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Butterfly hug intervention and anxiety among preoperative odontectomy patients

Faizar Dimas Nugraha*, Cahaya Nugraheni, Heri Puspito

Program Studi Keperawatan Anestesiologi, Universitas Aisyiyah Yogyakarta

Corresponding author: *E-mail: faizardinu@gmail.com

Abstract

Background: Odontectomy under general anesthesia frequently triggers pre-operative anxiety, which carries the risk of causing physiological complications and even surgical cancellation. Management that relies solely on pharmacological premedication can produce adverse side effects, making it necessary to explore safe and practical self-administered relaxation alternatives. One such non-pharmacological therapy for managing this anxiety is the butterfly hug technique.

Purpose: To explore the effectiveness of butterfly hug therapy as a practical and structured self-administered non-pharmacological relaxation intervention in reducing anxiety levels among pre-operative odontectomy patients.

Method: A quantitative approach with a pre-experimental research design was used. Samples were selected through purposive sampling, yielding 44 respondents. Data were collected using the Amsterdam Preoperative Anxiety and Information Scale (APAIS) questionnaire. Data analysis was performed using the non-parametric Wilcoxon Signed-Rank Test.

Results: The bivariate Wilcoxon test yielded a significance value of 0.000, which is lower than 0.05 (sig. 0.000 < 0.05), indicating a significant difference between pre-test and post-test scores. The hypothesis stating that "Butterfly Hug has an effect on anxiety levels in pre-operative odontectomy patients under general anesthesia at Salatiga Regional Hospital" was therefore supported.

Conclusion: Butterfly Hug has a significant effect on anxiety levels in pre-operative odontectomy patients under general anesthesia.

Keywords: Butterfly Hug; General Anesthesia; Odontectomy; Pre-operative Anxiety.

INTRODUCTION

Surgery is performed through procedures that cause tissue injury, induce physiological changes, and affect other organs. General Anesthesia is a medical intervention aimed at temporarily eliminating the patient's consciousness, inducing unresponsiveness to pain stimuli, and maintaining control over autonomic reflexes during the surgical procedure (Karunarathna, Hapuarachchi, Gunasena, Ekanayake, Rajapaksha, & Gunawardana, 2024). One of the most frequently performed surgeries in oral and dental surgery under General Anesthesia is Odontectomy. Odontectomy is a surgical procedure involving the extraction of teeth that fail to erupt properly, commonly referred to as impacted teeth

(Sari, 2021). Odontectomy cases themselves frequently induce pre-operative anxiety, which, as reported by various global studies, indicates that the incidence rate of pre-operative anxiety varies significantly, ranging from 16.7% to 97% (Alansaari, Tawfik, Jaber, Khamis, & Elameen, 2023). Pre-operative anxiety in the Central Java region accounted for approximately 80% of the 14.790 total general surgeries in 2020 (Hastuti, 2024). The highest levels of patient anxiety were significantly triggered by oral surgery and dental extraction procedures, reaching 95% (Zulfa, 2025). Pre-operative anxiety management must be implemented immediately to prevent the onset of physiological complications, one

of which is a spike in the patient's blood pressure. If left unmanaged, patients with excessive anxiety tend to lose control and become uncooperative, which can ultimately lead to the delay or even cancellation of the surgical procedure (Purnamasari, Nur, & Nia, 2024). Dental Anxiety is an irrational, intense, and negative emotional perception toward anything related to dental care and visits to dental clinics (Piechal, Siekierska, & Blecharz-Klin, 2026). The highest levels of patient anxiety were significantly triggered by oral surgery and dental extraction procedures, reaching 95%. Anxiety constitutes a significant problem during the pre-operative phase, particularly in invasive dental procedures such as odontectomy (Wardani, Sebayar, & Burhan, 2024). The causes of dental anxiety, particularly in invasive procedures, originate from anesthetic syringes, the sound and sensation of the drill, the extraction procedure, as well as feelings of embarrassment regarding changes in oral conditions (Eviyani, 2024). During the pre-operative period, patients will experience situations that stimulate psychological anxiety, thereby inducing stress during and after the surgery (Wang, Huang, Wang, & Akbari, 2022).

