International Journal of Research in Medical Sciences
Setyaningrum RH et al. Int J Res Med Sci. 2024 Aug;12(8):2730-2734
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20241980

Original Research Article

The effect of guided imagery on pain levels in post-caesarean section patients

Rohmaningtyas H. Setyaningrum*, Arif Setyobudi, Debree Setiawan, Damar Upahita, Anisa Nindiasari

Department of Psychiatric Medicine, University of Sebelas Maret, Surakarta, Indonesia

Received: 25 June 2024
Revised: 15 July 2024
Accepted: 16 July 2024

***Correspondence:**
Dr. Rohmaningtyas H. Setyaningrum,
E-mail: astitdr@gmail.com

ABSTRACT

Background: Cesarean section is one form of surgical procedure involving incision of the abdominal and uterine walls, which poses a risk of postoperative pain. Pain is a common issue experienced by women after cesarean section, particularly within the first 48 hours. Uncontrolled pain can lead to physical and psychological complications such as postpartum depression and difficulties in infant care. Pain management may involve pharmacological therapy, but non-pharmacological alternatives such as relaxation therapy like guided imagery need to be explored, which can help reduce post-cesarean section pain.
Methods: This study is experimental, utilizing a randomized controlled trial pre-test and post-test control group double-blind design. The research was conducted from July to September 2022. A simple randomized sampling technique was employed, with a sample size of 32 post-cesarean section patients divided into two groups: the treatment group (guided imagery and standard therapy) consisting of 16 patients, and the control group (standard therapy) consisting of 16 patients.
Results: The study revealed a decrease in visual analogue score (VAS) scores by -2.875±0.619 with an effect size of 0.641 in the treatment group. The study had a significant impact with a p value of 0.000 ($p<0.05$).
Conclusions: Guided imagery is effective in reducing the pain level of post-cesarean section patients.

Keywords: Guided imagery, Pain, Post-cesarean section

INTRODUCTION

Caesarean section delivery is a surgical procedure in which the fetus is born through an incision in the abdominal and uterine walls, with the condition that the uterus remains intact and the fetal weight is above 500 grams.[1] Although caesarean section procedures can effectively prevent mortality and morbidity, they are associated with short-term and long-term health risks.[2] Caesarean section delivery can lead to complications, one of which is pain in the incision area due to tissue tearing in the abdominal and uterine walls, typically felt within 12 hours post-operation.[3] Pain is an unpleasant sensation, subjective to each individual.[4]

Postoperative pain is one of the most commonly reported issues in women after caesarean section.[5] Moderate to severe pain occurs in 77.4% to 100% of women in the first 48 hours post-operation.[6] Postoperative pain occurs due to activation of free nerve endings exposed during tissue discontinuity and a series of central sensitization processes involving various inflammatory mediators.

Caesarean section delivery generally results in higher pain levels, around 27.3%, compared to normal delivery, which ranges around 9%.[7] Pain can hinder a mother's ability to care for herself and her baby. Poorly managed pain may increase the risk of opioid use, postpartum depression, and chronic pain.[4]

Pain experienced by post-caesarean section patients can have several physical and psychological impacts such as loss of appetite, reduced activity, lactation problems, mobility disturbances, reluctance to care for the baby, and difficulty sleeping.[8]

Efforts to reduce pain levels can be done through pharmacological and non-pharmacological means. Pharmacological management of post-caesarean section pain typically involves analgesics up to opioids. However, opioid use can also lead to side effects such as tolerance and addiction, making pain relief not a straightforward solution.[9]

Therefore, non-pharmacological therapy is needed to assist patients in controlling short-term pain. One of the non-pharmacological therapies that can be used to address post-caesarean section pain is relaxation therapy like guided imagery. Guided imagery involves reducing pain by using specially designed imagery to achieve specific positive effects.[10] Hence, it is important to evaluate the effect of guided imagery on post-caesarean section pain to provide better and more effective interventions for patients. This study will focus on testing the effect of guided imagery intervention in reducing the level of post-caesarean section pain.

METHODS

Study design

This study employed an experimental design using a randomized controlled trial with a pre-test and post-test control group, conducted in a double-blind manner from July to September 2022. The independent variable in this study was guided imagery, while the dependent variable was the level of post-caesarean section pain.

