

# Reduction of Preoperative Anxiety in Patients Undergoing General Anesthesia Using Combined Finger Hold Technique and Deep Breathing Relaxation

Hilda Nur Arifiah<sup>1\*</sup>, Suanda Saputra<sup>1</sup>, Lido Sianipar<sup>1</sup>, Deni Alamsah<sup>2</sup>

<sup>1</sup> Bachelor of Applied Nursing in Anesthesiology, Faculty of Health Sciences, Medika Suherman University, Bekasi, Indonesia

<sup>2</sup> Bachelor of Nutrition, Faculty of Health Sciences, Medika Suherman University, Bekasi, Indonesia

Email: [hilda.fachrizal@gmail.com](mailto:hilda.fachrizal@gmail.com)

## ARTICLE INFO

### Article history

Submitted: 09 April 2026

Revised: 21 Mai 2026

Accepted: 7 June 2026

### Keywords:

*Combination of finger hold technique and deep breath relaxation, anxiety, preoperative*

## ABSTRACT

Preoperative anxiety is a common psychological condition experienced by patients before surgery and may negatively affect the anesthetic process and postoperative recovery. This condition can increase anesthetic requirements, cause hemodynamic instability, and delay recovery. Non-pharmacological interventions, such as the combination of the finger hold technique and deep breathing relaxation, may help reduce anxiety. This study aimed to analyze the effect of the combination of the finger hold technique and deep breathing relaxation on preoperative anxiety levels in patients undergoing general anesthesia at RSUD Kabupaten Bekasi. A quantitative study with a quasi-experimental one-group pretest–posttest design was conducted. A total of 40 respondents were selected using purposive sampling. Anxiety levels were measured using The Amsterdam Preoperative Anxiety and Information Scale (APAIS). Data were analyzed using the Marginal Homogeneity test. Before the intervention, most respondents experienced severe anxiety (70.0%). After the intervention, the majority showed a decrease in mild anxiety (92.5%). Statistical analysis revealed a significant difference in anxiety levels before and after the intervention ( $\chi^2 = 106.000$ ;  $p < 0.001$ ). The combination of the finger hold technique and deep breathing relaxation is effective in reducing preoperative anxiety and can be considered a simple and practical non-pharmacological intervention in preoperative nursing care



*This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.*

## INTRODUCTION

Anxiety is an emotional response that arises from an individual's perception of threats, whether real or uncertain. In the preoperative phase, this response often manifests as patients' concerns about the surgical procedures they will undergo (ASKAN, 2023). Preoperative anxiety can trigger various clinical changes, such as increased anesthetic drug requirements, delayed recovery of consciousness, hemodynamic instability, and prolonged length of hospital stay. These conditions are associated with the activation of the autonomic nervous system, which affects the neuroendocrine system, leading to increased blood pressure, heart rate, and cardiac workload (Baagil et al., 2023).

Globally, the prevalence of anxiety among patients undergoing surgery is relatively high. Recent reports indicate that the majority of preoperative patients experience moderate to severe levels of anxiety, with prevalence rates ranging from 60% to 90%. In Indonesia, the prevalence of preoperative anxiety is also considerable, ranging from 75% to 90%. At the regional level, a study conducted at RSUD Pelabuhan Ratu reported that most patients experienced anxiety, predominantly in the mild category (74.2%). Meanwhile, a study conducted at RSUD Kabupaten Bekasi by Ratno (2024) found that the majority of patients experienced severe anxiety (66.7%), followed by moderate anxiety (33.3%), with no cases of mild or panic anxiety reported.

Efforts to manage preoperative anxiety can be carried out through pharmacological and non-pharmacological approaches. Non-pharmacological interventions are considered safer and associated with minimal side effects, one of which includes relaxation techniques (Nigussie et al., 2024). Relaxation methods, such as the finger hold technique and deep breathing relaxation, are known to produce a calming effect by stimulating the parasympathetic nervous system and reducing sympathetic activity, thereby alleviating both physical and psychological tension in patients (Hidayat, 2022).

