

The Effect of Deep Breathing Relaxation Techniques on the Nausea and Vomiting Response of Intraoperative Patients with Spinal Anesthesia in the Central Surgical Installation of Padang Panjang City Hospital

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ABSTRACT

One of the complications after spinal anaesthesia is nausea and vomiting. Nausea and vomiting are undesirable events that often occur during surgery. Cases reach 60-70% under general anaesthesia and 25% under spinal anaesthesia. The response to nausea and vomiting that occurs in spinal anaesthesia can occur because of hypotension. Handling of nausea and vomiting can be done pharmacologically and non-pharmacologically, relaxation techniques are actions that can liberate both mentally and physically to increase tolerance to pain. This review intends to decide the impact of deep breathing techniques on the nausea and vomiting of patients during spinal anaesthesia with the Central Surgery Device at Padang Panjang City Hospital in 2019. This type of study is a quasi-experimental study using a two-group post-test design. The study was conducted on September 10-17, 2019. The sample used was 16 people, divided into 2 groups, namely the control group and the intervention group. The response to nausea and vomiting in both groups was recorded using an observation sheet. The data obtained were then analyzed by T-independent with a significant degree of $p < 0.05$. The results showed that the average response to nausea and vomiting in the control group was 0.50 and the intervention group was 0.12. With the T-Test test, the p-value was 0.022 ($p > 0.05$), meaning that there was an effect of nausea and vomiting response. which means after being given a deep breathing technique. The conclusion of this study is the impact of profound breathing strategies on decreasing agony in postoperative patients. The deep breathing technique is one way to overcome the response of nausea and vomiting in patients with spinal anaesthesia. It is hoped that health services will be improved for patients who will undergo surgery and are more active in providing relaxation techniques so that patient anxiety is reduced and the response to nausea and vomiting decreases.

Keywords: *Deep Breathing Technique; Response to nausea and vomiting*

1. INTRODUCTION

Surgery or surgery is all treatment means that utilization intrusive strategies by opening or showing body parts. Surgery is generally done by making an incision, on the part of the body to be treated, then corrective action is taken and ends with closure and suturing of the wound. Anaesthesia is a medical procedure that aims to relieve pain during surgery or various other procedures. Fear and pain need to be eliminated because they can affect the surgical process. One of the most commonly used anaesthetics is spinal anaesthesia. Spinal anaesthesia is performed by inserting anaesthetic drugs into the subarachnoid

space so that it blocks the function of the sympathetic nerves. The effect is more prominent parasympathetic nerve function which is characterized by an increase in intestinal contractions, intraluminal pressure and sphincter relaxation. [1] [2]

Various complications can occur during surgery including cardiovascular, respiratory, gastrointestinal, urological, neurologic, ophthalmological, and other complications. Complications can occur at the time of surgery, immediately or after surgery is completed or while in the recovery room. One of the complications after spinal anaesthesia is nausea and vomiting.

Nausea and vomiting are one of the most common side effects after spinal anaesthesia or surgery. [3]

Postoperative nausea and vomiting is a significant problem that causes distress for patients. Severe complications due to the response to postoperative nausea and vomiting are relatively rare, but if aspiration pneumonia occurs, it can be fatal. The response to nausea and vomiting in general anaesthesia can be caused by intubation factors (stimulation of pharyngeal mechanoreceptor afferents), anaesthetics (anaesthesia used deeper or gastric impulses during breathing using a face mask), anaesthetic drugs (high risk with opioid use, ketamine, N₂O) and inhalation anaesthetics. [4] [5]

The response to nausea and vomiting that occurs in spinal anaesthesia can occur due to hypotension (the occurrence of peripheral vessel vasodilation due to the influence of anaesthetic drugs which causes a decrease in cardiac output and a decrease in venous return resulting in reduced blood filling into the right atrium, causing hypotension). In addition, there is a parasympathetic activity that causes increased intestinal peristalsis, also due to the pull of the nerves and plexuses, especially the vagus nerve, the presence of bile in the stomach due to relaxation of the pylorus and bile duct sphincter, as well as psychological factors and hypoxia.[6]

