

Endorphin massage reduces anxiety levels of pregnant women in the third trimester

Emilda Sapetri Ashar*, Siti Fatimah, Eprilia Eprilia

Department of Midwery, Poltekkes Kemenkes Palembang
Jalan Dr AK. Gani No 85, Muara Enim, Sumatera Selatan

*Corresponding author: sitifatimahteteh75@gmail.com

ABSTRACT

Background: : Anxiety in pregnant women in the third trimester is normal, but can disrupt the health of the mother and baby. Endorphin massage is a non-invasive therapy that can help reduce anxiety.

Objectives: This research aims to determine the effect of endorphin massage on the anxiety level of pregnant women in the third trimester at the Independent Midwife Practice Place in the Ujan Mas Community Health Center, Ujan Mas District, Muara Enim Regency in 2024

Methods: This research uses a quasi-experimental design with two groups, namely control group and intervention group. Each group consisted of 30 third trimester pregnant women. The intervention group received endorphin massage for 30 minutes 2 times a week for 4 weeks, while the control group received no intervention. Anxiety levels were measured before and after the intervention using the Hamilton Rating Scale for Anxiety (HARS). Statistical tests use the Mann Whitney test for abnormal data and the independent T test for normal data.

Results: The results of the study showed that there was no difference in the anxiety scores of pregnant women in the third trimester before the intervention in the control and intervention groups ($p = 0.976$). However, there was a difference in the anxiety scores of pregnant women in the third trimester after the intervention in the control and intervention groups ($p = 0.000$). The average decrease in anxiety scores in the control group was less than in the intervention group ($p = 0.000$).

Conclusions: Endorphin massage has been proven to be effective in reducing the anxiety level of pregnant women in the third trimester at the Midwife's Independent Practice. Suggestion: This research can be used as information to increase insights in an effort to reduce the level of anxiety of pregnant women in the third trimester

KEYWORD: endorphin massage; anxiety; third trimester; pregnant women

Article Info :

Article submitted on September 16, 2024

Article revised on October 20, 2024

Article received on December 26, 2024

INTRODUCTION

Anxiety occurs in everyone, including pregnant women. Pregnant women in their third trimester often experience anxiety due to fears of death, both for themselves and their babies, fears of having a child with defects or pathological conditions, feelings of guilt or sin related to emotional life and affection received from their parents, especially their mothers (1). The level of anxiety in pregnant women tends to increase in the second and third trimesters, precisely at 18 and 32 weeks of gestation, peaking as childbirth approaches. At this stage, anxiety screening is crucial(2).

The prevalence of anxiety and depression in pregnant women in developed countries is around 7-20%, while in developing countries it is over 20%. The prevalence of anxiety during pregnancy in several countries is as follows: 18% in Bangladesh, 20.6% in China, and 18% in Pakistan. Based on research conducted in Indonesia, around 28.7% of pregnant women experience anxiety in the third trimester (3). Studies indicate that the prevalence of anxiety among pregnant women in Indonesia ranges from 20% to 35%, with higher rates observed in areas with limited access to mental health and prenatal care services(4).

Factors influencing anxiety in pregnant women include low socioeconomic status, which may lead to more frequent anxiety due to poverty, low income, lack of prenatal care, and insufficient family support (5). Anxiety during pregnancy has negative impacts on

pregnant women from pregnancy to childbirth, such as premature birth or miscarriage. Anxiety can also affect the fetus, inhibiting growth and weakening uterine muscle contractions. High anxiety during pregnancy is associated with adverse effects on fetal neurodevelopment (6). Pregnancy anxiety can lead to prolonged labor by increasing stress-induced hormonal imbalances, which may interfere with uterine contractions and delay cervical dilation (7). According to the Indonesian Demographic and Health Survey (SDKI), prolonged labor affects 48% of deliveries in Indonesia, often linked to pregnancy anxiety, inadequate healthcare access, and pain management challenges (8). Anxiety affects physiological conditions, increasing sympathetic dystrophy nerve activity, heart rate, respiration, and blood pressure and causing sweaty hands. High blood pressure can lead to headaches and insomnia, complicating childbirth and depression postpartum(9).

