
THE EFFECT OF LAVENDER AROMATHERAPY ON PAIN LEVELS IN *POST-OPERATIVE* PATIENTS *CAESAREAN SECTION* IN THE MUHAMMAD SANI HOSPITAL 2024

Andriani¹, Ana Faizah² dan Ratna Dewi Silalahi³

andriani121282@gmail.com¹, anafaizah@univbatam.ac.id², ratnadewi841@univbatam.ac.id³

^{1,2,3} Program Studi Ilmu Keperawatan, Fakultas Ilmu Kesehatan, Universitas Batam
Kepulauan Riau, Batam 29464, Indonesia.

*Corresponding Author :

Andriani

E-mail : andriani121282@gmail.com

Abstract

Operational action *Caesarean section* This can cause pain in the mother and there can be changes in tissue continuity due to surgery. The mother will feel pain when the effects of spinal anesthesia begin to wear off after 6-8 hours post-surgery. Having pain problems can cause problems with lactation. To prevent this, interventions are needed to reduce pain, one of which is using lavender aromatherapy. The aim of this research is to determine the effect of lavender aromatherapy on pain levels in post-operative patients *caesarean section* in the obstetrics inpatient ward at Muhammad Sani Hospital, Karimun Regency in 2024. The research design uses *Quasi Experimental Design* with *One Group Pretest-Posttest Design*. The intervention is given by dripping 3 drops of lavender aromatherapy onto a tissue, then inhaling it at a distance of approximately 10 cm from the nose for 15 minutes and the intervention is given after 8 hours post spinal anesthesia, then carry out the therapy according to the doctor's instructions. The sample in this study consisted of 35 mothers *after caesarean section*. The results of the study showed the average pain scale in post-operative mothers *caesarean section* before being given lavender aromatherapy it was 4.97 and after it was 2.6. Analysis results using *Wilcoxon Signed Ranks Test* It is known that there is a difference in the level of pain before and after giving lavender aromatherapy (*p value* = 0,000).

Keywords : Painful, *After Caesarean Section*, Aromatherapy Lavender

PENGARUH AROMATERAPI LAVENDER TERHADAP TINGKAT NYERI PADA PASIEN *POST OPERASI SECTIO CAESAREA* DIRUANG RAWAT INAP KEBIDANAN RSUD MUHAMMAD SANI KABUPATEN KARIMUN TAHUN 2024

Adriani¹, Ana Faizah² and Ratna Dewi Silalahi³

andriani121282@gmail.com¹, anafaizah@univbatam.ac.id², ratnadewi841@univbatam.ac.id³
^{1,2,3} Nursing Science Study Program, Faculty of Health Sciences, Batam University
Riau Islands, Batam 29464, Indonesia.

**Corresponding Author :*

Andriani

Email: andriani@gmail.com

Abstrak

Tindakan operasi *Sectio Caesarea* ini dapat menyebabkan rasa nyeri pada ibu dan dapat terjadi perubahan pada kontinuitas jaringan diakibatkan adanya pembedahan. Nyeri akan dirasakan oleh ibu ketika efek anastesi spinal mulai hilang setelah 6-8 jam post operasi. Dengan adanya masalah nyeri dapat menimbulkan masalah pada laktasi. Untuk mencegah hal tersebut maka diperlukan intervensi yang dapat dilakukan untuk mengurangi nyeri salah satunya menggunakan aromaterapi lavender. Tujuan dari penelitian ini yaitu untuk mengetahui pengaruh aromaterapi lavender terhadap tingkat nyeri pada pasien post operasi *sectio caesarea* diruang rawat inap kebidanan RSUD Muhammad Sani Kabupaten Karimun Tahun 2024. Desain penelitian menggunakan *Quasi Experimental Design* dengan *One Group Pretest-Posttest Design*. Intervensi diberikan dengan cara meneteskan 3 tetes aromaterapi lavender ke tisu, kemudian dihirup dengan jarak lebih kurang 10 cm dari hidung selama 15 menit dan intervensi diberikan setelah 8 jam post spinal anastesi, selanjutnya lakukan terapi sesuai instruksi dokter. Sampel dalam penelitian ini berjumlah 35 ibu *post sectio caesarea*. Hasil penelitian menunjukkan rata-rata skala nyeri pada ibu post operasi *sectio caesarea* sebelum diberikan aromaterapi lavender sebesar 4,97 dan sesudah sebesar 2,6. Hasil analisis menggunakan *Wilcoxon Signed Ranks Test* diketahui terdapat perbedaan tingkat nyeri sebelum dan sesudah diberikannya aromaterapi lavender ($p\text{ value} = 0,000$).