If there is nausea and vomiting, it can cause airway obstruction, causing oxygen intake to the lungs to be hampered and have a very bad impact on the patient. Handling of nausea and vomiting can be done pharmacologically and non-pharmacologically. Pharmacologically, namely by giving antiemetic therapy from the antihistamine group such as ranitidine or receptor antagonist groups such as ondansetron. Meanwhile, non-pharmacologically through behavioural interventions, including relaxation, aromatherapy, self-hypnosis, acupuncture, and cognitive distraction. The combination of non-pharmacological and pharmacological techniques is an effective way to reduce the response of nausea and vomiting. In terms of costs and benefits, compared with the use of drug management, the use of non-drug management is more economical and has no side effects. It can also reduce the patient's dependence on drugs.[7]

Relaxation is an action to free mentally and physically from tension and stress so that it can increase tolerance to pain. Relaxation techniques are mental and actual independence from reliance and stress. Unwinding procedures give people restraint when there is distress, stress, physical, and emotional. Relaxation techniques aim to activate the power of energy and the right brain, which is the part of the brain that deals with emotional

problems and human imagination. One of the relaxation techniques that can reduce the response to nausea and vomiting is deep breathing techniques. [8] [9]

The deep breathing technique is one form of nursing care. In this case, the nurse teaches the patient how to do deep breaths, gentle breaths (hold inspiration maximally) and how to exhale slowly. Deep breathing techniques can improve lung ventilation and increase blood oxygenation. The deep breathing technique is done by breathing slowly, consciously, and deeply. Deep breathing techniques involve conscious movement of the lower abdomen or abdominal area. This technique focuses on the sensation of the body by feeling the airflow from the nose or mouth slowly towards the lungs and back through the same pathway so that all stimuli originating from the other senses are blocked.[5]

The principle that underlies the reduced response to nausea and vomiting by deep breathing techniques lies in the physiology of the autonomic sensory system which is important for the fringe sensory system that keeps up with homeostasis of the individual's internal environment. After performing this technique, there is an increase in the flow of oxygen into the cells. This can reduce the formation of lactic acid. The relaxed response can also increase levels of the hormone endorphins so that it provides a calming feeling. As a result, it reduces the work of the abdominal vagal nerve and inhibits the work of the Chemoreceptor Trigger Zone (CTZ) as a centre for nausea and vomiting. [10]

Researchers found previous studies that were related to this study, including Hasibuan's research entitled "The Effect of Deep Breathing Relaxation Techniques on Nausea and Vomiting Responses of Intraoperative Patients with Spinal Anesthesia at the Central Surgical Installation of Dr. RSUP. M. Djamil Padang in 2017", showed the average response to nausea and vomiting in the control group was 0.30 and the intervention group was 0.10. The P-value obtained from the T-independent test is 0.343 ($p > 0.05$), which means that there is no significant effect of nausea and vomiting response after being given deep breathing techniques. This research is a quasi-experimental research with a post-test only control group design. The sample used was 20 people who were divided into two groups, namely the control group and the intervention group.

According to Yusrizal et al's research, entitled "The Effect of Deep Breathing Relaxation Techniques and Massage on Reducing Pain Scale of Post-Appendectomy Patients in the Surgical Room of RSUD Dr. M. Zein Painan", showed the

difference in the average pain scale of the pretest-posttest control group was 2.30 and the difference in the average pain scale of the experimental group before and after giving deep breathing relaxation techniques and the massage was 3.50. The results of the statistical test of the experimental and control groups obtained a value of $p = 0.000$ ($p < 0.05$). It is concluded that deep breathing and massage techniques can reduce the pain scale in post-appendectomy clients.

Based on the above phenomena, this study was conducted to determine whether there is an impact of profound relaxing techniques on the response to nausea and vomiting in spinal anaesthesia intraoperative patients at the Central Surgical Installation of Padang Panjang Hospital. The reason for the review was to decide the impact of deep breathing techniques on the response to nausea and vomiting in spinal anaesthesia intraoperative patients at the Central Surgical Installation of Padang Panjang City Hospital.

2. RESEARCH METHODS

This examination is semi exploratory exploration, with a Two Group Pretest and Posttest Design approach. The study was conducted in two groups, namely the intervention group and the control group. The intercession bunch was given a profound breathing strategy while the benchmark group was not given any treatment. The population in this study were all patients who underwent spinal anaesthesia, totalling 25 people, with a sample of 16 people including the intervention group, there were 8 respondents and 8 respondents in the control group according to the inclusion criteria. The review was directed at the Central Surgical Installation of Padang Panjang City Hospital, the data collection technique used an observation sheet to see the level of nausea and vomiting, with Univariate investigation utilizing mean and bivariate examination with T-independent statistical test.

