Journal of Midwifery and Nursing, 7 (3) (2025) pp. 332-337

Published by: IOCSCIENCE

Journal of Midwifery and Nursing

Journal homepage: www.iocscience.org/ejournal/index.php/JMN

Finger hold relaxation intervention on reducing pain intensity in postoperative craniotomy patients in the Dahlia Room of Dr. Doris Sylvanus Hospital in 2025

Ayu Ristiana[1], Ester Inung Sylvia[2], Supriandi[3], Gad Datak[4]

[1,2,3,4] Nursing of Departement, Poltekkes Kemenkes Palangka Raya, Provinsi Kalimantan Tengah 73111, Indonesia

ARTICLE INFO

Article history:

Received Jul 5, 2025
Revised Jul 27, 2025
Accepted Jul 31, 2025

Keywords:

Craniotomy;
Finger grasp relaxation;
Pain.

ABSTRACT

Postoperative craniotomy pain is a common issue experienced by approximately 90% of patients within the first 48 hours after surgery. Effective pain management is crucial to prevent the progression of acute pain into chronic pain, which can hinder the patient's recovery. This study aims to evaluate the effectiveness of the finger grasp relaxation technique as a nonpharmacological intervention in post-craniotomy care. A descriptive design with a case study approach was used, involving two respondents who had undergone craniotomy at RSUD dr. Doris Sylvanus Palangka Raya. Data were collected through semi-structured interviews and direct observation. Data validity was ensured through source and method triangulation, and reliability was maintained by repeated measurement from two observers. Pain intensity was assessed using the Numerical Rating Scale (NRS) before and after the intervention. The finger grasp relaxation technique was applied for 15 minutes per session, once daily for three consecutive days. This technique is distinctive in combining gentle finger pressure with regulated breathing to stimulate reflex points believed to influence the central nervous system. The results indicated a decrease in pain intensity from a score of 5 to 2 in the first respondent, and from 6 to 2 in the second respondent, accompanied by a reduction in pain duration. Despite limitations such as a small sample size, the finger grasp relaxation technique has proven to be an effective, simple, and safe nonpharmacological therapy, with potential for application in nursing practice for postoperative pain management in craniotomy patients.

Corresponding Author:

Ester Inung Sylvia,
Nursing of Departement,
Poltekkes Kemenkes Palangka Raya,
Jl. G.Obos No30-32, Kota Palangka Raya, Provinsi Kalimantan Tengah 73111, Indonesia
Email: esterinung@polkesraya.ac.id

1. Introduction

Head injury is a traumatic brain disorder that causes changes in the function or structure of brain tissue due to external mechanical influences, either blunt or penetrating trauma. This can lead to temporary or permanent cognitive, physical, and psychosocial impairments (Riduansyah & Zulfadhilah, 2021). This condition is a leading cause of death and long-term disability, especially in the productive age group (Firmada et al., 2021). Based on epidemiological data, approximately 90% of deaths are related to head trauma, with the distribution of injury severity consisting of 75% mild, 15% moderate, and 10% severe (Friska,

2020). Head injury can lead to complications such as increased intracranial pressure (ICP), impaired cerebral perfusion, and cerebral edema, which can lead to brainstem herniation and death (Abdullah & Luneto, 2022; Azizah & Indrihapsari, 2023).

In cases of severe cerebral edema that do not respond to conservative therapy, surgical procedures such as craniotomy are often necessary to reduce intracranial pressure and treat intracranial lesions (Pratama et al., 2020). However, postoperative pain is a nearly invariable complication of craniotomy, with 90% of patients experiencing pain within the first 48 hours and 30% at risk of developing chronic pain (Isnaeni Rahmawati et al., 2024). Postcraniotomy pain, which, according to the International Headache Society (IHS), can be acute or persistent (>3 months), needs to be optimally managed in the acute phase to prevent chronicity (Handayani et al., 2024).

Postoperative pain management can be carried out using pharmacological and nonpharmacological approaches. Pharmacological analgesics are often used, but they are not free from side effects such as nausea, vomiting, excessive sedation, and the risk of addiction (Rahmatika et al., 2022). Therefore, non-pharmacological interventions are gaining attention because they are safe, easy to implement, and have minimal side effects. Several non-pharmacological techniques that have been studied include guided imagery, deep breathing, progressive muscle relaxation, and acupressure, each of which works through different mechanisms such as activating the parasympathetic nervous system, redirecting pain perception, and releasing endorphins. In the study conducted by Sharma et al.,(2023) ,guided imagery and deep breathing techniques were found to be effective in reducing pain intensity and anxiety, while acupressure provided analgesic effects through the stimulation of specific points that modulate nociceptive pathways.

