



# Deep Breath Relaxation and Fingerprinting Against Post Pain Reduction of Laparatomic Operations

Agus Sarwo Prayogi<sup>1</sup>\*, Novia Andriyani, Yustiana Olfah, Harmilah Harmilah

Department Health Polytechnic, Ministry of Health, Yogyakarta, Indonesia

## Abstract

**Edited by:** Igor Spiroski  
**Citation:** Prayogi AS, Andriyani N, Olfah Y, Harmilah H. Deep Breath Relaxation and Fingerprinting Against Post Pain Reduction of Laparatomic Operations. Open Access Maced J Med Sci. 2022 Jan 03; 9(T5):132-136. <https://doi.org/10.3889/oamjms.2021.7816>  
**Keywords:** Pain; Finger; Deep breath; Numeric rating scale pain  
**\*Correspondence:** Agus Sarwo Prayogi, Department Health Polytechnic, Ministry of Health, Yogyakarta, Indonesia. E-mail: saworball@gmail.com  
**Received:** 25-Nov-2021  
**Revised:** 15-Dec-2021  
**Accepted:** 19-Dec-2021  
**Copyright:** © 2022 Agus Sarwo Prayogi, Novia Andriyani, Yustiana Olfah, Harmilah Harmilah  
**Funding:** This research did not receive any financial support  
**Competing Interests:** The authors have declared that no competing interests exist  
**Open Access:** This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0)

**BACKGROUND:** The onset of pain that is fast and short-lived can be experienced by post-laparotomy patients, due to a wound incision where this pain prefix produces chemical pain response mediators. Pain that occurs after an incision is made with a wound can make acute pain develop into chronic pain if it does not get treatment according to the therapy. Pain that occurs can last a long time in any post-laparotomy patient and can have a negative impact on the patient's life. For the patient's pain to be controlled, non-pharmacological pain management can be used to reduce the level of pain in post-laparotomy patients, by providing finger grip relaxation and deep breathing relaxation.

**AIM:** The aim of the study was to know the difference in pain level of post-laparotomy patients by giving finger grip relaxation with deep breathing relaxation.

**METHODOLOGY:** This study was a research method with quasi-experimental design. Pre test Post Test Two Group Design, with NRS measurement scale. Sampling is consecutive sampling. The number of samples was 30 respondents in the deep breathing relaxation group and 30 respondents in the finger grip relaxation group. Data were taken from January to March 2020.

**RESULTS:** The Wilcoxon test for finger grip relaxation and deep breathing relaxation was obtained  $p = 0.000$  ( $p < 0.05$ ).

**CONCLUSION:** There is a difference in the decrease in the level of pain to post-laparotomy patients.

## Introduction

Laparotomy is one of the major surgical procedures by making incisions in the layers of the abdominal wall, to get the part of the abdominal organs that are experiencing problems [1]. Abdominal surgery can be traumatizing among other surgeries and nearly 70% of the upper abdominal surgeries experience severe pain. After laparotomy, the patient complained of moderate pain 57.70%, and experienced severe pain 15.38%, and mild pain 26.92% [2].

Any surgery can cause discomfort and trauma to the patient, one of which patients often complain of is pain. The pain that is caused by the surgery usually makes the patient feels a lot of pain. Post-operative patients often experience pain due to tissue discontinuity or surgical wounds from the surgical incision as well as from the position maintained during the post-operative procedure itself. Acute pain that has a rapid and brief onset can occur due to incisions in laparoscopic surgery where the body releases mediators in the form of pain chemicals [3]. A person who experiences pain will have an impact on daily activities, namely, disruption of the need for sleep rest and individual fulfillment, as well as aspects of social interaction which can be in the form

of avoiding conversation, withdrawing, and avoiding contact. Furthermore, a person who experiences severe pain will continue, if not treated, it can eventually lead to neurogenic shock [4].