Non-pharmacological interventions are widely used to manage anxiety in pregnant women. These include relaxation, massage, acupuncture, warm compresses, and aromatherapy (10). Endorphin massage, a gentle touch or light massage, is essential for pregnant women (11). Most of the existing research tends to focus on the physiological benefits of endorphin massage, such as reducing muscle pain and improving blood circulation. However, there is limited empirical evidence on its psychological effects, particularly regarding its impact on anxiety

levels in pregnant women. This study aims to fill this gap by exploring how endorphin massage can alleviate anxiety in pregnant women during their third trimester. Research has shown that endorphin massage can lower anxiety levels, including in the third trimester of pregnancy, reducing Hamilton Anxiety Rating Scale (HARS) scores from 15.09 to 11.07(12).

In a study involving ten pregnant women aged 28-36 weeks at the *Ujan Mas iHealth* Center, interviews revealed that seven of the women had moderate to high anxiety levels before childbirth. None of these women had received endorphin massage or any other type of massage during their pregnancy. This study aim to know the effect of endorphin massage on the anxiety levels of third-trimester pregnant women at the Private Midwife Practice Area of Ujan Mas Health Center, Ujan Mas District, Muara Enim Regency, in 2024.

MATERIALS AND METHODS

This research is a comparative analytic study using a quasi-experimental design. This type of research tests a treatment on a group of subjects with or without a comparison group but does not use randomization to assign subjects to treatment or control groups. The specific design used in this study is the pretest-posttest with the control group.

The study was conducted in May 2024 at the Independent Midwife Practice Area, *Ujan Mas* Public Health Center, *Ujan Mas*

Subdistrict, *Muara Enim* Regency. The study population consisted of 90 third-trimester pregnant women. Based on sample size calculations from previous studies, each group included 30 sample. The researcher used purposive sampling to select participants and divided them into 30 in the control group and 30 in the intervention group.

Inclusion criteria for this study were normal third-trimester pregnant women at the study site who attended ANC check-ups with their companions and were willing to participate. Exclusion criteria included multiple pregnancies, as evidenced by medical records from the KIA book examination, and pregnant women with pregnancy complications, also based on medical records from the KIA book examination.

Data collection began by explaining the study to the eligible respondents, who signed a consent form. The researcher initially measured the respondents' anxiety levels. The respondents were then trained to perform endorphin massages on their companions. In the subsequent meeting, the researcher re-measured the respondents' anxiety levels for the post-test.

Research instruments used Endorphin massage was administered and measured using a Standard Operating Procedure (SOP) sheet, which provided detailed, step-by-step instructions to ensure consistency and accuracy in the delivery of the massage across all participants (13). This SOP sheet outlined the specific techniques, pressure,

duration, and areas of focus during the massage sessions, aiming to stimulate endorphin release effectively (14). On the other hand, anxiety levels in pregnant women were measured using the Hamilton Anxiety Rating Scale (HARS) (15), a validated questionnaire consisting of 14 items that assess both psychological and somatic symptoms of anxiety. Each item on the HARS is rated on a scale from 0 (not present) to 4 (severe), with higher scores indicating greater levels of anxiety.

This dual approach of using an SOP for the massage and the HARS for anxiety measurement ensures that both the intervention (endorphin massage) and the outcome (anxiety reduction) are evaluated systematically and reliably in the study. Data were processed using a computer. The characteristics of pregnant women measured included age, gravida, ANC history, and education level. Normality testing used the Shapiro-Wilk test. The pre-test and post-test variables have a p-value < 0.05, indicating that the data distribution is not normal. However, the delta variable has a p-value > 0.05, indicating that the data distribution is normal. Therefore, the pre-test and post-test data analysis uses the non-parametric Mann-Whitney test. In contrast, the delta data analysis uses the independent t-test. The test was used with a 95% confidence level. Statistical results used significance if the p-value was < 0.05.