Among these methods, the finger-grip relaxation technique has emerged as a simple, non-invasive, and easy-to-learn approach. This technique utilizes stimulation of reflex points on the fingers, which are believed to influence the body's energy flow and activate neuromodulation mechanisms through the central nervous system (Pitasari, 2025). Compared with other techniques, finger-grip relaxation has the advantage of being accepted by patients because it can be performed independently without additional equipment and has the potential to reduce physical and emotional tension. Several studies have reported the effectiveness of this technique in reducing acute post-craniotomy pain (Liestarina et al., 2023)..

2. Methods

This study used a descriptive design with a case study approach to evaluate the effectiveness of the finger grip relaxation technique in reducing post-craniotomy pain in the Dahlia Ward of Dr. Doris Sylvanus Regional General Hospital, Palangka Raya (February 24–April 22, 2025). Two informants were purposively selected in accordance with the case study principle that emphasizes depth of analysis. Inclusion criteria included patients aged 30–55 years, fully conscious, able to communicate, experiencing post-craniotomy headache (NRS ≥ 4), and willing to be respondents; exclusion criteria included hand motor disorders, severe cognitive or psychological disorders, and post-operative complications requiring continuous sedation. The intervention was carried out for three consecutive days, each session lasting 15 minutes, with the following procedures: sitting or semi-Fowler position, deep breathing exercises, gripping each finger from the thumb to the little finger for ±2 minutes per finger with gentle pressure and verbal guidance, then final breath relaxation. Pain intensity was measured using the Numerical Rating Scale (NRS) before and after each session. Data were collected through observation, semi-structured interviews, and medical record documentation, then analyzed inductively using source triangulation. Research ethics were maintained through informed consent, anonymity, and confidentiality of respondent data.

3. Results and Discussion

Results

The findings indicate a decrease in pain levels among patients following the finger grip relaxation intervention. Pain intensity measured using the NRS scale demonstrated a downward trend from day one to day three for both respondents (Figure 1). This reduction was consistent with patients, subjective reports obtained during interviews and supported by nurses, observations, which noted

reduced pain-related facial expressions and improved comfort during mild mobilization. Medical records also indicated a decrease in additional analgesic use.

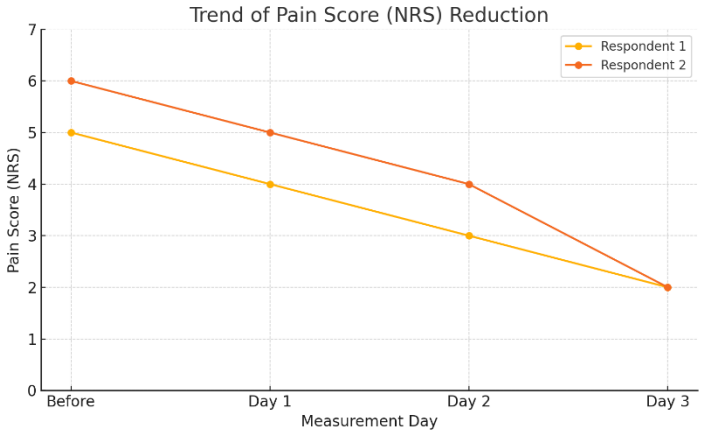

Figure 1. Pain Score (NRS) Reduction Trend for Respondents 1 and 2

Discussion

a. Identify features of case study respondents

Both respondents had similar clinical characteristics, in accordance with the research inclusion criteria, namely post-craniotomy patients who experienced head pain. According to Isnaeni Rahmawati et al. (2024), craniotomy is a common intracranial surgical procedure that causes significant pain in 90% of patients, especially in the first 48 hours postoperatively. This pain, if not managed properly, risks becoming chronic pain in about 30% of patients.

b. Pain response before nursing implementation

Before the intervention, both respondents reported complaints of head pain that appeared when the head moved position. Based on the PQRST assessment, Respondent 1 experienced pain with characteristics such as stabbing in the head area (scale 5, intermittent), and Respondent 2 showed higher pain intensity (scale 6) with similar characteristics.

c. Pain response after nursing implemention

After the intervention was carried out for three days, there was a decrease in pain intensity in both respondents. Respondent 1 showed a decrease from scale 5 to 2, and respondent 2 from scale 6 to 2. Although the location and character of pain did not change, the intensity and duration of pain were consistently reduced every day. This shows the effectiveness of the finger grasp relaxation technique in reducing pain perception.