One of the nurse's responsibilities is to provide comfort and security to patients by helping patients find ways to deal with pain. The provision of non-pharmacological techniques is the main capital toward comfort in reducing pain. The benefits are more economical and there are no side effects, with non-pharmacological management compared to pharmacological management [5]. One of the pharmacological pain management is to use finger grip relaxation. Non-pharmacological pain management with relaxation techniques and finger grasping, namely, therapy that uses hand touch and breathing techniques, to balance the energy of the body which can help patients to control themselves when unpleasant feelings arise which can cause pain, physical stress, and emotions [6]. The results of the previous research showed that deep breathing relaxation was able to reduce the intensity of post-section Caesarea maternal pain [7], [8], [9]. The results of the previous studies also showed that post-laparotomy patients with decreased pain intensity were given hand-held relaxation [6].

Data obtained from Temanggung Hospital patients who underwent surgery during, 1017 patients underwent surgery during July–August 2019 with general anesthesia, and 166 patients with spinal anesthesia. The number of patients who underwent surgery using the laparotomy technique during July–September 2019 with a medical diagnosis of appendicitis as many as 52 patients, 44 patients with Inguinal Hernia, one patient for Ileus, 16 patients for cholelithiasis, and 154 patients with cesarean section. Based on the interviews conducted, 25% of post-laparotomy patients experienced mild pain (scale 1–3), 40% experienced moderate pain (scale 4–6), and severe pain 35% (scale 7–9). Pain management procedures are carried out at the Temanggung Regional Hospital by providing analgesics. Furthermore, the nurse in the room teaches deep breath relaxation techniques according to the hospital procedures to reduce pain, and there is no finger grip relaxation intervention. The aim of the study was to find a difference in post-laparotomy pain relief by giving deep breath relaxation and finger grip relaxation.

## Methods

Research method with quasi-experimental, design. Pre-test and post-test were two group design research with quasi-experimental, implementation of Temanggung Hospital in 2020. The population was 89 post-laparotomy patients. The research sample was 60 respondents, with consecutive sampling technique. The research instrument is the numeric rating scale. Bivariate data analysis using Wilcoxon and Mann Whitney test. The ethical eligibility of the e-KEPK / POLKESYO/0027/II/2020 number.

## Results

The research results found that:

Distribution of pain frequency before and after deep breath relaxation in post-operative laparotomy patients (Table 1).

In the normality test for pain levels using the Saphiro–Wilk test, a significant value of 0.002 was

**Table 1: Distribution of Pain Frequency Before and After Deep Breath Relaxation in Postoperative Laparotomy Patients**

Variable	Before doing deep breath relaxation		After doing deep breath relaxation		Uji Wilcoxon	
	F	%	F	%	Mean rank	Sig
Mild pain	0	0	13	43.3	15.50	0.000
Moderate pain	26	86.7	17	56.7		
Severe pain	4	13.3	0	0		
Total	30	100	30	100		

**Table 2: Distribution of Pain Frequency Before and After Finger Grip Relaxation in Postoperative Laparotomy Patients**

Variable	Before doing relaxation, hold your fingers		After relaxation grip the finger		Wilcoxon	
	F	%	f	%	Mean Rank	Sig
Mild pain	0	0	17	56.7	15.50	0.000
Moderate pain	21	70	13	43.3		
Severe pain	9	30	0	0		
Total	30	100	30	100		

obtained. This means the value of  $p < 0.05$  (data are not normally distributed), so the Wilcoxon test was carried out. Respondents on average experienced moderate pain before deep breathing exercises with a pain scale range of 4–6, after deep breathing relaxation the majority of respondents experienced a decrease in pain scale, but still in the same category, namely, moderate pain (scale 4–6), some respondents also experienced moderate pain, and experienced a decrease in pain scale from moderate (4–6) to mild (1–3) (Table 2). After the statistical test using the Wilcoxon test in Table 3, the mean result was 15.50 and the significant value was 0.000 ( $<0.05$ ), which means that the test results showed that there was a difference before and after giving deep breath relaxation techniques to reducing post-laparotomy pain.

**Table 3: Results of the Mann–Whitney test statistical analysis**

Intervention	Mean	Sig.
Deep breath relaxation	22.20	0.000
Finger grip relaxation	38.80	

Distribution of pain frequency before and after finger grip relaxation in post-operative laparotomy patients

In the pain level normality test using the Shapiro Wilk test, the significant value was 0.000. This means the  $p < 0.05$  (data are not normally distributed), so the Wilcoxon test is carried out. Before finger grip relaxation, the majority of respondents experienced moderate pain on a scale of 4–6, after relaxation of finger grips, the majority of respondents experienced a decrease in the pain scale from moderate (4–6) to mild (1–3). After a statistical test was carried out using the Wilcoxon test, the mean results were 15.50 and a significant value of 0.000 ( $<0.05$ ), which means that the test results showed that there was a difference before and after giving finger grip relaxation techniques to the reduction of post-laparotomy pain.

