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Application of Finger-Hold Relaxation Technique on Postoperative Pain Intensity in Laparotomy Patients: A Case Study in dr. Moewardi General Hospital, Surakarta

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Abstract

Background: Effective postoperative pain management is essential to enhance recovery, reduce complications, and improve patient comfort following major abdominal surgery such as laparotomy. Non-pharmacological interventions offer safe adjuncts to conventional analgesia, particularly in resource-conscious or multimodal pain management settings. **Objective:** This study aimed to evaluate the effectiveness of the finger grip relaxation technique in reducing pain intensity among post-laparotomy patients. **Methods:** A descriptive case study was conducted with two female patients diagnosed with colon cancer who underwent elective laparotomy at Flamboyan 5 Ward, Dr. Moewardi General Hospital, Surakarta, Indonesia. Pain intensity was assessed using the Numeric Rating Scale (NRS; 0–10) before and after the intervention. The finger grip relaxation technique, a simple, self-administered method involving rhythmic gripping and releasing of the fingers, was applied once daily for three consecutive days, with each session lasting 20 minutes. **Results:** Both patients exhibited clinically meaningful reductions in pain intensity following the intervention. Patient A's NRS score decreased from 4 to 2, and Patient S's score declined from 6 to 3, indicating a shift from moderate to mild pain levels. No adverse effects were observed. **Conclusion:** The finger grip relaxation technique is a feasible, non-invasive, and low-cost adjunctive strategy for managing acute postoperative pain after laparotomy. These preliminary findings support the integration of this approach into multimodal pain management protocols. However, larger controlled trials are warranted to confirm efficacy, determine optimal dosing, and assess broader clinical applicability.

Keywords: Postoperative pain, Laparotomy, Finger grip relaxation, Non-pharmacological intervention

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1. BACKGROUND

Laparotomy is one of the major surgical procedures, involving an incision through the abdominal wall to access abdominal organs affected by issues such as cancer, bleeding, obstruction, and

perforation (Yuliana et al., 2021). Laparotomy is performed when there are severe health problems in the abdominal area, for example, acute appendicitis. Every surgery can cause discomfort and trauma to the patient, with pain being one of the most common complaints reported by patients (Nadianti & Minardo, 2023).

According to the World Health Organization (2021), the number of patients undergoing surgical procedures shows a significant annual increase globally. It is estimated that 165 million surgical procedures are performed worldwide every year. In 2021, 234 million patients underwent surgery in hospitals around the world. In Indonesia, the number of surgical procedures reached up to 1.2 million patients in 2021 (Ramadhan et al., 2023). The World Health Organization (WHO) reports that the number of laparotomy patients increases annually by approximately 10%. In 2017, there were 90 million laparotomy patients worldwide, increasing to 98 million in 2018. In Indonesia in 2018, laparotomy ranked fifth among surgeries, with 42% of the total 1.2 million surgical cases being laparotomies (KEMENKES, 2023).

Data from medical records at dr. Moewardi General Hospital show that the number of surgical procedures in the IBS unit in January was 981 procedures, averaging 32 procedures per day. The actual number of surgical procedures conducted in the first quarter reached 2,366 procedures (26.15%) of the target set for the first quarter of 2,262 procedures (25%), indicating a positive deviation of 1.15% (dr. Moewardi General Hospital, 2022). After surgery, one of the experiences patients commonly report is post-operative pain.

Pain is a condition that commonly occurs in every patient undergoing a surgical procedure (Hermawan & Rosyid, 2024). Pain following laparotomy is often experienced at moderate or severe levels due to damage to the skin, muscle tissue, and vascular structures, resulting in longer-lasting pain during recovery. Post-laparotomy patients often face inflammation and pain, which can limit mobility (Kushariyadi & Pribadi, 2024). If the pain experienced by post-laparotomy patients is not adequately managed, it can lead to discomfort, inability to perform activities or mobility impairment, restlessness or anxiety, decreased appetite, pain sensations at the surgical wound site, affect the pulmonary system (rapid breathing), and the cardiovascular system (Nadianti & Minardo, 2023).