3. RESULTS

Univariate Analysis

Nausea and Vomiting response to the Control Group

Table 1. Distribution of Nausea and Vomiting Control Group of Spinal Anesthesia Intraoperative Patients at the Central Surgical Installation of Padang Panjang City Hospital in 2019

Control Group	Mean	Min – Max	Standard Deviation
Nausea and vomiting pre-control group	0,37	0-1	0,52
Nausea and vomiting post control group	0,50	0-1	0,53

Based on table 1. the average value of the control group before is 0.37 with a standard deviation of 0.52 and the average after is 0.50 with a standard deviation of 0.53 respondents with nausea and vomiting in the Control Group of Intraoperative Spinal Anesthesia Patients in Central Surgical Installation of Padang Panjang City Hospital in 2019.

Response to nausea and vomiting in the intervention group

Table 2. Distribution of Nausea and Vomiting Intervention Group for Spinal Anesthesia Intraoperative Patients at the Central Surgical Installation of Padang Panjang City Hospital in 2019

Intervention Group	Mean	Min – Max	Standard Deviation
Nausea and vomiting pre-intervention group	0,75	0-1	0,46
Nausea and vomiting post-intervention group	0,12	0-1	0,35

Based on table 2. the average value of the intervention group before is 0.75 with a standard deviation of 0.46, while after the intervention the average value is 0.12 with a standard deviation of 0.35 for nausea and vomiting in the Intraoperative Anesthesia Patient Intervention Group. Spinal in

the Central Surgical Installation of the Padang Panjang City Hospital in 2019.

Bivariate Analysis

In this study, researchers tested the data using the T-independent statistical test, to determine the impact of deep breathing techniques on the response to nausea and vomiting.

Table 3. The Impact of Deep Breathing Techniques on Nausea and Vomiting Responses in Intraoperative Spinal Anesthesia Patients at the Central Surgical Installation of Padang Panjang City Hospital in 2019

No	Variable	F	Mean	95% CI	P-Value
1	Nausea vomiting response	0,037	0,75	0,12-1,37	0,022

In light of the information in table 3. it tends to be seen that average nausea and vomiting in the Spinal Anesthesia Intraoperative Patient Intervention Group at the Central Surgical Installation of the Padang Panjang City Hospital in 2019 was 0.75. From the T-independent test, a P-Value of 0.022 ($p > 0.05$) was obtained, meaning that there was a significant effect of nausea and vomiting after deep breathing techniques. While in the control group there was no significant effect of nausea and vomiting respondents.

4. DISCUSSION

The Effect of Deep Breathing Techniques on Nausea and Vomiting Responses in Intraoperative Spinal Anesthesia Patients at the Central Surgical Installation of Padang Panjang City Hospital

The results showed that average nausea and vomiting in the Intraoperative Anesthesia Patient Intervention Group at the Central Surgical Installation of Padang Panjang City Hospital in 2019 was 0.75. From the T-independent test, a P-Value of 0.011 ($p > 0.05$) was obtained, meaning that there was a significant effect of nausea and vomiting after deep breathing techniques. Meanwhile, in the control group, there was no significant effect of nausea and vomiting on respondents. This review is in accordance with research directed by Safitri (2018) with the title The effectiveness of giving deep breath relaxation therapy to reducing pain levels in postoperative patients was obtained p -value = 0.013. This means that deep breathing relaxation therapy is effective for reducing pain levels in postoperative patients.

