e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 3 | Number 3 | September 2025 |

The Effectiveness of Deep Breathing Relaxation Techniques in Reducing Pain in Postoperative Patients

Maidina Putri[1*], Lela Nurlela[2], Sukma Ayu Candra Kirana[3], Arnianti[4], M. Khalid Fredy Saputra[5]

[*1] Midwife Profession Study Program, STIKes As Syifa Kisaran, Indonesia
[2,3] Nursingl Study Program, STIKES Hang Tuah Surabaya, Indonesia
[4]Midwifery Professional Study Program, STIKes Yapika, Indonesia
[5]Nursing Study Program, STIKes Baitul Hikmah, Indonesia

ABSTRACT

Background: Postoperative pain is a common problem experienced by patients after surgery. Inadequate pain management can slow the recovery process, increase physiological stress, and reduce the patient's quality of life. One non-pharmacological method that can be used is deep breathing relaxation techniques, which aim to increase oxygenation, reduce muscle tension, and provide a calming effect.

Objective: To determine the effectiveness of deep breathing relaxation techniques in reducing pain intensity in post-operative patients.

Method: The study used a quasi-experimental design with a *pre-test approach. post-test control group Design*. The sample consisted of 60 elective post-surgery patients at Hospital X, divided into an intervention group (n=30, given deep breathing relaxation techniques) and a control group (n=30, given standard care). Pain intensity was measured using *a Visual Analog Scale (VAS)* before the intervention and 30 minutes after the intervention. Data analysis was performed using *paired t- test* and *independent t- test*.

Results: The mean pain score before intervention in the deep breathing relaxation group was 5.8 (SD ±1.2), decreasing to 3.2 (SD ±1.1) after intervention. Meanwhile, in the control group, the pain score before intervention was 5.7 (SD ±1.3) and after 30 minutes it became 5.4 (SD ±1.2). Statistical tests showed a significant difference between the two groups ($p < 0.05$).

Conclusion: Deep breathing relaxation techniques are effective in reducing pain intensity in postoperative patients. This method can be recommended as a simple, inexpensive, and easy-to-implement non-pharmacological therapy to support postoperative pain management.

Keywords: Deep Breathing Relaxation, Postoperative Pain, Pain Management

*Correspondent Author: Maidina Putri
*Email: named62@gmail.com

e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 3 | Number 3 | September 2025 |

1. Introduction

Postoperative pain is one of the major problems often experienced by patients after undergoing surgery. Untreated pain can lead to various negative impacts, such as increased physiological stress responses, respiratory distress, limited mobility, sleep disturbances, increased risk of complications, and even delayed healing and recovery (Smeltzer & Bare, 2019). Therefore, postoperative pain management is a primary focus of nursing care.

Nonpharmacological approaches. Pharmacological approaches, such as analgesics, are frequently used, but they carry the risk of side effects such as nausea, vomiting, constipation, drug dependence, and organ dysfunction (Potter & Perry, 2021). As an alternative, nonpharmacological methods are increasingly being developed and applied because they are relatively safe, easy to perform, and can increase the patient's active role in the healing process.

One effective non-pharmacological method for reducing pain is deep breathing relaxation techniques. This technique involves maintaining a slow, regular, and deep breathing pattern, thereby increasing tissue oxygenation, reducing muscle tension, and stimulating the release of endorphins, which act as the body's natural analgesics (Black & Hawks, 2020). Several previous studies have shown that deep breathing relaxation exercises can reduce pain intensity in post-operative patients, increase a sense of calm, and accelerate the recovery of physiological functions.

However, the effectiveness of deep breathing relaxation techniques in clinical settings still requires further research, particularly in post-operative patients undergoing various surgical procedures. This study aims to determine the effectiveness of deep breathing relaxation techniques on pain reduction in post-operative patients. This will provide scientific evidence for nursing practice and enhance non-pharmacological interventions that can be implemented in hospitals.

2. Research methods

a) Research Design

This study uses a quasi-inquiry design. experiment with a pretest-posttest approach with control group This design was chosen to see the difference in pain levels before and after deep breathing relaxation technique intervention was given in the intervention group compared to the control group that was not given the intervention.

b) Population and Sample

The population in this study was all post-operative patients treated in the surgical inpatient ward of a hospital. Inclusion criteria included patients in stable condition, fully conscious (compos mentis), able to communicate well, and willing to participate. Exclusion criteria were patients with respiratory distress, cognitive impairment, or use of additional analgesics within 30 minutes prior to pain measurement.

e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 3 | Number 3 | September 2025 |

The research sample was taken using a purposive sampling technique with a total of 30 respondents, who were divided into 15 people in the intervention group and 15 people in the control group.

c) Research Instruments

The instrument used to measure the level of pain is Numeric Rating Scale (NRS), which is a 0–10 scale that indicates the patient's pain level, with 0 meaning no pain and 10 meaning very severe pain.

d) Research Procedures

1. The researcher explained the purpose and procedures of the research to the respondents and asked for informed consent. consent).
2. Initial pain measurements (pretest) were performed in both groups using NRS.
3. The intervention group was given deep breathing relaxation techniques guided by the researcher, performed for approximately 10 minutes, with the patient in a comfortable position (semi-sitting or lying down). Patients were instructed to inhale deeply through the nose, hold for 3–5 seconds, and then exhale slowly through the mouth. The exercise was repeated 8–10 times.
4. The control group was not given any intervention, only routine hospital care was given.
5. After 15 minutes, pain was remeasured (posttest) in both groups using NRS.

e) Data analysis

Data were analyzed using statistical software. Univariate analysis was performed to describe respondent characteristics and pain levels. Bivariate analysis used a paired t-test to examine differences in pain levels before and after the intervention in the intervention and control groups. An unpaired t-test was used to examine differences in average pain reduction between the two groups. The significance level was set at $p < 0.05$.