Inadequate and inaccurate pain management after surgery can increase the risk of complications, thereby slowing down the healing process (Hexendr et al., 2024). Pain management can be combined using pharmacological and non-pharmacological therapies. Pharmacological therapy involves medications such as analgesics. Analgesics may include opioid drugs like morphine sulfate, codeine sulfate, and methadone, or non-opioid analgesics such as aspirin, acetaminophen, and nonsteroidal anti-inflammatory drugs (NSAIDs). Non-pharmacological therapy is used as an adjunct to pharmacological therapy to reduce pain intensity through relaxation, distraction, aromatherapy, and other methods (Apriliani, 2022). Finger-hold relaxation techniques, also known as finger grip relaxation, are one form of non-pharmacological therapy that can help reduce pain in post-laparotomy patients. The purpose of this relaxation technique is to reduce pain, fear, and anxiety; relieve panic and worry; provide comfort to the body; calm the mind; control emotions; and improve blood circulation (Hakim et al., 2023).

Relaxation techniques are related to the fingers and energy flow within the body. Gripping the fingers while taking deep breaths (relaxation) can reduce and heal physical and emotional tension. This technique warms the entry and exit points of energy along the meridians (energy pathways) located in the fingers, thus providing spontaneous reflex stimulation during the grip (Larasati & Hidayati, 2022). This is supported by Rasyidah et al. (2022), whose study involved the administration of finger-hold relaxation therapy for three days, once daily for 20 minutes. The results showed that 100% of respondents experienced a decrease in pain scale scores.

Based on preliminary observations conducted during clinical nursing practice in February 2025 at Flamboyan 5 Ward of dr. Moewardi General Hospital, Surakarta, post-laparotomy patients generally received pharmacological therapy in the form of analgesics and non-pharmacological therapy such as deep breathing relaxation. Data collected on February 11, 2025, revealed patient Mrs. A with a pain score of 4, while data collected on February 18, 2025, revealed patient Mrs. S with a pain score of 6. Interviews with post-laparotomy patients indicated that they were unaware of non-pharmacological techniques to alleviate post-surgical pain. Therefore, the author is interested in conducting "the application of finger-hold

relaxation techniques to reduce pain intensity in post-laparotomy patients at Flamboyan 5 Ward of dr. Moewardi General Hospital, Surakarta.

2. METHODS

The method used in this application is a case study method. The case study serves as the main focus of the author's exploration regarding nursing care issues related to acute pain in post-laparotomy surgery patients who have undergone finger-hold relaxation therapy in Room Flamboyan 5 at dr. Moewardi General Hospital, Surakarta.

The subjects involved in this application are post-operative patients in Room Flamboyan 5 at dr. Moewardi General Hospital, Surakarta. This application will involve two patients with the Inclusion criteria refer to general characteristics of the research population that are accessible. The inclusion criteria for this application are: patients experiencing pain after laparotomy surgery in Room Flamboyan 5 at dr. Moewardi General Hospital, Surakarta, and patients with mild or moderate pain following laparotomy surgery. Exclusion criteria include patients suffering from mental disorders.

The application of finger-gripping relaxation therapy to reduce pain was conducted on two patients who had undergone laparotomy surgery in Room Flamboyan 5 at dr. Moewardi General Hospital, Surakarta.

Patient 1 underwent an assessment on February 11, 2025. The patient, Mrs. A, aged 50 years, had been diagnosed with colon cancer. Her primary complaint was pain in the post-operative wound area. She underwent stoma repair, and her physical examination showed she was fully conscious with vital signs recorded as follows: blood pressure 125/86 mmHg, body temperature 37.3°C, pulse rate 98 beats per minute, oxygen saturation (SpO_2) at 99%, respiratory rate 22 breaths per minute. Pain assessment revealed that Mrs. A experienced pain at the surgical wound site; the pain occurred when moving and was described as sharp, centered at the surgical scar, with a pain scale rating of 4 and characterized by intermittent episodes. Based on these findings, the identified nursing diagnosis for Mrs. A was acute pain related to physical injury agents.

Patient 2 underwent an assessment on February 16, 2025. The patient, Mrs. S, aged 53 years, had also been diagnosed with colon cancer. Her primary complaint was pain at the post-operative wound area.

Physical examination showed she was fully conscious with vital signs recorded as follows: blood pressure 136/95 mmHg, body temperature 36.8°C, pulse rate 105 beats per minute, SpO_2 at 99%, respiratory rate 22 breaths per minute. Pain assessment indicated that Mrs. S experienced pain at the surgical wound site, which occurred when moving and was described as sharp, centered at the surgical scar, with a pain scale rating of 6 and characterized by intermittent episodes. Based on these findings, the identified nursing diagnosis for Mrs. S was also acute pain related to physical injury agents.