Several previous studies have demonstrated the effectiveness of relaxation techniques in reducing anxiety. A study conducted by Tiara (2023) At RSUD Kota Salatiga reported that the finger hold technique significantly reduced anxiety levels in patients undergoing general anesthesia. The study employed a quasi-experimental design with a control group and involved 40 respondents in each group, with anxiety measured using the DASS-42 instrument. However, studies examining the combined use of the finger hold technique and deep breathing relaxation remain limited, particularly among preoperative patients undergoing general anesthesia

Based on this gap, there is a need to examine the effectiveness of combining these two relaxation techniques as a more comprehensive intervention. The combination of finger hold and deep breathing relaxation is presumed to produce a synergistic effect, as it involves both sensory stimulation and respiratory regulation simultaneously, potentially leading to more optimal outcomes in reducing anxiety.

Therefore, this study aims to analyze the effect of the combination of the finger hold technique and deep breathing relaxation on the level of preoperative anxiety in patients undergoing general anesthesia at RSUD Kabupaten Bekasi. This study is expected to contribute to the development of effective, practical, and easily applicable non-pharmacological interventions in anesthetic nursing practice.

## **METHOD**

This study employed a quantitative approach with a quasi-experimental design using a one-group pretest-posttest model to assess changes in anxiety levels before and after the intervention. The study was conducted in the preoperative room of the Central Surgical Installation (IBS) at Bekasi District General Hospital in December 2025.

The population consisted of patients scheduled to undergo elective surgery under general anesthesia. A total of 40 respondents who met the inclusion criteria were selected using a non-probability sampling method with a purposive sampling technique. The respondents consisted of both male and female patients undergoing various types of elective surgery under general anesthesia. Inclusion criteria were patients with preoperative anxiety, compos mentis consciousness, aged 18–65 years, scheduled for elective surgery under general anesthesia, able to communicate effectively, classified as ASA physical status I–II, and willing to participate by signing informed consent.

The independent variable in this study was the combination of the finger hold technique and deep breathing relaxation, while the dependent variable was the level of preoperative anxiety. The intervention was administered once for approximately 20 minutes prior to surgery. The finger hold technique was performed by asking respondents to gently grasp each finger alternately for approximately 1–2 minutes while maintaining a comfortable and relaxed position. Simultaneously, respondents were instructed to perform deep breathing relaxation by inhaling slowly through the nose for 4 seconds, holding the breath for 2 seconds, and exhaling slowly through the mouth for 6 seconds. The breathing cycle was repeated continuously throughout the intervention period.

Anxiety levels were measured using The Amsterdam Preoperative Anxiety and Information Scale (APAIS), a validated instrument used to assess preoperative anxiety before and after the intervention (Zhao, 2020). Anxiety was assessed twice: before the intervention (pretest)

and immediately after completion of the intervention prior to surgery (posttest). Respondents included in this study were patients categorized as having moderate to severe preoperative anxiety based on the APAIS assessment results. The operational definition of anxiety in this study was determined according to the APAIS interpretation guidelines, which categorized anxiety into mild, moderate, and severe levels.

Data were analyzed using the Marginal Homogeneity test (Bowker Test of Symmetry) to identify differences in anxiety levels before and after the intervention. Statistical analysis was performed using SPSS software, with a significance level set at  $p < 0.05$ .

This study was conducted in accordance with ethical principles and was approved by the Health Research Ethics Committee of Universitas Medika Suherman. The ethical clearance number for this study was No. 005385/UNIVERSITAS MEDIKA SUHERMAN/2025, issued on November 20, 2025. All participants provided informed consent prior to participation, and the confidentiality of participant data was strictly maintained.

## RESULTS

Presents the characteristics of respondents, including age, gender, history of previous surgery, and anxiety levels. The frequency distribution of each characteristic is shown in the table.

