

Original Article

Psychoeducation reduces anxiety and cortisol hormones in high-risk pregnant women

Sapiah Sahupala ¹[∞], Suharsono ¹, Krisdiana Wijayanti ¹

¹ Postgraduate Program, Master of Applied Midwifery, Health Polytechnic of Health Semarang, Semarang, Central Java, Indonesia

ARTICLE INFORMATION

Received: August 01, 2024 Revised: October 11, 2024 Accepted: October 21, 2024

KEYWORDS

Hydrocortisone; Pregnant Women; Anxiety; Pregnancy High-Risk;

CORRESPONDENCE

Phone: +62 81343337432 E-mail: sapiahsahupala8@gmail.com **Background:** High-risk pregnancy poses significant challenges to both maternal and fetal health, increasing the risk of complications, anxiety, and elevated cortisol levels. Anxiety in high-risk pregnancies has been widely studied, but most interventions focus on pharmacological treatments or psychological support without integrating physiological stress markers such as cortisol levels. Psychoeducation is a nonpharmacological intervention designed to enhance understanding, equip women with stress management skills, and promote confidence in facing pregnancy. However, limited studies have examined its direct impact on both anxiety and cortisol levels in high-risk pregnant women.

Purpose: This study aims to evaluate the effectiveness of psychoeducation in reducing anxiety and cortisol levels among high-risk pregnant women.

Methods: This study employed a pre-experimental one-group pretest-posttest design without a control group. The intervention consisted of four structured psychoeducation sessions, each lasting 120 minutes over two weeks. A total of 23 high-risk pregnant women participated in the study. Anxiety levels were measured using the DASS-21, and cortisol levels were assessed through saliva samples collected before and after the intervention. Data were analyzed using the Wilcoxon signed-rank test.

Results: The findings revealed a significant reduction in anxiety scores from 15.60 \pm 2.99 to 8.52 \pm 1.88 (p < 0.001) and cortisol levels from 15.72 \pm 9.10 to 10.40 \pm 6.97 (p < 0.001), indicating the effectiveness of psychoeducation in reducing both psychological and physiological stress in high-risk pregnancies.

Conclusion: Psychoeducation, delivered through four sessions over two weeks, is effective in reducing anxiety and cortisol levels in high-risk pregnant women. This intervention should be integrated into prenatal care to support maternal well-being and stress management.

INTRODUCTION

High-risk pregnancy is a condition that poses significant health concerns for both mothers and fetuses, affecting pregnancy outcomes, childbirth, and even the postpartum period.^{1,2} If not managed promptly and effectively, these conditions can threaten maternal and neonatal safety.

High-risk pregnancies are associated with increased psychological distress, particularly stress and anxiety.³⁻⁵ Anxiety during pregnancy is linked to elevated cortisol production, a key stress hormone.⁶ In mothers, excessive cortisol may exacerbate anxiety, increase the risk of complications such as preeclampsia, and contribute to mental health disorders.⁷ In fetuses, high cortisol levels can

impair brain development, elevate the risk of preterm birth, and lead to other growth-related complications.⁸

The prevalence of anxiety and depression among pregnant women varies globally. In developed countries, rates range from 7% to 20%, whereas in developing countries, the prevalence exceeds 20%. In Indonesia, approximately 28.7% of pregnant women experience anxiety.^{9,10} In Maluku province, the number of pregnant women increased from 770 in 2021 to 779 in 2022, with high-risk pregnancies rising from 89 to 104 cases.¹¹ Data from Dr. H. Ishak Umarella Regional General Hospital recorded 26 cases of pregnancy-related anxiety in 2022. These statistics highlight the need for effective interventions to manage anxiety in high-risk pregnancies.

https://doi.org/10.30595/medisains.v23i1.23398

^{©(2025)} by the Medisains Journal. Readers may use this article as long as the work is properly cited, the use is educational and not for profit, and the work is not altered. More information is available at <u>Attribution-NonCommercial 4.0 International.</u>

Various interventions exist to mitigate stress and anxiety in pregnant women, broadly categorized into pharmacological and nonpharmacological approaches.¹² Nonpharmacological interventions include prayer and dhikr therapy, music therapy, yoga, relaxation techniques, and hypnotherapy.¹³ Additionally, psychoeducation has emerged as a promising intervention for managing anxiety in pregnant women. Psychoeducation systematically educates patients and their families about mental health conditions, providing essential information about disorders and treatment options while integrating emotional aspects, thus enabling patients to cope with their conditions more effectively.¹⁰

Several studies have demonstrated the benefits of psychoeducation in reducing anxiety and improving mental health outcomes.¹⁴ Research has shown that structured psychoeducational programs significantly lower anxiety levels and enhance emotional resilience in high-risk pregnancies.¹⁵ Furthermore, psychoeducation has been widely used in managing chronic illnesses, psychiatric disorders, and perinatal mental health issues, proving its broad applicability in healthcare settings.¹⁶

A study found that psychoeducational interventions significantly reduced anxiety levels in pregnant women diagnosed with gestational hypertension.¹⁷ Another study demonstrated that integrating psychoeducation with relaxation techniques resulted in better psychological wellbeing among pregnant women with preeclampsia.¹⁸ However, despite the established benefits, few studies have explored the direct impact of psychoeducation on cortisol hormone levels in high-risk pregnancies.

