

The Effect of Finger-Gripping Relaxation Techniques on Pain Levels in Post-Surgical Laparotomy Patients

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ABSTRACT

Laparotomy is a surgical procedure on the abdominal cavity that often causes postoperative pain due to tissue damage and the inflammatory process. Unmanaged pain can hinder mobilization, slow wound healing, and reduce patient comfort. One nonpharmacological intervention that can reduce pain is the finger-hold relaxation technique. Objective: To describe the application of the finger-hold relaxation technique on pain levels in post-laparotomy patients in Flamboyan 10 Ward, Dr. Moewardi General Hospital. Methods: This study used a descriptive design with a case study approach involving two post-laparotomy patients selected purposively based on inclusion criteria. The finger-hold relaxation technique was performed for approximately 15 minutes once daily for three consecutive days. Pain levels were measured using the Numeric Rating Scale (NRS) before and after each session. Results: Both respondents showed a decrease in pain intensity. The first respondent's pain score decreased from 6 to 3, while the second respondent's score decreased from 5 to 2 after three days of intervention. Conclusion: The finger-hold relaxation technique was effective in reducing pain levels in post-laparotomy patients and can be recommended as a complementary nonpharmacological therapy in nursing care for postoperative pain management.

Keywords: Laparotomy; Pain; Finger-Hold Relaxation Technique; Nonpharmacological Therapy; Nursing Care



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INTRODUCTION

Laparotomy is a surgical procedure performed by making an incision in the abdominal wall to manage disorders of the abdominal organs, such as hemorrhage, perforation, cancer, or obstruction (1). It is a complex procedure that can pose a potential or actual threat to an individual's biopsychosocial and spiritual integrity, commonly manifesting as postoperative pain (2,21). Globally, the number of laparotomy procedures continues to rise; the World Health Organization reported an annual increase of approximately 15%, with laparotomy accounting for around 29% of surgical procedures worldwide, including colorectal cancer, appendicitis, peritonitis, abdominal obstruction, and caesarean section cases (3). In Indonesia, the Ministry of Health reported that laparotomy patients reached approximately 80 million

cases in 2023, with women comprising the largest proportion (55 million cases) compared to men (25 million cases) (4). The Indonesian Health Survey further reported a laparotomy prevalence of 27%, with women remaining the most frequently affected group (5).

Medical record data from Dr. Moewardi General Hospital Surakarta showed 761 surgical procedures were performed in the operating theatre in January alone, averaging 25 procedures per day, with 332 post-laparotomy patients treated in Flamboyan Ward during the same period. Nearly 75% of postoperative patients experience pain complaints, an unpleasant sensory and emotional experience that is highly subjective and results from tissue damage (6). Pain intensity varies depending on the individual's prior pain experience, and if inadequately managed, postoperative pain can prolong immobilization, delay wound healing, increase treatment costs and length of hospital stay, and potentially develop into chronic pain (7,1).

Postoperative pain management can combine pharmacological and nonpharmacological approaches. Pharmacological therapy relies on analgesic medication, whereas nonpharmacological therapy such as relaxation, distraction, and aromatherapy serves as a complementary approach with minimal side effects, enabling patients to independently manage their basic needs (8,9). One simple nonpharmacological technique that nurses can teach patients is the finger-hold relaxation technique (10). This technique involves holding each finger in turn while performing slow, controlled breathing for approximately three minutes per finger; the warmth generated at the meridian points located in the fingers is believed to reduce physical and emotional tension and lower pain intensity (6).