The results of this study are consistent with various previous studies that have shown the effectiveness of finger grasp relaxation techniques in reducing postoperative pain intensity. Rini Indah Pratiwi & Dian Hudiyawati, (2024) reported a decrease in pain scale from 5 to 2 after three days of intervention in post-craniotomy patients. A similar study by Heriyanti, (2023), also noted a decrease in pain scale from 4 to 2 in patients with mild head injury who received the same intervention. Similar support was also found in the study of Hidayat et al., (2023) , which showed that this technique statistically significantly decreased pain with a p value <0.05. This finding was reinforced by the studies Ahmad & Kardi, (2022) Wijayanti et al., (2022) , and Zul'irfan et al., (2022) , all of which reported a p-value = 0.000, indicating a significant difference between pain conditions before and after the intervention. Taken together, these data confirm that the finger grip relaxation technique is an effective nonpharmacological intervention for postoperative pain management, particularly in the context of neurosurgery and abdominal surgery.

Physiologically, the effectiveness of the finger grip relaxation technique can be explained through the pain transmission mechanism based on gate control theory. Stimulation that occurs due to surgery triggers the release of pain mediators that flow through afferent nerve fibers to the gelatinous substance in the spinal cord. From there, pain impulses are forwarded to the thalamus and finally to the

cerebral cortex, where pain is realized and interpreted (Saputra et al., 2023). However, when gentle pressure is applied to the fingers through the finger grasping technique, non nociceptor neural pathways are activated. This activation produces impulses that are able to close the "gate" of pain in the spinal cord, so that the transmission of pain impulses can be inhibited. As a result, the perception of pain reaching the brain is significantly reduced. This mechanism demonstrates a direct link between sensory stimulation of the fingers and central nervous system inhibition of pain perception.

Not only does it have a physiological impact, the finger grasp relaxation technique also has a profound psychological effect. Muzaki et al., (2021), explained that this technique can help calm the mind and relieve negative emotions through stimulation of meridian energy points located on the fingers. This effect is reinforced by research Ristanti et al., (2023) , which shows that the combination of finger pressure and breath regulation when performing this technique simultaneously is able to reduce physical and emotional tension. This proves that the finger grasping technique is not only physical, but also stimulates emotional aspects that are closely related to pain perception. Other studies have also reinforced these findings. Atalla et al., (2022) suggests that stimulation of the reflection points of the fingers is significantly able to reduce the sensory transmission of pain from the wound area to the central nervous system. In line with that, Vioneery et al., (2022) suggests that when a person experiences pain or excessive emotional stress, the flow of energy in the body can be disrupted or blocked. By performing finger grasping techniques accompanied by deep breathing, the flow of emotional energy can return smoothly, which in turn helps accelerate the healing process holistically.

Furthermore, Satriani et al., (2021) states that the finger grasping relaxation technique also contributes to the fulfillment of patients' basic needs for a sense of security and comfort, especially in postoperative patients. This intervention allows patients to develop more adaptive coping strategies in dealing with stress and pain. In addition to its physiological and psychological benefits, this technique has advantages in terms of practice: this technique can be done independently, without the need for assistance from medical personnel (Hakim et al., 2023) . This makes the finger grasp relaxation technique an efficient intervention that can be integrated into home care and health facilities.

The intervention results obtained in this study reinforced the findings from previous studies, showing a consistent pattern of progressive pain reduction over the three days of therapy. From a nursing practice perspective, the application of this technique has the potential to be integrated in a holistic nursing approach. Nurses can use it as a complementary therapy in postoperative patients with pain risk, especially when pharmacological approaches have limitations or side effects. This technique is also simple, can be done independently, and does not require high equipment or costs, as also confirmed in the two previous studies. These findings strengthen the empirical basis for the effectiveness of the finger grip relaxation technique as a reliable nursing intervention in pain management.

However, the results of this study also need to be viewed in light of its limitations. First, the very small sample size (two respondents) limits the generalizability of the results to a broader population. This case study provides initial insights, but cannot yet serve as a strong evidence base without further research with a larger sample size. Second, there is potential bias in pain perception, as pain is a subjective experience that is strongly influenced by psychological factors and individual expectations of the intervention. Third, the lack of a control group makes it difficult to confirm that the pain reduction was entirely due to the finger grip intervention, and not to other factors such as the placebo effect, natural postoperative adaptation, or psychosocial support provided during the intervention. Therefore, further research with experimental and randomized designs is needed to strengthen these findings and evaluate the intervention's effectiveness more objectively and systematically.