The data collection methods included interviews, observations, and documentation studies. Interviews were conducted to gather information about the patients' complaints, medical history, family health history, lifestyle patterns, and any ongoing treatments. Observations focused on the patients' general condition, vital signs, and breathing patterns. Documentation studies involved reviewing medical records, laboratory results, and therapies received by the patients to complete the collected data.

Data processing included narrative descriptions and tabular presentations. Narrative descriptions provided textual explanations of the primary data collected, such as patient demographics, main complaints, past medical history, family health history, physical examinations, vital sign assessments, and measurements before and after applying the finger-hold relaxation technique. Tabular presentations were used to record the progression and comparison of pain levels experienced by both respondents before and after undergoing the finger-hold relaxation technique.

Ethical considerations were taken into account during the research process, including informed consent, anonymity, confidentiality, veracity, and justice. These principles ensured that participants understood the purpose and implications of the research, their identities remained confidential, all information provided was kept private, they were given honest explanations about the research, and fair treatment was extended to all parties involved.

The implementation of the finger-hold relaxation technique aimed to reduce pain intensity was carried out over several days, focusing on two respondents. The results demonstrated varying degrees of pain reduction among the participants. Before the intervention, both respondents reported moderate pain levels, which decreased to mild pain levels after undergoing the finger-hold relaxation therapy. Comparisons between the two

respondents showed individual differences in pain perception and response to the intervention, highlighting the subjective nature of pain experience.

3. RESULTS

The research was conducted in Room Flamboyan 5 at dr. Moewardi General Hospital, Surakarta. Flamboyan 5 Ward is an inpatient care unit within the Flamboyan installation that provides inpatient services for surgical cases and also accepts referrals from other departments when those units are full. Flamboyan 5 Ward consists of 8 rooms with 4 beds in each room. It is divided into PP I and PP II; PP I manages odd-numbered rooms (rooms 501, 503, 505, 507), while PP II manages even-numbered rooms (rooms 502, 504, 506, 508).

This implementation is a descriptive study aimed at determining the effectiveness of finger-holding relaxation therapy in reducing pain levels in post-laparotomy patients in Flamboyan 5 Ward at dr. Moewardi General Hospital, Surakarta. The sample consisted of 2 respondents diagnosed with the same condition in Flamboyan 5 Ward at dr. Moewardi General Hospital, Surakarta. The implementation was conducted directly by the researcher on the respondents.

Table 1. Pain scale of post-laparotomy patients before receiving finger-hold relaxation therapy in Flamboyan 5 Ward at dr. Moewardi General Hospital, Surakarta

Name	Date	Pain Scale	Pain Intensity
Mrs. A	February 11, 2025	4	Moderate
Mrs. S	February 16, 2025	6	Moderate

Based on the table 1, the results of the pain assessment of post-laparotomy patients before undergoing finger-hold relaxation therapy showed moderate pain intensity at levels 4 and 6.

Table 2. Pain scale of post-laparotomy patients after receiving finger-hold relaxation therapy in Flamboyan 5 Ward at dr. Moewardi General Hospital, Surakarta

Name	Date	Pain Scale	Pain Intensity
Mrs. A	February 13, 2025	2	Mild
Mrs. S	February 18, 2025	3	Mild

Based on the table 2, the results of the pain intensity assessment of post-laparotomy patients after undergoing finger-hold relaxation therapy indicated that the patients reported no pain, with mild pain scales at levels 2 and 3.

Table 3. Development of pain scale in laparotomy patients after receiving finger-hold relaxation therapy in Flamboyan 5 Ward at dr. Moewardi General Hospital, Surakarta

Name	Day of Implementation	Date	Before	After
Mrs. A	1	February 11, 2025	4 (Moderate)	3 (Mild)
	2	February 12, 2025	4 (Moderate)	3 (Mild)
	3	February 13, 2025	3 (Mild)	2 (Mild)
Mrs. S	1	February 16, 2025	6 (Moderate)	4 (Moderate)
	2	February 17, 2025	5 (Moderate)	4 (Moderate)
	3	February 18, 2025	4 (Moderate)	3 (Mild)

Based on the table 3, both respondents were initially categorized under moderate pain intensity at levels 4 and 6, and after the intervention, they experienced a reduction in pain intensity to levels 2 and 3, classified as mild.