Several prior studies support the effectiveness of this technique. Yunus et al. found that the proportion of patients experiencing moderate pain decreased from 81.8% before the finger-hold technique to 63.6% reporting only mild pain afterward (1). Kayasa et al. reported a significant change in pain scale before and after the intervention among post-laparotomy patients at Dr. Moewardi General Hospital, with respondents reporting greater comfort and reduced pain following therapy (11). Firsia demonstrated a significant effect of finger-hold relaxation on pain levels among post-laparotomy patients in Central Sulawesi (12), while Alahtiar et al. and Amelia et al. reported comparable pain-scale reductions among post-laparotomy patients following finger-hold interventions, including in combination with music therapy (13,14). Septiyono et al. and Dewi et al. further confirmed decreased pain intensity after finger-hold relaxation among post-surgical patients in other surgical wards (15,16), and Selfiana reported similar benefits among post-appendectomy patients (17). Nevertheless, most of these studies used pre-experimental or quasi-experimental designs with larger samples, while detailed case documentation of the day-to-day progression of pain scores during three consecutive days of finger-hold relaxation specifically among post-laparotomy patients in Flamboyan 10 Ward remains limited.

The novelty of this study lies in its detailed, day-by-day case documentation of pain-scale changes in two post-laparotomy patients before and after finger-hold relaxation, integrated within the nursing process and evaluated using the Indonesian Nursing Diagnosis, Outcome, and Intervention Standards (SDKI/SLKI/SIKI) (18), an approach not extensively reported in previous single-case laparotomy studies focusing on broader postoperative nursing care needs such as sleep quality or comfort (19,20).

A preliminary study conducted in Flamboyan 10 Ward, Dr. Moewardi General Hospital, Central Java, on 29 January 2026 identified 20 postoperative patients, of whom 8 had undergone laparotomy. Interviews using the Numeric Rating Scale (NRS) revealed pain scores in the moderate range (4–6) among post-laparotomy patients, with many still reporting

pain three hours after analgesic administration, disrupting sleep quality, mobility, and emotional wellbeing. Based on this background, this study aimed to describe the application of the finger-hold relaxation technique on pain levels among post-laparotomy patients before and after three days of intervention in Flamboyan 10 Ward, Dr. Moewardi General Hospital, Central Java.

METHODS

This study used a descriptive design with a case study approach, applying the finger-hold relaxation technique to reduce pain levels in two post-laparotomy patients treated in Flamboyan 10 Ward, Dr. Moewardi General Hospital, Central Java. The case study was conducted through a complete nursing process comprising assessment, nursing diagnosis, planning, implementation, and evaluation, with the primary focus on implementing the finger-hold relaxation technique to reduce pain intensity.

The subjects were two post-laparotomy patients selected purposively based on the following inclusion criteria: fully conscious (composmentis), willing to participate as respondents, reporting pain on a scale of 4-6, aged 18-55 years, 6-7 hours after analgesic administration, and having intact use of the hands and fingers. Exclusion criteria were decreased consciousness and conditions that could hinder participation, such as dementia, psychiatric disorders, or an inability to follow instructions during the procedure.

The finger-hold relaxation technique was performed by holding each finger of the hand in turn, from the thumb to the little finger, for approximately three minutes per finger, while the patient closed their eyes, focused attention, and breathed slowly, inhaling through the nose and exhaling through the mouth. The entire procedure took approximately 15 minutes and was performed once daily for three consecutive days for each respondent.

The instruments used were an SOP (Standard Operating Procedure) sheet for the finger-hold relaxation technique and a pain observation sheet using the Numeric Rating Scale (NRS), an 11-point scale ranging from 0 (no pain) to 10 (worst possible pain), used to measure pain intensity before and after each intervention session.

Data were collected through interviews to explore the respondents' chief complaints and medical history, direct observation of the respondents' clinical condition before and after nursing actions, and physical examination, including vital signs and NRS pain-scale measurement, performed before the intervention as baseline data for comparison after the intervention. Secondary data were obtained from the patients' medical records to complement the clinical information.

Data analysis was performed by organizing the results of interviews, observation, and documentation review into a narrative description, which was then compared with relevant theory and prior research to generate recommendations for nursing intervention. No inferential statistical testing was applied; results were presented narratively and in tabular form to facilitate interpretation of the finger-hold technique's application. This study was conducted after obtaining approval from the Nursing Professional Study Program, Faculty of Health Sciences, Universitas 'Aisyiyah Surakarta, and permission from Dr. Moewardi General Hospital, Central Java, and adhered to the ethical principles of informed consent, anonymity, confidentiality, veracity, and justice.

