction with binder		
Supportive device		
Assessment of health outcomes		
Massage	Manual therapy	
Massage therapy for pain control		
Early post-surgical activity	Mobility enhancement and pain management	
Prolonged pain management		
Patient acceptance of mobility		
Improved physical activity		
Acceptance of acupuncture treatment	Patient engagement and positive patient experiences	
Future use of acupuncture		
Positive experience with aromatherapy		
Significant improvement in comfort levels		
Enhanced overall comfort		

Physiotherapy techniques	Physiotherapy for pain management and mobility enhancement	
Mobility enhancement		
Respiratory management		
Posture improvement		
Focus on back pain management		
Complimentary approach to pain relief	Efficacy of Combined Treatments	
Standardization of pain management practices		

#### Appendix 4. Result of the content analysis (Research Question 2)

Sub-category	Generic category	Main category
Post caesarean pain reduction effectiveness	Effectiveness of pain management and health benefits	Benefits of non-pharmacological methods for managing post-surgical pain after a C-section.
Medication use and side effect reduced		
Economic and health benefit		
Pain reduction with Su Jok and aromatherapy	Combination therapy effectiveness	
Effectiveness of combined therapy		
Pain and discomfort reduction with binder	Binder benefits for pain relief and comfort	
Enhanced functional support and advantage		
Comfort and support during physical activities		

Enhanced patient comfort	Effective symptom relief	
Pain management effectiveness		
Distress management		
Hemorrhage control		
Improved hematologic outcomes		
Reduction in symptom distress		
Pain relief comfort enhancement	Physiological and psychological benefits	
Improved circulation		
Sleep quality improvement		
Enhanced maternal-infant interaction		
Anxiety relief		
Massage therapy as a treatment		
Decreased analgesic use	Improved functional recovery	
Enhanced physical activity		
Mobility improvement		
Safety of intervention		
Improvements in pain levels	Pain management effectiveness	
Positive patient response		
Enhanced pain relief		
Effectiveness of lavender aromatherapy	Effectiveness and cost efficiency of lavender aromatherapy	
Safe and cost-effective treatment		
Timely intervention for pain management	Comprehensive benefits of physiotherapy for pain and well-being	
Enhancement of overall well-being		

Targeted physiotherapy exercises		
Breathing techniques in physiotherapy		
Enhanced mobility and movement		
Pain reduction comparison	Accessible and effective pain reduction through Benson relaxation techniques	
Effectiveness of Benson relaxation		
Accessibility of pain management techniques		
Effectiveness of reflexology	Outcomes of reflexology in pain management	
Comparison of Pain Intensity Scores		
Improvement in Patient Comfort		
Behavioral change post-intervention		
Practical application of reflexology		
Pain relief through massage	Benefits of massage therapy in health and recovery	
Significant reduction in pain		
Physiological stability		
Pain and anxiety reduction		
Increased pain management		
Improved gastrointestinal comfort		
Faster -recovery post surgery		
Enhanced maternal -infant bonding		