Pharmacological treatments frequently entail adverse effects, including respiratory depression, somnolence, pharmacodynamic disturbances, and prolonged recovery times; consequently, non-pharmacological interventions are increasingly favored in clinical practice (Wang et al., 2022). Although pre-operative anxiety related to odontectomies is highly prevalent at Salatiga Regional General Hospital, preliminary observations indicate that anxiety management remains heavily reliant on pharmacological premedication or basic communication. To date, no structured, specific, self-administered non-pharmacological intervention protocols have been implemented in the pre-operative preparation room.

The Butterfly Hug method is an interventional approach utilizing bilateral stimulation, where the individual crosses both arms over the chest and taps their hands alternatively, simulating the fluttering of butterfly wings (Putri, Mumpuni, & Chairani, 2024). This technique is indicated for mitigating trauma and anxiety by engaging the autonomic nervous system. Such activation stimulates the hypothalamus, reduces cortisol levels, and elevates the production of serotonin and endorphins, which are hormones critical

for emotional regulation and pain alleviation (Novianti, Faddila, & Ningsih, 2025). Given the time constraints during pre-operative preparation and the high patient turnover at the hospital, there is a pressing need for a straightforward intervention that yields rapid effects without requiring complex equipment, thereby empowering patients to apply the technique independently. The efficacy of Butterfly Hug therapy in significantly reducing pre-operative anxiety among laparotomy patients. The intervention group experienced a substantial decline in anxiety, with mean scores dropping from 47.44 pre-intervention to 24.02 post-intervention. In contrast, the control group exhibited minimal variation, recording a pretest mean of 46.88 and a posttest mean of 45.41.

RESEARCH METHOD

A quantitative pre-experimental design using a one-group pretest–posttest approach. The study was conducted from February 1 to February 28, 2026, in the Wijaya Kusuma and Flamboyan surgical wards of Salatiga Regional General Hospital. The study population consisted of 65 patients scheduled for odontectomy during the study period. A total of 44 respondents were recruited using purposive sampling based on predefined eligibility criteria. The inclusion criteria were patients aged 17–45 years, undergoing odontectomy for the first time, classified as American Society of Anesthesiologists (ASA) physical status I or II, fully conscious (Glasgow Coma Scale score of 15), cooperative, able to communicate effectively, having an educational level ranging from elementary school to bachelor's degree, and willing to participate by providing written informed consent. Patients with cognitive impairment, hearing disorders, severe psychiatric disorders, or emergency surgical conditions were excluded. Preoperative anxiety was measured using the Amsterdam Preoperative Anxiety and Information Scale (APAIS). The instrument consists of six items scored on a 5-point Likert scale (1 = not at all to 5 = extremely), with total scores ranging from 6 to 30, where higher scores indicate greater preoperative anxiety and information needs. The Indonesian version of the APAIS demonstrated satisfactory psychometric properties, with item validity coefficients ranging from [value] to [value] and a Cronbach's alpha coefficient of [value].

The Butterfly Hug intervention was delivered individually by the researcher after completion of the

Faizar Dimas Nugraha*, Cahaya Nugraheni, Heri Puspito

Program Studi Keperawatan Anestesiologi, Universitas Aisyiyah Yogyakarta
Corresponding author: *E-mail: faizardinu@gmail.com

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pretest assessment. Participants first received standardized education and a demonstration of the Butterfly Hug technique. They were then instructed to perform 10 bilateral taps in each session, with the procedure repeated over four consecutive sessions, resulting in a total of 40 bilateral taps. The complete intervention lasted approximately 10–15 minutes. Anxiety was assessed twice: immediately before the intervention (pretest) and 15 minutes after completion of the final Butterfly Hug session (posttest) using the same APAIS questionnaire. Descriptive statistics were used to summarize participants' demographic characteristics, including age, sex, and educational level, as well as anxiety scores. Data normality was

assessed using the Shapiro–Wilk test. Because the anxiety scores were not normally distributed ($p < 0.05$), differences between pretest and posttest scores were analyzed using the Wilcoxon signed-rank test, with statistical significance set at $p < 0.05$. This study received ethical approval from the Health Research Ethics Committee of Salatiga Regional General Hospital (Approval No. 064/EC/RSUD Salatiga/2025). Written informed consent was obtained from all participants prior to data collection. Participant confidentiality, anonymity, and privacy were strictly maintained throughout the study in accordance with ethical research principles.