Research/Application Stages Flowchart:

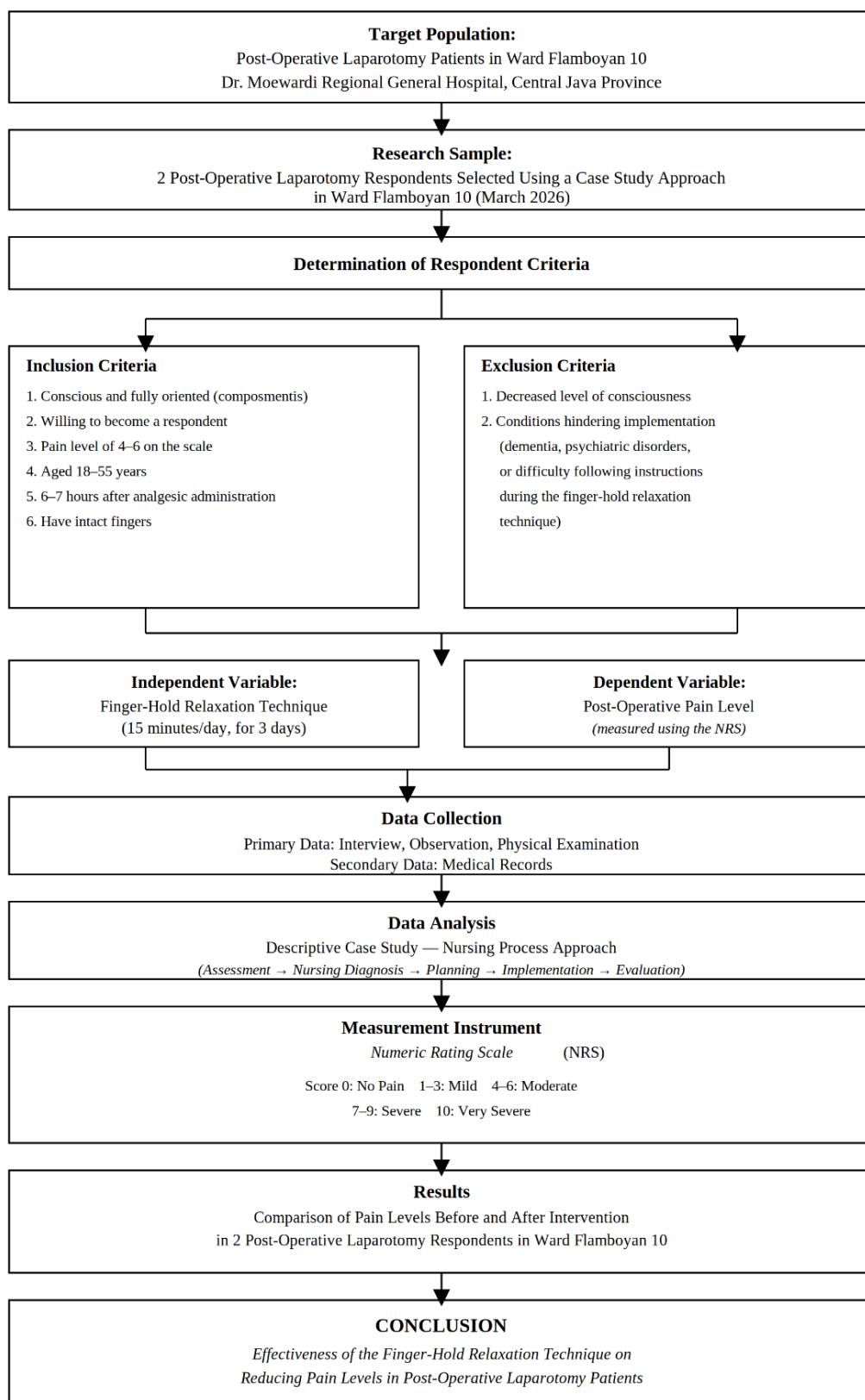


Figure 1. Finger-Hold Relaxation Technique Application Stages

RESULTS

Flamboyan 10 Ward at Dr. Moewardi General Hospital, Central Java, is a 70-bed surgical inpatient ward that cares for patients before and after surgical procedures, including three corridors, two of which contain a 3-bed isolation room. The finger-hold relaxation technique was applied to two post-laparotomy patients, Mr. P (43 years old, diagnosed with hepatic tumor) and Mr. M (51 years old, diagnosed with caecal tumor), over three consecutive days between 2-7 March 2026. Both respondents still reported pain several hours after analgesic administration, meeting the inclusion criteria for the intervention.

Table 1. Pain Scale Before the Finger-Hold Relaxation Technique

Day	Respondent 1 (Mr. P)	Respondent 2 (Mr. M)	Pain Category
1	6	5	Moderate
2	5	4	Moderate
3	4	3	Mild-Moderate

Source: primary data, 2026

Table 1 shows that before the finger-hold relaxation technique, both respondents were in the moderate pain category. Respondent 1 scored 6 on day one, decreasing to 5 on day two and 4 on day three; Respondent 2 scored 5 on day one, decreasing to 4 on day two and 3 on day three.

Table 2. Pain Scale After the Finger-Hold Relaxation Technique

Day	Respondent 1 (Mr. P)	Respondent 2 (Mr. M)	Pain Category
1	5	4	Moderate
2	4	3	Mild-Moderate
3	3	2	Mild

Source: primary data, 2026

Table 2 shows that after three consecutive days of the finger-hold relaxation technique, Respondent 1's pain score decreased progressively from 5 (day one) to 4 (day two) and 3 (day three). Respondent 2's pain score decreased from 4 (day one) to 3 (day two) and 2 (day three). Both respondents reported feeling calmer and more comfortable after each session.

Table 3. Pain Scale Progression Before and After the Finger-Hold Relaxation Technique

Day	Respondent 1 (Before -> After)	Respondent 2 (Before -> After)	Decrease
1	6 -> 5	5 -> 4	1 point each
2	5 -> 4	4 -> 3	1 point each
3	4 -> 3	3 -> 2	1 point each

