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Effect of hand massage on anxiety levels before contraceptive device installation in prospective IUD and implant users

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ABSTRACT

Background: *Anxiety prior to contraceptive insertion is commonly experienced by prospective family planning acceptors. Psychological discomfort during the procedure may reduce client comfort, influence decision-making, and potentially affect the continuity and effectiveness of contraceptive use. In many clinical settings, anxiety management is often limited to verbal reassurance, while simple non-pharmacological approaches are rarely implemented. One technique that has received increasing attention is hand massage, which may promote relaxation through stimulation of peripheral nerves and improved blood circulation. This intervention is simple, inexpensive, and easy to apply in routine healthcare services.*
Objectives: *This study aimed to examine the effect of hand massage on reducing anxiety levels among prospective intrauterine device (IUD) and implant acceptors at the Independent Midwife Practice of Istri Yuliani, Sleman.*
Methods: *This research employed a quasi-experimental design with a one-group pre-test and post-test approach to examine changes before and after the intervention. This research employed a quasi-experimental design with a one-group pre-test and post-test approach to examine changes before and after the intervention A total of 56 prospective contraceptive acceptors participated in the study. Anxiety levels were measured using the Hamilton Rating Scale for Anxiety (HRS-A) before and after the hand massage intervention. The massage was administered prior to contraceptive insertion as a relaxation technique. Data analysis was performed using descriptive statistics to describe the distribution of anxiety levels and paired t-test to examine the significance of anxiety reduction following the intervention.*
Results: *Before the intervention, 75% of respondents experienced mild anxiety, while only 3.6% reported no anxiety symptoms. After receiving hand massage, the proportion of respondents without anxiety symptoms increased substantially to 80.4%, whereas mild anxiety decreased to 19.6%. The paired t-test indicated a statistically significant reduction in anxiety scores (p = 0.001).*
Conclusions: *Hand massage is associated with a reduction in anxiety prior to contraceptive insertion. This technique may serve as a supportive non-pharmacological intervention to enhance client comfort and improve the overall experience of family planning services.*

KEYWORD*: anxiety; contraceptive device; hand massage; IUD; implant*

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INTRODUCTION

The insertion of contraceptives, such as IUDs (Intrauterine Devices) and Implants, often causes anxiety in potential acceptors (1). This anxiety is caused by a variety of factors, including uncertainty about the procedure, concerns about possible side effects, and worries about the psychological impact of using the contraceptive. This phenomenon is common among many patients, and can influence their decision to choose a contraceptive method and potentially affect their effectiveness and satisfaction with the method (2,3). Global and national data indicate that anxiety prior to contraceptive procedures remains a frequently reported barrier in family planning uptake, particularly for long-acting reversible contraceptives, which require invasive insertion procedures.

The consequences of high anxiety before contraceptive insertion are not only limited to emotional discomfort, but can also have an impact on the patient's physical and psychological health. High anxiety can lead to increased stress, sleep disturbances, and discomfort during the procedure. In addition, anxiety can reduce adherence to contraceptive method use and affect the outcome of the method (4,5). The causes of this anxiety range from lack of adequate information about the insertion procedure, uncertainty about side effects, to traumatic experiences that may have been experienced previously (6,7). Mistrust of the medical procedure and physical discomfort during insertion are also important factors that play a role in triggering anxiety in potential acceptors (8,9).

To overcome the anxiety experienced by patients, various intervention efforts can be applied. One method that shows potential in reducing anxiety is hand massage, which is known to relieve anxiety and promote relaxation by stimulating the parasympathetic nervous system, thereby increasing patient comfort before medical procedures. While hand massage has not been extensively studied in the context of contraceptive device insertion, it has been identified as a promising technique for reducing anxiety through similar mechanisms (10). Additionally, innovative techniques such as umbilical vibration during IUD insertion have demonstrated positive patient responses, suggesting that non-invasive methods can effectively alleviate pain and anxiety (11). Furthermore, relaxation therapies, including Benson's relaxation technique, have proven effective in reducing anxiety across various medical settings, indicating their potential

applicability in contraceptive procedures (12,13). However, existing literature still shows a clear gap in terms of limited empirical evidence specifically examining hand massage in the context of IUD and implant insertion procedures, particularly in relation to anxiety outcomes in family planning services. This gap indicates the need for further focused investigation to strengthen the evidence base in this specific clinical setting.