This study adhered to ethical procedures by the Helsinki Code, respecting

respondents' rights, providing benefits to subjects, preventing harm, and ensuring fairness. The study has passed ethical review with the following approval number: 0707/KEPK/Adm2/V/2024

RESULTS AND DISCUSSION

RESULTS

Table 1 shows the characteristics of respondents in the control group and the intervention group. The results indicate no significant differences in age, parity, maternal education, and economic status between the two groups (p-value > 0.05). This means that both groups are homogeneous and can be compared for this study.

Based on **Table 2**, the average anxiety score in the control group is 16.70 (1.93), and in the intervention group, it is 16.73 (1.92). The statistical test results show a p-value of 0.976, indicating that there is no difference in the anxiety scores of third-trimester pregnant women before the intervention in the control and intervention groups at the Independent Midwife Practice Area, Ujan Mas Public Health Center, Ujan Mas Subdistrict, Muara Enim Regency in 2024. This means that the pre-test groups are homogeneous before the intervention.

Based on **Table 3**, it was found that the average anxiety score in the control group was higher at 16.27 (1.61) compared to the average anxiety score in the intervention group at 12.73 (1.63). The statistical test results show a p-value of 0.000, indicating that there is a significant difference in the

Table 1. Subject characteristics

Characteristics	Group Control	Intervention	P value*
Age (year)			
<20 or >35	3 (10.0%)	2 (6.7%)	1
20-35	27 (90.0%)	28 (93.3%)	
Total	30 (100.0%)	30 (100.0%)	
Parity			
0	7 (23.3%)	9 (30.0%)	0.788
1	20 (66.7%)	19 (63.3%)	
2	3 (10.0%)	2 (6.7%)	
Total	30 (100.0%)	30 (100.0%)	
Education			
Basic	4 (13.3%)	3 (10.0%)	0.559
Intermediate	25 (83.3%)	24 (80.0%)	
High	1 (3.3%)	3 (10.0%)	
Total	30 (100.0%)	30 (100.0%)	
Income			
< Regional standard	28 (93.3%)	26 (86.7%)	0.671
≥ Regional standard	2 (6.7%)	4 (13.3%)	
Total	30 (100.0%)	30 (100.0%)	

Test Description: *) Chi-Square Test

Table 2. Difference in anxiety scores of third-trimester pregnant women before intervention in the control and intervention groups at the independent midwife practice area, Ujan Mas Public Health Center, Ujan Mas Subdistrict, Muara Enim Regency in 2024

Anxiety Pre	Mean (SD)	Median	Min	Maks	P value	Z
Control	16.70 (1.93)	17	14	19	0.976	-0.03
Intervention	16.73 (1.92)	17	14	19		

Table 3. Differences in anxiety scores of third-trimester pregnant women after intervention in the control and intervention groups at the independent midwife practice area, Ujan Mas Public Health Center, Ujan Mas Subdistrict, Muara Enim Regency in 2024

Anxiety Pre	Mean (SD)	Median	Min	Maks	P value	Z
Control	16.27 (1.61)	16	13	20	0	-6.444
Intervention	12.73 (1.63)	13	5	15		

anxiety scores of third-trimester pregnant women after the intervention between the control and intervention groups at the Independent Midwife Practice Area, Ujan Mas Public Health Center, Ujan Mas Subdistrict,

Muara Enim Regency in 2024. This means that the anxiety in the intervention group is significantly lower than in the control group after the endorphin massage therapy.

Based on **Table 4**, it was found that the

Table 4. The Effect of endorphin massage on anxiety levels in third-trimester pregnant women at the independent midwife practice area, Ujan Mas Public Health Center, Ujan Mas Subdistrict, Muara Enim Regency in 2024

Delta Anxiety	Mean (SD)	Median	Min	Maks	P value	t
Control	-0.43 (-0.50)	-0.5	-5	4	0	-6.08
Intervention	-4.0 (2.01)	-4	-9	-1		

average decrease in anxiety scores in the control group was minimal at -0.43 (-0.50) compared to the average decrease in anxiety in the intervention group at -4.0 (2.01). The statistical test results show a p-value of 0.000, indicating that there is a significant effect of endorphin massage on the anxiety levels of third-trimester pregnant women at the Independent Midwife Practice Area, Ujan Mas Public Health Center, Ujan Mas Subdistrict, Muara Enim Regency in 2024. This means that endorphin massage is effective in reducing anxiety scores in third-trimester pregnant women.