**Table 1. Frequency Distribution of Respondents' Characteristics Based on Age, Gender, and Surgical History at the Central Surgical Installation (IBS) of RSUD Kabupaten Bekasi (n = 40)**

No	Characteristics	Frequency (n)	Presentage (%)
<b>1.</b>	<b>Age</b>		
	Late Adolescence (18-25 years)	8	20,0
	Early Adulthood (26-35 years)	9	22,5
	Late adulthood (36-45 years)	13	32,5
	Early Elderly (46-65 years)	10	25,0
	<b>Total</b>	<b>40</b>	<b>100</b>
<b>2.</b>	<b>Gender</b>		
	Male	18	45,0
	Female	22	55,0
	<b>Total</b>	<b>40</b>	<b>100</b>
<b>3.</b>	<b>Surgical History</b>		
	a. Ya	13	32,5
	b. Tidak	27	67,5
	<b>Total</b>	<b>40</b>	<b>100</b>

Based on Table 1, which presents the characteristics of respondents by age, gender, and surgical history, the majority of respondents were in the late adulthood age group (36–45 years) (32.5%). Most respondents were female (55.0%). Regarding surgical history, the majority had no prior surgical experience (67.5%).

**Table 2. Frequency Distribution of Preoperative Anxiety Levels Before and After the Combination of Finger Hold and Deep Breathing Relaxation (n = 40)**

Group	Anxiety Level	Frequency (n)	Percentage (%)
<b>Before</b>	Moderate Anxiety	12	30,0
	Severe Anxiety	28	70,0
	<b>Total</b>	<b>40</b>	<b>100</b>

<b>After</b>	Mild Anxiety	37	92,5
	Moderate Anxiety	3	7,5
<b>Total</b>		<b>40</b>	<b>100</b>

Table 2 shows that before the intervention, the majority of respondents experienced severe anxiety (70.0%), while the remaining respondents experienced moderate anxiety (30.0%). After the intervention with the combination of the finger hold technique and deep breathing relaxation, there was a noticeable change in anxiety levels. Most respondents experienced mild anxiety (92.5%), while a small proportion remained in the moderate category (7.5%).

**Table 3. Results of the Marginal Homogeneity Test on Preoperative Anxiety Levels Before and After the Intervention**

Variable	Mean MH	SD	X <sup>2</sup> (MH)	p-value
Preoperative Anxiety (Before-After)	73,500	5,408	106,000	0,000

Based on the results of the Marginal Homogeneity test, the chi-square value ( $\chi^2$ ) was 106.000 with a significance value (p-value) of <0.001. This indicates that there was a statistically significant difference in the distribution of anxiety levels before and after the application of the combination of the finger hold technique and deep breathing relaxation.

## DISCUSSION

The results of this study showed that the majority of respondents were in the late adulthood age group (36–45 years), indicating that individuals in the productive age range tend to dominate patients undergoing surgery under general anesthesia. In this study, respondents in late adulthood appeared to experience considerable anxiety because individuals at this stage generally have active occupational, social, and family responsibilities. Concerns regarding postoperative recovery, the ability to return to work, and potential disruptions to daily roles may contribute to an increased psychological burden before surgery. Preoperative anxiety is a common psychological response experienced before surgical procedures and is often associated with concerns about anesthesia, potential complications, and surgical outcomes (Nigussie et al., 2024; Kain et al., 2020). This finding is consistent with studies by Fahmi (2020) and Mitchell (2020), which reported that adults tend to experience higher levels of anxiety due to greater cognitive awareness of medical risks as well as active social and economic responsibilities. Adults are generally more capable of anticipating negative outcomes, which may intensify perceived threats and anxiety levels. From a theoretical perspective, individuals in adulthood are in a developmental stage characterized by productivity and responsibility, making health threats more likely to be perceived as disruptions to their social roles and stability. Similar findings have also been reported by Ayele et al. (2021), who highlighted that increased awareness and responsibility contribute significantly to psychological stress before surgery.