Relaxation techniques are mental and actual independence from strain and stress. Unwinding strategies give people poise when there is uneasiness, physical and emotional stress. Relaxation techniques aim to activate the power of energy and the right brain, the part of the brain that deals with emotional problems and human imagination. The deep breathing technique is a form of nursing care, by teaching the patient how to do deep breaths, gentle breathing (hold inspiration maximally), and how to exhale slowly. Deep breathing techniques can also improve lung ventilation and improve blood oxygenation. Deep breathing techniques are the easiest relaxation method. Deep breathing techniques are slow, conscious, and deep breathing. This technique includes cognizant development of the lower midsection or stomach region. The deep breathing technique focuses on the sensation of the body by feeling the airflow from the nostrils or mouth slowly towards the lungs and back through the same pathway so that all stimuli originating from the other senses will be blocked. In a state of panic due to stimulation of nausea and vomiting, a person's breath becomes faster and shorter, with upper chest muscle contractions becoming stronger. When the upper chest expands, nerve excitability increases, and vital signs (heart rate, blood pressure) increase. In a relaxed state, the body's metabolism runs slowly so that the respiratory cycle becomes lower. The principle underlying the reduced response to nausea and vomiting by deep breathing techniques lies in the physiology of the autonomic sensory system, which is the piece of the fringe sensory system that keeps up with homeostasis of the individual's internal environment.[11] [2]

5. CONCLUSIONS AND SUGGESTIONS

The results of this study can be inferred that there is an impact of deep breathing relaxation techniques on the response to nausea and vomiting of intraoperative spinal anaesthesia patients in the central surgical installation of Padang Panjang City Hospital. The provision of deep breathing techniques in patients with spinal anaesthesia is one of the operational standards for nurses, to reduce the response of intraoperative nausea and vomiting to improve the quality of care oriented to patient safety

REFERENCES

- [1] M. Mallick-Searle, T., & Fillman, "The pathophysiology, incidence, impact, and treatment of opioid-induced nausea and vomiting," *J. Am. Assoc. Nurse Pract.*, vol. 29, no. 11, pp. 704–710, 2017.
- [2] Y. Hosseini, M., Tirgari, B., Forouzi, M. A., & Jahani, "Guided imagery effects on chemotherapy-induced nausea and vomiting in Iranian breast cancer patients," *Complement. Ther. Clin. Pract.*, vol. 25, pp. 8–12, 2016.
- [3] H. C. W. Ho, K. Y., Lam, K. K. W., Chung, J. O. K., Xia, W., Cheung, A. T., Ho, L. K., ... & Li, "Systematic review of the effectiveness of complementary and alternative medicine on nausea and vomiting in children with cancer: a study protocol," *BMJ Open*, vol. 9, no. 10, p. e031834, 2019.
- [4] Y. Suryono, A., Akbar, F., Nugraha, F. S., & Armiyati, "Combination of Deep Breathing Relaxation and Murottal Reducing Post Chemotherapy Nausea Intensity in Nasopharyngeal Cancer (NPC) Patients," *Media Keperawatan Indones.*, vol. 3, no. 1, pp. 24–31, 2020.
- [5] D. S. Brunner, L. S., Smeltzer, S. C. O., & Suddarth, *Brunner & Suddarth's textbook of medical-surgical nursing*. lippincott Williams & Wilkins, 2010.
- [6] S. A. Khonsary, *Guyton and Hall: textbook of medical physiology*. 2017.
- [7] D. Z, and N. Avianti, "Spiritual Emotional Freedom Technique Decreasing Stress on Patients With Cervical Cancer," *J. NERS*, vol. 9, no. 1, p. 91, 2017, doi: 10.20473/jn.v9i1.3233.
- [8] M. Fateme, B., Fatemeh, M. K., Vahid, M., Arezou, N. J., Manizhe, N., & Zahra, "The effect of Benson's muscle relaxation technique on severity of pregnancy nausea," *Electron. J. Gen. Med.*, vol. 16, no. 2, 2019.
- [9] H. Y. Aybar, D. O., Kılıc, S. P., & Çınkır, "The effect of breathing exercise on nausea, vomiting and functional status in breast cancer patients undergoing chemotherapy," *Complement. Ther. Clin. Pract.*, vol. 40, no. 101213, 2020.
- [10] M. Perciavalle, V., Blandini, M., Fecarotta, P., Buscemi, A., Di Corrado, D., Bertolo, L., ... & Coco, "The role of deep breathing on stress," *Neurol. Sci.*, vol. 38, no. 3, pp. 451–458, 2017.
- [11] B. N. Virgiani, "Gambaran Terapi Distraksi, Relaksasi dan Mobilisasi dalam Mengatasi Post Operative Nausea and Vomiting (PONV) pada Pasien Post Operasi di RSUD Indramayu," *J. Surya*, vol. 11, no. 2, pp. 17–23, 2019.