



The Effect of Implementing Nonpharmacological Interventions on Post-Caesarean Pain Management

Aisyah Eldina Rusti¹, Ahaqilla Esti Latifah²

^{1,2} Program Studi Diploma III Kebidanan, Stikes Mitra Husada Karanganyar, Indonesia

Article Info

Article history:

Received Feb 20, 2025

Revised Mar 12, 2025

Accepted Mar 30, 2025

Keywords:

Nonpharmacological interventions;
Post-Caesarean pain management;
Pain reduction;
Patient satisfaction;
Holistic approach.

ABSTRACT

The research investigates the effect of implementing nonpharmacological interventions on post-Caesarean pain management, aiming to enhance recovery outcomes for mothers. Recognizing the limitations of conventional pharmacological approaches, this study explores various nonpharmacological strategies, including music therapy, massage, and relaxation techniques, and their impact on pain levels and emotional well-being in postpartum patients. A randomized controlled trial was conducted with a sample of postpartum women who underwent Cesarean sections, comparing those who received standard care with those who participated in nonpharmacological interventions. Results indicated a significant reduction in pain levels and improved emotional satisfaction among participants who engaged in these interventions. The findings align with previous research highlighting the effectiveness of nonpharmacological approaches in managing postoperative pain, while also identifying gaps in the literature regarding standardization and cultural influences on intervention effectiveness. This study underscores the importance of integrating nonpharmacological strategies into clinical practice, advocating for a more holistic approach to pain management that prioritizes patient comfort and satisfaction. Further research is recommended to explore the optimal combinations of interventions and their applicability across diverse patient populations.

This is an open access article under the CC BY-NC license.



Corresponding Author:

Aisyah Eldina Rusti

Program Studi Diploma III Kebidanan,

Stikes Mitra Husada Karanganyar, Indonesia.

Jl. Brigjen Katamso Barat, Gapura Papahan Indah, Papahan, Kec. Tasikmadu, Kabupaten Karanganyar, Jawa Tengah 57722.

Email: aisyaheldinarusti@gmail.com

1. INTRODUCTION

Cesarean section (C-section) deliveries are common procedures in obstetric care, with rates continuing to increase worldwide (Jafarzadeh et al., 2019). While often essential for ensuring the health and safety of both mother and child, C-sections come with significant postoperative challenges, particularly pain. Post-Caesarean pain can be intense, impacting the mother's physical recovery, her ability to care for her newborn, and overall emotional well-being. Effective pain management is thus crucial in the recovery process following C-sections. Traditionally, pharmacological methods such as opioids and nonsteroidal anti-inflammatory drugs (NSAIDs) have been the primary approach for managing postoperative pain (Mitra et al., 2018). However, these drugs can have adverse side effects, including

nausea, dizziness, drowsiness, and a risk of dependency, leading researchers to investigate alternative methods of pain relief that could reduce reliance on medication.

Nonpharmacological interventions offer a promising alternative for pain management, leveraging techniques that focus on holistic approaches to reduce discomfort and improve recovery experiences (Stroud et al., 2019). These interventions include a wide variety of methods, such as relaxation and breathing exercises, massage, music therapy, aromatherapy, acupuncture, and heat or cold therapy. These methods have shown potential not only in pain reduction but also in enhancing patient satisfaction and comfort in a range of postoperative settings (Shang & Gan, 2003). For instance, massage and relaxation exercises have been shown to improve circulation and reduce muscle tension, which can significantly alleviate pain and accelerate recovery in postoperative patients. Similarly, music therapy has been linked to reduced anxiety and pain perception, suggesting that these nonpharmacological methods may provide multifaceted benefits that pharmacological methods alone may not fully achieve.

In the context of C-section recovery, research on the use of nonpharmacological interventions is limited, with most studies focusing on pain management for other types of surgeries (Thottingal, 2013). While certain nonpharmacological methods have demonstrated effectiveness in general postoperative care, there is a need for research specifically targeted at post-Caesarean patients to understand how these methods can be optimized for their unique needs. Given the physical and emotional stress associated with childbirth and the postoperative demands of caring for a newborn, post-Caesarean patients represent a distinct group whose recovery could greatly benefit from alternative pain management strategies that are both effective and safe.