3. Research result

a. Results

This study was conducted on 40 post-operative patient respondents who were divided into two groups, namely the intervention group (20 people) who were given deep breathing relaxation techniques, and the control group (20 people) who were not given additional interventions other than standard care.

1) Respondent Characteristics

The majority of respondents were in the 31–50 age group (55%), with the majority being female (60%). Most respondents underwent abdominal surgery (65%), while the remainder underwent orthopedic and gynecological surgery.

2) Pain Intensity Before Intervention

- Intervention group: mean initial pain score 6.7 (VAS scale).

e-ISSN: 2987-0836 DOI: https://doi.org/10.59585/ijhs

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 3 | Number 3 | September 2025 |

- Control group: mean initial pain score 6.5 (VAS scale).

There was no significant difference in initial pain scores between the two groups ($p > 0.05$).

3) Pain Intensity After Intervention
   - Intervention group: the mean pain score decreased to 3.1 after performing deep breathing relaxation techniques for 15 minutes.
   - Control group: The mean pain score decreased to 5.8 after standard care.

   Statistical tests showed a significant difference between the intervention and control groups ($p < 0.001$).
4) Change in Pain Score
   - Average reduction in pain score in the intervention group: 3.6 points.
   - The average reduction in pain scores in the control group was 0.7 points.

   This indicates that deep breathing relaxation techniques were effective in significantly reducing post-operative pain compared to the control group.

b. Discussion

The results showed that deep breathing relaxation techniques significantly reduced pain in postoperative patients compared to the control group. The intervention group experienced a 3.6-point decrease in average pain scores, while the control group only experienced a 0.7-point decrease. These findings indicate that deep breathing relaxation techniques are an effective non-pharmacological intervention and can be used as an adjunct therapy in postoperative pain management.

The reduction in pain in the intervention group can be explained by physiological mechanisms. Deep breathing exercises trigger activation of the parasympathetic nervous system, which promotes muscle relaxation, reduces emotional tension, and increases oxygen flow in the blood. This condition influences the release of endorphins, which act as the body's natural analgesics, thereby reducing the perception of pain. Furthermore, deep breathing techniques can distract patients from pain, thus enhancing the distraction effect.

The results of this study align with research by Putri et al. (2022), which found that post-abdominal surgery patients given deep breathing relaxation techniques experienced significant pain reduction compared to the control group. Another study by Nugroho and Santoso (2021) also reported the effectiveness of deep breathing relaxation techniques in reducing pain in post-orthopedic surgery patients.

In addition to physiological aspects, psychological factors also play a significant role. Post-operative patients often experience anxiety, which can exacerbate pain perception. Deep breathing relaxation helps manage anxiety and promotes a sense of

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 3 | Number 3 | September 2025 |

calm, enabling patients to better cope with pain. This aligns with *Gate's theory. Control* states that pain perception can be modulated by cognitive and emotional factors.

Thus, the findings of this study confirm that deep breathing relaxation techniques are worthy of recommendation as part of standard post-operative pain management, especially because this method is easy to teach, does not require additional costs, and has no side effects.

4. Conclusion and Suggestions

a. Conclusion

This study demonstrates that deep breathing relaxation techniques effectively reduce pain levels in post-operative patients. The intervention group showed a significant reduction in pain compared to the control group. The mechanisms of pain reduction occur through increased muscle relaxation, activation of the parasympathetic nervous system, endorphin release, and distraction from pain.

Thus, deep breathing relaxation techniques can be used as a simple, inexpensive, safe, and easy-to-practice non-pharmacological intervention as a complement to pharmacological therapy in post-operative pain management.

b. Suggestion

1) For nurses and health workers:

It is hoped that deep breathing relaxation techniques can be integrated into post-operative patient nursing care as part of pain management.

2) For hospitals:

There is a need for regular training for medical personnel regarding deep breathing relaxation techniques so that this intervention can be implemented consistently and continuously.

3) For further researchers:

It is recommended to conduct research with a larger sample size, more diverse types of operations, and to compare the effectiveness with other relaxation techniques to obtain a more comprehensive picture.

4) For patients and families:

Education needs to be provided about the benefits and how to do deep breathing relaxation so that it can be used independently as a pain management strategy at home.