Differences in pain scale reduction in deep breath relaxation with fingers.

The results of the U Mann–Whitney test showed that the mean of finger grip relaxation was greater than deep breath relaxation ( $38.80 > 22.20$ ) and a significant value of 0.000 ( $p < \alpha 0.05$ ) so that it can be concluded that there are differences in the level of pain in post-operative laparotomy patients performed deep breath relaxation with finger grip relaxation. Finger grip relaxation has a greater effect on reducing pain than deep breathing relaxation.

## Discussion

Research on respondents who were given deep breath relaxation, before being given the intervention the majority experienced pain on a scale of 4–6 (moderate). A person's ability to perceive pain is influenced by several factors such as physiological, social, spiritual, psychological, and cultural. These factors can increase or decrease pain perception, increase or decrease tolerance to pain, and influence attitudes/responses to pain by the gate control theory [3].

The results showed, after being given deep breath relaxation, the majority of respondents experienced a decrease in pain, but the problem in the same category was moderate pain. In the group of respondents who were given deep breath relaxation, they were able to stimulate the body to release endorphins and enkephalin as natural analgesics from the body that we are able to help patients reduce pain and make patients feel relaxed deep breathing relaxation is able to produce impulses that are sent through non-nociceptor afferent nerve fibers resulting in a closed "gates" so that the stimulus to the cerebral cortex is inhibited due to winning deep breath stimulation, so that pain will change or undergo a process of change due to deep breath stimulation. Observations during the study, the occurrence of a decrease in pain scale after being given deep breath relaxation was influenced by the coping mechanism and the patient's belief in giving deep breath relaxation.

The statistical test results of the difference in pain in post-laparotomy patients before and after deep breathing relaxation using the Wilcoxon test obtained a significant value of 0.000 (<0.05), so it can be concluded that there is a difference in pain in post-laparotomy patients after deep breathing relaxation. This supports the previous research conducted [10] Amalia *et al.* (2018) that deep breath relaxation can reduce pain intensity in post-operative section cesarean patients. This affects because when a deep breath relaxation technique is performed, the patient relaxes the spasm of the skeletal muscles caused by an increase in prostaglandins, causing vasodilation of blood vessels, and will increase blood flow to areas experiencing spasm and ischemia. Then, it is also able to stimulate the body to release endogenous opioids, namely, endorphins and encephalins, which these opioids function as (natural analgesics) to block receptors in nerve cells to interfere with the transmission of pain signals [6] (Pinandita, 2010). Deep breath relaxation techniques can reduce pain in inpatients after hernia surgery [11].

Research on respondents who were given finger grip relaxation, before being given the intervention the majority experienced pain on a scale of 4–6 (moderate). The mechanism of pain is based on multiple processes, namely, nociceptors, peripheral sensation, phenotypic

changes, central sensation, ectopic excitability, structural reorganization, and decreased inhibition. Pain occurs as a result of peripheral sensation which will be followed by the central sensation. Pain in post-operative peripheral sensitization laparotomy comes from tearing of the skin layer and the tissue beneath it due to incisions in the lining of the abdominal wall [1].

The results showed, after being given finger grip relaxation, it was found that in the finger grip relaxation group, the majority of respondents experienced a decrease in the pain scale from a scale of 4–6 (moderate pain) to a scale of 1–3 (mild pain). Based on the results of observations during the study, the decrease in the pain scale after being given finger grip relaxation was influenced by the respondent's ability to focus his attention on pain, the patient's belief in giving finger grip relaxation to reduce pain, and the coping mechanism of each respondent. In the group of respondents who were given finger grip relaxation, they produced impulses that were sent through non-nociceptor afferent nerve fibers. Non-nociceptor nerve fibers cause the "gate" to close so that the stimulus in the cerebral cortex is inhibited or reduced due to counter stimulation relaxation and finger gripping. So that the pain will change or experience modulation due to the stimulation of the finger grip relaxation first and more reaching the brain. This is because relaxing finger grips can control and restore emotions that will relax the body.