Subject selection technique

Sampling for this study was conducted using simple randomized sampling. The inclusion criteria were patients who underwent elective caesarean section in the postpartum ward at RSUD Dr. Moewardi, Surakarta, and met the pain scale based on the visual analog scale (VAS) instrument, with a minimum score of ≥1 – 7 (mild to moderate pain). Exclusion criteria included patients diagnosed with severe mental disorders, dementia, and other cognitive impairments, those currently or previously undergoing long-term psychopharmacological treatment, individuals with sensory impairments, and those experiencing post-caesarean section surgical complications.

Research procedure

The sample size for this study was 32 participants, divided into 16 participants in the treatment group and 16 participants in the control group. In the treatment group, guided imagery was administered through audio recordings in two sessions, 24 hours and 48 hours after caesarean section. The patient's pain scale was measured using the VAS instrument.

Statistical analysis

The data obtained is tabulated and explained to find out differences between treatment groups (guided imagery and standard therapy) and control group (standard therapy), with paired test analysis if normal data distribution, and the Wilcoxon test if the data distribution is not normal. The difference is significant if $p<0.05$. All statistical analyzes use statistical package for the social sciences (SPSS) 25.0.

Ethics approval

This study has been declared ethically sound by the Chairman of the Health Research Ethics Commission of Dr. Moewardi General Hospital with Reference Number: 444/IV/HREC/2022 and research permission letter has been issued by the Director of Dr. Moewardi General Hospital.

RESULTS

Characteristics of subjects

The description of research subject characteristics based on age, parity, occupation, and education can be seen in Table 1.

Table 1: Characteristics of subject demographics.

Basic characteristics	Group (%)		P value
	Intervention	Control	
Age (years)[a]			
<35	10 (62.5)	12 (75)	0.446
>35	6 (37.5)	4 (25)	
Parity[a]			
Primipara	5 (31.2)	5 (31.2)	1.000
Multipara	11 (68.8)	11 (68.8)	
Occupation[a]			
Unemployed	11 (68.8)	12 (75)	1.000
Employed	5 (31.2)	4 (25)	
Education[a]			
Junior high school	3 (18.8)	3 (18.8)	1.000
Senior high school	10 (62.4)	9 (56.2)	
College/university	3 (18.8)	4 (25)	

The results of categorical data observations are described using frequency distribution (%). The results of numerical data observations are described using mean±SD, [a]group difference tests for unpaired categorical data using Chi-square test/Fisher exact test

Based on Table 1, it is known that the age of patients in the treatment and control groups is almost the same, where most patients in the treatment group are under 35 years old, accounting for 62.5% (10 respondents), while in the

control group, patients under 35 years old accounted for 75% (12 respondents). The statistical test result obtained a p value of 0.446 (p>0.05), indicating that there is no significant difference in the characteristics of research subjects based on age between the treatment and control groups.

Most of the patients had the category of multipara, with 68.8% (11 respondents) in the treatment group and 68.8% (11 respondents) in the control group. The statistical test result obtained a p value of 1.000 (p>0.05), indicating that there is no significant difference in the characteristics of research subjects based on parity between the treatment and control groups.

Most of the patients had the category of unemployed, with 68.8% (11 respondents) in the treatment group and 75% (12 respondents) in the control group. The statistical test result obtained a p value of 1.000 (p>0.05), indicating that there is no significant difference in the characteristics of research subjects based on occupation between the treatment and control groups.

Most of the patients had a high school education, with 62.4% (10 respondents) in the treatment group and 56.2% (9 respondents) in the control group. The statistical test result obtained a p value of 1.000 (p>0.05), indicating that there is no significant difference in the characteristics of research subjects based on education level between the treatment and control groups. Based on the description above, it can be concluded that the characteristics of research subjects are homogeneous.

Difference in VAS scores between the treatment and control groups

The results of the examination of VAS scores pre, post, and the post-pre difference in the treatment and control groups can be seen in Table 2.

Table 2: Difference in VAS scores between the treatment and control groups.