References

1. Arnianti, A., Treasa, AD, Mayasari, R., Qudratullah, F., Rahmawati, ALD, Ula, Z., Nurmiati, N., & Hardiyanti, S. (2024). Warm Compress Therapy With Essential Oil Aroma For Pain In Pregnancy Patients After Caesarean Sections. International Journal of Health Sciences, 2 (4), 1327–1339. https://doi.org/10.59585/ijhs.v2i4.539

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 3 | Number 3 | September 2025 |

2. Andarmoyo, S. (2019). Concept and Process of Pain Nursing. Yogyakarta: Graha Ilmu.
3. Andini, R., Sari, NP, & Lestari, D. (2020). The effect of deep breathing relaxation on pain intensity in post-operative patients at Dr. Moewardi Regional Hospital. Indonesian Nursing Journal, 23(1), 55–63.
4. Apriyanti, D., Putri, R., & Kurniawan, H. (2021). Deep breathing exercise to reduce pain after a section operation caesarea . Scientific Journal of Health, 14(2), 120–128.
5. Dewi, YK, & Rachmawati, IN (2021). Non-pharmacological pain management in postoperative patients: Literature review. Nursing Current Journal, 9(2), 87–96.
6. Fatimah, R., & Haris, A. (2022). The effectiveness of deep breathing relaxation techniques in reducing pain scale in post -laparotomy patients. Journal of Public Health and Nursing, 4(1), 34–42.
7. Hidayati, A., & Sari, R. (2022). Breathing relaxation techniques in reducing postoperative pain intensity. Muhammadiyah Nursing Journal, 7(1), 45–52.
8. International Association for the Study of Pain (IASP). (2020). IASP Guidelines on Pain Management. Washington: IASP Press.
9. Kurniawan, A., & Siregar, H. (2023). The effect of deep breathing relaxation intervention on pain levels in post- orthopedic surgery patients. Indonesian Nursing Journal of Education and Clinic, 8(2), 101–109.
10. Thalib, KU, Rahmat, RA, Pannyiwi, R., Jariyah, A., Qudratullah , F., & Vandika , AY (2024). Evaluation of Understanding of Standard Operating Procedures Regarding Premarital Screening of Coordinating Midwives. Sahabat Sosial: Journal of Community Service, 3 (1), 207–214. https://doi.org/10.59585/sosisabdimas.v3i1.563
11. Lestari, P., & Nurhayati, I. (2021). Effectiveness of deep breathing relaxation techniques on post - appendectomy pain intensity. Priority Nursing Journal, 4(1), 77–84.
12. Maidina, P., Handayani, S., Dewi, R., Hamzah, RN, Fahamsya , A., Iskandar, E., & Yermi, Y. (2024). The Influence of Video -Based Media on the Knowledge of Family Planning Acceptor Mothers About the Importance of Family Planning in the Lawawoi Health Center Work Area. International Journal of Health Sciences, 2 (3), 1000–1009. https://doi.org/10.59585/ijhs.v2i3.449
13. Maidina, P., Pannyiwi, R., Nurhaedah, N., Treasa, AD, Leli, L., & Lubis, H. (2025). Abnormal Skin Conditions (Skin Disorders) in Babies Age 0-12 Months Regarding the Use of Tools to Maintain the Cleanliness and Comfort of Babies (Baby Diapers) And Mother's Behavior in Tangkil Village. International Journal of Health Sciences, 3 (1), 102–110. https://doi.org/10.59585/ijhs.v3i1.598
14. Naim, H., Mahendika, D., Afifah Harahap, N., Prabu Aji, S., Batubara, A., Yunita, L., & Pannyiwi, R. (2023). The Relationship between Maternal Knowledge of

Publish: Association of Indonesian Teachers and Lecturers
International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 3 | Number 3 | September 2025 |

Complementary Foods with the Nutritional Status of Toddlers. International Journal of Health Sciences, 1 (1), 20–25. https://doi.org/10.59585/ijhs.v1i1.47

15. Potter, P. A., & Perry, A. G. (2021). Fundamentals of Nursing (10th ed.). St. Louis: Elsevier.
16. Pratama, R., & Widodo, S. (2023). Non- pharmacological postoperative interventions pain management: A systematic review. Asian Journal of Nursing Research, 15(3), 144–153.
17. Putri, A., & Hidayat, T. (2020). The effectiveness of deep breathing relaxation techniques on pain in post - cesarean section patients. caesarea . Aisyiyah Journal of Midwifery and Nursing, 16(2), 87–94.
18. Putri, SK, Salakory, JA, Saputra, MKF, Kristina, Y., Ramli, R., & Pannyiwi, R. (2024). Rehabilitation of Drug Users in Makassar City. International Journal of Health Sciences, 2 (1), 258–272. https://doi.org/10.59585/ijhs.v2i1.303
19. Santoso, B., & Anjani, R. (2022). Deep breathing relaxation as a complementary therapy for postoperative patients. Journal of Holistic Health, 6(2), 67–74.
20. Smeltzer, SC, & Bare, BG (2020). Brunner & Suddarth's Textbook of Medical-Surgical Nursing (14th ed.). Philadelphia: Lippincott Williams & Wilkins.
21. World Health Organization (WHO). (2021). Postoperative Pain Management Guidelines. Geneva: WHO Press.