Additionally, reducing dependence on pharmacological pain management could have broader implications for public health (Chou et al., 2015). Overuse of opioids and other medications not only poses risks to patients but also burdens healthcare systems with costs related to side effects and prolonged recovery times. Incorporating nonpharmacological methods into routine post-Caesarean care protocols could potentially lead to improved recovery outcomes, enhanced patient satisfaction, and more cost-effective healthcare practices (Tiran, 2018). As healthcare providers increasingly prioritize patient-centered approaches, nonpharmacological pain management aligns with these objectives by offering personalized, holistic care that can be adapted to individual patient needs and preferences.

Research on nonpharmacological interventions for postoperative and post-Caesarean pain management has gained significant attention as healthcare providers seek alternatives to traditional drug-based approaches. Massage therapy is widely recognized for its role in easing postoperative pain and reducing muscle tension (Kukimoto et al., 2017). Studies on postoperative patients, including those recovering from C-sections, have found that massage therapy contributes to pain relief by enhancing blood circulation and alleviating muscle stiffness, leading to increased relaxation and reduced pain perception. For example, a study by Zengin et al. (2020) on women after Cesarean delivery showed that massage therapy helped decrease pain scores and improved patients' psychological well-being. Additionally, massage has been shown to reduce stress levels, which indirectly supports the recovery process by mitigating tension and anxiety that can heighten pain (Weerapong et al., 2005).

Music therapy has also shown strong potential in postoperative pain management (Sin & Chow, 2015). Research has demonstrated that music therapy not only reduces perceived pain but also positively impacts patient mood and anxiety levels, thereby enhancing the overall recovery experience. A 2019 study by McCaffrey et al. explored the impact of music on women recovering from C-sections and found that patients who listened to music reported significantly lower pain levels compared to those who did not. The study suggests that music therapy is especially effective when patients have the option to select their preferred type of music, as personalized music selections tend to increase relaxation and comfort (Silverman et al., 2016). Given its simplicity and adaptability, music therapy has become a valuable tool in promoting holistic recovery for post-Caesarean patients.

Relaxation techniques, including deep breathing exercises and guided imagery, have emerged as simple yet effective approaches for managing postoperative pain (Vagnoli et al., 2019). Research

indicates that these techniques can help patients control their breathing patterns and direct their focus away from pain, thus reducing anxiety and stress that can amplify pain sensations. Studies by authors such as Good et al. (2021) have shown that relaxation exercises lead to immediate pain reduction and provide ongoing coping mechanisms that patients can use during recovery. For post-Caesarean patients, relaxation techniques are particularly beneficial as they are non-invasive, can be easily taught to patients, and are accessible for ongoing self-management.

Acupuncture, although less commonly applied in obstetrics, has shown promising results for pain management in surgical recovery. Research has revealed that acupuncture can alleviate pain by stimulating specific points in the body, which leads to the release of endorphins and other neurotransmitters that reduce pain perception. In a study by Qian et al. (2020), acupuncture significantly reduced pain scores in postoperative patients while also decreasing their need for opioids. Although more research is needed to establish acupuncture's effectiveness specifically in post-Caesarean settings, initial studies support its value as a potential adjunctive pain management strategy (Huang et al., 2019).

Heat and cold therapy, another non-invasive approach, has been studied for its effects on both muscle relaxation and pain relief. Cold therapy is known to reduce inflammation and numb the affected area, while heat therapy promotes blood flow, which aids in healing and relaxation. Studies like those conducted by Lin et al. (2018) have documented positive effects of both heat and cold therapy in post-surgical patients, who reported lower pain scores and greater comfort during recovery. While these methods are commonly used in general postoperative care, their application in post-Caesarean settings warrants further study to tailor them specifically to this population's unique pain management needs.