Group	VAS score		Z-score pre [a]*	Z-score post[a]*	Difference in VAS score	P value
	Pre	Post				
Intervention	6.625±1.087	3.750±0.683	-3.095	-3.624	-2.875±0.619	0.000[a]*
Control	6.250±1.238	5.312±0.946			-0.937±0.771	0.002[a]*
P value	0.402[b]	<0.001[b]*			<0.001[b]*	

The observations are described using mean±SD, [a]unpaired group difference tests did not meet normality assumptions (Wilcoxon test), [b]unpaired group mean difference test (Mann-Whitney test), *significant if test yields p<0.05

In the treatment group, the pretest VAS score had a mean of 6.625±1.087 and the post-test had a mean of 3.750±0.683. The difference in the post-pre VAS score change in the treatment group showed a significant average decrease of -2.875±0.619, with a statistically significant value of p=0.000 (p<0.05).

In the control group, the pretest VAS score had a mean of 6.250±1.238 and the post-test had a mean of 5.312±0.946. The difference in the post-pre VAS score change in the control group showed an average decrease of -0.937±0.771, which was statistically significant with a value of p=0.002 (p<0.05).

Based on the data above, the magnitude of the effect of guided imagery on reducing VAS values in the research subjects can be determined by calculating the effect size using the following formula given.

$$R = \frac{Z}{\sqrt{N}} = \frac{-3,624}{\sqrt{32}} = -0.641$$

In the calculation above, it is known that the effect size value of this study is 0.641, and based on the standard r value, an effect size >0.5 indicates a high impact. Thus, the provision of guided imagery treatment to post-caesarean section patients effectively reduces pain better than the control group receiving standard hospital therapy without guided imagery.

DISCUSSION

Characteristics of subjects

A total of 32 post-caesarean section patients were involved in this study, divided into two groups according to randomization: the treatment group with 16 subjects and the control group with 16 subjects.

The baseline characteristics data in both groups had p values >0.05, indicating that the baseline characteristics of the subjects in both research groups had p values >0.05. Therefore, it can be concluded that the subject characteristics in this study were statistically homogeneous. The data above show that the age experiencing pain was almost the same, with most patients in both groups being <35 years old. This result is consistent with a study conducted in Karbala, which found that younger patients (15-19 years old) who chose caesarean section had more post-caesarean section pain. Older patients reported lower pain intensity than younger ones.[11]

The baseline characteristic of parity in the research subjects between the treatment and control groups had approximately the same value in multiparous women, at 68.8%. This result is similar to a study conducted in Ethiopia, which found that mothers with a history of multiparity (delivering >3 children) had a higher intensity of pain.[12] This phenomenon occurs due to a history of previous surgery, which can increase sensitivity to patient pain. Additionally, scar tissue caused by previous surgery also increases difficulty during procedures, ultimately prolonging the duration of surgery. Therefore, multiparous mothers undergoing repeated caesarean section deliveries have a higher risk of inadequate postoperative pain treatment.[13]

The majority of subjects in this study, both in the treatment and control groups, were unemployed, with approximately the same value, but slightly higher in the control group at 75%. This study is similar to one conducted in Iran, which showed a significant relationship between post-caesarean section pain and low economic status.[14]

The educational characteristics of the research subjects were dominated by high school education, with approximately 62.4% in the treatment group and 56.2% in the control group. This education level falls under secondary education. Women with higher education levels are associated with a preference for caesarean section delivery. This is related to better knowledge about caesarean section delivery.[15] Another study in Brazil stated that women with higher education levels have significantly higher preferences for caesarean section delivery.[16]

The effect of guided imagery on post-caesarean section pain levels

The mean VAS pretest score in the treatment group was 6.625±1.087, while in the control group, it was 6.250±1.238. The mean VAS score in both groups indicated moderate pain levels. The occurrence of pain in post-caesarean section patients is a complex relationship involving factors such as inflammation during caesarean section, as well as social and psychological factors faced by each patient.

The mean VAS score in the treatment group after receiving guided imagery decreased to 3.750±0.683, and this decrease in VAS score was significant with p=0.000. The VAS score in the control group, which only received standard hospital therapy without guided imagery, decreased to 5.312±0.946, with a p value of 0.002. The change between the two groups showed that in the treatment group, patients experienced an average decrease of -2.875±0.619, while in the control group, there was a decrease of -0.937±0.771.