The novelty of this study lies in the limited empirical evidence regarding the application of hand massage as an intervention to reduce the anxiety of prospective IUD and Implant contraceptive acceptors. Previous studies have generally focused on other relaxation techniques or pharmacological interventions, while hand massage has only minimally been explored and lacks sufficient evidence in this context. Considering that anxiety prior to contraceptive insertion may negatively influence the decision to use long-term contraceptive methods and reduce acceptor comfort during the procedure, identifying simple and effective strategies to manage this anxiety becomes increasingly important in family planning services. This study aims to address this limited evidence base rather than strongly claiming a novelty gap by providing empirical data on the effect of hand massage in reducing anxiety specific to contraceptive insertion. With this simple and non-invasive approach, this study is expected to contribute preliminary evidence to clinical practice, as well as open up possibilities for the application of similar techniques in other medical contexts.

Previous studies have shown that non-pharmacological interventions such as relaxation techniques can have a positive effect in reducing patient anxiety (1416). However, research on the effectiveness of hand massage especially in the context of contraceptive device insertion is still limited. This limitation is important because anxiety related to contraceptive procedures may discourage potential acceptors from choosing long-acting reversible contraceptive methods such as IUDs and implants, which are essential for improving the effectiveness of family planning programs. Therefore, this study aims to explore the effect of hand massage on the anxiety level of prospective IUD and Implant family planning acceptors before insertion, with the hope of contributing to clinical practice in improving patient comfort and satisfaction during contraceptive insertion procedures.

This study aims to assess the extent to which hand massage can reduce anxiety levels, identify changes in anxiety levels before and after the application of this technique, and provide empirical evidence regarding the effectiveness of hand massage as a non-pharmacological intervention in overcoming anxiety in patients who will undergo contraceptive insertion. **T**he findings are expected to provide practical evidence that can support

the integration of simple, low-cost, and non-invasive interventions into routine family planning services to improve the quality of care and client experience.

MATERIALS AND METHODS

This study used a quantitative method with a quasi-experiment pre-test post-test one group design to assess the effect of hand massage on anxiety levels before the installation of IUD and Implant contraceptives. The study population consisted of 56 women of childbearing age at the Independent Practitioner Midwife (PMB) Istri Yuliani, Sleman, Yogyakarta. The sample was taken using purposive sampling technique, including women who were willing to sign informed consent and experienced anxiety before contraceptive insertion. Data were collected through the Hamilton Rating Scale for Anxiety (HRS-A) questionnaire and a hand massage observation sheet. The validity and reliability of the instruments were tested to ensure measurement accuracy and consistency. The validity coefficients for the questionnaire ranged from 0.65 to 0.80, indicating its effectiveness in measuring the intended construct, while the reliability was confirmed with Cronbach's Alpha values above 0.70 for all categories. Data processing involved editing, coding, data entry, and cleaning. Univariate analysis was used to describe characteristics and anxiety levels, while bivariate analysis using the paired t-test compared anxiety levels before and after treatment. Ethical approval for the study was granted under No. EC: 1.810/X/HREC/2023, issued by RSUD Dr. Moewardi Surakarta.