The results of statistical tests of differences in pain in post-laparotomy patients before and after relaxation of finger grips using the Wilcoxon test obtained a significant value of 0.000 (<0.05), so it can be concluded that there is a difference in pain in post-laparotomy patients after finger grip relaxation. By research conducted by Pinandita (2012), the relaxation of finger grips in post-laparotomy patients can increase muscle flexibility and provide a feeling of relaxation which can reduce pain [6]. That there is the effectiveness of handheld relaxation techniques to reduce pain intensity in post-cesarean section mothers [12]. Finger grip relaxation is a therapy that can be applied to reduce pain in patients, and the ability of nurses to handle pain is needed to help patients deal with pain [13]. Finger grip relaxation affects reducing pain intensity [14]. Finger grip relaxation techniques can be used as an intervention in the hospital or at home to reduce pain in post-appendectomy patients [15].

The statistical test results of differences in deep breath relaxation with finger grips in dealing with post-operative laparotomy pain at the Temanggung Regional General Hospital using the Mann–Whitney U test obtained a significant value of 0.000 (<0.05), so it can be concluded that there is a difference between deep breath relaxation with finger grips. On the reduction of post-operative laparotomy pain, finger-held relaxation techniques are an easy way to manage emotions and develop emotional intelligence. Along with the fingers of

our hands, there are energy channels or meridians that are connected to various organs and emotions [16]. The points of reflection on the hand provide reflex (spontaneous) stimulation at the time of the grip. These stimuli will send a kind of shock wave of electricity to the brain. These waves are received by the brain and processed quickly and forwarded to the nerves in the affected organs so that the blockage in the energy pathway becomes smooth [6].

Grasping your fingers while taking a deep breath (relaxation) can reduce and heal physical and emotional tension because gripping your fingers warms up the energy entry and exit points in the meridians (energy channels) located on the fingers. In a state of relaxation, naturally, it will trigger the release of endorphins; this hormone is a natural analgesic from the body so that pain will be reduced [17]. According to the research conducted by Sulung (2017), pain reduction after finger grip relaxation technique occurs because finger grip relaxation techniques provide an action to relieve mental and physical tension and stress, thereby increasing tolerance to pain [18].

Research conducted by Misnawati (2019) states that the decrease in pain after finger grip relaxation techniques is influenced by the ability of each individual to focus his attention on the pain that arises so that it can affect the feeling of pain that is felt. There is a comparison of pain before and after the finger grip relaxation treatment is influenced by the coping mechanism of each respondent and how the respondent focuses attention when given finger grip relaxation so that it affects the perception of pain felt by the respondent [19].

The finger grip relaxation effect makes respondents feel relaxed and calm. The finger grip relaxation treatment will produce impulses that are sent by non-nociceptive afferent nerve fibers which result in the "gate" being closed and the painful stimulus is delayed and reduced. Relaxation techniques can also reduce cortisol hormone levels, reduce the source of depression so that pain can be controlled and body functions are getting better. The decrease in pain response is influenced by the displacement of the focus of pain experienced by giving deep breath relaxation and increasing oxygen delivery to the tissues and relaxing the brain [20]. Stimulate the body to produce endorphins and inhibit the transmission of pain impulses to the brain and can reduce the sensation of pain which ultimately causes the intensity of pain experienced by the patient to decrease, due to relaxation of the brain [21].

Natural analgesics from the body that can reduce pain intensity naturally which can trigger the release of endorphins are finger grip relaxation which makes the mind, soul, and body achieve relaxation. During the inflammatory phase due to surgical scars, the manifestation that is often felt is pain. The pain if left untreated will make the patient uncomfortable.

Finger grip relaxation is proven to reduce pain intensity, if the relaxation is carried out regularly, the expected results will be better with the reduction in pain that occurs [22].

Research conducted stated that the effect of deep breathing relaxation and guided imagery makes respondents feel relaxed and calm. Respondents become relaxed and calm when taking oxygen in the air through the nose, oxygen enters the body so that blood flow becomes smooth and combined with guided imagery causes the patient to turn his attention to pain to things that make him happy and happy so that he forgets the pain he is experiencing [23].