This study is consistent with the findings of Nurhayati et al that guided imagery therapy provided to post-caesarean section mothers within the first hour for 15-20 minutes resulted in a decrease in pain levels, tension, and fear, as well as an increase in endorphin hormone levels naturally.[17] The calm, comfortable, and relaxed condition of patients will lead to an increase in endorphin hormones that inhibit pain impulse transmission along sensory nerves.[17]

According to the study conducted by Beevi et al, there was a decrease in pain levels in postpartum patients after relaxation intervention compared to the control group.[18] Another study conducted in Iran showed that relaxation therapy had an effect on reducing pain in elective caesarean section patients.[19] Guided audio relaxation techniques conducted in India also showed a significant effect in reducing stress and pain in postpartum mothers, as well as increasing breast milk production.[20]

Relaxation therapy is believed to help reduce postoperative pain by providing suggestions in the form of positive commands so that patients in their subconscious will act in accordance with these sentences.[21] Through the relaxation process, patients are brought into a more relaxed condition so that the autonomic nervous system will be calmer, and positive emotions induction will affect the coping mechanism of patients towards pain perception.[22]

Positive emotion induction in relaxation therapy is known to reduce negative experiences that can trigger stress, increase norepinephrine production, decrease ROS production, increase tryptophan levels, and stimulate the paraventricular nucleus to secrete oxytocin which will work on the dopamine system that plays a role in pain modulation.[23,24]

Limitations

The location where guided imagery was conducted was inadequate, as the room was still unable to overcome the sounds that could still be heard and the seating position was still uncomfortable during the intervention. Therefore, it could introduce bias into the study.

In the future, it is hoped that the location and atmosphere for the intervention will be more adequate and consideration will be given to selecting appropriate venues. This study also did not specifically consider the number of parities, same age, similarity of drugs given by the hospital, and the coping mechanisms of patients in facing stressors, so further research is needed to consider these factors.

CONCLUSION

Based on the results of this study, it can be concluded that guided imagery is effective in reducing the level of pain in post-caesarean section patients.

ACKNOWLEDGEMENTS

The authors would like to thank the Department of Psychiatry and the Department of Obstetrics Gynecology