In terms of gender, the findings revealed that female respondents were more likely to experience preoperative anxiety than male respondents. In the researcher's opinion, female patients tend to express emotional concerns more openly during the preoperative phase, particularly fears related to anesthesia, pain, and surgical outcomes. This emotional expressiveness may explain why anxiety was more frequently identified among women in this study. This result is in line with studies by Juseok (2024) and Kassahun (2022), which identified female gender as a significant factor associated with higher anxiety levels. Biologically, hormonal factors such as estrogen may influence emotional regulation and stress responses, increasing vulnerability to anxiety. Psychosocially, women are generally more likely to communicate emotional distress, while men may suppress emotional responses due to social and cultural

expectations. Previous studies have also suggested that gender differences in anxiety are influenced by both neurobiological and sociocultural factors, which interact to shape emotional responses in stressful situations (Guo, 2021).

Regarding surgical history, respondents without prior surgical experience were found to have higher levels of anxiety. In this study, respondents without previous surgical experience appeared to have greater uncertainty regarding operating room procedures, anesthesia administration, and postoperative conditions. The absence of prior experience may increase fear of the unknown, thereby intensifying anxiety responses before surgery. This finding is consistent with studies by Marbun (2023) and Rahmawati (2021), which reported that lack of experience increases uncertainty about medical procedures and contributes to higher anxiety levels. According to cognitive appraisal theory, anxiety arises when individuals perceive a situation as threatening and feel a lack of control over the situation. Previous surgical experience may enhance an individual's sense of familiarity and control, thereby reducing anxiety. Similar findings were also reported by Mulugeta et al. (2020), who emphasized that familiarity with medical procedures plays an important role in reducing psychological distress and improving patient readiness before surgery.

Furthermore, the results demonstrated a substantial decrease in anxiety levels after the administration of the combined finger hold technique and deep breathing relaxation. In this study, most respondents initially experienced moderate to severe anxiety before the intervention, but after the intervention, the majority shifted to mild anxiety levels. The researchers assume that the combination of finger hold technique and deep breathing relaxation produced a synergistic calming effect because both interventions simultaneously addressed physiological and psychological responses to anxiety. Deep breathing relaxation helped stabilize autonomic responses, while the finger hold technique provided comfort through tactile stimulation and distraction from negative thoughts related to surgery.

This finding is supported by previous studies, including those by Tiara et al. (2023), Wulandari (2021), and Siregar (2022), which demonstrated that relaxation techniques are effective in reducing preoperative anxiety. Physiologically, deep breathing relaxation activates the parasympathetic nervous system, leading to decreased heart rate, reduced blood pressure, and lower stress hormone production. Meanwhile, the finger hold technique provides sensory stimulation that promotes relaxation and emotional comfort. This mechanism is consistent with findings from Chin et al. (2024), who highlighted the important role of autonomic nervous system regulation in reducing anxiety responses.

Psychologically, the combination of these techniques helps divert attention from perceived threats and enhances self-control over anxiety. The integration of sensory stimulation and controlled breathing creates a synergistic effect that addresses both physiological and cognitive aspects of anxiety simultaneously. Previous studies have also demonstrated that combining multiple relaxation techniques produces more significant outcomes compared to single interventions alone (Powell et al., 2020; Tadesse et al., 2022).

Statistical analysis further confirmed a significant difference in anxiety levels before and after the intervention ( $p < 0.001$ ), indicating that the combination of the finger hold technique and deep breathing relaxation is effective in reducing preoperative anxiety. The significant reduction in anxiety levels observed in this study indicates that simple non-pharmacological interventions may provide meaningful psychological benefits for preoperative patients. These findings are consistent with previous studies demonstrating that non-pharmacological interventions can reduce stress responses through autonomic regulation and psychological adaptation (Nigussie et al., 2024). Given its simplicity, safety, and ease of implementation, this intervention has strong potential to be integrated into preoperative nursing care as an effective strategy for anxiety management. Furthermore, integrating such interventions into routine clinical practice may improve patient satisfaction, emotional preparedness, and overall perioperative outcomes (Mitchell, 2020).