Despite the established benefits of psychoeducation, few studies have explored its direct impact on cortisol hormone levels in high-risk pregnancies.¹⁹ Existing research primarily focuses on subjective measures of anxiety reduction without incorporating biochemical markers that provide objective evidence of stress regulation.²⁰ Additionally, most studies on psychoeducation have been conducted in developed countries, whereas research in developing regions remains scarce despite the high prevalence of maternal anxiety in these areas.

The novelty of this study lies in its investigation of maternal anxiety levels following psychoeducation, assessed using cortisol hormone measurements. By integrating psychoeducation with biochemical assessments, this study aims to establish an evidence-based approach to reducing anxiety and stress-related physiological responses in highrisk pregnant women. The findings will contribute to a deeper understanding of the relationship between psychological interventions and hormonal stress regulation, providing valuable insights for maternal healthcare strategies.

METHOD

Study Design

This study uses a pre-experimental design with a pre-test and post-test in a group without a control group.²¹

Setting and Respondent

The study, conducted at RSUD by Dr. H Ishak Umarella, involved 23 high-risk pregnant women selected through purposive sampling. Inclusion criteria were gestational age 28-32 weeks, primary parity, and consent to participate. Exclusion criteria included uncooperative behavior and severe health conditions.

Experimental Procedure

Participants underwent a pre-test assessment measuring anxiety (DASS-21) and cortisol levels (saliva samples). The psychoeducation intervention consisted of five 60-minute sessions over four weeks, covering stress management, coping strategies, and relaxation techniques through group discussions, booklets, and videos. Following the intervention, a post-test assessment is conducted using the same instruments to measure changes in anxiety and cortisol levels. Data analysis is then performed to evaluate the effectiveness of psychoeducation in reducing anxiety and physiological stress responses in high-risk pregnancies.

Variables, Instruments, and Measurements

The variables in this study consist of anxiety and cortisol hormone levels as dependent variables. Anxiety levels are measured using the Depression Anxiety Stress Scale-21 (DASS-21), a validated questionnaire designed to assess anxiety symptoms in pregnant women systematically. The questionnaire consists of 21 items, with seven specifically targeting anxiety symptoms. Participants complete the DASS-21 before and after the intervention to evaluate changes in anxiety levels.

Cortisol hormone levels are measured using saliva samples collected from participants at two-time points: before the psychoeducation intervention (pre-test) and after the intervention (post-test). Saliva samples are analyzed using the Enzyme-Linked Immunosorbent Assay (ELISA) Kit at the GAKI Laboratory, Diponegoro National Hospital, Semarang. The ELISA method ensures precise quantification of cortisol concentrations, providing an objective measure of physiological stress responses. This approach allows for a comprehensive evaluation of the impact of psychoeducation on both psychological and physiological stress indicators in high-risk pregnant women.

Data Analysis

Pre- and post-test data were analyzed using the Wilcoxon signed-rank test due to non-normal data distribution (Shapiro-Wilk test, p < 0.05), ensuring appropriate evaluation of anxiety and cortisol level changes.

Ethical Consideration

This comprehensive research effort underwent a rigorous evaluation process. The Semarang Ministry of Health Polytechnic Research Ethics Committee granted ethical approval, as indicated by official reference number 0931/EA/KEPK/2023.

RESULTS

Table 1 presents the demographic characteristics of the respondents. The majority (91.3%) were aged 20-35, unemployed, and had a high school education.

Table 2 demonstrates a significant reduction in anxiety and cortisol levels following the psychoeducation intervention. Anxiety scores decreased from 15.60 ± 2.99 to 8.52 ± 1.88 , with a mean difference of -7.08 (p < 0.001). Similarly, cortisol levels declined from 15.72 ± 9.10 to 10.40 ± 6.97 , with a mean difference of -5.32 (p < 0.001). These results suggest that psychoeducation effectively reduces both psychological distress and physiological stress responses in high-risk pregnant women.