Source: primary data, 2026

Table 3 shows that both respondents experienced a one-point reduction in pain scale each day during the three-day intervention period, with a total reduction of three points per respondent by the end of the application: from scale 6 to 3 for Respondent 1, and from scale 5 to 2 for Respondent 2.

DISCUSSION

Before the finger-hold relaxation technique, both respondents were in the moderate pain category, consistent with Firs'a's finding that post-laparotomy patients typically present with moderate pain intensity before any intervention (12). Pain intensity in this study was influenced by anxiety level, physical condition, and prior pain experience, in line with Kayasa et al., who explained that pain arises from nerve stimulation transmitted to the brain and is shaped by age, sex, education, physical and psychological condition, and anxiety (11). Postoperative pain intensity combines sensory, emotional, and unpleasant mental experiences caused by surgical trauma along with endocrine, metabolic, physiological, and behavioral responses (22).

Postoperative pain intensity is influenced not only by physiological tissue damage but also by psychological factors and individual pain experience. Surgical trauma triggers the release of inflammatory mediators such as prostaglandins, histamine, bradykinin, and cytokines, which stimulate peripheral nociceptors and generate pain impulses transmitted to the spinal cord, thalamus, and cerebral cortex (23). Postoperative anxiety activates the sympathetic nervous system, increasing stress-hormone release and heightening pain sensitivity; patients with higher anxiety levels tend to report greater pain intensity than those with a stable psychological state (24). Prior severe pain or surgical trauma can also create a pain memory in the central nervous system, leading to central sensitization in which mild stimuli are perceived as more intense pain, while poorer physical condition is associated with a lower pain threshold and greater sensitivity to postoperative pain (25).

Respondent 1 (Mr. P) reported a stabbing pain around the surgical wound with an intensity of 6, intermittent in nature, appearing to wince and sweat slightly, whereas Respondent 2 (Mr. M) reported a throbbing pain with an intensity of 5, also intermittent, appearing to wince and restless. This is consistent with Alahtiar et al., who reported that individual pain sensation varies according to factors such as age and sex (13). Repeated exposure to a similar type of pain generally enables patients to interpret and cope with pain more effectively, allowing earlier self-initiated pain-relief actions.

After the finger-hold relaxation technique, both respondents' pain scores decreased progressively across the three intervention days, and interviews revealed that both felt more relaxed and comfortable after each session. This is consistent with Ahmad & Kardi, who found that of 21 respondents with moderate pain before the finger-hold technique, 19 experienced a reduction to mild pain afterward (10). This occurs because the finger-hold technique increases pain tolerance, promotes comfort and relaxation, and reduces bodily tension, reflecting the cognitive, physiological, and behavioral components of the relaxation response.

Physiologically, the finger-hold relaxation technique reduces pain sensation through the gate control theory mechanism: non-nociceptive afferent impulses generated by the finger-hold technique inhibit the transmission of pain impulses to the brain, thereby lowering perceived pain intensity (9). According to Sutiani et al., this technique works by producing a relaxation effect that reduces muscle tension and modulates the nervous system's perception of pain (26). This finding is consistent with Lutfitawaliyah & Aprina, who reported an average pain-scale reduction of 1.62 points after finger-hold relaxation, attributing this to the flow of energy through the fingers, which reduces pain, promotes calmness, improves focus and comfort, and reduces anxiety and depressive symptoms (6). Similarly, Yunus et al. found that the finger-hold technique produces impulses transmitted through non-nociceptive afferent

fibers, closing the pain gate and reducing the transmitted stimulus, while also reducing excessive anxiety and improving bodily function (1), and Dewi et al. reported that the touch involved in finger-holding produces a positive response, relaxing muscle tissue, improving blood circulation, and reducing pain and stress intensity (16).

The progression of pain scores across the three days indicated a meaningful change before and after the finger-hold relaxation technique for both respondents, consistent with Lutfitawaliyah & Aprina, who reported a decrease in post-laparotomy pain intensity to a milder category following finger-hold intervention, attributable to impulses that inhibit pain-stimulus transmission (6). This progressive decrease also improved both respondents' ability to rest and reduced their anxiety levels, indicating a positive effect of the therapy on postoperative pain management, in line with Yunus et al., who noted that the technique frees the body and mind from tension and stress, thereby increasing an individual's pain tolerance (1). Psychological conditions such as anxiety, muscle tension, and fear after surgery can heighten perceived pain through increased sympathetic nervous system activity and muscle tension (27). These findings are consistent with Septiyono et al. and Wahdaniyah, who documented improved pain management outcomes when nonpharmacological relaxation techniques were integrated into post-laparotomy nursing care (15,20). Comparable findings were also reported in broader post-laparotomy nursing care case studies emphasizing rest, comfort, and pain management (19,28,29,30).

CONCLUSION

Before the finger-hold relaxation technique, Respondent 1 (Mr. P) had a pain scale of 6 and Respondent 2 (Mr. M) had a pain scale of 5. After the technique was applied for approximately 15 minutes daily for three consecutive days, both respondents' pain scores decreased: Respondent 1 to a scale of 3 and Respondent 2 to a scale of 2, representing a total reduction of three points for each respondent. These findings indicate that the finger-hold relaxation technique is effective as a nonpharmacological therapy in helping to reduce pain intensity in post-laparotomy patients and can be adopted as a safe, simple, and beneficial complementary intervention in postoperative nursing care. The main limitations of this study were the absence of a direct comparison of outcomes between the two respondents and the inability of the researcher to directly supervise the technique when performed independently by the respondents outside observation hours. Nurses are encouraged to implement the finger-hold relaxation technique as a nonpharmacological nursing intervention for post-laparotomy pain, and further studies with larger samples, stronger designs, and longer intervention durations are recommended to obtain more comprehensive and generalizable results.

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