Kata Kunci : Nyeri, *Post Sectio Caesarea*, Aromaterapi Lavender

Introduction

Childbirth is a process of expelling viable products of conception (fetus) into the world outside the womb through the birth canal or other means (Diana et al., 2019). Sectio caesaria is a surgery to deliver the fetus through an incision in the abdominal wall and uterus of artificial labor, so that the fetus is born through the abdomen and abdominal wall and uterine wall so that the child is born intact and healthy (Harnawati, 2008 and A. Faizah, et al., 2017).

Wijayanti et al., (2022) stated that the types of labor are divided into three, including spontaneous labor, recommended labor and artificial labor. Labor *Caesarean section* is a type of artificial birth that is carried out using a surgical procedure through an incision in the abdominal wall and uterine wall to remove the fetus with the aim of saving and maintaining the life of the mother and fetus (Sumelung et al., 2014).

Over the years, the operating rate *Caesarean section* global operations have increased significantly from around 7% in 1990 to 21% in 2021, surpassing operating levels *Caesarean section*. The acceptable ideal is around 10%–15%. This increase is expected to continue to increase in the future, with almost a third (29%) of all births likely to occur via caesarean section by 2030 (World Health Organization, 2021). Based on 2018 RISKESDAS data, the number of deliveries by method *Caesarean section* in Indonesia it is 17.6% (Indonesian Ministry of Health, 2021). According to data obtained by researchers at Muhammad Sani Regional Hospital in 2023, data on the number of ob-gyn cases requiring surgery in the operating room was 1452 patients, of which 821 patients underwent surgery. *Caesarean section*.

Meanwhile, in the last 3 months of data obtained from March to May 2024, there were 251 cases, 171 of which were delivered using the birth method. *Caesarean section*. Based on studies conducted by operations researchers *Caesarean section*. This was done because patients with ob-gyn cases at Muhammad Sani Regional Hospital experienced abnormalities or complications during the delivery process such as pre-eclampsia, eclampsia, cephalopelvic disproportion, latitude, premature rupture of membranes and others.

Operational action *Caesarean section*. This can cause pain in the mother and there can be changes in tissue continuity due to surgery. One of the anesthetic techniques that is often used in surgery *Caesarean section* is spinal anesthesia (Wardhana et al., 2022). The mother will feel pain when the effects of spinal anesthesia begin to wear off after 6-8 hours post-surgery and the pain response will usually be felt after 12 hours (Karyati et al., 2019). With this surgery, there are problems that arise, namely causing pain, because pain can cause problems with lactation (Tirtawati et al., 2020).

Many mothers complain of pain at the stitches *Caesarean section*. This complaint is actually normal because the body is injured and the healing process is not complete. The pain experienced by post-operative patients is acute and must be treated immediately. Pain management strategies include both pharmacological and non-pharmacological approaches. All interventions will be most successful if carried out before the pain becomes more severe and success is often achieved if several interventions are applied simultaneously (Nurhayati et al., 2020).

There are two ways to deal with pain, namely pharmacological and non-pharmacological, to deal with pain pharmacologically, it can be done by administering analgesic drugs and to deal with pain using non-pharmacological means, it can be done by giving aromatherapy to reduce the pain (Tirtawati et al. , 2020). Aromatherapy is a complementary therapy in nursing practice and uses essential oils from fragrant plants to reduce health problems and improve quality of life. When aromatherapy is inhaled, the active substances contained in it will stimulate the hypothalamus (pituitary gland) to release endorphin hormones. Endorphins are known as substances that cause feelings of calm, relaxation and happiness (Widayani in Collin & Maydinar, 2021).

One of the aromatherapy that can be given is lavender aromatherapy. The working mechanism of this aromatherapy is able to provide a pain relieving, relaxing and comfortable effect on the body because lavender aromatherapy contains linalyl acetate and linalool (C₁₀H₁₈O) where linalyl acetate functions to loosen the working system of nervous muscles which are in a tense condition and linalool has benefits as a relaxing and sedative effect. , resulting in the benefit of reducing post pain *Caesarean section*. Providing lavender aromatherapy via lavender essential oil dripped on a tissue can reduce pain, this is because when lavender aromatherapy is inhaled through the olfactory organ it then stimulates the hypothalamus in the brain stem so that it does not react too strongly to the stressor it receives. So Lavender aromatherapy stimulates the thalamus to release enkephalin (Dwijayanti in Rahmayani & Machmudah, 2022).

Lavender aromatherapy provides a feeling of calm, happiness, relaxation and can relax tense muscles due to the pain that arises, then the pain that arises in postpartum mothers will decrease slowly (Azizah et al., 2020). In research conducted by Yustika (2023), the results showed that the level of pain in patients who were given lavender aromatherapy intervention decreased significantly compared to patients who were given deep breathing relaxation techniques.

The advantages of lavender aromatherapy compared to other types of aromatherapy are that it is safe to use, easy to find, economical, doesn't take a long time. In research conducted by Anjelia (2021) and Prasetyo & Susilo (2020), the pain felt in post-operative patients *Caesarean section* After being given lavender aromatherapy, it had an effect on reducing pain levels in post-patients *Caesarean section*. Providing lavender aromatherapy is done by dripping 2-3 drops of lavender essential oil on a tissue and then inhaling it to the respondent at a distance of approximately 10 cm from the nose for 15 minutes.

The results of research conducted by Dey et al. (2023) which aims to determine the effect of lavender aromatherapy on pain in post-caesarean section mothers at Grandmed Lubuk Pakam Hospital. Based on statistical tests with the help of SPSS based on the Paired Sample T-test statistical test, a p value of 0.000 was obtained, which means that there is an influence of lavender aromatherapy on the intensity of post caesarean section pain at Grandmed Lubuk Pakam Hospital.

Based on ob-gyn patient data obtained by researchers from March to May 2024 in the Muhammad Sani Hospital Operating Room, data was

obtained for 171 patients. *Caesarean section* with a monthly average of around 57 patients per month. Based on the results of the researcher's interview with the head of the room, it was found that the head of the room said that the efforts made to reduce pain in patients had been carried out in accordance with the SOP but there had never been any other activities for post-operative pain management. *Caesarean section* who use non-pharmacological techniques other than deep breathing relaxation techniques.

Based on the results of researchers' interviews with 10 post patients *Caesarean section* 7 patients showed severe pain and 3 showed moderate pain. Among the 7 patients who experienced severe pain, they said it was still difficult to adapt to the pain and hoped that there would be analgesic medication to reduce the pain they experienced.

Based on the results of interviews with operating room nurses, it was stated that efforts had been made to help patients overcome the pain they were experiencing, such as using therapeutic communication techniques and teaching deep breathing techniques. The use of lavender aromatherapy is still rarely used because not many nurses know about lavender aromatherapy to control post-pain *Caesarean section*.

Research methods

Research result

The experimental research method that will be used is research design *Quasi Experimental Design* with shape *One Group Pretest-Posttest Design* is the nature of research about how cause and effect relationships exist without control. The samples in this study were patients *post caesarean section* in the obstetrics inpatient room at Muhammad Sani Hospital, a total of 35 respondents were taken using techniques *purposive* sampling by establishing inclusion and exclusion criteria. The research was carried out in July 2024 at Muhammad Sani Regional Hospital.

Data collection tools or research data collection instruments are the necessary tools used to collect information. so that it can be trusted, correct and scientifically accountable (Sahir, 2021). A This research data collection tool uses an observation sheet containing the patient's initials and the results of observations of pain levels before and after administering lavender aromatherapy. To observe the level of pain in this study, an observation sheet was used *Nuemic Rating Scale* (NRS). The use of NRS is relatively easy to understand, making it easier for examiners to teach patients about using it. An observation sheet that includes the NRS is used to measure pain *after caesarean section* subjectively.

Data were collected and analyzed statistically using univariate and bivariate analysis using tests *Wilcoxon Signed Ranks Test*.

Table 1
Description of Pain Levels Before Giving Lavender Aromatherapy

Pain Level Variables	N	Mean	SD
Pre Test Pain Level	35	4,97	0,78

Based on the table above, the results show the average level of pain before being given lavender aromatherapy with a sample size of 35. The value obtained *mean* amounted to 4.97 which is the level of pain in the moderate and SD categories (*standard deviation*) is 0.78, which means the standard deviation/measure of the general distribution of data in a sample to see how far or how close the data value is to the average.

Table 2
Description of Pain Levels After Being Given Lavender Aromatherapy

Pain Level Variables	N	Mean	SD
Post Test Pain Level	35	2,6	0,88

Based on the table above, the results show the average level of pain before being given lavender aromatherapy with a sample size of 35. The value obtained *mean* of 2.6 which is the level of pain in the mild category and SD (*standard deviation*) is 0.88, which means the standard deviation/measure of the general distribution of data in a sample to see how far or how close the data value is to the average.

Table 3
The Effect of Lavender Aromatherapy on Pain Levels in Patients *Post Operation* Caesarean section At Muhammad Sani Regional Hospital in 2024

Pain Level	Mean	Min-Max	SD	Mean Difference	P Value
Pre Test	4,97	3 – 6	0,78	2,37	0,000
Post Test	2,6	1 – 4	0,88		

Based on the table above, it can be seen that there is a decrease in the average pain level score in the initial measurement of 4.97 and the final measurement of 2.6 so the difference is (*mean difference*) of 2.37, which means there was a decrease in the average pain level score after being given lavender aromatherapy. In the test *Wilcoxon Signed Rank Test* The results showed that the significance of 0.000 was smaller than 0.05, so it could be stated that there was a difference in pain levels before and after lavender aromatherapy was given. .

Discussion

a. Pain Level *Post Caesarean section* Before being given Lavender Aromatherapy at Muhammad Sani Regional Hospital in 2024

Based on univariate analysis before the lavender aromatherapy intervention was carried out, data on the average value of pain level before lavender aromatherapy was given with a sample size of 35 was

obtained. *mean* amounted to 4.97 which is the level of pain in the moderate and SD categories (*standard deviation*) of 0.78.

The mother will feel pain when the effects of spinal anesthesia begin to wear off after 6-8 hours *post* surgery and a pain response will usually be felt after 12 hours (Karyati et al., 2019). With this surgery, there are problems that arise, namely pain, because pain occurs, it has the potential to cause

other problems such as lactation (Tirtawati et al., 2020).

In accordance with research conducted by Dey et al. (2023) shows that pain intensity *after caesarean section* before intervention was given, it was 4.18, namely in the moderate category. In line with research conducted by Endarwati et al. (2024) where the patient *after caesarean section* the majority experienced pain at a moderate level, namely 76.7%.

According to researchers pain levels *after caesarean section* in the moderate pain category before being given lavender aromatherapy was in the significant range but could be reduced. According to researchers, patients who recently underwent *caesarean section* usually experience moderate pain caused by the surgical wound and the ongoing healing process. This level of pain is estimated to be sufficient to interfere with daily activities and patient comfort, but is still within the limits that can be tolerated with non-pharmacological interventions.

Caesarean section is a surgery performed to deliver a fetus by opening the abdominal wall and uterine wall to deliver the fetus from inside the womb (Sartika, 2023). Action *Caesarean section* This can cause pain in the mother and there can be changes in tissue continuity due to surgery. One of the anesthetic techniques that is often used in surgery *Caesarean section* is spinal anesthesia (Wardhana et al., 2022).

The form of pain that often appears in patients *post Caesarean section* namely acute pain, *International Assosiation For The Study Of Pain* (IASP) states that pain is a sensory and emotional experience that gives a feeling of

discomfort that is closely related to actual or potential tissue damage that can be felt, such as damage. Measuring pain using a facial scale is done by paying attention to the patient's facial expression or facial expression at the time. pain is felt, this method is applied to patients who cannot express their pain on a numerical scale (Tirtawati et al., 2020).

The impact of pain caused by *caesarean section* will last for the first 24 hours, this occurs because the body has not been able to adjust to the pain response (Kuswandari & Afsah, 2016). Many mothers complain of pain at the stitches *Caesarean section*. This complaint is actually normal because the body is injured and the healing process is not complete. The pain experienced by post-operative patients is acute and must be treated immediately. Pain management strategies include both pharmacological and non-pharmacological approaches. All interventions will be most successful if carried out before the pain becomes more severe and success is often achieved if several interventions are implemented simultaneously (Nurhayati et al., 2020).

b. Pain Level *Post Caesarean section* After being given Lavender Aromatherapy at Muhammad Sani Regional Hospital in 2024

After the intervention of giving lavender aromatherapy, data on the average value of pain level before being given lavender aromatherapy was obtained with a sample size of 35. *mean* of 2.6 which is the level of pain in the mild category and SD (*standard deviation*) of 0.88. There

are two ways to deal with pain, namely pharmacological and non-pharmacological, to deal with pain pharmacologically, it can be done by administering analgesic drugs and to deal with pain using non-pharmacological means, it can be done by giving aromatherapy to reduce the pain (Tirtawati, Purwandari, & Yusuf, 2020). So apart from the pharmacological treatment that mothers receive, non-pharmacological treatment can be an effort for mothers to reduce their pain levels.

Non-pharmacological therapy such as aromatherapy is an alternative that can be used to reduce pain in mothers *after cesarean section*. Aromatherapy is a therapy that uses essential oils which can improve *hormone endorphin* so that the body relaxes which indirectly helps and maintains physical and mental health (Dey et al., 2023).

Based on research data, the results showed that the difference in pain levels before and after lavender aromatherapy was given was 2.37. In accordance with research conducted by Dey et al. (2023) shows that pain intensity *after cesarean section* after being given the intervention, it was 1.19, namely in the mild category.

According to researchers, patients before being given lavender aromatherapy generally report pain in the moderate category, then after being given lavender aromatherapy, it is assumed that there is a decrease in pain intensity, which is indicated by a shift in the pain category from moderate to mild. The calming effects of lavender aromatherapy are believed to help in reducing the perception of pain and provide additional comfort to the patient,

thereby improving post-operative well-being.

The mechanism of lavender aromatherapy occurs through the olfactory system. By inhaling lavender aromatherapy, it will increase alpha waves in the brain which helps to create a relaxed state. Lavender essential oil can reduce anxiety. Lavender can provide calm, balance, a sense of comfort, a sense of openness and confidence. The active substance is: *linalool* and *linalyl acetate* contained in lavender has an analgesic effect (Fatmawati & Fauziah, 2018).

Smells have a direct effect on the brain like analgesics. When aromatherapy is inhaled, the active substances contained in it will stimulate the hypothalamus (pituitary gland) to release *hormones endorphin*. *Endorphin* known as a substance that creates a sense of calm, relaxation, and happiness (Astuti & Aini, 2020).

c. The Effect of Lavender Aromatherapy on Pain After Cesarean Section

Based on the research results, it is known that there is a decrease in the average pain level score at the initial measurement of 4.97 and at the final measurement of 2.6, so the difference is (*mean difference*) of 2.37, which means there was a decrease in the average pain level score after being given lavender aromatherapy. In the test *Wilcoxon Signed Rank Test* The results showed that the significance of 0.000 was smaller than 0.05, so it could be stated that there was a difference in pain levels before and after lavender aromatherapy was given.

The research results are in line with research conducted by Prasetyo & Susilo (2020) where the research results show that the p value is smaller than α ($0.021 < 0.05$), so it can be concluded that there is an effect of giving lavender aromatherapy to change the scale of maternal wound pain. *post caesarean section*.

According to researchers, there is an effect of lavender aromatherapy on pain levels where there are active components in lavender, such as *linalool* and *linalyl acetate*, has analgesic and relaxant properties that have psychological and physiological effects that work synergistically to create an effective analgesic effect that can help relieve physical pain. The use of lavender aromatherapy can stimulate the central nervous system, reduce the perception of pain, and increase relaxation, resulting in a significant reduction in the level of pain felt by research subjects.

According to Prasetyo & Susilo (2020) the main lavender oil content *linalyl acetate* and *linalool* can lower, loosen and relax tension. If aromatherapy oil enters the nasal cavity through direct inhalation, it will work faster because of the oil molecules *essential* easily evaporated by *hypothalamus* because the aroma is processed and converted by the body into an action by releasing neurochemical substances in the form of substances *endorphin* and *serotonin* so that it has a direct effect on the olfactory organ and is operated by the brain to provide reactions that create physiological changes in the body, soul, mind, and produce a calming

effect on the body (Prasetyo & Susilo, 2020).

The results of the research are similar to research conducted by Herlyssa, et al (2018) with the title "Lavender Aromatherapy *Essential Oils* Dominant Influence on the 24 Hour Pain Scale *After Caesarean Section*". The design of this research is quasi-experimental with *pretest-post test design* with a control group with a sample of 68 respondents who were divided into an intervention group (34 respondents) and a control group (34 respondents). Test the difference between two means between groups using the test *T test*. Based on test results using *uji t* pairs, in the intervention group, were obtained *p-value* of 0.000 ($p < 0.05$). From the results of this test, it was proven that giving lavender aromatherapy was proven to be able to reduce pain *after Caesarean section* significantly.

According to Anjelia (2020) the mother's pain level *Post Sectio Caesarea* after being given Lavender *Essential Oil* reduced because this technique relaxes the mother. Inhaling fragrant essential oils through the nose can cause psychological and physiological changes in humans. Lavender essential oil increases alpha waves in the brain and these waves can help to create a relaxed state.

Inhaling lavender aromatherapy also stimulates the production of *endorphin* which produces analgesia by binding to *receptor opioid* on pre- and post-synaptic nerve terminals, primarily exerting its effects through presynaptic binding. When bound, a series of interactions results in inhibition of the release of tachykinin, specifically substance P,

a key protein involved in pain transmission. In the central nervous system, opioid receptors are found throughout the peripheral nerves and have been identified in the central terminals *primary afferent neurons*, nerve fibers *peripheral sensory*, and *dorsal root ganglia* (Sprouse-Blum et al., 2010).

The aroma that is inhaled has a direct effect on the human brain. Aromatherapy that is used through inhalation or inhalation will enter the limbic system where the aroma will be processed so that we can smell it. When we inhale an aroma, its chemical components enter the body *bulbus olfactory*, then to *limbic* system in the brain. This will stimulate memory and emotional responses. *Hypothalamus* acts as a relay and regulator, generating messages that must be received and then converted into actions in the form of the release of electrochemical compounds in the form of endorphins and serotonin, so that they have a direct effect on the olfactory organ and are perceived by the brain to provide reactions that create physiological changes in the body, mind, soul, and produces a calming effect on the body so that it can reduce pain (Anwar et al., 2018).

Conclusion

Based on the results of the research discussion entitled "The Effect of Lavender Aromatherapy on Pain Levels in Patients *Post Operation Caesarean section* At Muhammad Sani Regional Hospital in 2024, several conclusions were drawn:

- a. Average level of pain before giving lavender aromatherapy to patients *post operation caesarean section* at Muhammad Sani Hospital is 4.97.

- b. Average level of pain after giving lavender aromatherapy to patients *post operation caesarean section* at Muhammad Sani Regional Hospital is 2.6.
- c. There is a significant effect of lavender aromatherapy on pain levels in patients *after caesarean section* at Muhammad Sani Regional Hospital in 2024.

Suggestion

Based on the conclusions above, the author can put forward the following suggestions

- a. For Post Partum Mothers
In post partum mothers, both normal and vaginal births *caesarean section* You can consider using lavender aromatherapy as an intervention to reduce post-partum and post-operative pain. The use of lavender aromatherapy, which is easily accessible and has minimal side effects, can be an effective and affordable alternative in speeding up patient recovery and increasing maternal comfort.
- b. For Hospitals
It is hoped that hospitals can apply this action so that collaboration between pharmacological and non-pharmacological treatments can provide maximum results in dealing with pain problems *after Caesarean section*.
- c. For Nursing Education
For educational institutions, it is hoped that it can become library reference material, methodological techniques in research, and can become input for the next generation of research regarding lavender aromatherapy to reduce pain. *After Caesarean Section*.
- d. For Further Researchers

It is hoped that future researchers will be able to increase scientific insight, collect data, process data, analyze data, become a reference, and become basic data that can be developed using other variables and expanding research variables.

Reference

- Ana. F, dkk. (2017). Efektifitas Relaksasi Nafas Dalam Terhadap Penurunan Rasa Nyeri Klien Post Sectio Caesaria Di Ruang Rawat Inap Kebidanan RSUD Kota Batam. <https://ejurnal.univbatam.ac.id/index.php/zonakesehatan/article/view/11>
- Anjelia, N. (2021). The effect of lavender essential oil on post-caesarean section. *Journal of Maternal and Child Health Sciences (JAKIA)*, 1(1), 8–13. <https://doi.org/10.36086/jakia.v1i1>
- Azizah, N., Rosyidah, R., & Destiana, E. (2020). Murotal Al-Qur'an Surah Arrahman and Lavender Aromatherapy Inhalation (Lavendula Augustfolia) in Labor Pain during the 1st Active Phase. *Midpro Journal*, 12(1), 10–17.
- Collin, V., & Maydinar, D. D. (2021). The Effect of Lavender Aromatherapy on Reducing Pain Intensity in Post Sect Caesaria Patients in the Tribata Room at Bhayangkara Hospital, Bengkulu City. *PREPOTIF: Journal of Public Health*, 5(2), 1235–1242. <https://doi.org/10.31004/prepotif.v5i2.2411>
- Dey, T. N., Pasaribu, S. K., & Wilda Wahyuni Siregar. (2023). The Effect Of Lavender Aromatherapy On Post Sectio Caesaria Pain Intensityat The Grandmed Hospital Lubuk Pakam. *Kestra Midwifery Journal (Jkk)*, 6(1), 73–78. <https://doi.org/10.35451/jkk.v6i1.1862>
- Diana, S., Mail, E., & Rufaida, Z. (2019). *Textbook of Midwifery Care for Childbirth and Newborns*. Surakarta: Oase Group.
- Endarwati, S., Mustika Dewi, I., Margaretha Marsiyah, M., Panembahan Senopati Bantul, R., Wahidin Sudiro Husodo, J., Nursing Studies, P. D., Wira Husada, S., Babarsari, J., & Bayan, T. (2024). Murottal Therapy to Overcome Post Sectio Caesaria Pain. *Journal of Nursing*, 16(1), 249–256. <http://journal.stikeskendal.ac.id/index.php/Keperawatan>
- Karyati, S., Hanafi, M., & Astuti, D. (2019). Effectiveness of Early Mobilization in Reducing Post-Cesarean Section Pain Scale at Kudus Regional Hospital. *Journal of Nursing*, 1(1), 866–872. <http://repository.urecol.org/index.php/proceeding/article/view/277>
- Kuswandari, R. P., & Afsah, Y. R. (2016). The Effect of Dhikr to Reduce the Pain Scale in Post Sectio Caesarea (SC) Mothers. *Journal of Nursing Science*, 3(1), 1–19. <https://etd.umy.ac.id/id/eprint/27842>
- Nurhayati, N. A., Andriyani, S., Malisa, N., & Dustira, A. R. (2020). Autogenic Relaxation to Decrease Pain Scale in Post-Operation Mothers after Surgery Auyogenic Relaxation to Decrease Secito Caesarea Post Surgery. *Scholastic Nursing*, 1(2).
- Prasetyo, B. D., & Susilo, B. (2020). The Effect of Lavender Aromatherapy on Reducing Maternal Wound Pain Post Sectio Caesarea at Dr Malang Hospital. *Journal of Islamic Medicine*, 4(1), 14–20.

- <https://doi.org/10.18860/jim.v4i1.9032>
- Rahmayani, S. N., & Machmudah, M. (2022). Reducing Post Sectio Caesarea Pain Using Lavender Aroma Therapy at Permata Medika Ngaliyan Hospital Semarang. *Young Nurse*, 3(3). <https://doi.org/10.26714/nm.v3i3.8377>
- Sahir, S. H. (2021). *Research methodology* (M. S. Dr. Ir. Try Koryati (ed.); I). KBM Indonesia.
- Sprouse-Blum, A. S., Smith, G., Sugai, D., & Parsa, F. D. (2010). Understanding endorphins and their importance in pain management. *Hawaii Medical Journal*, 69(3), 70–71.
- Sumelung, V., Kundre, R., & Karundeng, M. (2014). Factors that play a role in increasing the incidence of cesarean section at the Liun Kendage Tahuna Regional General Hospital. *Unsrat Nursing Journal*.
- Tirtawati, G. A., Purwandari, A., & Yusuf, N. H. (2020). Effectiveness of Giving Lavender Aromatherapy on Post Sectio Caesarea Pain Intensity. *JIDAN (Scientific Journal of Midwives)*, 7(2), 38–44. <https://doi.org/10.47718/jib.v7i2.1135>
- Wardhana, M. P., Wiweko, B., Hestiantoro, A., & Irwinda, R. (2022). *Clinical Guide to Cesarean Section* (August Issue). Central Executive of the Indonesian Obstetrics and Gynecology Association.
- Wijayanti, I., Wardana, K. E. L., Farahdiba, I., Susanto, Y. P. P., Sari, M., Darmiati, Rismayana, Pondaang, M. F., Islamiyati, Malahayati, I., Larasati, E. W., Sunarti, A., & Hartuti, N. (2022). *Midwifery Concept*. Padang: PT Global Executive Technology.
- World Health Organization. (2021). *Caesarean section rates continue to rise, amid growing inequalities in access*. WHO.
- Yustika, F. F. (2023). *Differences between Deep Breathing Relaxation Techniques and Lavender Aromatherapy on the Intensity of Anesthesia Spinal Needle Puncture Pain at Kardinah Hospital, Tegal City*. Yogyakarta Ministry of Health Polytechnic.