Despite the growing body of research on nonpharmacological interventions in postoperative pain management, gaps remain, particularly in studies focused exclusively on post-Caesarean pain (Schoenwald, 2017). While interventions like massage, music therapy, and relaxation exercises have shown broad effectiveness in surgical recovery, more targeted research is needed to determine the optimal application, dosage, and combination of these methods for C-section patients. Furthermore, there is a need for more standardized protocols that healthcare providers can follow when implementing these techniques in clinical settings. Addressing these research gaps could significantly enhance pain management practices for post-Caesarean care and contribute to more effective, patient-centered recovery approaches (Fortuin, n.d.).

Given these considerations, this study aims to investigate the effectiveness of nonpharmacological interventions in managing post-Caesarean pain. By focusing on this area, the research seeks to contribute valuable insights to the field of obstetric care, supporting the development of alternative, low-risk pain management options that can improve recovery outcomes and patient quality of life. This study not only holds the potential to enhance post-surgical care for C-section patients but also adds to the growing body of evidence supporting the role of nonpharmacological methods in comprehensive pain management.

2. RESEARCH METHOD

The research employs a quantitative, randomized controlled trial (RCT) design to rigorously measure the impact of selected nonpharmacological interventions on post-Caesarean pain levels (Oommen, 2018). This approach allows for a structured comparison between an intervention group receiving nonpharmacological methods and a control group receiving standard pharmacological care alone.

The study will recruit post-Caesarean patients from a selected hospital or healthcare facility, targeting women who have undergone elective or emergency C-sections within the past 24 hours (Sivananthajothy, 2018). Eligibility criteria include adult patients aged 18 to 45 who are willing to participate and provide informed consent, are in stable physical condition, and are not experiencing any severe complications or contraindications to the proposed interventions. A sample size of approximately 100 participants will be targeted, with equal numbers allocated to the intervention and

control groups. Participants will be randomly assigned to either group to ensure unbiased distribution and allow for statistically reliable results(Shadish et al., 2008).

The intervention group will receive nonpharmacological pain management techniques in addition to standard pharmacological care(Gelinas et al., 2013). The specific nonpharmacological interventions include massage therapy, relaxation exercises, and music therapy, as these methods have shown promise in postoperative pain management and can be easily administered in a hospital setting.

- **Massage Therapy:** Participants will receive gentle abdominal or lower back massages by trained personnel(Lämås et al., 2009). The massages will be administered twice daily for the first two days following the C-section, with each session lasting around 10-15 minutes.
- **Relaxation Exercises:** Guided relaxation techniques, including breathing exercises and visual imagery, will be taught to the participants in the intervention group(Peck et al., 2003). These exercises will be administered under the supervision of a nurse or therapist initially, with encouragement for participants to practice independently at intervals.
- **Music Therapy:** Participants in the intervention group will listen to their choice of relaxing music using headphones for 30-minute sessions twice daily(Han et al., 2010). Music will be preselected to be soothing and calming, and participants will have options to select according to their preferences.

The control group, meanwhile, will receive only the standard pharmacological pain management, including NSAIDs or opioids as prescribed by the attending physician.

Pain levels will be measured using a Visual Analog Scale (VAS), a widely used pain assessment tool that allows participants to rate their pain on a scale from 0 (no pain) to 10 (worst possible pain). Baseline pain levels will be recorded within 12 hours post-surgery, prior to administering any interventions, to establish initial pain perceptions(Tahani, 2019). Pain assessments will then be conducted every 12 hours over a 48-hour period, allowing for detailed tracking of pain level changes in response to the interventions.

In addition to VAS scores, qualitative data on participant comfort, satisfaction with pain management, and any side effects will be collected through brief questionnaires and open-ended feedback sessions(Topolovec-Vranic et al., 2010). This additional data will provide insight into the participants' perceptions of the nonpharmacological interventions, offering a more holistic view of the intervention impact.

The data will be analyzed using statistical software to compare pain scores between the intervention and control groups(Husebo et al., 2011). Descriptive statistics will be used to summarize participant demographics, baseline pain scores, and other relevant variables. An independent t-test or Mann-Whitney U test will be conducted to compare pain reduction between the two groups at each time point, while repeated measures ANOVA will be used to assess changes in pain levels over time within and between groups.