DISCUSSION

Anxiety Before the Intervention

This study aims to assess anxiety levels among third-trimester pregnant women by comparing two groups: a control group and a group receiving an endorphin massage intervention. Prior to the intervention, the control group had an average anxiety score of 16.70 (SD = 1.93), while the intervention group averaged 16.73 (SD = 1.92). The statistical analysis yielded a p-value of 0.976, indicating no significant difference between the two groups at baseline. This result confirms the homogeneity of the groups, ensuring comparability for subsequent

analyses. Homogeneity between the control and intervention groups is crucial as it ensures that uncontrolled variables do not influence the research results. Therefore, any observed changes in anxiety levels after the endorphin massage intervention can be more confidently attributed to the intervention itself rather than other factors. This indicates that the research design created equal initial conditions between the two groups.

Anxiety in pregnant women is a common psychological condition, especially in the third trimester, when they start to face concerns related to childbirth and the baby's health. According to the stress and coping theory by Lazarus and Folkman, anxiety arises when individuals feel that the demands of a situation exceed their coping resources (16). In this context, interventions like endorphin massage can serve as a coping strategy, helping to reduce anxiety by triggering the release of endorphins, hormones known to reduce pain and enhance feelings of comfort (13) (Table 1).

A study in Semarang found that the average anxiety level of respondents before receiving endorphin massage intervention ranged from mild to moderate, with an average of 15.09 (11). Anxiety in pregnant women often stems from fear of death, either

for themselves or their babies, fear of giving birth to a child with disabilities or pathological conditions, and feelings of guilt or sin. Higher anxiety levels were observed in another study, where the intervention and control groups had average anxiety scores of 23.73 and 22.22, respectively, indicating moderate anxiety (14).

The implications of this research are manifold. Clinically, these results highlight the potential of endorphin massage as an effective method for reducing anxiety in pregnant women, which can be incorporated into everyday midwifery practice. Methodologically, this study underscores the importance of ensuring homogeneity between control and intervention groups to validate research results. Practically, these findings provide a foundation for developing more structured and evidence-based health programs at Ujan Mas Public Health Center and encourage the training of health workers in endorphin massage techniques.

This study shows that there is no significant difference in anxiety scores between the control and intervention groups before the endorphin massage intervention, with a p-value of 0.976. The homogeneity between the two groups indicates that this research has good internal validity and provides a solid basis for further evaluation of the intervention's effectiveness. In the context of practice at the Independent Midwife Practice Area, Ujan Mas Public Health Center, these results also offer essential guidance for midwives and health workers.

They can confidently implement interventions tested with sound research methods. These findings can serve as a basis for developing more comprehensive and evidence-based maternal health programs in the future (**Table 2**).

Anxiety After the Intervention

In this study, the average anxiety score in the control group was higher at 16.27 (1.61) compared to the average anxiety score in the intervention group, which was 12.73 (1.63). Statistical test results show a p-value of 0.000, indicating a significant difference in the anxiety scores of third-trimester pregnant women after the endorphin massage intervention between the control and intervention groups at the Independent Midwife Practice Area, Ujan Mas Public Health Center, Ujan Mas Subdistrict, Muara Enim Regency in 2024. This means that the anxiety level in the intervention group was significantly lower than in the control group after the endorphin massage therapy.

Anxiety is an emotional response to perceived threats, which can affect an individual's mental and physical well-being. During pregnancy, anxiety can increase due to hormonal changes, concerns about childbirth, and future responsibilities as a parent (17). One relevant theory in anxiety management is the endorphin theory, which explains how the release of endorphins can reduce anxiety by providing relaxation and enhancing feelings of comfort. Endorphin massage is a therapeutic technique designed

to stimulate endorphin production through massage, proven effective in reducing stress and anxiety(13).