RESULTS AND DISCUSSION

The research results are derived from systematically organizing and grouping information gathered through a detailed data collection process. This process involves analyzing various aspects related to the research topic, which in this case relates to the effect of hand massage on anxiety levels before the insertion of contraceptives such as IUDs and implants. The aim was to provide a comprehensive understanding of how different interventions impact on anxiety, particularly in the context of contraceptive procedures. The results are presented below, which summarizes the key findings and their implications:

Table 1. Characteristics of respondents and distribution

Characteristic	Frequency (n)	Percentage (%)
Age		
Reproductive Age	26	46.4
Non-Reproductive Age	30	53.6
Education		
Higher Education	7	12.5
Secondary Education	49	87.5
Parity		
Multipara	45	80.4
Primipara	11	19.6
Occupation		
Employed	9	16.1
Not Employed	47	83.9

As shown in **Table 1**, the highlighted characteristics of the respondents include a predominant proportion with secondary education (87.5%), indicating limited higher educational attainment. The majority were multiparous (80.4%), suggesting prior childbirth experience among most participants. Additionally, a substantial number of respondents were not employed (83.9%), reflecting a lower rate of participation in the workforce. These three dominant categories represent the most notable features among the respondent group.

Table 2. Type of long-term contraceptive method and reason for visit

Variable	Category	Frequency	Percentage
Type of Contraceptive	Implant	26	46.4
	IUD	30	53.6
Reason for Visit	Removal/Replacement	32	57.1
	New Insertion	24	42.9

Table 3. Relationship between respondent characteristics and type of long-term contraceptive method

Characteristic	Category	Implan		IUD		Total		p-v
		n	%	n	%	n	%	
Age	Reproductive Age	16	61.5	10	33.3	26	46.4	0.032*
	Non-Reproductive Age	10	38.5	20	66.7	30	53.6	
Education	Secondary	21	80.8	28	93.3	49	87.5	0.041*
	Higher	5	19.2	2	6.7	7	12.5	
Parity	Multipara	20	76.9	25	83.3	45	80.4	0.264
	Primipara	6	23.1	5	16.7	11	19.6	
Employment	Employed	7	26.9	9	30	16	28.6	0.375
	Not Employed	19	73.1	21	70	40	71.4	

As presented in **Table 2**, the distribution of long-term contraceptive methods among the respondents was relatively balanced, with a slightly higher proportion using IUDs (53.6%) compared to implants (46.4%). In terms of the reasons for visiting the health facility, the majority came for removal or replacement procedures (57.1%), while 42.9% sought new insertions.

Table 3 illustrates the relationship between respondents' characteristics and the choice of long-term contraceptive methods. Statistically significant associations were found for age and education: women of reproductive age more frequently chose implants (61.5%, n = 16) compared to IUDs (38.5%, n = 10) (p = 0.032), while those with secondary education predominantly selected IUDs (93.3%, n = 28) over implants (42.3%, n = 21) (p = 0.041). In contrast, parity and employment status showed no significant influence on contraceptive choice (p >

Table 4. Anxiety levels before and after the procedure

Anxiety Level	Before the Procedure (n=56)	(%)	After the Procedure (n=56)	(%)	p-value
None	2	3.6	45	80.4	
Mild	42	75	11	19.6	0.001
Moderate	12	21.4	0	0	

0.05). These results indicate that both age and education significantly affect the selection of long-term contraceptive methods, suggesting the need for targeted counseling based on these factors.