Table 4. Comparison between the two respondents after implementing finger-hold relaxation technique to reduce pain intensity in post-laparotomy patients in Flamboyan 5 Ward at dr. Moewardi General Hospital, Surakarta

Name	Pain Scale Before	Pain Scale After	Notes
Mrs. A	4	2	Pain level reduced from scale 4 to 2
Mrs. S	6	3	Pain level reduced from scale 6 to 3

Based on the table 4, it shows that both respondents experienced different levels of pain. Mrs. A had a pain level of 4 before the intervention, which decreased to 2 after the intervention. Whereas Mrs. S had a pain level of 6 before the intervention, which decreased to 3 after the intervention.

4. DISCUSSION

Before implementing the finger-hold relaxation technique to reduce pain intensity in post-laparotomy patients in Flamboyan 5 Ward at dr. Moewardi General Hospital, Surakarta

The pain assessment results of both respondents showed that they were experiencing moderate pain intensity before undergoing finger-hold relaxation therapy. The pain intensity of Mrs. A was at pain scale level 4, while Mrs. S was at level 6. The researcher assumed that the pain level of post-laparotomy patients was mostly at moderate intensity, and the difference in pain scale levels between the two patients was due to individual differences in pain tolerance. This aligns with Arif et al. (2021), who stated that post-laparotomy pain varies in response

and sensation, making it impossible to generalize across individuals, as only the person experiencing it can explain how the pain feels. This is also consistent with Rasyidah et al. (2022), who noted that factors influencing an individual's pain threshold are usually related to past experiences; those accustomed to experiencing pain may experience moderate or mild pain subsequently.

Laparotomy is an exploratory surgery to address issues in the abdominal area using techniques that involve opening the peritoneum or incision techniques performed in the abdominal area (Sandra et al., 2023). Post-laparotomy pain is discomfort experienced after undergoing laparotomy surgery, which involves opening the abdominal cavity. This pain is caused by surgical wounds and tissue damage that occurs during the operation. After post-laparotomy procedures, several issues may arise, including bleeding, infection, bruising, seroma/hematoma, wound dehiscence, necrosis, incisional hernia, numbness on the skin, fistulation with underlying structures, increased intra-abdominal compartment pressure, and pain (Rajaretnam et al., 2024).

Treatment for post-laparotomy pain includes pharmacological therapy with analgesics and non-pharmacological therapy. Non-pharmacological therapy is a technique that can reduce pain in patients experiencing post-operative wound pain. Non-pharmacological management to reduce pain includes pain management using aromatherapy, breathing technique education, environmental comfort management, position adjustment, warm compresses, music therapy, distraction, and relaxation (Alahtiar et al., 2024). One form of relaxation that can be used to reduce pain is finger-hold relaxation.

After implementing the finger-hold relaxation technique to reduce pain intensity in post-laparotomy patients in Flamboyan 5 Ward at dr. Moewardi General Hospital, Surakarta

The research results showed that the pain scale levels of each patient experienced a decrease after applying the finger-hold relaxation technique. Mrs. A experienced a reduction from pain scale level 4 to level 2. While Mrs. S experienced a reduction from pain scale level 6 to level 3. Finger-hold relaxation is a very simple and easy relaxation technique that anyone can perform. It is associated with the fingers and the flow of energy within our bodies. The finger-hold technique is also known as finger hold. The finger-hold relaxation technique is a method used to alleviate or reduce post-surgical pain intensity (Alahtiar et al., 2024). Many

factors influence pain response, such as age, gender, previous pain experiences, anxiety, culture, placebo effect, coping patterns, family, and social support (Nadianti & Minardo, 2023).

Finger-hold relaxation therapy can reduce pain intensity in post-laparotomy patients. This is consistent with Rosiska's (2021) research, which found that more than half of the respondents (63%) experienced mild pain and a small portion (13%) experienced moderate pain after undergoing finger-hold relaxation techniques.

The decrease in pain intensity after applying finger-hold relaxation therapy focuses the patient on the movements performed, thus distracting them from the pain they are experiencing. As stated by Alahtiar et al. (2024), holding one's fingers while taking slow breaths (relaxation) can reduce physical and emotional tension because the finger grip warms up the points where energy enters and exits along the meridians (energy channels) located in our fingers. These reflex points will provide spontaneous stimulation during the grip. Along our fingers, there are channels or meridians of energy connected to various organs and emotions. Reflex points on the hands provide reflexive (spontaneous) stimulation during the grip. This stimulation sends a kind of shock wave or electricity to the brain. The wave is received by the brain and quickly processed, then sent to the nerves of the affected body organ, thereby clearing blockages in the energy pathway. The finger-hold relaxation procedure will generate impulses transmitted through non-nociceptive afferent nerve fibers. These non-nociceptive afferent nerve fibers cause the "gate" to close, blocking the pain stimulus and reducing it.