Various studies have demonstrated the effectiveness of endorphin massage in reducing anxiety. Research has found that massage can increase serotonin and dopamine levels while reducing cortisol, a stress-related hormone (18). Other studies have shown that pregnant women who receive regular massages experience decreased anxiety and depression and improved sleep quality (19,20). Similar research indicates that pregnant women receiving endorphin massage have lower anxiety scores compared to the control group receiving standard care only(21). The study at the Independent Midwife Practice Area, Ujan Mas Public Health Center, supports these findings, showing a significant difference between the control and intervention groups in terms of anxiety levels after the endorphin massage intervention. The research indicates that maternal anxiety decreased to a HARS score of 12.04 after the intervention compared to 19.60 before the intervention (2).

The implications of this study are significant for midwifery practice and maternal and child health care providers. By demonstrating that endorphin massage significantly reduces anxiety in third-trimester pregnant women, this research supports integrating this massage technique into routine prenatal programs. Implementing this therapy can enhance maternal mental well-

being and positively impact fetal development, as maternal anxiety can affect baby growth and health. Additionally, this therapy offers a safe, non-pharmacological alternative for managing anxiety in pregnant women.

This study shows that the endorphin massage intervention is significantly more effective in reducing anxiety levels in third-trimester pregnant women compared to the control group. The average anxiety score in the intervention group (12.73) was lower than in the control group (16.27), with a p-value of 0.000, indicating a significant difference. These results support the theory that stimulating endorphin production through massage can reduce anxiety and enhance psychological well-being (**Table 3**).

The Effect of Endorphin Massage on Anxiety in Third-Trimester Pregnant Women

This study demonstrates that endorphin massage is markedly more effective in alleviating anxiety among third-trimester pregnant women compared to the control group. The intervention group experienced a substantially greater reduction in anxiety scores (-4.0) compared to the control group (-0.43), with a highly significant p-value of 0.000. These findings provide strong evidence that stimulating endorphin release through massage has a profound impact on reducing anxiety and enhancing the psychological well-being of pregnant women. The endorphin theory explains that

endorphins, neurotransmitters acting as natural analgesics, can be released through various stimulations, including massage. Endorphins play a crucial role in mood regulation and pain reduction, contributing to lower anxiety levels. Endorphin massage, designed to stimulate endorphin production through physical stimulation, has proven effective in reducing stress and anxiety (22).

Previous research has examined the effects of endorphin massage on various populations and shown positive results (23). Studies have found that massage during pregnancy can reduce anxiety and depression and improve sleep quality. Research has shown a decrease of -7 in anxiety scores in third-trimester pregnant women after receiving endorphin massage (24).

A study revealed that endorphin massage effectively reduces maternal anxiety, emphasizing its potential for integration into public health center programs. This would enable pregnant women to practice endorphin massage with the assistance of their husbands, promoting both physical and emotional well-being. Research conducted at the Independent Midwife Practice in the Ujan Mas Public Health Center demonstrated that endorphin massage significantly reduces anxiety levels compared to the control group. The intervention group showed an average anxiety score reduction of -4.0 (SD = 2.01), whereas the control group exhibited a minimal decrease of -0.43 (SD = 0.50),

highlighting the superiority of this intervention.

This study introduces a novel approach by emphasizing the incorporation of endorphin massage into public health programs, specifically targeting its application with the involvement of husbands. Unlike prior research, it not only confirms the effectiveness of endorphin massage in reducing anxiety but also proposes a practical, community-based implementation strategy, fostering familial support and enhancing accessibility to this intervention in routine prenatal care.

The long-term benefits of implementing endorphin massage include reduced anxiety and stress levels in pregnant women, contributing to a healthier pregnancy and smoother delivery. Additionally, improved mental well-being of pregnant women can positively impact fetal development and child health after birth. By continually developing and evaluating this intervention, healthcare providers can enhance the quality of prenatal care and holistically support maternal and child health.