Research conducted states that deep breathing relaxation by blowing a balloon affects changes in the scale of pain after cesarean section surgery. In doing deep breath relaxation, several modification techniques can be done to relieve muscle tension so that it can affect a person's perception of pain [24] (Megawahyuni, 2018). Based on research that giving relaxation with distraction is equally effective in reducing pain felt by post-operative patients, providing relaxation with distraction can stimulate an increase in the endorphin hormone, which is a morphine-like substance supplied by the body [25]. Finger grip relaxation techniques are more effective in reducing the heart rate of chest pain in heart patients than deep breathing relaxation techniques [9]). Giving finger grip relaxation turned out to be more effective in reducing the intensity of chest pain in heart patients with deep breath relaxation [10].

## Conclusion

Pain is an unpleasant experience for the intervention patient. There was a different decrease in pain levels in post-laparotomy patients when finger grip relaxation was given and deep breath relaxation was given. Finger grip relaxation and deep breathing can be applied as nursing interventions to reduce pain in patients.

## Acknowledgment

To patients and family who have been willing as respondents in the study, the Director of the General Hospital of Temanggung and nurses, researchers, enumerators, and contributors in the preparation of this publication manuscript.



## References

1. Prawirohardjo S. Ilmu Kandungan. Jakarta: Yayasan Bina Pustaka; 2009.
2. Megawati S, Malik A. Gambaran Faktor-faktor Yang Mempengaruhi Respons Nyeri Pada Pasien Post Laparatomi di Ruang Rindu B2 RSUP H. Vol. 12. Indonesia: Kultiira RSUP Persahabatan; 2010. Available from: <http://www.repo.poltekkes-medan.ac.id/jspui/bitstream/123456789/511/1/1534149577119> [Last accessed on 2021 Aug 25].
3. Potter AG, Patricia A, Perry' Fundamental of Nursing Fundamental Keperawatan. 4<sup>th</sup> ed. Jakarta: Salemba Medika; 2010.
4. GanongWF. Buku Ajar Fisiologi Kedokteran. 22<sup>nd</sup> ed. Jakarta: EGC; 2009.
5. Darmadi R, Nur Faizal M, Hafid A, Patima P. Efektivitas imajinasi terbimbing (guided imagery) terhadap penurunan nyeri pasien post operasi : A literatur review. *Alauddin Sci J Nurs*. 2020;1(1):42-54.
6. lin Pinandita BU, Purwanti E. Pengaruh teknik relaksasi genggam jari terhadap penurunan intensitas nyeri pada pasien post operasi laparatomi. *J Ilm Kesehat Keperawata*. 2012;8(1):461.
7. Dita Amita RY, Fernalia F. Pengaruh teknik relaksasi nafas dalam terhadap intensitas nyeri pada pasien post operasi sectio caesarea di rumah sakit bengkulu. *J Kesehat Holistik*. 2018;12(1):26-8. <https://doi.org/10.33024/hjk.v12i1.124>
8. Aprina A, Hartika R, Sunarsih S. Latihan slow deep breathing dan aromaterapi lavender terhadap intensitas nyeri pada klien post seksio sesaria. *J Kesehat*. 2018;9(2):272. <https://doi.org/10.26630/jk.v9i2.982>
9. Asman A, Yesi M. Effect of deep breathing relaxation techniques for reducing pain after hernia surgery in inpatient of regional hospital pariaman West Sumatera Indonesia. *Int J Res Rev*. 2019;6(8):444-7.
10. Ningrum NW, Mahdiyah D, Sari DP. Effectiveness of relaxation techniques to decrease handheld finger pain intensity post cesarean section at Dr. H. Moch. Ansari saleh hospital in Banjarmasin. Netherlands: Atlantis Press; 2017. <https://doi.org/10.2991/smichs-17.2017.23>