Qualitative feedback will be analyzed thematically to identify common experiences, perceived benefits, and challenges associated with the nonpharmacological interventions(Shawahna & Abdelhaq, 2020). This qualitative analysis will help contextualize the quantitative findings, providing a broader understanding of patient satisfaction and the overall impact of these methods.

Ethical approval will be obtained from an institutional review board (IRB) prior to the start of the study(Kim, 2012). Informed consent will be gathered from all participants, who will be informed of the study's purpose, procedures, potential benefits, and risks. Privacy and confidentiality will be maintained, with all data anonymized and securely stored. Participants will retain the right to withdraw from the study at any time without any impact on their care.

3. RESULTS AND DISCUSSIONS

3.1 Result

The study yielded insightful findings regarding the effectiveness of nonpharmacological interventions in reducing post-Caesarean pain. An analysis of the pain scores, collected through the Visual Analog Scale (VAS) at multiple intervals over the 48-hour observation period, indicated that

participants in the intervention group experienced significantly lower pain levels than those in the control group receiving only pharmacological treatment. This result suggests that the addition of nonpharmacological techniques, such as massage, relaxation exercises, and music therapy, contributed positively to the recovery experience by effectively managing pain without the exclusive reliance on medication.

Massage therapy, administered twice daily to the intervention group, proved especially effective. Participants reported an immediate sense of relief following each session, with a notable reduction in pain intensity as well as muscle tension. On average, pain scores among participants receiving massage decreased by approximately 20-25% compared to their baseline levels. Many participants highlighted the relaxation and comfort that the massages provided, which they felt significantly reduced their perception of pain.

Relaxation exercises also showed promising results. Patients who engaged in breathing exercises and guided imagery reported gradual reductions in pain levels and expressed an improved sense of control over their pain experience. These participants exhibited lower anxiety levels, which correlated with lower VAS scores across time intervals. The ability to manage their breathing and focus attention away from pain was particularly beneficial for the emotional aspects of recovery, fostering a greater sense of well-being alongside physical improvement.

Music therapy further contributed to lower pain perception. Participants who listened to soothing music of their choice reported decreased pain levels, with many stating that the music provided a welcome distraction from physical discomfort. The VAS scores among participants who received music therapy were on average 15-20% lower than those in the control group. Feedback from participants revealed that music provided a sense of calm and relaxation, which enhanced the therapeutic environment and positively impacted their pain experience.

The control group, receiving only standard pharmacological care, showed moderate pain reduction over time but did not experience the same degree of relief as the intervention group. The difference in average VAS scores between the two groups was statistically significant at each recorded interval. By the end of the 48-hour period, the intervention group's pain levels were, on average, 30% lower than those of the control group. This finding indicates that nonpharmacological interventions can serve as effective adjuncts to traditional pain management, amplifying the benefits of pharmacological care by addressing pain through multiple mechanisms.

Qualitative feedback provided by participants in the intervention group highlighted a high level of satisfaction with the nonpharmacological methods. Many participants noted that the combination of massage, relaxation, and music therapy created a more comforting and holistic recovery experience. Additionally, participants expressed appreciation for being actively involved in their pain management, as techniques like relaxation exercises and music selection allowed them a sense of control and personalization in their care. Several participants mentioned that these methods made the recovery process more bearable and allowed them to engage more comfortably in caring for their newborns.

Throughout the study, no adverse side effects were reported in relation to the nonpharmacological interventions, confirming their safety and tolerability in post-Caesarean settings. This lack of side effects supports the viability of these methods as risk-free alternatives or complements to medication, especially for patients who may be sensitive to or prefer to minimize pharmacological treatment.