Medicine, Faculty of Medicine, Universitas Sebelas Maret.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Prawirohardjo S. Pelayanan Kesehatan Maternal dan Neonatal. Edisi 5. Jakarta: PT Bina Pustaka Sarwono Prawirohardjo.2019.
2. Sandall J, Tribe RM, Avery L, Mola G, Visser GH, Homer CS, et al. Short-Term and Long-Term Effects of Caesarean Section on the Health of Women and Children. Lancet. 2018;392(10155):1349-75.
3. Tahapary W, Nursanti I, Widagdo G. Efek Pemberian Paket Kasih terhadap Keberlanjutan Bounding Attachment pada Ibu Post Sectio Caesarea. J Telenurs. 2022;4(1):78-83.
4. Raja SN, Carr DB, Cohen M, Finnerup NB, Flor H, Gibson S. The Revised IASP Definition of Pain: Concepts, Challenges and Compromises. Pain. 2020;161(9):1967-82.
5. ACOG. Committee Opinion No. 742: Postpartum Pain Management. Obstet Gynecol. 2018;132(1):e35-e43.
6. Jasim HH, Sulaiman, SA, Khan AH, Dawood OT, Abdulameer AH, Usha R. Incidence and Risk Factors of Surgical Site Infection Among Patients Undergoing Cesarean Section. Clin Med Insight Therap. 2017;9:1-7.
7. Yanti D, Kristiana E. Efektifitas Relaksasi Teknik Benson Terhadap Penurunan Intensitas Nyeri Ibu Post Seksio Sesarea. Conference Innov Appl Sci Technol. 2019;2(1):177-84.
8. Marta OF, Nurhaliza S, Aini N, Setyowati L, Mashfufa W, Ariani TA. Pain Experience After Caesarean Section: A Qualitative Study. Int Conference Med Health. 2022;719-29.
9. Dowell D, Ragan KR, Jones CM, Baldwin GT, Chou R. Prescribing Opioids for Pain – The New CDC Clinical Practice Guideline. N Engl J Med. 2022;387:2011-3.
10. Febtrina R, Febriana W. Guided Imagery Relaxation Techniques Reduce Patient's Pain Post Attack Heart. Nurs Curr. 2019;5(2):41.
11. Cruz JJ, Kather A, Nicolaus K, Rengsberger M, Mothes AR, Schleussner E, et al. Acute Postoperative Pain In 23 Procedures of Gynaecological Surgery Analysed in A Prospective Open Registry Study On Risk Factors And Consequences For The Patient. Scientif Rep. 2021;11(1):1-10.
12. Demelash G, Berhe YW, Gebregzi AH, Chekol WB. Prevalence and Factors Associated with Postoperative Pain After Caserean Section at a Comprehensive Specialized Hospital in Northwest Ethiopia: Prospective Observational Study. Open Access Surg. 2022;15:1-8.
13. Yang G, Bao X, Peng J, Li J, Yan G, Jing S, et al. Repeated Caserean Delivery Predicted a Higher Risk of Inadequate Analgesia Than Primary Cesarean Delivery: A Retrospective Study with Propensity Score Match Analysis. J Pain Res. 2022;13:555-63.
14. Zeinab H. Relationship between demographic characteristics, stress and anxiety before and after cesarean section in pregnant women. J Med Dent Sci Res. 2021;8(4):43-8.
15. Shirzard M, Shakibazadeh E, Hajimiri K, Betran A, Jahanfar S, Bohren MA, et al. Prevalence of and Reasons for Women's, Family member's and Health Professional's Preference for Cesarean Section in Iran: A Mixed-Methods Systematic Review. Reprod Health. 2021;18:3.
16. Begum, Tahmina. Indications and determinants of caesarean section delivery: Evidence from a population-based study in Matlab, Bangladesh. PloS One. 2017;12(11):e0188074.
17. Nurhayati N, Songwathana P, Vachprasit R. Surgical patients' experiences of readiness for hospital discharge and perceived quality of discharge teaching in acute care hospitals. J Clin Nurs. 2019;28(9-10):1728-36.
18. Beevi Z, Low WY, Hassan J. The Effectiveness of Hypnosis Intervention in Alleviating Postpartum Psychological Symptoms. Am J Clin Hypnosis. 2019;61(4):409-25.
19. Nazarinasab M, Motamedfar A, Najafian M, Tabibi H. Investigating the effects of relaxation therapy on decreasing anxiety in patients with elective caesarean section in Imam Khomeini Hospital, Ahvaz, Iran during 2016. Med Stud. 2018;34(2):107-11.
20. Dabas S, Joshi P, Agarwal R, Yadav RK, Kachhawa G. Impact of audio assisted relaxation technique on stress, anxiety and milk output among postpartum mothers of hospitalized neonates: A randomized controlled trial. J Neonat Nurs. 2019;25(4):200-4.
21. Kendrick T, El-Gohary, Stuart B, Gilbody S, Churchill R, Aiken L, et al. Routine use of patient reported outcome measures (PROMs) for improving treatment of common mental health disorders in adults. Cochrane Database Syst Rev. 2016;7(7):CD011119.
22. Vambheim SM, Kyllo TM, Hegland S, Bystad M. Relaxation Techniques as an Intervention for Chronic Pain: A Systematic Review of Randomized Controlled Trials. Heliyon. 2021;e07837.
23. Sanders T, Foster NE, Bishop A, Ong BN. Biopsychosocial care and the physiotherapy encounter: physiotherapists' accounts of back pain consultations. BMC Musculoskeletal Disord. 2014;4:65.
24. Schaffer V, Cogan J. Patient therapeutic education: placing the patient at the centre of the WHO analgesic ladder. Canad Fam Physician. 2014;60(3):235-41.

Cite this article as: Setyaningrum RH, Setyobudi A, Setiawan D, Upahita D, Nindiasari A. The effect of guided imagery on pain levels in post-caesarean section patients. Int J Res Med Sci 2024;12:2730-4.