RESEARCH RESULTS

Table 1. Characteristics of Respondents (N= 44)

Variable	Results
Age (n%)(Mean±SD)(Range)(Year)	(34.6±8.54)(17-45)
17-25	18/40.9
26-35	21/47.7
36-45	5/11.4
Gender (n%)	
Male	12/27.3
Female	32/72.7
Education (n%)	
Elementary School	1/2.3
Junior High School	3/6.8
Senior High School	21/47.7
Bachelor's Degree	19/43.2
Anxiety Before Intervention (n%)	
No Anxiety	0/0
Mild	0/0
Moderate	14/31.8
Severe	30/68.2
Anxiety After Intervention (n%)	
No Anxiety	0/0
Mild	9/20.5
Moderate	26/59.1
Severe	9/20.5

Table 1 presents the demographic characteristics of the respondents and the distribution of anxiety levels before and after the intervention. The respondents had a mean age of 34.6 ± 8.54 years (range: 17–45 years), with the

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Program Studi Keperawatan Anestesiologi, Universitas Aisyiyah Yogyakarta
Corresponding author: *E-mail: faizardinu@gmail.com

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majority aged 26–35 years (47.7%), followed by 17–25 years (40.9%) and 36–45 years (11.4%). Most respondents were female (72.7%), while males accounted for 27.3%. Regarding educational attainment, nearly half had completed senior high school (47.7%), followed by a bachelor's degree (43.2%), junior high school (6.8%), and elementary school (2.3%). Before the intervention, all respondents experienced anxiety, with 68.2% classified as having severe anxiety and 31.8% as having moderate anxiety. After the intervention, the severity of anxiety decreased, as 20.5% of respondents experienced mild anxiety, 59.1% had moderate anxiety, and only 20.5% remained in the severe anxiety category. No respondents were classified as having no anxiety either before or after the intervention.

Table 2. Average of Anxiety Levels

Anxiety	Mean	Std. Deviation	Min	Max
Pre Intervention	20.07	3.113	14	24
Post Intervention	15.77	3.784	8	24

The mean anxiety score decreased from 20.07 ± 3.113 before the intervention to 15.77 ± 3.784 after the intervention, indicating a reduction in anxiety levels following the intervention. Pre-intervention anxiety scores ranged from 14 to 24, while post-intervention scores ranged from 8 to 24.

Table 3. The Effects of Butterfly Hug Intervention

Anxiety	Mean	Difference in Mean	Std. Deviation	Z value	p value
Pre Intervention	20.07		3.113		
Post Intervention	15.77	4.3	3.784	-5.592 ^b	< 0.001

The mean anxiety score decreased from 20.07 ± 3.113 before the intervention to 15.77 ± 3.784 after the intervention, with a mean difference of 4.3 points. The Wilcoxon signed-rank test demonstrated a statistically significant reduction in anxiety levels following the intervention ($Z = -5.592$, $p < 0.001$), indicating that the intervention was effective in reducing anxiety among the participants.

DISCUSSION

The present study observed a predominance of female participants, totaling 32 individuals, compared to their male counterparts. Theoretically, this disparity aligns with the mandibular growth trajectory in females. This development typically decelerates or ceases earlier, a timeline that often coincides with puberty or menarche. This developmental arrest occurs precisely as the third molars begin to develop. In contrast, mandibular growth in males persists until the typical age of dental eruption, thereby providing sufficient anatomical space for the normal emergence

of wisdom teeth (Pinto, Francisco, Marques, Martins, & Caramês, 2024).

The majority of the cohort comprised 21 individuals aged 26-35 years, classifying them as early adults. The third molar is the final tooth to erupt, with a standard developmental window falling between 18 and 25 years of age (Varghese, 2021). The higher prevalence within this specific demographic likely stems from a combination of physiological elements, specifically the delayed eruption timeline characteristic of late adolescence and young adulthood, alongside psychological factors such as heightened health literacy and awareness associated with an individual's peak productive years (Diputera, Susanto, & Burhan, 2025).

The anxiety observed among the participants is presumed to originate from inadequate psychological readiness to confront impending physical alterations and the anticipation of surgical pain. Consequently, these individuals often struggle to regulate their emotions, accept their clinical diagnosis, and acclimate to the hospital environment (Oh, Lee, Ki,

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Program Studi Keperawatan Anestesiologi, Universitas Aisyiyah Yogyakarta
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Suh, Hwang, & Lee, 2024). Patients scheduled for an odontectomy frequently endure a "double burden of anxiety." On one hand, they experience specific dental anxiety stemming directly from the tooth's pathology; this manifests as the anticipation of persistent pain, concerns regarding aesthetic impairments due to facial edema, and the potential resurfacing of prior traumatic dental experiences (Mursyid, Septiawan, & Lisetiawati, 2024).

Patients simultaneously confront generalized pre-operative anxiety. This apprehension encompasses the fear of needles, potential adverse effects of general anesthesia, and the surgical risks of hemorrhage or localized nerve damage within the maxillofacial region. Anticipatory fears of surgical failure or permanent disability, conditions that patients often perceive as rendering them a financial or emotional burden to their families, further exacerbate this psychological distress. Moreover, the inherent uncertainty regarding post-operative recovery or potential clinical deterioration significantly amplifies their anxiety (Noor, Fauziah, Suyanto, & Wahyuningsih, 2023).

Individuals experiencing severe anxiety exhibit diminished attention spans and tend to hyper-fixate on minor details (Pujiati & Matondang, 2025). Consequently, these patients require structured guidance, such as self-administered coping mechanisms, to successfully redirect their cognitive focus. This behavioral pattern aligns directly with the present study's pretest observations, which recorded a pronounced prevalence of severe pre-operative anxiety among participants prior to the Butterfly Hug intervention. The Butterfly Hug serves as a straightforward yet highly effective therapeutic modality for delivering bilateral brain stimulation. Neurologically, this bilateral sensory input is theorized to enhance interhemispheric communication. This functional improvement is characterized by increased connectivity between the amygdala, responsible for emotional processing, and the prefrontal cortex, which governs executive function (Endah et al., 2025). Beyond inducing a state of generalized physical relaxation, the technique actively facilitates the neurological desensitization of the specific fears and phobias experienced by the patient.

For odontectomy patients, cognitive focus is frequently fixated on the anticipation of mechanical pain, such as the sound of dental drills or the pressure

of surgical instruments within the oral cavity. By employing the rhythmic, tactile stimulation of the arms or shoulders inherent in the Butterfly Hug technique, patients can effectively shift their sensory focus away from the maxillofacial region. This sensory distraction allows negative cognitive patterns regarding dental and surgical interventions to subside gradually. These findings are consistent with the results of the present study, which recorded a significant reduction in mean anxiety scores, with many patients transitioning to mild anxiety levels following the intervention. The effective application of the Butterfly Hug is indicated for the mitigation of trauma and anxiety due to its role in modulating the autonomic nervous system. This process activates the hypothalamus, thereby facilitating a reduction in cortisol levels while simultaneously elevating the levels of serotonin, an essential neurotransmitter for mood regulation, and endorphins, which serve as natural analgesics (Novianti et al., 2025). Indirectly, this mechanism interrupts the cycle of panic induced by the anticipation of surgery, thereby alleviating emotional tension and fostering a sense of composure and self-control.

The Butterfly Hug offers distinct advantages as a coping mechanism; its gentle, rhythmic motion acts as a cognitive diversion from external stressors while providing a sense of tranquility. Furthermore, the technique is highly accessible, requiring no specialized equipment and proving easy to implement for diverse populations in any quiet setting (Endah, Khairani, & Rezeki, 2025). These results corroborate prior research, such as the study titled "The Effect of Butterfly Hug Therapy on Reducing Pre-operative Anxiety in Laparotomy Patients at Tarakan Regional General Hospital," which demonstrated that this self-healing intervention exerts a statistically significant influence on reducing patient anxiety levels.

CONCLUSION

Based on an evaluation of 44 patients scheduled for an odontectomy under general anesthesia at RSUD Salatiga in 2026, the findings substantiate the research hypothesis by demonstrating that the Butterfly Hug intervention significantly reduces pre-operative anxiety, effectively shifting the predominant pretest state of severe anxiety (68.2%) to a posttest state of moderate anxiety (59.1%). Analysis utilizing the Wilcoxon signed-rank test yielded a significance

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Program Studi Keperawatan Anestesiologi, Universitas Aisyiyah Yogyakarta
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value of 0.000. Because this value falls well below the established threshold ($p < 0.05$), the findings confirm significance of butterfly hug to reduce anxiety levels in pre-operative odontectomy. As a clinical follow-up, nurse anesthetists are encouraged to actively guide patients in applying this technique within the surgical preparation room; furthermore, these findings can be provide a foundational framework for future investigators to design quasi-experimental studies that incorporate a control group.

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