Referring to **Table 4**, the results of this study indicate significant changes in anxiety levels before and after the procedure. Before the procedure, 3.6% of respondents reported no anxiety, while this increased to 80.4% after the procedure (p-value = 0.001). Anxiety levels categorized as mild were reported by 75.0% of respondents before the procedure, but this decreased to 19.6% after the procedure. No respondents experienced moderate anxiety after the procedure, compared to 21.4% before the procedure. The total number of respondents before and after the procedure was 56 each. The study on anxiety about contraceptive insertion revealed significant findings related to the demographic characteristics of respondents, with a focus on education level, parity and employment status. These findings are in line with previous research, showing that these factors significantly influence attitudes and anxiety levels towards contraceptive use. Education has an important influence in shaping attitudes towards contraceptive use. Women with secondary education often have a better understanding of contraception, which can reduce anxiety related to medical procedures. Adequate knowledge regarding the benefits, safety, and procedures of contraceptive methods may help reduce uncertainty that often triggers anxiety among prospective acceptors. This is supported by research showing that lower levels of education are associated with higher anxiety towards medical procedures. In rural populations, comprehensive sexual and reproductive health education is important to dispel myths and misconceptions about contraception, thereby reducing anxiety (17). Education influences behavior in choosing contraceptive methods, with higher education levels correlating with better knowledge and reduced anxiety (18). Therefore, improving access to clear and accurate reproductive health information is important to support informed decision-making and reduce psychological barriers to contraceptive use. Within this context, the present study focuses on hand massage as an intervention that is associated with changes in anxiety levels observed between

pre- and post-measurement in a single-group design. Multiparous women, who have previous childbirth experience, often feel more prepared for medical procedures, which may reduce anxiety compared to primiparous women. This finding is consistent with Konsam and Hosaini which suggest that childbirth experience can influence perceptions towards medical procedures, making multiparous women more comfortable with contraceptive installations (19,20). Previous exposure to reproductive health services may also increase familiarity with clinical procedures, thereby reducing uncertainty and fear related to contraceptive insertion. Employment status influences the frequency of visits to health facilities, thereby affecting anxiety management. Women who are unemployed may have less frequent access to healthcare services, which can potentially elevate anxiety levels. Employment status impacts access to healthcare, which subsequently influences anxiety management associated with contraceptive use (12). Greater engagement with healthcare systems through employment-related access or social networks may also contribute to better health information and psychological preparedness before undergoing medical procedures.

The choice between implants and IUDs reflects individual preferences, influenced by personal needs and perceptions. Personal preference significantly influences the choice of contraceptive method, which may affect anxiety levels (21). Perceptions regarding safety, effectiveness, and the insertion procedure often shape individual confidence in selecting a contraceptive method. Awareness and the need for long-term contraceptive management are crucial in reproductive health care, which impacts anxiety levels. The importance of long-term management in reducing anxiety has been emphasized (22). Adequate counseling and understanding of long-term contraceptive benefits may help reduce uncertainty and psychological discomfort prior to the procedure.

Although this study highlights the influence of education, parity and occupation on anxiety towards contraceptive insertion, it is important to consider broader social and cultural factors. For example, social norms and misconceptions about contraception may also contribute to anxiety, as seen in various cultural contexts (23,25). The role of the partner and societal attitudes can also influence individual beliefs and levels of anxiety regarding contraceptive use (26). Addressing these factors through community engagement and education may further reduce anxiety and increase contraceptive uptake (27,28). This study evaluated the impact of hand massage on the anxiety levels of prospective contraceptive acceptors, focusing on changes that occurred before and after the

intervention. Results showed that hand massage significantly reduced perceived anxiety before contraceptive insertion. This finding is in line with existing literature, which indicates that relaxation techniques such as hand massage are effective in reducing anxiety in medical contexts.

The decrease in anxiety after hand massage intervention suggests that this technique can be a useful relaxation strategy before medical procedures. Previous research supports these findings, suggesting that physical relaxation techniques, including hand massage, play an important role in reducing anxiety before medical procedures (29,30). Nasihin also reported that massage methods, as part of relaxation techniques, can reduce anxiety in clinical settings, including preparation for invasive procedures (31). Comparison with other relevant studies, found that non-pharmacological relaxation techniques, including hand massage, were able to significantly reduce anxiety in patients before medical procedures (16,32). This finding supports the results of this study, which show that hand massage is effective in overcoming anxiety before contraceptive insertion.

These findings highlight the importance of integrating relaxation techniques such as hand massage in medical preparation protocols. Given the evidence supporting the effectiveness of this technique in reducing anxiety, it may be considered to adopt similar methods in clinical practice to improve patient comfort. Further research is needed to explore other applications of relaxation techniques and to understand more deeply the mechanisms of effective anxiety reduction in a medical context.