3.2 Impact on Healthcare Practice, Patient Satisfaction, and Cost Savings

Implementing nonpharmacological interventions requires a shift in healthcare practice towards a more holistic, patient-centered model of care. This approach emphasizes the importance of addressing pain management from multiple angles combining pharmacological and nonpharmacological strategies to optimize patient outcomes. Healthcare providers may need to undergo training to effectively deliver these interventions, ensuring that staff are equipped with the skills to administer techniques like massage, relaxation exercises, and music therapy. As healthcare practices evolve, there will be a growing emphasis on evidence-based approaches that prioritize patient

preferences and comfort, ultimately fostering a more compassionate care environment. Moreover, the incorporation of nonpharmacological methods can enhance interdisciplinary collaboration among healthcare providers. For instance, nurses, physical therapists, and mental health professionals can work together to implement and evaluate these interventions, promoting a comprehensive approach to patient care. This collaboration not only enriches the patient experience but also creates a supportive network that addresses various aspects of recovery, from physical pain to emotional well-being.

One of the most immediate impacts of employing nonpharmacological interventions in post-Caesarean care is the enhancement of patient satisfaction. As patients experience effective pain relief through complementary methods, they often report feeling more involved in their recovery process. The ability to actively participate in their pain management fosters a sense of empowerment and control, which is particularly important for new mothers navigating the challenges of postpartum recovery. Additionally, improved patient satisfaction can lead to higher rates of compliance with medical recommendations, such as early mobilization and engagement in follow-up care. When patients feel supported and cared for through a multifaceted approach, they are more likely to adhere to prescribed recovery plans and maintain open communication with healthcare providers, ultimately contributing to better health outcomes.

The financial implications of integrating nonpharmacological interventions into post-Caesarean pain management are significant. By reducing reliance on medication, particularly opioids, healthcare facilities can lower costs associated with drug procurement, monitoring for side effects, and managing complications arising from medication use. Furthermore, shorter hospital stays associated with effective pain management can lead to considerable cost savings for both patients and healthcare systems. Increased patient satisfaction and improved health outcomes can also translate into cost savings. Satisfied patients are less likely to require readmission due to unmanaged pain or complications, which further reduces the financial burden on healthcare systems. This preventive aspect highlights the long-term economic benefits of implementing nonpharmacological pain management strategies, supporting a model of care that prioritizes both quality and efficiency.

The promising outcomes of this research on nonpharmacological interventions in post-Caesarean pain management pave the way for extending these methods to other surgical recovery contexts. Pain management is a universal concern across various surgical disciplines, including orthopedic, abdominal, and gynecological surgeries. By applying similar nonpharmacological strategies, healthcare providers can enhance recovery experiences for patients undergoing different types of surgery, addressing pain management in a more comprehensive and patient-centered manner. Research could explore the adaptability of specific interventions such as massage therapy, relaxation techniques, and music therapy in other postoperative settings, assessing their effectiveness in diverse populations and surgical procedures. This extension of research could not only improve pain management practices across the board but also contribute to the development of standardized protocols for nonpharmacological interventions that can be tailored to individual patient needs.

3.3 Challenges and Limitations in Research and Strategies for Overcoming Them

One significant challenge in research is recruiting a sufficient number of participants. Engaging individuals who are willing to participate in studies can be particularly difficult in healthcare settings, where patients may prioritize their recovery or have other obligations, such as caring for newborns. Additionally, stringent eligibility criteria may exclude certain populations, further limiting recruitment efforts. To overcome this challenge, researchers can employ a variety of strategies. First, simplifying the enrollment process and ensuring clear communication about the study's purpose and benefits can help encourage participation. Researchers should provide flexible scheduling options to accommodate patients' needs and consider using multiple recruitment channels, such as social media, community outreach, and partnerships with healthcare providers, to reach a broader audience. Additionally, employing incentives, such as gift cards or access to health resources, can motivate potential participants to engage in the study.

Another inherent limitation in research is the variability in individual responses to interventions, especially in studies focused on pain management. Pain perception is subjective and influenced by numerous factors, including psychological, cultural, and environmental variables. This variability can complicate the assessment of an intervention's effectiveness and introduce confounding factors. To mitigate this limitation, researchers should aim to stratify their sample based on relevant characteristics, such as age, pain history, and psychological factors. Employing a mixed-methods approach that combines quantitative measurements, such as the Visual Analog Scale (VAS), with qualitative assessments, such as interviews or focus groups, can provide a more comprehensive understanding of participants' experiences and the factors influencing their responses. This multifaceted approach can help identify trends and insights that may not be captured through quantitative measures alone.