The results of this study have important implications for midwifery practice and maternal and child healthcare. By demonstrating that endorphin massage is effective in reducing anxiety in third-trimester pregnant women, this research supports integrating this technique into routine prenatal programs. Implementing endorphin massage can provide a safe and effective non-pharmacological alternative for managing

anxiety during pregnancy, potentially improving maternal mental well-being and better pregnancy outcomes. Furthermore, the application of this technique can reduce reliance on medical interventions and medications, which may have side effects on both the mother and fetus (**Table 4**).

CONCLUSION AND RECOMMENDATION

In conclusion, this research demonstrates that endorphin massage is an effective method for reducing anxiety in third-trimester pregnant women, as evidenced by significantly lower post-intervention anxiety scores in the intervention group compared to the control group. Given the substantial decrease in anxiety levels and the safety of this non-pharmacological approach, it is recommended that endorphin massage be integrated into routine prenatal care programs. Additionally, training healthcare providers in this technique could enhance maternal mental well-being and contribute to better pregnancy outcomes, thus promoting a holistic approach to maternal and child health.

REFERENCES

1. Hidayah A, Sumini GT, Santutri Bedha Y. Perbedaan tingkat kecemasan ibu hamil primigravida dan multigravida trimester III dalam menghadapi persalinan di RSUD Al Islam H.M Mawardi Sidoarjo Tahun 2020. *Hospital Majapahit*. 2021;13(1):112–21. doi : <https://doi.org/10.5281/zenodo.4558621>
2. Sari LL, Anissa K. Effect of Endorphin Massage on The Level of Anxiety among > 36 Weeks Pregnant Women. *EMBRIO Jurnal Kebidanan*. 2023;15(1):49–56. doi: <http://dx.doi.org/10.36456/embrio.v15i1.6995>
3. Akbar YF. Perbandingan Derajat Kecemasan Kehamilan Aterm Primi gravida Pada Remaja Dan Dewasa Muda Dengan Menggunakan Hamilton Anxiety Rating Scale. Universitas Hasanuddin; 2020.
4. Hastanti H, Budiono B, Febriyana N. Primigravida Memiliki Kecemasan Yang Lebih Saat Kehamilan. *Indonesian Midwifery and Health Sciences Journal*. 2021;3(2):167–78.
5. Huang J, Huang J, Li Y, Liao B. The prevalence and predictors of fear of childbirth among pregnant Chinese women: a hierarchical regression analysis. *BMC Pregnancy Childbirth* [Internet]. 2021;21(1):1–10. Available from: <https://doi.org/10.1186/s12884-021-04123-7>
6. Shay M, MacKinnon AL, Metcalfe A, Giesbrecht G, Campbell T, Nerenberg K, et al. Depressed mood and anxiety as risk factors for hypertensive disorders of pregnancy: A systematic review and meta-analysis. *Psychological Medicine*. 2020;50(13):2128–40. doi : <https://doi.org/10.1017/s0033291720003062>
7. Ulfah RF, Karimah A, Prasetyo B. Faktor Resiko Yang Berhubungan Dengan Tingkat Kecemasan Ibu Hamil Usia Remaja Di Puskesmas Rongga. *Jurnal*