The findings of this study provide preliminary empirical evidence that a simple and non-invasive intervention such as hand massage can be associated with changes in anxiety levels among prospective contraceptive acceptors prior to insertion procedures. The use of a standardized anxiety measurement instrument also supports the reliability of the results obtained. However, several considerations remain important.

The use of a one-group pre-test and post-test design without a control group limits the ability to determine whether the observed reduction in anxiety can be attributed solely to the intervention. In addition, the study was conducted within a single independent midwife practice with a relatively limited sample size, which may affect the generalizability of the findings to other populations or healthcare settings. Therefore, future studies involving larger samples, multiple clinical settings, and more rigorous experimental designs are recommended to strengthen the evidence regarding the association between relaxation-based interventions and anxiety outcomes in reproductive health services.

CONCLUSION AND RECOMMENDATION

This study shows that hand massage is an effective intervention for reducing anxiety among prospective contraceptive acceptors prior to insertion procedures. The decrease in anxiety observed among participants highlights the potential role of simple relaxation techniques as a supportive complement to routine medical care in reproductive health services. Such approaches may help improve client comfort and the overall experience during contraceptive procedures.

Based on these findings, health facilities may consider incorporating hand massage into the preparatory stage of long-acting contraceptive services. This intervention is simple, low-cost, and consistent with patient-centered care principles.

Future research involving larger samples and diverse clinical settings is recommended to further confirm these findings and explore the effectiveness of other relaxation-based interventions in reproductive health services.

REFERENCES

1. Rasyid PS. The effect of providing information on implant installation procedures to the anxiety level of the implant acceptor candidate in gorontalo city (2019) Jurnal Nasional Ilmu Kesehatan. 2019;1(3):15–27.
2. Estevez E, Hem-Lee-Forsyth S, Viechweg N, John S, Menor SP. Advancing Pain Management Protocols for Intrauterine Device Insertion: Integrating Evidence-Based Strategies Into Clinical Practice. Cureus. 2024. https://doi.org/110.7759/cureus.63125.
3. Envall N, Elgemark K, Kopp Kallner H. Mepivacaine instillation for pain reduction during intrauterine device placement in nulliparous women: a double-blinded randomized trial. American Journal of Obstetrics & Gynecology. 2024. 231,(5), 524.e1-524.e7.https://doi.org/110.1016/j.ajog.2024.05.038.
4. Qu J-H, Shou C-C, Xin He QW, Fang Y-X. Analysis of acupoint massage combined with touch on relieving anxiety and pain in patients with oral implant surgery. World Journal of Psychiatry. 2024;3206(4):533–540. https://doi.org/10.5498/wjp.v14.i4.533.
5. Bürger Z, Müllerschön C, Kübbeler J, Comasco E, Henes M, Kogler L, et al. Association of hormonal contraception with stress reactivity in women. Psychoneuroendocrinology.2024;160:106833.https://doi.org/10.1016/j.psyneuen.2023.106833
6. Eriç J, Purut YE, Harmancl H. The Effect of Video Assisted Information on Anxiety and Pain Associated with Intrauterine Device Insertion. Gynecologic and Obstetric Investigation. 2020; 85(1): 82–7. https://doi.org/10.1159/000503819