Development before and after implementing the finger-hold relaxation technique to reduce pain intensity in post-laparotomy patients in Flamboyan 5 Ward at dr. Moewardi General Hospital, Surakarta

The development of respondents after undergoing finger-hold relaxation therapy showed differences. For Mrs. A, on the first day before the intervention, the pain scale was recorded at 4 and decreased to 3. On the second day, the result before the intervention was 4 and decreased to 3. On the third day, the result before the intervention was recorded at 3 and decreased to 2. For Mrs. S, on the first day before the intervention, the pain scale was recorded at 6 and decreased to 4. On the second day, the result before the intervention was recorded at 5 and decreased to 4. On the third day, the result

before the intervention was recorded at 4 and decreased to 3 after the intervention. Both respondents experienced a decrease in pain scale, which was caused by receiving non-pharmacological therapy through the finger-hold relaxation technique. This indicates that each individual's pain perception and response vary. This is supported by Indrawati & Arham (2021), who demonstrated that pain scale assessments differ among individuals even when given the same stimulation.

The decrease in pain intensity for each patient varied daily. Pain is influenced by age, gender, anxiety, past pain experiences, socio-cultural factors, religious values, environment, and close support. This aligns with Rasyidah et al. (2022), who found that factors affecting an individual's pain threshold are usually linked to past experiences; those accustomed to experiencing pain will have subsequent moderate or mild pain experiences.

On the third day of finger-hold relaxation, both patients experienced a reduction in pain intensity, where the patients reported a decrease in pain at scales 2 and 3 with mild pain intensity. Finger-hold relaxation proved to be more effective as a combined therapy with analgesic therapy compared to using analgesic therapy alone to reduce pain. The finger-hold relaxation technique is effective in reducing post-operative pain, and the relaxation technique also enables patients to control themselves when experiencing discomfort or pain, physical stress, and emotional pain (Rosiska, 2021).

Comparison between the two respondents after implementing the finger-hold relaxation technique to reduce pain intensity in post-laparotomy patients in Flamboyan 5 dr. Moewardi General Hospital, Surakarta

The implementation results obtained from both respondents showed a decrease in pain scale between before and after the intervention. The pain level experienced by the respondents differed; Mrs. A had a pain level of 4 before the intervention, indicating moderate pain, which decreased to 2 after the intervention, indicating mild pain. Meanwhile, Mrs. S experienced moderate pain at scale 6 before the intervention, which decreased to scale 3 after the intervention.

The pain levels of patients Mrs. A and Mrs. S differed due to variations in the assessments obtained. Patient Mrs. A underwent a laparotomy procedure one year ago, whereas patient Mrs. S had not undergone a laparotomy procedure. This aligns with Rasyidah et al. (2022), who noted that factors affecting an individual's

pain threshold are usually linked to past experiences; those accustomed to experiencing pain will have subsequent moderate or mild pain experiences. Pain perception is subjective, so no two people experience exactly the same pain.

In addition to being influenced by past experiences, the difference in pain levels between Mrs. A and Mrs. S could also be influenced by the psychological factors of each respondent. Yani et al. (2024) stated that psychological and emotional factors play a role in pain assessment. Some respondents have better coping mechanisms in dealing with pain, while others feel more anxious or stressed, which can affect their perception of pain.

5. CONCLUSION

Based on the analysis and discussion that has been presented, it can be concluded that the application of finger-hold relaxation techniques effectively reduces pain intensity in post-laparotomy patients. Before the intervention, both patients reported moderate pain levels, but after the implementation of the finger-hold relaxation technique, there was a noticeable decrease in pain intensity, shifting from moderate to mild. Daily progress showed consistent improvement with each session, indicating that the method is beneficial over time. Additionally, when comparing the two respondents, it was observed that both experienced a reduction in pain levels after undergoing the intervention, although individual differences in pain perception influenced the extent of the effect.

For the community suggests that the finger-hold relaxation technique can serve as an effective non-pharmacological therapy for managing postoperative pain following laparotomy.

AUTHOR CONTRIBUTIONS

The author contributes in conceptualization, data collection and analysis Auliasa Hanum Kayasa, Eska Dwi Prajayanti, Isti Wulandari. Writing and manuscript revisions: Auliasa Hanum Kayasa.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest in this research.

DATA AVAILABILITY STATEMENT

The data are available from the corresponding author upon reasonable request.

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