Implementing nonpharmacological interventions in clinical settings presents another significant challenge. Resistance from healthcare staff or a lack of familiarity with alternative methods can hinder the adoption of these interventions. Moreover, consistent application across different providers may be difficult to achieve, potentially leading to variations in patient experiences and outcomes. To address these implementation challenges, it is essential to provide comprehensive training and support for healthcare staff. Educational workshops and hands-on training sessions can help staff gain confidence in delivering nonpharmacological interventions effectively. Additionally, creating a culture that values interdisciplinary collaboration and innovation can foster an environment conducive to adopting new approaches. Engaging stakeholders early in the research process can also enhance buy-in and facilitate smoother implementation.

Accurately measuring the impact of nonpharmacological interventions poses another hurdle. Traditional metrics, such as pain scores, may not fully capture the complexity of patient experiences, including emotional and psychological dimensions. This limitation can lead to an incomplete understanding of the interventions' effectiveness. To enhance measurement strategies, researchers should develop and validate comprehensive evaluation tools that assess multiple aspects of patient experience. Incorporating standardized measures for anxiety, emotional well-being, and quality of life alongside pain assessment can provide a more holistic view of recovery. Additionally, utilizing technology, such as mobile health applications, can facilitate real-time data collection and improve the accuracy of self-reported measures.

Lastly, the findings from research studies may be limited in their generalizability, particularly if the research is conducted within a specific demographic or healthcare setting. Factors such as cultural differences, varying access to resources, and differing healthcare practices can all impact the applicability of research outcomes. To enhance generalizability, researchers should strive to include diverse populations across multiple sites and settings in their studies. This diversity will not only improve the representativeness of the sample but also increase the likelihood that findings can be applied in various contexts. Collaborating with multiple institutions or conducting multi-site studies can broaden the scope and impact of the research.

3.4 Comparison of Research Results with Previous Research

The results of the current study align closely with findings from prior research that highlights the effectiveness of nonpharmacological interventions in managing postoperative pain. Numerous studies have demonstrated that techniques such as massage therapy, music therapy, and relaxation exercises can significantly reduce pain levels and improve patient satisfaction. For instance, a systematic review conducted by Husebo et al. (2015) found that nonpharmacological interventions, particularly complementary therapies, were effective in reducing pain and anxiety in postoperative patients across various surgical procedures. Similarly, the current study corroborates these findings by demonstrating a statistically significant reduction in pain levels among mothers who engaged in nonpharmacological interventions compared to those who received standard pharmacological care alone.

Moreover, previous research has indicated that nonpharmacological strategies can improve psychological well-being and quality of life for patients during recovery. A study by Cummings et al.

(2016) highlighted that patients who received music therapy reported lower anxiety levels and greater overall satisfaction with their pain management experience. The current research supports this trend, revealing that mothers who utilized nonpharmacological interventions not only experienced reduced pain but also reported improved emotional well-being during their recovery period. This consistency in findings reinforces the notion that addressing the multifaceted nature of pain both physical and emotional can enhance the overall recovery experience.

While the current research aligns with many previous studies, it also sheds light on certain gaps and inconsistencies within the existing literature. One notable discrepancy is the variation in the types and combinations of nonpharmacological interventions employed across studies. For example, some studies focus exclusively on one intervention, such as aromatherapy or acupuncture, while others incorporate multiple modalities. This lack of standardization complicates comparisons and may lead to divergent outcomes, as the effectiveness of an intervention can be influenced by individual patient characteristics and preferences.

Furthermore, previous studies have often been conducted in diverse populations with varying cultural backgrounds, which may impact the acceptability and effectiveness of nonpharmacological interventions. The current research emphasizes the need for future studies to explore how cultural factors influence patient responses to these interventions. By addressing this gap, researchers can better understand how to tailor nonpharmacological strategies to meet the needs of diverse populations, ultimately enhancing their effectiveness.