Table 1. Characteristics of Respondents

Characteristics	Result
Mother's age	
< 20 years	2 (8.7 %)
20-35 years	21(91.3%)
> 35 years	0 (0%)
Occupation	
Working	2 (8.7%)
Not working	21 (91.3%)
Education	
University	2 (8.7%)
High school	16 (69.6%)
Junior high school	5 (21.7%)

Table 2. Effects of Psychoeducation on Anxiety and Cortisol

 Hormone

Variable	Mean±SD	Mean±SD	Mean	p-
	(Before)	(After)	Difference	value
Anxiety	15.60±2.99	8.52±1.88	-7.08	<0.001
Cortisol	15.72±9.10	10.40±6.97	-5.32	<0.001
Hormone				

DISCUSSION

This study demonstrates that psychoeducation significantly reduces anxiety and cortisol levels in high-risk pregnant women. The intervention provides essential knowledge, enhances coping mechanisms, and promotes relaxation techniques, allowing participants to manage stress effectively. By improving their understanding of high-risk pregnancy and its management, participants experience reduced uncertainty and increased control over their condition, leading to decreased anxiety. This is an anticipatory response to an experience considered a threat to one's role in life, bodily integrity, and even one's life.^{18,19}

The physiological impact of psychoeducation is evident in the reduction of cortisol levels. Chronic stress elevates cortisol secretion, negatively affecting maternal and fetal health. Psychoeducation helps mitigate this response by equipping pregnant women with stress management techniques, including deep breathing and mindfulness, which modulate the body's physiological stress response.

The findings align with previous research. A study on psychoeducation for postpartum blues reported significant anxiety reduction, while another study on remembrance psychoeducation found lowered postpartum depression and anxiety levels.^{20,21} Additionally, psychoeducation has been shown to enhance maternal confidence in childbirth and reduce decision-making conflicts.²² Our study adds to this body of evidence by incorporating cortisol measurements, objectively confirming reduced physiological stress.

However, some studies suggest that psychoeducation alone may not be sufficient in severe cases of maternal anxiety.^{23,24} Providing psychoeducation with an approach to mothers and families positively impacts reducing the hormone cortisol.²⁵ Other interventions, such as cognitivebehavioral therapy or pharmacological treatment, may be required for more pronounced anxiety symptoms. Additionally, while this study provides strong preliminary evidence, its lack of a control group limits definitive conclusions regarding causality.

The primary limitation of this study is its pre-experimental design, which lacks a comparison group. Future studies should implement randomized controlled trials to strengthen causal inferences. Additionally, the sample size is relatively small, warranting further research with larger populations to enhance generalizability. Despite these limitations, this study contributes valuable insights into the role of psychoeducation in reducing both psychological and physiological stress in high-risk pregnancies, highlighting its potential for integration into routine maternal healthcare programs.

CONCLUSIONS AND RECOMMENDATION

Psychoeducation effectively reduces anxiety and cortisol levels in high-risk pregnant women, with significant decreases in anxiety and cortisol levels. Psychoeducation should be integrated into prenatal care with structured stress management techniques, personalized interventions, and ongoing psychological support. Healthcare providers require proper training to optimize their delivery. Future studies should incorporate control groups, larger sample sizes, and long-term follow-ups to strengthen evidence on the sustained effectiveness of psychoeducation in maternal health.

REFERENCES

1. García-Blanco A, Monferrer A, Grimaldos J, et al. A Preliminary Study To Assess The Impact of Maternal Age on Stress-Related Variables in Healthy Nulliparous Women. *Psychoneuroendocrinology*. 2017;78(2017):97-104. doi:10.1016/j.psyneuen.2017.01.018

- 2. Rochjati P. Skring Antenatal Pada Ibu Hamil. Airlangga University Press; 2011.
- Rahmawati L, Amalia FE, Kahar M, et al. Literature Review: Faktor-Faktor Risiko Terjadinya Preeklampsia pada Ibu Hamil. *J Borneo Holist Heal*. 2022;5(2):122-132. doi:https://doi.org/10.35334/borticalth.v5i2.3115
- Isnaini I, Hayati EN, Bashori K. Identifikasi Faktor Risiko, Dampak dan Intervensi Kecemasan Menghadapi Persalinan pada Ibu Hamil Trimester Ketiga. Anal J Magister Psikol. 2020;12(2):112-122. doi:DOI: 10.31289/analitika.v12i2.3382
- Seth S, Lewis AJ, Galbally M. Perinatal Maternal Depressiona and Cortisol Function in Pregnancy and The Postpartum Period: A Systematic Literature Review. *BMC Pregnancy Childbirth*. 2016;16(1):1-19. doi:10.1186/s12884-016-0915-y
- Bleker LS, Roseboom TJ, Vrijkotte TG, Reynolds RM, de Rooij SR. Determinants of Cortisol During Pregnancy – The ABCD Cohort. *Psychoneuroendocrinology*. 2017;83(1):172-181. doi:10.1016/J.PSYNEUEN.2017.05.026
- Amalina N, Kasoema RS, Mardiah A. Faktor yang Mempengaruhi Kejadian Preeklampsia pada Ibu Hamil. *Voice Of Midwifery*. 2022;12(1):8-21. doi:https://doi.org/10.35906/vom.v12i1.168
- Marwah DS, Zata KN, Naufal M, Fadhillah MI, Fithri NK. Literature Review: Analisis Faktor yang Berhubungan dengan Tingkat Stres Ibu Hamil dan Implikasinya pada Kesehatan Janin. J Ilmu Kedokt dan Kesehat. 2023;10(8):2578-2587.