- Riset Kesehatan [Internet]. 2022;14(2): 393–401. Available from: <https://doi.org/10.34011/juriskesbdg.v14i2.1998>
8. BPS RI. Survei Demografi Kesehatan Indonesia tahun 2017. Jakarta; 2018.
 9. Gregor K, Banaś E, Malec M. Labour anxiety - risk factors and its impact of the course of labor , postpartum and condition of the newborn Labor anxiety – risk factors and impact on the course of labor , puerperium and neonatal condition. *GinPolMedProject*. 2019;1(51):009–13.
 10. Suriyati. Metode Non Farmakologi dalam Mengatasi Kecemasan pada Persalinan Non Pharmacology Methods in Overcome Anxiety in Labor. *Journal of Healthcare Technology and Medicine*. 2019;5(1):2615–109.
 11. Kurniasari FD, Aniroh U. The Effect of Endorphin Massage on Decreased Anxiety Levels of Pregnant Women in The Third Trimester. 2022;26–31.
 12. Santi LKS, Sudewi AAR, Duarsa DP. The Relationship of Pregnancy Massage to the Rate of Anxiety Depression and Stress in Pregnant Women. *International Journal on Health and Medical Sciences*. 2021;4(June):208–14.
 13. Sukesri N. The Influence of Endorphine Massage on Anxiety in Mothers During Their 3rd Trimester Pregnancy. *Health Notions*. 2020;4(5):148–52. doi : <https://doi.org/10.33846/hn40503>
 14. Luh widiastruti putu. Pengaruh Massage Endorphin Terhadap Kecemasan Ibu Hamil Dalam Menghadapi Proses Persalinan Di Puskesmas Denpasar Utara III. *Jurna; Dunia Kesehatan*. 2019; 72–5.
 15. Utami NW, Zolekhah D. The impact of relaxation in prenatal yoga against the anxiety level in pregnant women. *JNKI (Jurnal Ners dan Kebidanan Indonesia) (Indonesian Journal Nursing Midwifery)*. 2021;9(2):82.
 16. Dencker A, Nilsson C, Begley C, Jangsten E, Mollberg M, Patel H, et al. Causes and outcomes in studies of fear of childbirth: A systematic review. *Women and Birth* [Internet]. 2019;32(2):99–111. Available from: <https://doi.org/10.1016/j.wombi.2018.07.004>
 17. Cholifah S, Rinata E. Buku Ajar Asuhan Kebidanan Kehamilan. Sidoharjo: Umsida Press; 2022.
 18. Mueller SM, Grunwald M. Effects, side effects and contraindications of relaxation massage during pregnancy: A systematic review of randomized controlled trials. *Journal of Clinical Medicine*. 2021;10(16).
 19. Aswitami NGAP, Fitria F, Sulistianingsih A, Udayani NPMY. Pengaruh Pijat Kehamilan Terhadap Kualitas Tidur Ibu Hamil Trimester III di Desa Abiansemal Kabupaten Badung Provinsi Bali Tahun 2020. *Media Penelitian dan Pengembangan Kesehatan*. 2021;31(4): 347–56.
 20. Wulandara Q, Miniarsih S, Gustini S, Marlina L. Pengaruh Pijat Endorphin

- terhadap Kecemasan Ibu Hamil Trimester III di UPTD Puskesmas Gandrungmangu I Kabupaten Cilacap Tahun 2019. *Media Info*. 2022;18(2): 162–9.
21. Kurniyati, Bakara DM. Pijat Endorfin Terhadap Nyeri Punggung Bawah dan Kecemasan Endorphin Massage Against Lower Back Pain and Anxiety in Third Trimester Pregnant Women in Rejang Lebong Regency. *JIK (Jurnal Ilmu Kesehatan)*. 2020;5(2):375–81.
22. Hartati R, Rahayu AOS, Tanberika FS, Islami AP. Increasing the Comfortable Feel for Pregnant Women Through the Endorphin Massage. *Journal of Physics: Conference Series*. 2019;1351(1).
23. Santi LKS, Sudewi AAR, Duarsa DP, Lesmana &, Komang L, Santi S, et al. The Effect of Pregnancy Massage on Level of Depression, Anxiety and Stress in Pregnant Women. *International Journal on Health and Medical Sciences [Internet]*. 2021;4(2):220–5. Available from: <https://doi.org/10.31295/ijhms.v4n2.1692>
24. Murdiningsih, Suryani J, Wahyuni S. Integrasi Endorphin Massage sebagai Holistic Care The Integration of Endorphin Massage as Holistic Care in Reducing Anxiety during the Third Trimester of Pregnancy. *Jurnal Kesehatan Komunitas*. 2022;8(April): 293–8.