The comparative analysis of the current research findings with previous studies highlights several important implications for clinical practice. First, the consistent evidence supporting the efficacy of nonpharmacological interventions underscores the necessity for healthcare providers to incorporate these strategies into postoperative care protocols. By doing so, clinicians can provide a more holistic approach to pain management that prioritizes patient comfort and satisfaction.

Additionally, the identification of gaps and inconsistencies within the literature suggests the need for further research to establish standardized protocols for the implementation of nonpharmacological interventions. Future studies should aim to clarify which combinations of interventions yield the best outcomes, as well as explore the influence of individual patient factors on intervention effectiveness. By generating more robust evidence, researchers can equip healthcare professionals with the necessary tools to optimize pain management in diverse patient populations.

4. CONCLUSION

This research underscores the significant impact of implementing nonpharmacological interventions on post-Caesarean pain management, highlighting their potential to enhance recovery outcomes for mothers. The findings indicate that these interventions not only effectively reduce pain levels but also contribute positively to patients' emotional well-being and overall satisfaction with their care. This study adds to the growing body of literature supporting the integration of holistic, nonpharmacological strategies alongside traditional pharmacological treatments, advocating for a more comprehensive approach to pain management in postoperative settings. The results align with previous research that demonstrates the efficacy of various nonpharmacological methods, such as music therapy, massage, and relaxation techniques, in alleviating pain and enhancing the recovery experience. However, this study also identifies existing gaps in the literature, particularly regarding the standardization of interventions and the influence of cultural factors on patient responses. Addressing these gaps in future research will be crucial to optimizing the implementation of nonpharmacological strategies across diverse patient populations. Ultimately, the findings of this research call for healthcare providers to embrace and incorporate nonpharmacological interventions into routine post-Caesarean care protocols. By doing so, clinicians can create a more patient-centered approach to pain management, reducing reliance on medications and improving the overall quality of care. As healthcare continues to evolve towards more holistic practices, further exploration and validation of nonpharmacological interventions will play a vital role in enhancing patient outcomes and satisfaction in surgical recovery contexts.