4. Conclusion

Based on the case study of two respondents with similar medical characteristics and primary complaints of post-craniotomy headache, the finger-grip relaxation technique was found to be effective in reducing pain intensity, as demonstrated by a decrease in pain scores from 5 and 6 to 2 after three days of intervention. These findings are consistent with previous studies supporting the effectiveness of this technique in post-surgical pain management, thereby strengthening the empirical evidence of its therapeutic benefits. However, this study has notable limitations, particularly the very small sample size and the absence of a control group, which restrict the generalizability of the results. Despite these limitations, this research contributes significantly to nursing practice by presenting a safe, effective, and

side-effect-free non-pharmacological intervention, which has the potential to improve patient care quality and accelerate postoperative rehabilitation.

References

Abdullah, M. R. Y., & Luneto, S. I. (2022). HEAD INJURY PATIENTS: THE EFFECT OF 30-DEGREE HEAD ELEVATION ON AWARENESS INTRODUCTION Head Injury or TBI (Traumatic Brain Injury). 6(2). https://doi.org/10.57214/jka.v6i2.162

Ahmad, S., & Kardi, S. (2022). The Effect of Finger Grip Relaxation Technique on Pain Levels in Post-Appendectomy Patients in the Melati Ward of Kendari City General Hospital in 2020. 1(2), 27–32. https://doi.org/10.69677/avicenna.v1i2.14

Atalla, T., Amalia, R., & Nuraisya, W. (2022). Midwifery Care for Post-SC Mothers Using Finger Grip Relaxation Techniques for Surgical Wound Pain at Amelia Hospital, Pare-Kediri. 59–64. https://doi.org/10.58222/juvokes.v1i2.44

Azizah, M. N., & Indrihapsari, E. F. (n.d.). A 62-YEAR-OLD WOMAN WITH CARDIOEMBOLIC STROKE AND CEREBRAL EDEMA. 334–339. https://proceedings.ums.ac.id/kedokteran/article/view/2929/2891

Firmada, M. A., Kristianti, M., & Husain, F. (2021). Pain Management with Guided Imagery Relaxation in Patients with Mild Head Injuries in the Emergency Department (ED): Literature Review. 2, 20–25. https://doi.org/10.30787/asjn.v2i1.814

Friska, N. (2020). Emergency Nursing Care for Cerebral Edema in Traumatic Head Injury. BIMIKI (Scientific Journal of Indonesian Nursing Students), 7(1), 36–41. https://doi.org/10.53345/bimiki.v7i1.27

Hakim, A., Kesumadewi, T., & Ludiana. (2023). Implementation of Finger Grip Relaxation on the Pain Scale of Hakim, Application of Finger Grip. 3. https://jurnal.akperdharmawacana.ac.id/index.php/JWC/article/view/434

Handayani, A. Y., Fitri, S. U. R., & Pahria, T. (2024). Head Elevation Intervention in Patients with Space-Occupying Lesions (SOL) Due to Meningioma Post-Craniotomy with Headache: Case Report. SENTRI: Journal of Scientific Research, 3(3), 1523–1535. https://doi.org/10.55681/sentri.v3i3.2429

Heriyanti, N. A. N. (2023). Application of finger grip relaxation technique on pain levels in post-operative craniotomy patients with mild head injuries in the intensive care unit of Dr. Soeradji General Hospital. 9. https://eprints.ukh.ac.id/id/eprint/4675/1/ANTRINKA NOVIEN_SN2221014_NASKAH PUBLIKASI.pdf

Hidayat, A., Kartiningrum, E. D., & Sari, I. P. (2023). The Effectiveness of Deep Breathing Relaxation Techniques and Finger Grip Relaxation Techniques on Pain Reduction in Postoperative Appendicitis Patients at Mojokerto Hospital. Medica Majapahit (SCIENTIFIC JOURNAL OF HEALTH, MAJAPAHIT SCHOOL OF HEALTH SCIENCES), 15(1), 1–12. https://ejournal.stikesmajapahit.ac.id/index.php/MM/article/view/904

Isnaeni Rahmawati, Ahmad Zakiudin, Tati Karyawati, & Nur Umi Aminatussholihah. (2024). Nursing Care for Mr. M with Post-Operative Craniotomy: Moderate Head Injury in Room Mawar 2, Dr. Soeselo General Hospital, Tegal Regency. Calory Journal: Medical Laboratory Journal, 2(3), 182–194. https://doi.org/10.57213/caloryjournal.v2i3.392