7. Nguyen L, Lamarche L, Lennox R, Ramdyal A, Patel T, Black M, et al. Strategies to Mitigate Anxiety and Pain in Intrauterine Device Insertion: A Systematic Review. Journal of Obstetrics and Gynaecology Canada . 2020; 42(9): 1138-1146.e2. https://doi.org/10.1016/j.jogc.2019.09.014
8. Wessels J, Klinger R, Benson S, Brenner T, Zöllner C, Elsenbruch S, et al. Preoperative Anxiolysis and Treatment Expectation (PATE Trial): open-label placebo treatment to reduce preoperative anxiety in female patients undergoing gynecological laparoscopic surgery – study protocol for a bicentric, prospective, randomized-controlled trial. Frontiers in Psychiatry 2024;15. https://doi.org/10.3389/fpsyt.2024.1396562
9. Masruroh M, Yuliani I, Mindarsih E, Verawati B, Rahmawati I. Anxiety Of Mothers Before IUD And Implant Insertion. Nurse and Health: Jurnal Keperawatan. 2024;13(2):409–14. https://doi.org/10.36720/nhjk.v13i2.691
10. Mamlukah. A comparative analysis of the use of back massage and Murattal Al-Qur'an on dysmenorrhea pain and anxiety levels. International Journal of Research in Medical Sciences. 2024;12(7):2252–7.https://dx.doi.org/10.18203/2320-6012.ijrms20241868
11. Mckenzie N, Barnhart K. An innovative and non-invasive method of reducing pain utilizing vibration during iud insertion: patient reactions and one provider's approach. The Journal of Sexual Medicine. 2024; 21(Supplement_5).https://doi.org/10.1093/jsxmed/qdae054.042
12. ElShora SAE, Elsayed H, El-Feshawy N, Abd Elaziz Hassen H. The Effect of Benson's Relaxation Therapy on Pre-Cesarean Section Fear and Anxiety among Nulliparous Women. Assiut Scientific Nursing Journal. 2024; 12(41):75–83.https://doi.org/10.21608/asnj.2024.259888.1746
13. Abidah SN, Novianti H, Masruroh N. Effectiveness of combination of benson relaxation and lavender aromatherapy relaxation towards changes in anxiety in the third trimester pregnant woman. Journal of Medical and Healthcare Development. 2023;12(3):3382–6. doi: https://doi.org/10.15562/bmj.v12i3.4419
14. Li Z, Bauer B, Aaberg M, Pool S, Van Rooy K, Schroeder D, et al. Benefits of hand massage on anxiety in preoperative outpatient: A quasi-experimental study with pre- and post-tests. Explore. 2021;17(5):410–6. https://doi.org/10.1016/j.explore.2020.08.016
15. Anggri Yanti D, Sumiati Silaban L, Purba S, Mariati Simarmata J,. Pengaruh hand massage terhadap penurunan tingkat kecemasan klien pre operasi di rumah sakit patar asih

lubuk pakam tahun 2021. Jurnal Keperawatan dan Fisioter. 2021 ;3(2):171–9.
16. Nasihin N. The Effect of Hand Massage on Reducing the Anxiety Level of Pre-Surgery Clients in Tangerang City Regional Public Hospital. Poltekita: Jurnal Ilmu Kesehatan. 2023; 17(1):1–7. https://doi.org/10.33860/jik.v17i1.2025
17. Risbud N, Daukia K, Ghanekar K. Knowledge attitude and practice of contraception in women of rural population following delivery in a tertiary care hospital. Indian Journal Applied Research. 2024;60–1. https://www.doi.org/10.36106/ijar/6002250
18. Ardanti NKJ, Dewi NLMA. Gambaran tingkat pengetahuan pasangan usia subur tentang penggunaan alat kontrasepsi IUD. Coping Community of Publishing in Nursing. 2023;11(5):490. https://doi.org/10.24843/coping.2023.v11.i05.p15
19. Konsam M, Praharaj SK, Shetty J, Panda S, Lakshmi R V, Kamath A, et al. Effectiveness of Comprehensive Health-literacy And Relaxing Music (CHARM) intervention on pregnancy-related anxiety among low-risk primigravid women: A randomized controlled trial. Psychology of Music. 2024;https://doi.org/10.1177/03057356241258958
20. Hosaini S, Yazdkhasti M, Ghafari FM, Mohamadi F, Rad SHRK, Mahmoodi Z. The relationships of spiritual health, pregnancy worries and stress and perceived social support with childbirth fear and experience: A path analysis. PLoS One. 2023; 18(12). https://doi.org/10.1371/journal.pone.0294910
21. Kazemi SN, Vaziri-harami R, Vaziri-harami S, Mousavian FS. Anxiety Disorders in Pregnant Women and its Effects on Choosing the Delivery Method. Revista Colombiana de Psiquiatría. 2023. https://doi.org/10.1016/j.rcpeng.2025.10.010
22. Zeng G, Niu J, Zhu K, Li F, Liu L, Gao K, et al. Effects of Non-Pharmacological Interventions on Depression and Anxiety in Pregnant Women: A Systematic Review and Network Meta-Analysis. eClinical Medicine . 2024. https://doi.org/10.1016/j.eclinm.2024.103011
23. Bukuluki P, Kisaakye P, Houinato M, Ndieli A, Letiyo E, Bazira D. Social norms, attitudes and access to modern contraception for adolescent girls in six districts in Uganda. BMC Health Service Research. 2021; 21(1):1–14. https://doi.org/10.1186/s12913-021-07060-5
24. Idris IB, Syed Soffian SS, Baharom M, Baharuddin UM, Hashim S, Nawi AM. Influence of sociocultural beliefs and practices on contraception: a systematic review. Women Health.