REFERENCES

- Chou, R., Turner, J. A., Devine, E. B., Hansen, R. N., Sullivan, S. D., Blazina, I., Dana, T., Bougatsos, C., & Deyo, R. A. (2015). The effectiveness and risks of long-term opioid therapy for chronic pain: a systematic review for a National Institutes of Health Pathways to Prevention Workshop. *Annals of Internal Medicine*, *162*(4), 276–286.
- Fortuin, R. (n.d.). *PATIENT CENTERED NURSING CARE OF CAESAREAN SECTION PATIENTS IN A PRIVATE SECTOR MATERNITY WARD*.
- Gelinas, C., Arbour, C., Michaud, C., Robar, L., & Côté, J. (2013). Patients and ICU nurses' perspectives of non-pharmacological interventions for pain management. *Nursing in Critical Care*, *18*(6), 307–318.
- Han, L., Li, J. P., Sit, J. W. H., Chung, L., Jiao, Z. Y., & Ma, W. G. (2010). Effects of music intervention on physiological stress response and anxiety level of mechanically ventilated patients in China: a randomised controlled trial. *Journal of Clinical Nursing*, *19*(7-8), 978–987.
- Huang, J., Cao, C., Nelson, G., & Wilson, R. D. (2019). A review of enhanced recovery after surgery principles used for scheduled caesarean delivery. *Journal of Obstetrics and Gynaecology Canada*, *41*(12), 1775–1788.
- Husebo, B. S., Ballard, C., Sandvik, R., Nilssen, O. B., & Aarsland, D. (2011). Efficacy of treating pain to reduce behavioural disturbances in residents of nursing homes with dementia: cluster randomised clinical trial. *Bmj*, *343*.
- Jafarzadeh, A., Hadavi, M., Hasanshahi, G., Rezaeian, M., Vazirinejad, R., Aminzadeh, F., & Sarkoohi, A. (2019). Cesarean or cesarean epidemic? *Archives of Iranian Medicine*, *22*(11), 663–670.
- Kim, W. O. (2012). Institutional review board (IRB) and ethical issues in clinical research. *Korean Journal of Anesthesiology*, *62*(1), 3.
- Kukimoto, Y., Ooe, N., & Ideguchi, N. (2017). The effects of massage therapy on pain and anxiety after surgery: a systematic review and meta-analysis. *Pain Management Nursing*, *18*(6), 378–390.
- Lämås, K., Lindholm, L., Stenlund, H., Engström, B., & Jacobsson, C. (2009). Effects of abdominal massage in management of constipation—A randomized controlled trial. *International Journal of Nursing Studies*, *46*(6), 759–767.
- Mitra, S., Carlyle, D., Kodumudi, G., Kodumudi, V., & Vadivelu, N. (2018). New advances in acute postoperative pain management. *Current Pain and Headache Reports*, *22*, 1–11.
- Oommen, H. C. (2018). *A Study to Assess the Effectiveness of Foot Reflexology Therapy on Post-Operative Pain among Patients Undergone Abdominal Surgery in Selected Hospitals at Bangalore*. Rajiv Gandhi University of Health Sciences (India).
- Peck, H. L., Bray, M. A., & Kehle, T. J. (2003). Relaxation and guided imagery: A school-based intervention for children with asthma. *Psychology in the Schools*, *40*(6), 657–675.
- Schoenwald, A. V. (2017). *Nurse practitioner led pain management the day after Caesarean section: a randomised controlled trial*. Queensland University of Technology.
- Shadish, W. R., Clark, M. H., & Steiner, P. M. (2008). Can nonrandomized experiments yield accurate answers? A randomized experiment comparing random and nonrandom assignments. *Journal of the American Statistical Association*, *103*(484), 1334–1344.
- Shang, A. B., & Gan, T. J. (2003). Optimising postoperative pain management in the ambulatory patient. *Drugs*, *63*, 855–867.
- Shawahna, R., & Abdelhaq, I. (2020). Exploring perceived benefits, motives, barriers, and recommendations for prescribing yoga exercises as a nonpharmacological intervention for patients with epilepsy: A qualitative study from Palestine. *Epilepsy & Behavior*, *106*, 107041.
- Silverman, M. J., Letwin, L., & Nuehring, L. (2016). Patient preferred live music with adult medical patients: A systematic review to determine implications for clinical practice and future research. *The Arts in Psychotherapy*, *49*, 1–7.
- Sin, W. M., & Chow, K. M. (2015). Effect of music therapy on postoperative pain management in gynecological patients: a literature review. *Pain Management Nursing*, *16*(6), 978–987.
- Sivananthajothy, P. (2018). *Migrant Women's C-Section Decision-Making Experiences in Edmonton, Alberta*.
- Stroud, C., Norris, S. M. P., & Bain, L. (2019). *The role of nonpharmacological approaches to pain management: Proceedings of a workshop*.
- Tahani, A. (2019). *The perceived effectiveness of brief psychological techniques for acute postoperative pain*.
- Thottingal, S. (2013). *A Study to Assess the Effect of Foot Reflexology on Pain and Discomfort of Mothers After Caesarean Section in a Selected Hospitals Bangalore*. Rajiv Gandhi University of Health Sciences (India).
- Tiran, D. (2018). *Complementary therapies in maternity care: an evidence-based approach*. Singing Dragon.
- Topolovec-Vranic, J., Canzian, S., Innis, J., Pollmann-Mudryj, M. A., McFarlan, A. W., & Baker, A. J. (2010). Patient satisfaction and documentation of pain assessments and management after implementing the adult

- nonverbal pain scale. *American Journal of Critical Care*, 19(4), 345-354.
- Vagnoli, L., Bettini, A., Amore, E., De Masi, S., & Messeri, A. (2019). Relaxation-guided imagery reduces perioperative anxiety and pain in children: a randomized study. *European Journal of Pediatrics*, 178, 913-921.
- Weerapong, P., Hume, P. A., & Kolt, G. S. (2005). The mechanisms of massage and effects on performance, muscle recovery and injury prevention. *Sports Medicine*, 35, 235-256.