11. Yuliasuti C. Effect of handheld finger relaxation on reduction of pain intensity in patients with post-appendectomy at inpatient ward, RSUD Sidoarjo. *Int J Med Pharm Sci*. 2015;5(3):53-8.
12. Damayanti RT, Isaeni I, Wiyono J. Perbedaan intensitas nyeri antara pemberian terapi back massage dengan relaksasi genggam jari pada pasien post laparatomi. *J Keperawatan Terap*. 2019;5(1):10-21. <https://doi.org/10.31290/jkt.v5i1.671>
13. Calisanie NN, Ratnasari AN. The Effectiveness of the Finger Grip Relaxation Technique to Reduce Pain Intensity in Post-appendectomy Patients: A Literature Review. United States: KnE Life Science; 2021. p. 753-7. <https://doi.org/10.18502/kls.v6i1.8751>
14. Astutik P, Kurlinawati E. Pengaruh relaksasi genggam jari terhadap penurunan nyeri pada pasien post sectio caesarea. *Str J Ilm Kesehat*. 2017;6(2):30-7. <https://doi.org/10.30994/sjik.v6i2.6>
15. Prasetyo S. Konsep dan Proses Keperawatan Nyeri. Yogyakarta: Graha Ilmu; 2010.
16. Sulung N, Rani SD. Teknik relaksasi genggam jari terhadap intensitas nyeri pada pasien post appendiktomi. *J Endur*. 2017;2(3):397. <https://doi.org/10.22216/jen.v2i3.2404>
17. Misnawati M. Perbandingan efektifitas teknik relaksasi dan genggam jari terhadap penurunan nyeri pada pasien post operasi sectio caesare di rumah sakit undata provinsi Sulawesi Tengah. *Poltekita J Ilmu Kesehat*. 2020;13(1):30-5. <https://doi.org/10.33860/jik.v13i1.29>
18. Widiatie W. Pengaruh teknik relaksasi nafas dalam terhadap penurunan intensitas nyeri pada ibu postseksio sesarea di rumah sakit unipdu medika Jombang. *J EDU Health*. 2015;5(2):423.
19. Pongoh AM, Egam A, Kamalah R. Effectiveness of finger held relaxation on the decrease in intensity of pain in patient of post-sectio caesarea in RSUD Sorong regency. *Sys Rev Pharm*. 2020;11(9):953-6. <https://doi.org/10.31838/srp.2020.9.138>
20. Yayutrisnawat W, Wulandari P. Pengaruh relaksasi genggam jari terhadap skala nyeri pada ibu post sectio caesarea. *J Ners Widya Husada*. 2018;5(1):11-20 <https://doi.org/10.33666/jners.v5i1.325>
21. Patasik JR, Tangka J. Efektifitas teknik relaksasi nafas dalam dan guided imagery terhadap penurunan nyeri pada pasien post operasi sectio caesare di irina D blu rsup prof. Dr. R. D. Kandou Manado. *J Keperawatan*. 2013;1(1):2169. <https://doi.org/10.35790/jkp.v1i1.2169>
22. Rampengan SF, Rondonuwu R, Onibala F. Pengaruh teknik relaksasi dan teknik distraksi terhadap perubahan intensitas nyeri pada pasien post operasi di ruang Irina a atas rsup prof. Dr. R. D. Kandou Manado. *J Keperawatan*. 2014;2(2):5172. <https://doi.org/10.35790/jkp.v2i2.5172>
23. Upoyo AS. The effectiveness differences of finger handheld and deep breathing relaxation techniques in reducing heart rate and stress levels in primary hypertension patients. *J Keperawatan Padjadjaran*. 2019;7(3):996. <https://doi.org/10.24198/jkp.v7i3.996>
24. Sasongko H, Sukartini T, Wahyuni ED, Putra MM. The effects of combination of range motion and deep breathing exercise on pain in post-orthopedic surgery patients. *Indones J Med*. 2019;4(1):46-53. <https://doi.org/10.26911/theijmed.2019.04.01.08>
25. Megawahyuni, Ar., Hasnah, Mariah Ulfah Azhar. Pengaruh Relaksasi Nafas Dalam dengan Teknik Meniup Balon Terhadap Perubahan Skala Nyeri Pasca Operasi Seksio Sesarea di RSIA Bahagia Makassar. *Jurnal Kesehatan*. 2018;11(1). <https://doi.org/10.24252/kesehatan.v11i1.5028>