Liestarina, A. S., Hermawati, H., Ika, Y., & Sutanto, A. (2023). Application of Finger Grip Relaxation for Reducing Pain Intensity in Postoperative Patients at Ir. Soekarno General Hospital, Sukoharjo. Duta Medika Nursing Journal, 3(2), 67–74. https://doi.org/10.47701/dutamedika.v3i2.2917

Muzaki, A., Widiyanto, B., & Yuliana, W. E. (2021). LITERATURE REVIEW: THE APPLICATION OF FINGER GRIP RELAXATION TECHNIQUES IN REDUCING PAIN INTENSITY IN POST-APPENDECTOMY CLIENTS. 2. https://doi.org/10.53510/nsj.v2i1.64

Pitasari. (2025). Application of finger grip relaxation technique intervention in breast cancer patients with acute pain. Journal of Nursing, 9, 1350–1355. https://doi.org/10.31004/jn.v9i2.41072

Pratama, R. A., Laksono, B. H., & Fatoni, A. Z. (2020). Management of Acute Pain After Craniotomy. 1(3), 28–38. https://jap.ub.ac.id/index.php/jap/article/view/29

Rahmatika, D., Utami, I. T., & Purwono, J. (2022). Application of lavender aromatherapy for patients with headaches in the neurology ward of RSUD Jend. Ahmad Yani Metro. 2. https://www.jurnal.akperdharmawacana.ac.id/index.php/JWC/article/view/301

Riduansyah, M., & Zulfadhilah, M. (2021). Description of the level of consciousness of head injury patients using the Glasgow Coma Scale (GCS). https://www.jurnal-ppni.org/ojs/index.php/jppni/article/view/236

Rini Indah Pratiwi, & Dian Hudiyawati. (2024). Application of Finger Grip Relaxation Technique on Pain Reduction in Post-Craniotomy Surgery Patients. Ventilator Journal, 2(2), 92–101. https://doi.org/10.59680/ventilator.v2i2.1188

Ristanti, S. G., Inayati, A., Hasanah, U., & Kunci, K. (2023). *PENERAPAN TEKNIK RELAKSASI GENGGAM JARI TERHADAP SKALA NYERI PADA PASIEN POST OPERASI APPENDIKTOMI DI RUANG BEDAH RSUD JENDERAL AHMAD YANI METRO*. *3*, 568–575. https://www.jurnal.akperdharmawacana.ac.id/index.php/JWC/article/view/506

Sharma, A., Sharma, N., & Sharma, A. (2023). Soft tissue therapy in managing neonatal procedural pain: A systematic review. Journal of Neonatal Nursing, 29(6), 815-824. https://www.sciencedirect.com/science/article/abs/pii/S1355184123000376

Saputra, M., Bina, U., & Getsempena, B. (2023). *PERBANDINGAN TEKNIK RELAKSASI GENGGAM JARI DENGAN TEKNIK RELAKSASI BENSON TERHADAP PENURUNAN NYERI PADA PASIEN POST OPERASI APENDIKTOMI*. *2*(2), 83–92. https://doi.org/10.46244/ghsj.v2i2.2253

Satriani, A. E., Thahir, N., & Rosnia, R. (2021). Pengaruh Teknik Relaksasi Genggam Jari Terhadap Penurunan Intensitas Nyeri Pasien Post Operasi Fraktur Di Rumah Sakit Bhayangkara Makassar. *Patria Artha Journal of Nursing Science*, *6*(1), 1–10. https://doi.org/10.33857/jns.v6i1.508

Vioneery, D., Listiyanawati, M. D., & Dirhan, D. (2022). Penurunan Nyeri Osteoarthritis Dengan Teknik Relaksasi Genggam Jari. *Nursing News : Jurnal Ilmiah Keperawatan*, *6*(2), 70–75. https://doi.org/10.33366/nn.v6i2.2502

Wijayanti, E., Furry TS, R., & B, S. (2022). *EFFEKTIFITAS TEKNIK RELAKSASI GENGGAM JARI (FINGER HOLD) TERHADAP PENURUNAN INTENSITAS NYERIPADA PASIEN 6 JAM POSTOPERASI SECTIO CAESARIA DI RSUD DR KANUJOSO DJATIWIBOWO BALIKPAPAN TAHUN 2020*. *10*(1), 83–90. https://doi.org/10.37676/jm.v10i1.2632

Zul'irfan, M., Bayu, A., & Pandini, A. I. (2022). *RELAKSASI GENGGAM JARI BERPENGARUH TERHADAP PENURUNAN SKALA NYERI PASIEN PASCA BEDAH FRAKTUR EKSTREMITAS BAWAH*. *12*, 887–892. https://journal2.stikeskendal.ac.id/index.php/PSKM/article/view/225/307