2022;62(8):688–99.https://doi.org/10.1080/03630242.2022.2117764

25. Adewale Ogundiran T, Mohammadnezhad M, Ibrahim Ogundiran A, Mohammed H. Role of sociocultural beliefs/norms on level of access and uptake of contraceptives among unmarried adolescent girls in Nigeria: A systematic review study. MOJ: Public Health. 2024;13(1):73–9. https://doi.org/10.15406/mojph.2024.13.00441
26. Sarnak DO, Wood SN, Zimmerman LA, Karp C, Makumbi F, Kibira SPS, et al. The role of partner influence in contraceptive adoption, discontinuation, and switching in a nationally representative cohort of Ugandan women. PLoS One. 2021; 16(1).https://doi.org/10.1371/journal.pone.0238662
27. Agha S, Morgan B, Archer H, Paul S, Babigumira JB, Guthrie BL. Understanding how social norms affect modern contraceptive use. BMC Public Health. 2021;21(1):1061–1061. https://doi.org/10.1186/s12889-021-11110-2
28. Minkanic M, Tran E. Socioeconomic and Cultural Factors Influencing Type of Hormonal Contraceptive Use in Women in Developed vs Under-Developed Geographic Areas. Clinical and Experimental Investigations. 2024; 4(1): 2–9.http://dx.doi.org/10.31487/j.CEI.2024.01.01
29. Li Z, Bauer B, Aaberg M, Pool S, Van Rooy K, Schroeder D, et al. Benefits of hand massage on anxiety in preoperative outpatient: A quasi-experimental study with pre- and post-tests. Explore (NY). 2021;17(5):410–6. https://doi.org/10.1016/j.explore.2020.08.016
30. Hamdani SU, Zill-e-Huma, Zafar SW, Suleman N, Um-ul-Baneen, Waqas A, et al. Effectiveness of relaxation techniques 'as an active ingredient of psychological interventions' to reduce distress, anxiety and depression in adolescents: a systematic review and meta-analysis. International Journal of Mental Health Systems.2022;16(1):31. https://doi.org/10.1186/s13033-022-00541-y
31. Nasihin N. The Effect of Hand Massage on Reducing the Anxiety Level of Pre-Surgery Clients in Tangerang City Regional Public Hospital. Poltekita Jurnal Ilmu Kesehatan. 2023;17(1):1–7.
32. Nabighadim M, Mirghafourvand M, Maghalian M. Non-Pharmacological Interventions Before Cataract Surgery for Preoperative Anxiety: A Systematic Review and Meta-Analysis. Nursing Open, 2025;12(1). https://doi.org/10.1002/nop2.70122