## CONCLUSION

This study concludes that the combination of the finger hold technique and deep breathing relaxation is effective in reducing preoperative anxiety in patients undergoing general anesthesia. A significant reduction in anxiety levels was observed, with patients shifting from moderate and severe anxiety prior to treatment to predominantly mild anxiety afterward. Statistical analysis further confirmed a significant difference in anxiety levels before and after treatment ( $p < 0.001$ ).

Therefore, this combined relaxation approach can be recommended as a safe, simple, and practical non-pharmacological intervention for reducing preoperative anxiety. Its application in clinical nursing practice may contribute to improving psychological readiness and overall perioperative outcomes.

## AUTHOR'S DECLARATION

### Authors' contributions and responsibilities

HNA: Conceptualization, Methodology, Formal Analysis, Investigation, Data Curation, Writing - Original Draft Preparation, Intervention

SS: supervision, validation, review, and editing of the manuscript

LS: supervision, validation, and critical review of the manuscript

DA: supervision, validation, and critical review of the manuscript

### Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. It was funded by the personal expenses of the authors

### Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available due to confidentiality agreements with participants, but are available from the corresponding author upon reasonable request

### Competing interests

The authors declare that there are no competing interests, whether financial or non-financial, that could have influenced the work reported in this paper

## ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to the Health Study Program, Faculty of Health Sciences, Universitas Medika Suherman, and RSUD Kabupaten Bekasi for the support and facilities provided during this study. The authors also extend their appreciation to all IBS staff and respondents at RSUD Kabupaten Bekasi for their participation and assistance in this research. Special thanks are given to the supervisors and examiners for their valuable insights and constructive feedback throughout the preparation of this manuscript. This study would not have been possible without their contributions and support