http://ejurnalmalahayati.ac.id/index.php/kesehatan

- Mandagi DV V., Pali C, Sinolungan JS V. Perbedaan Tingkat Kecemasan pada Primigravida dan Multigravida Di RSIA Kasih Ibu Manado. *J e-Biomedik*. 2013;1(1):197-201. doi:10.35790/ebm.1.1.2013.1617
- Bedaso A, Adams J, Peng W, Sibbritt D. The Relationship Between Social Support and Mental Health Problems During Pregnancy: A Systematic Review and Meta Analysis. *Reprod Health*. 2021;18(1):1-23. doi:10.1186/s12978-021-01209-5
- 11. Maluku DKP. Laporan Kinerja Bidang Kesehatan Masyarakat 2021. 2021;1(1):1-8.
- 12. Nörby U, Forsberg L, Wide K. Neonatal Morbidity After Maternal Use of Antidepressant Drugs During Pregnancy. *Pediatrics*. 2016;138(5). doi:10.1542/peds.2016-0181
- Mendes FCO, Santos KVGD, Dantas JKDS, et al. Nonpharmacological strategies to reduce stress and anxiety in endovascular procedures: A scoping review. *Nurs Open*. 2024;11(3):e2105. doi:10.1002/nop2.2105
- Alshammari M, Lee RLT, Stubbs M, Chan SW. Effectiveness of psychoeducation interventions for pregnant women with gestational diabetes mellitus: an integrative review. *BMC Public Health*. 2024;24(1):2929. Published 2024 Oct 22.

doi:10.1186/s12889-024-20428-6

- 15. Mhango W, Crowter L, Michelson D, Gaysina D. Psychoeducation as an active ingredient for interventions for perinatal depression and anxiety in youth: a mixed-method systematic literature review and lived experience synthesis. *BJPsych Open*. 2023;10(1):e10. Published 2023 Dec 13. doi:10.1192/bjo.2023.614
- Colizzi M, Lasalvia A, Ruggeri M. Prevention and early intervention in youth mental health: is it time for a multidisciplinary and trans-diagnostic model for care?. *Int J Ment Health Syst.* 2020; 14(23). doi.org/10.1186/s13033-020-00356-9
- Umamah F, Santoso B, Yunitasari E, Nisa F, Wulandari Y. The effectiveness of psycho-educational counseling in pregnant women with preeclampsia: A systematic review. J Public Health Res. 2022;11(3):22799036221104161. Published 2022 Jul 8. doi:10.1177/22799036221104161
- 18. Yoo H, Ahn S. Effects of nonpharmacological interventions on the psychological health of high-risk pregnant women: a systematic review and metaanalysis. *Korean J Women Health Nurs*. 2021;27(3):180-195. doi:10.4069/kjwhn.2021.09.17
- Jagtap A, Jagtap B, Jagtap R, Lamture Y, Gomase K. Effects of Prenatal Stress on Behavior, Cognition, and Psychopathology: A Comprehensive Review. *Cureus*. 2023;15(10):e47044. Published 2023 Oct 14. doi:10.7759/cureus.47044
- Gherardi-Donato ECDS, Gimenez LBH, Fernandes MNF, et al. Mindfulness Practice Reduces Hair Cortisol, Anxiety and Perceived Stress in University Workers: Randomized Clinical Trial. *Healthcare (Basel)*. 2023;11(21):2875. Published 2023 Oct 31. doi:10.3390/healthcare11212875
- 21. Aulia T. Jenis Penelitian Kuantitatif Eksperimen. Universitas Muhammadiyah Sumatera Utara. Published 2023. https://uptjurnal.umsu.ac.id/jenis-penelitiankuantitatif-eksperimen/
- Yuliani DR, Widyawati MN, Rahayu DL, Widiastuti A, Rusmini R. Terapi Murottal Sebagai Upaya Menurunkan Kecemasan dan Tekanan Darah pada Ibu Hamil dengan Preeklampsia: Literature Review Dilengkapi Studi Kasus. *J Kebidanan*. 2018;8(2):79-98. doi:https://doi.org/10.31983/jkb.v8i2.3738
- 23. Annisa DF, Ifdil I. