



## Systematic Review: The Effect of Neiguan Acupressure Technique on Nausea and Vomiting in Postoperative Sectio Caesarea Patients with Spinal Anesthesia

Halima Aulia Ita Maghfiroh<sup>1\*</sup>, Aem Ismail<sup>2</sup>

Politeknik Insan Husada Surakarta, Indonesia

Email: [halima@polinsada.ac.id](mailto:halima@polinsada.ac.id)<sup>1</sup>, [aem@polinsada.ac.id](mailto:aem@polinsada.ac.id)<sup>2</sup>

### ABSTRAK

#### Keywords:

Neiguan Acupressure;  
Nausea and Vomiting;  
Sectio Caesarea

Nausea and vomiting after cesarean section with spinal anesthesia is a common problem that can interfere with patient recovery. The use of the Antigua acupressure technique (P6) as a non-pharmacological therapy shows the potential to reduce these symptoms. This study aims to analyze the effect of the neiguan acupressure technique on nausea and vomiting in postoperative sectio caesarea patients with spinal anesthesia. The method used was a systematic review by analyzing three relevant primary studies from PubMed and Google Scholar databases during the period 2019-2024. Data were collected and evaluated to assess the effectiveness of acupressure in relieving nausea and vomiting. The results showed that the neiguan acupressure technique significantly reduced nausea and vomiting, with measurements taken at hour 6 postoperatively showing  $p=0.003$  and hour 12  $p=0.005$ . All studies analyzed showed positive results regarding the effect of acupressure. The Neiguan acupressure technique is effective in overcoming nausea and vomiting in postoperative cesarean section patients with spinal anesthesia. However, other factors also contribute to changes in nausea and vomiting response, so this technique should be considered as part of a comprehensive therapeutic approach.

**Correspondent Author: Halima Aulia Ita Maghfiroh**

Email: [halima@polinsada.ac.id](mailto:halima@polinsada.ac.id)

Open access articles under license



### Introduction

Sectio caesarea, often called cesarean section, is increasing globally. According to WHO (2021), patients undergoing cesarean section account for more than 1 in 5 (21%) of all births. It is estimated that this number will continue to rise, with almost 29% of all deliveries to be performed by cesarean section by 2030. In situations where vaginal delivery poses a risk, cesarean section is the best option for delivery to save the life of both mother and baby.

Although sectio caesarea poses the risk of immediate and long-term complications, for some women, it can be the safest or even the only way to deliver a healthy baby (Sung &

Mahdy, 2023). The section cesarean procedure requires anesthesia so that the patient does not feel pain. Regional anesthesia is the main choice for section cesarean procedures.

Some of the advantages of this anesthesia option are decreased maternal risk of aspiration, reduced fetal exposure to depressant drugs, the mother remaining conscious during the section cesarean delivery process, and the use of opioids in spinal anesthesia as post-surgical pain management (Rehatta et al., 2019). In addition to the advantages, spinal anesthesia also causes several complications that occur due to the effects of anesthetic drugs used, techniques, and insertion height. Some complications that often occur are nausea and vomiting, hypotension, shivering, and headache (Wahyuda et al., 2022).

Nausea and vomiting are physiological reactions experienced by patients after surgery that usually occur in the first 24 hours after surgery is completed and have the potential to become a continuing complication (Setiawan, 2023). In research conducted at KK Women's and Children Hospital Singapore, out of 124 patients who underwent cesarean section, around 14 patients experienced vomiting after cesarean section Thay et al., (2018) (Meyfiana, 2024). In Indonesia, the rate of nausea and vomiting after cesarean section surgery with spinal anesthesia has not been fully described. However, researchers found data from a preliminary study conducted at Tgk Chik Ditiro Sigli Hospital, Pidie Regency, Aceh Province, that out of 10 patients post-cesarean section surgery, 6 patients (60%) experienced nausea and vomiting in the first 24 hours after surgery and 4 patients (40%) did not experience nausea and vomiting (Muntasir et al., 2023). The incidence rate of nausea and vomiting reported in another study was 27.7%, with the highest prevalence in the first 24 hours postoperatively Amirshahi et al. (2020) (Sarif et al., 2024).

One way of pharmacological therapy to overcome nausea and vomiting after cesarean section surgery is by administering antiemetic drug therapy. However, this therapy cannot completely overcome nausea and vomiting. Therefore, practitioners found non-pharmacological methods to overcome postoperative nausea and vomiting, namely using complementary therapies such as hypnosis therapy, imagery relaxation, music therapy, acupuncture, electroacupuncture, and acupressure. One of the non-pharmacological therapies that can be done by nurses in the room and anesthesiologists in the recovery room is acupressure. This therapy is carried out by stimulating certain points through massage (Sarif et al., 2024).

Research by Sarif et al. (2024) concluded that acupressure affects reducing postoperative nausea and vomiting in section caesarea patients with spinal anesthesia, with a more significant effect on the 6th-hour postoperative measurement ( $p=0.003$ ) compared to the 12th-hour measurement ( $p=0.005$ ). This is in line with other studies which state that there is a significant difference between the control group (the group that is not given treatment) and the intervention group (the group given acupressure action at the neiguan point), which shows that the neiguan acupressure technique has an effective effect in reducing symptoms of nausea and vomiting in postoperative patients. The results of statistical tests in the study confirmed that the effect of neiguan acupressure techniques in overcoming nausea and vomiting in postoperative section caesarea patients with spinal anesthesia had a significant impact (Supandi et al., 2023).

Based on the description above, the authors are interested in conducting a systematic review with the title "The Effect of Neiguan Acupressure Technique on Nausea and Vomiting in Postoperative Sectio Caesarea Patients with Spinal Anesthesia." This aims to analyze the

effect of the neiguan acupressure technique on nausea and vomiting in postoperative sectio caesarea patients with spinal anesthesia based on previous studies. The general objective of this study is to understand the extent to which the neiguan acupressure technique can affect the condition of nausea and vomiting in these patients. Specifically, this study aims to determine several things: first, the effect of the neiguan acupressure technique on nausea and vomiting in postoperative sectio caesarea patients with spinal anesthesia. Second, the characteristics of the population in the study related to the effect of the neiguan acupressure technique. Third, the intervention or management actions applied in this study. Fourth, the comparative measures used in the study. Moreover, finally, the impact or outcome caused by neiguan acupressure intervention on nausea and vomiting in postoperative sectio caesarea patients with spinal anesthesia.

The benefits of this research are divided into two categories, namely theoretical benefits and practical benefits. From a theoretical perspective, the results of this study are expected to add to the existing understanding of the effect of neiguan acupressure techniques on nausea and vomiting in postoperative cesarean section patients with spinal anesthesia. Meanwhile, the practical benefits include several aspects. First, for the community, this study can provide information related to the management of nausea and vomiting after cesarean section surgery with spinal anesthesia so that it is expected to minimize anxiety for those who undergo the procedure. Secondly, for healthcare facilities, this study can serve as additional empirical evidence in the development of nursing or anesthesia care standards in patients who experience postoperative nausea and vomiting. Finally, for educational institutions, especially the Anesthesiology Nursing Study Program, this study can be used as an additional reference in developing students' knowledge related to the management of these conditions so that students can practice it properly when undergoing clinical practice in hospitals, especially in recovery rooms or surgical wards.

## **Research Methods**

This study used a systematic review design. The focus of this study contains an analysis that is the center of attention, namely a comprehensive summary of the results of primary research on the effect of neiguan acupressure techniques on nausea and vomiting in postoperative cesarean section patients with spinal anesthesia.

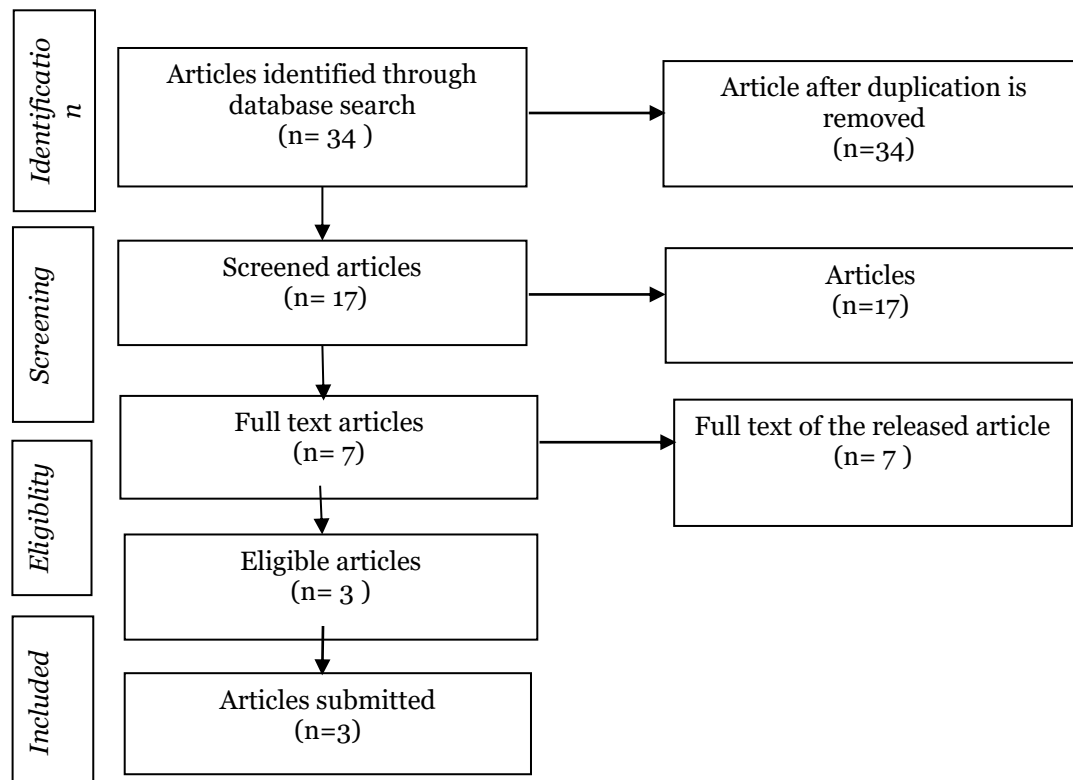
This study searched and screened data from primary research conducted in Indonesia. The study period was primary research conducted in the last 5 years (2019-2024). Research data were searched from several online journal databases, namely Google Scholar and PubMed, using the search keywords "postoperative nausea and vomiting," "Antigua acupressure technique," and "Antigua acupressure for post-op sc patients."

**Data Collection Techniques and Instruments** The instruments used in this study were published articles from online databases. **Data Processing** Data consists of identifying and collecting eligible articles from several journal sites. Conclusions from several similar articles were collected and then re-analyzed to come up with new conclusions.

## Results and Discussion

### Article Search Results

The search for articles in this study was done through databases, including PubMed and Google Scholar. With keywords including postoperative nausea and vomiting, neiguan acupressure technique, and neiguan acupressure for post-op sc patients. 1 Research related to the effect of neiguan acupressure technique on nausea and vomiting in postoperative cesarean section patients with spinal anesthesia from the initial search process resulted in 34 articles. After the article deletion process, 7 articles were obtained, with 3 of them eligible for further full-text review.

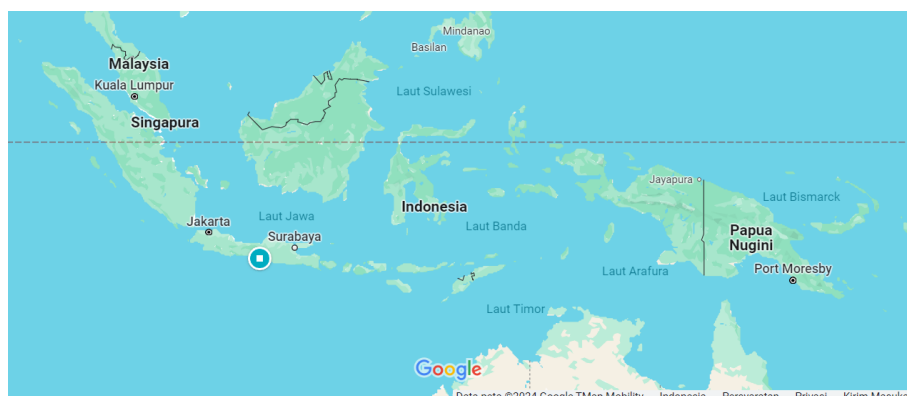


**Figure 1. Prism Flow Chart**

Source: Adapted from PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines.

### Location Overview

The figure below shows that the research articles listed in the table above are from Indonesia.



**Figure 2. Research Location Distribution of Articles Related to the Effect of Neiguan Acupressure Techniques on Postoperative Sectio Caesarea Patients in Indonesia**  
Source: Data processed

**Table 1. Summary of research results related to the effect of neiguan acupressure technique on nausea and vomiting in postoperative cesarean section patients with spinal anesthesia,**

No.	Research Title	Researcher Name and Year	Research Design	Population and Sample	Results
1	THE EFFECT OF ACUPRESSURE ON NAUSEA AND VOMITING IN POST-SECTION CAESAREA PATIENTS WITH SPINAL ANESTHESIA	Sarif et al. (2024).	Quantitative with a quasi-experimental design and the pre-test-post test randomized experimental design.	All postoperative cesarean section patients with spinal anesthesia and postoperative cesarean section patients in the recovery room and Delima treatment room of RSUD K.H Hayyung Selayar Islands.	Acupressure affects reducing postoperative nausea and vomiting in sectio caesarea patients with spinal anesthesia, with a more significant effect at the sixth postoperative hour measurement ( $p=0.003$ ) than at the 12th-hour measurement ( $p=0.005$ ). There is a significant difference between the intervention group and the control group $p<\alpha$ 0.05 with $p=0.001$ at the 6th hour and $p=0.027$ at the 12th hour.
2	THE EFFECT OF ACUPRESSURE THERAPY ON NAUSEA AND VOMITING AFTER CESAREAN SECTION SURGERY WITH SPINAL ANESTHESIA AT THE HOSPITAL OF ACEH TAMIANG DISTRICT	Setiawan (2023)	Quantitative with a pseudo-experiment design and the pre-test-post test randomized experimental design.	All patients who underwent cesarean section surgery under spinal anesthesia at Aceh Tamiang District Hospital and cesarean section surgery patients with ASA physical status I and II aged 18 - 45 years.	The administration of acupressure has a significant effect on the incidence of nausea and vomiting in postoperative section cesarean patients with spinal anesthesia in the recovery room of the Aceh Tamiang District Hospital with the results of the Mann-Whitney test $p$ -value 0.000 ( $p$ -value $<0.005$ ).
3	REFLEXOLOGY FOR THE INCIDENCE OF NAUSEA VOMITING (PONV) POST-SECTION CAESAREA WITH SPINAL ANESTHESIA AT RSUD H. SAHUDIN KUTACANE	Supandi et al. (2023)	Quantitative with pre-experiment using the static group comparison (intervention that has been carried out (X), then observation).	All postoperative cesarean section patients with spinal anesthesia at RSUD H.Sahudin Kutacane and postoperative cesarean section patients with spinal anesthesia, with Aldrette Score 8, were fully conscious and could communicate well.	The $p$ -value of 0.00 indicates that the difference between the control group and the intervention group in the matter being tested does not occur by chance. These results indicate that there is a significant effect of reflexology techniques on the management of nausea and vomiting in patients after cesarean section under spinal anesthesia.

## Data Extraction

Based on the table above, 3 journals discuss the effect of neiguan acupressure techniques on nausea and vomiting in postoperative sectio caesarea patients with spinal anesthesia, following the interpretation of the table above:

1. Duration of neiguan acupressure technique intervention
  - a. Based on research by Sarif et al. in 2024 at K.H Hayyung Hospital, Selayar Islands, acupressure technique intervention was carried out twice at hour 0 and hour 6 postoperatively at point P6 (neiguan), ST 36 and LI 4 with a duration of 2 minutes at each point.
  - b. Based on Setiawan's research in 2023 at Aceh Tamiang Regency Hospital, acupressure technique intervention was carried out once, for 2-5 minutes, with a total of 30 massages at point P6 (neiguan).
  - c. Based on the research of Supandi et al. (2023) at RSUD H. Sahudin Kutacane, there is no mention of the duration of the implementation of acupressure techniques at the neiguan point.
2. Measurement time of nausea and vomiting
  - a. Based on the research of Sarif et al. in 2024 at RSUD K.H Hayyung Selayar Islands, the intervention group and the control group were measured for nausea and vomiting three times, namely at 0 hours (pre-test), 6 hours (post-test I), and 12 hours (post-test II) postoperative sectio caesarea with spinal anesthesia.
  - b. Based on Setiawan's research in 2023 at the Aceh Tamiang Regency Hospital, nausea and vomiting were measured twice: once at 0 hours postoperatively (pre-test) and again at 6 hours postoperatively (post-test).
  - c. Based on the research of Supandi et al. (2023) at RSUD H. Sahudin Kutacane, there is no detailed mention regarding the time of measurement of nausea and vomiting. However, from the explanation written in the study, the researchers gave a nausea and vomiting score, namely by calculating the difference between the Postoperative Nausea and Vomiting (PONV) observations in the treatment group that was given the action and the control group that was not given the reflexology technique. The score will certainly be compared with the nausea and vomiting score before the action is taken. So, the researcher assumes that the measurement of nausea and vomiting was carried out 2 times, namely before the intervention (hour 0 postoperative) and after the intervention.
3. Changes in nausea and vomiting response
  - a. Based on research by Sarif et al. in 2024 at RSUD K.H Hayyung Selayar Islands, it shows that acupressure affects reducing postoperative nausea and vomiting in cesarean section patients with spinal anesthesia, with a more significant effect on the sixth postoperative hour measurement ( $p=0.003$ ) compared to the 12th-hour measurement ( $p=0.005$ ). There is a significant difference between the intervention group and the control group  $p<\alpha 0.05$  with  $p=0.001$  at hour 6 and  $p=0.027$  at hour 12.
  - b. Based on Setiawan's research in 2023 at Aceh Tamiang Regency Hospital, the decrease in the mean value of nausea and vomiting before and after the intervention group performed acupressure therapy obtained a value of 0.68, while in the control

group, 0.75. Based on Table 9, the Mann-Whitney test results have a p-value of 0.000 (p-value <0.005), meaning that there is a significant difference in nausea and vomiting in patients in the intervention group given acupressure therapy and the control group given pharmacological therapy in Aceh Tamiang Regency Hospital.

- c. Based on the research of Supandi et al. (2023) at RSUD H. Sahudin Kutacane, a significance value (p-value) was obtained, which indicated a significant effect of the Acupressure Reflexology Massage Technique in Overcoming Nausea and Vomiting (PONV) in Post Sectio Caesaria Patients with spinal anesthesia at RSUD H. Sahudin Kutacane. The p-value of 0.00 indicates that the difference between the control group and the intervention group in the matter being tested does not occur by chance.

## Discussion

The 3 journals reviewed all discuss the effect of the Nevuan acupressure technique on nausea and vomiting in postoperative cesarean section patients with spinal anesthesia, including the duration of the intervention, the measurement time of nausea and vomiting, and changes in nausea and vomiting response.

### 1. Duration of Neiguan Acupressure Technique Intervention

Based on the results of the three studies reviewed related to the duration of the neiguan acupressure technique intervention, two studies discuss in detail how much time is needed and used in the neiguan acupressure technique. In the study of Sarif et al. in 2024 at K. H Hayyung Hospital, Selayar Islands, the duration of intervention was explained as 2 minutes at point P6 (neiguan). Likewise, in Setiawan's research in 2023 at the Aceh Tamjang Regency Hospital, the duration intervention was carried out in 2 - 5 minutes at point P6 (Antigua). Thus, from these two studies, it can be said that the duration of intervention in performing neiguan acupressure techniques is approximately carried out in a minimum duration of 2 minutes. This is also in accordance with the book cited by the author, namely the book from Fajria et al. (2014), which is a theoretical study that says that the duration of emphasis is about 3 minutes.

### 2. Nausea and Vomiting Measurement Time

Based on the results of the three studies reviewed, all three discuss the measurement time of nausea and vomiting. Starting from research conducted by Sarif et al. in 2024 at K.H Hayyung Hospital, Selayar Islands, measurements were taken three times, namely at 0 hours (pretest), 6 hours (posttest I), and 12 hours (posttest II) postoperatively. In research conducted by Setiawan in 2023 at Acem Tamiang Hospital, measurement of nausea and vomiting was carried out twice, namely 0 hours postoperative (pre-test) and 6 hours postoperative (post-test). So also research conducted by Supandi et al. (2023) at RSUD H. Sahudin Kutacane, although it was not mentioned in writing in the study related to the time of measurement of nausea and vomiting, it can be concluded in the explanation written in the study that the researchers gave nausea and vomiting scores, namely by calculating the difference between Postoperative Nausea and Vomiting (PONV) observations that measurements were taken twice, namely before the intervention (hour 0 postoperative), and after the intervention. From the three research results reviewed, it can be said that the ideal measurement time for nausea and vomiting, which shows accurate results, is at hour 0 postoperatively and after intervention at hour 6 postoperatively. Additional measurements can also be taken after 6 hours, for example, at 12, 18, etc., depending on the needs of the person taking the measurements.

### 3. Change in Nausea and Vomiting response

Research conducted by Sarif et al. in 2024 at K.H Hayyung Hospital, Selayar Islands, showed the effectiveness of the neiguan acupressure technique, which reduces postoperative nausea and vomiting, with a more significant effect on the 6th-hour postoperative measurement. Setiawan's research in 2023 at the Aceh Tamiang Regency Hospital also said that the neiguan acupressure technique also affected significantly, reducing nausea and vomiting in postoperative patients. In addition to the two studies above, the research of Supandi et al. (2023) at RSUD H. Sahudin Kutacane also said the same thing, namely that there was a significant effect of the neiguan acupressure technique in overcoming nausea and vomiting in postoperative patients. It was also explained in the study that the effect of the acupressure technique in reducing nausea and vomiting did not occur by chance.

From the three studies reviewed above, it is agreed that the neiguan acupressure technique has a significant effect in overcoming nausea and vomiting in postoperative patients. However, it is also noted that it cannot be said 100% that the neiguan acupressure technique can overcome nausea and vomiting in postoperative patients, as in the research conducted by Sarif et al. in 2024 at RSUD K.H. Hayyung Selayar Islands that there was not only the P6 point that was given acupressure but ST36 and LI4 as well. So, it can be said that changes in nausea and vomiting responses also involve various factors outside of the neiguan acupressure technique.

### Conclusion

Based on the journals that have been reviewed by looking for differences in each study, it can be concluded that From the three journals reviewed, it was concluded that the duration of the neiguan acupressure technique intervention was carried out with a minimum duration of 2 minutes with a varied duration between 2-5 minutes. The measurement of nausea and vomiting should ideally be done at hour 0 and hour 6 post-surgery, but it is also possible to do more, such as measuring at hours 12, 18, etc., depending on the needs of the measurer. From the three studies reviewed above, it is concluded that neiguan acupressure techniques can influence changes in nausea and vomiting responses. Performing neiguan acupressure techniques on postoperative patients can significantly reduce and even overcome nausea and vomiting. The neiguan acupressure technique is not the only factor in acupressure techniques that can overcome nausea and vomiting in postoperative patients because, in other studies, it is said that acupressure techniques are not performed at point P6 (neiguan) alone, but also points ST36 and LI4.

### Bibliography

- Amirshahi, M., Behnamfar, N., Badakhsh, M., Rafiemanesh, H., Keikhaie, K., Sheyback, M., & Sari, M. (2020). Prevalence of postoperative nausea and vomiting: A systematic review and meta-analysis. *Saudi Journal of Anaesthesia*, 14(1), 48. [https://doi.org/10.4103/sja.SJA\\_401\\_19](https://doi.org/10.4103/sja.SJA_401_19)
- Black, J. M., & Hawks, J. H. (2014). *Keperawatan medikal bedah: manajemen klinis untuk hasil yang diharapkan*. Elsevier (Singapore).
- Elvir-Lazo, O. L., White, P. F., Yumul, R., & Cruz Eng, H. (2020). Management strategies for the treatment and prevention of postoperative/postdischarge nausea and vomiting: an updated review. *F1000Research*, 9, 983. <https://doi.org/10.12688/f1000research.21832.1>



- Fadlika, F. (2019). Perbedaan Respon Mual Muntah Post Anestesi Umum dengan Teknik Akupresur Neiguan dan Relaksasi Nafas dalam di RSUD Margono Soekarjo Purwokerto [Poltekkes Kemenkes Yogyakarta]. <http://eprints.poltekkesjogja.ac.id/id/eprint/3568>
- Fajria, N. L., Amelia, N. N., & Oktafah, N. S. N. A. (2024). Terapi Komplementer Mual Muntah Dalam Kehamilan. Penerbit Adab.
- Indonesia. (2015). Panduan akupresur mandiri bagi pekerja di tempat kerja. Kementerian Kesehatan RI.
- Meyfiana, A. M. (2024). Gambaran Kejadian dan Faktor Risiko Mual Muntah Pasca Operasi Pada Pasien Seksio Sesarea dengan Anestesi Spinal di Rumah Sakit Ibu dan Anak Permata Bunda Kota Solok [Skripsi, Universitas Andalas]. <http://scholar.unand.ac.id/id/eprint/461825>
- Muntasir, E., Handayani, R. N., & Ningrum, E. W. (2023). Analisis Faktor Yang Mempengaruhi Kejadian Post Operatif Nausea and Vomiting (Ponv) Pada Pasien Sectio Caesarea Dengan Anestesi Spinal Di RSUD Tgk Chik Ditiro Sigli Kabupaten Pidie Provinsi Aceh. *Kebidanan Dan Keperawatan*, 16(2), 187–193. <https://doi.org/https://doi.org/10.35960/vm.v16i2.920>
- Olawin, A. M., & Das, J. M. (2022). Spinal anesthesia. In StatPearls [Internet]. StatPearls Publishing.
- Pardo, M. C. (2022). Miller's Basics of Anesthesia (8th ed.). Churchill Livingstone Elsevier.
- Rehatta, N. M., Hanindito, E., & Tantri, A. R. (2019). Anestesiologi dan Terapi Intensif: Buku Teks Kati-Perdatin (Edisi Pertama). Gramedia Pustaka Utama.
- Sarif, S., Supriyadi, S., Widigdo, D. A. M., & Sudirman, S. (2024). Pengaruh Akupresur terhadap Mual dan Muntah pada Pasien Post Sectio Caesarea dengan Spinal Anestesi. *Quality : Jurnal Kesehatan*, 18(1), 1–12. <https://doi.org/10.36082/qjk.v18i1.1575>
- Setiawan, B. (2023). Pengaruh Pemberian Terapi Akupresur Terhadap Mual Muntah Pasca Operasi Sectio Caesaria dengan Anestesi Spinal di RSUD Kabupaten Aceh Tamiang. *Journal Sport Science, Health and Tourism of Mandalika (Jontak)*, 4(2), 92–107. <https://doi.org/https://doi.org/10.36312/jontak.v4i2.1968>
- Shick, L., & Windle, P. E. (2015). *Perianesthesia nursing core curriculum* (3rd ed.). American Society of Perianesthesia Nurses (ASPAN), Elsevier Health Sciences.
- Sung, S., & Mahdy, H. (2023). Cesarean section. In StatPearls [Internet]. StatPearls publishing.
- Supandi, A., Susana, S. A., & Sutejo, Ns. (2023). Pijat Refleksi untuk Kejadian Mual Muntah (PONV) Post Sectio Caesarea dengan Spinal Anastesi di RSUD H. Sahudin Kutacane. *Journal Scientific of Mandalika (JSM)* e-ISSN 2745-5955 | p-ISSN 2809-0543, 4(11), 252–262. <https://doi.org/10.36312/10.36312/vol4iss11pp252-262>
- Wahyuda, I., Mardiyono, M. N. S., Ta'adi, N., Kp, S., & Kes, M. H. (2022). Implementasi Komplementer Sujok Terhadap Tekanan Darah, Nadi, Respirasi, Dan Post Operative Nausea Vomiting (PONV) Pada Pasien Pasca Bedah Dengan Spinal Anestesi. Lembaga Omega Medika.
- WHO. (2021). Cesarean section rates continue to rise amid growing inequalities in access. World Health Organization. <https://www.who.int/News/Item/16-06-2021-Caesarean-Section-Rates-Continue-To-Rise-Amid-Growing-Inequalities-In-Access>
- Yi, M. S., Kang, H., Kim, M. K., Choi, G.-J., Park, Y.-H., Baek, C. W., Jung, Y. H., & Woo, Y. C. (2018). Relationship between the incidence and risk factors of postoperative nausea and vomiting in patients with intravenous patient-controlled analgesia. *Asian Journal of Surgery*, 41(4), 301–306. <https://doi.org/10.1016/j.asjsur.2017.01.005>