## REFERENCES

- ASKAN. (2023). *BUKU Asuhan kepenataan anesthesiologi (ASKAN)* (M. A. A (ed.); Edisi pert). UHB Press.
- Ayele, Y., Belay, H., & Kassa, G. (2021). Magnitude of preoperative anxiety and associated factors among surgical patients. *BMC Surgery*, 1(21), 1–8.  
<https://doi.org/10.1186/s12884-021-03877-4>
- Baagil, H., & Gerbershagen, M. U. (2023). Preoperative Anxiety Impact on Anesthetic and Analgesic Use. *Medicina (Lithuania)* [revista en Internet] 2023 [acceso 21 de febrero de 2024]; 59(12): 1-11. *Medicina*, 1-11.  
<https://doi.org/10.3390/medicina59122069>
- Chin, P., Gorman, F., Beck, F., Russell, B. R., Stephan, K. E., & Harrison, O. K. (2024). A systematic review of brief respiratory, embodiment, cognitive, and mindfulness interventions to reduce state anxiety. *Frontiers in Psychology*, 15(June), 1–14.  
<https://doi.org/10.3389/fpsyg.2024.1412928>
- Fahmi, M. (2020). Preoperative anxiety and associated factors among adult surgical patients. *BMC Surgery*, 1(20), 1–7.  
<https://pmc.ncbi.nlm.nih.gov/articles/PMC10655790/>
- Guo. (2021). Preoperative education interventions to reduce anxiety and improve recovery. *Patient Education and Counseling*, 1(104), 1–8.  
<https://pubmed.ncbi.nlm.nih.gov/24894181/>
- Hidayat. (2022). Factors influencing patient anxiety before surgery. *Journal of Nursing and Midwifery Science*, 2(13), 101–108.  
<https://adihusada.ac.id/jurnal/index.php/AHNI/article/view/168>
- Juseok, O. (2024). Factors influencing preoperative anxiety in elective surgery patients. *Ournal of Clinical Anesthesia Research*, 2(38), 115–122.  
<https://pubmed.ncbi.nlm.nih.gov/38541129/>
- Kain, Z. N., Sevarino, F. Alexander, G. M., & Pincus, S. (2020). Preoperative anxiety and its management in adult patients. *Anesthesiology Clinics*, 2(38), 1–12.  
<https://pubmed.ncbi.nlm.nih.gov/11182434/>
- Kassahun. (2022). Preoperative anxiety and associated factors among adult surgical patients. *BMC Anesthesiology*, 1(22), 1–8.  
<https://pmc.ncbi.nlm.nih.gov/articles/PMC10655790/>
- Marbun. (2023). Factors related to the level of preoperative patient anxiety. *Sumatra Nursing Journal*, 2(8), 45–52.  
<https://jurnal.globalhealthsciencegroup.com/index.php/IJNHS/article/view/2066>
- Manatiara, Abdul Majid, W. K. (2023). The Effect of Finger Grip Relaxation on Anxiety Levels in Pre-Operative Patients with General Anesthesia at Salatiga City Hospital. *Poltekkesjogja*, 2(1), 4–6.  
<https://eprints.poltekkesjogja.ac.id/13001/2/2.%20Abstract.pdf>
- Mitchell. (2020). Influence of gender and anaesthesia type on day surgery anxiety. *Journal of Advanced Nursing*, 5(66), 1014–1025.  
<https://doi.org/10.1111/j.1365-2648.2011.05801.x>
- Mulugeta, H., Ayana, M., & Sintayehu, M. (2020). Preoperative anxiety and associated factors among adult surgical patients. *International Journal of Surgery Open*, 25, 1–6.  
<https://pubmed.ncbi.nlm.nih.gov/30376809/>
- Nigussie, S., Belachew, T., & Wolancho, W. (2024). Predictors of preoperative anxiety among surgical patients. *International Journal of Surgery*, 1(1), 1–6.  
<https://pubmed.ncbi.nlm.nih.gov/25189274/>
- Powell, R., Scott, N., W & Manyande, A. (2020). Psychological preparation and postoperative

- outcomes for adults undergoing surgery. *Cochrane Database of Systematic Reviews*, 5. <https://pubmed.ncbi.nlm.nih.gov/27228096/>
- Rahmawati. (2021). The relationship between surgical experience and preoperative patient anxiety levels. *Indonesian Journal of Clinical Nursing*, 1(5), 32–39. <file:///C:/Users/Yeti/Downloads/Jurnal+Ilmiah+Kedokteran+dan+Kesehatan+-+Volume.5,+Nomor.2+Mei+2026+Hal+503-516.pdf>
- Ratno dan zerin. (2024). *The relationship between anxiety levels and increased blood pressure in preoperative patients undergoing general anesthesia at Bekasi District Hospital*. <https://doi.org/10.31101/jian.v1i2.4068>
- Siregar. (2022). The effectiveness of finger grip therapy in reducing patient anxiety before surgery. *Indonesian Journal of Nursing Science*, 3(10), 210–218.
- Tadesse. (2022). Preoperative anxiety and its impact on surgical outcomes. *Annals of Medicine and Surgery*, 73. <https://doi.org/10.1016/j.amsu.2021.103190>
- Wulandari. (2021). The effect of deep breathing relaxation techniques on preoperative patient anxiety. *Soedirman Nursing Journal*, 1(16), 45–52. <https://media.neliti.com/media/publications/107908-ID-pengaruh-deep-breathing-pada-pasien-prao.pdf>
- Zhao. (2020). Validation of the Chinese version of the Amsterdam preoperative anxiety and information scale (APAIS). *Health and Quality of Life Outcomes*, 1(18), 1–6. <https://doi.org/10.1186/s12955-020-01294-3>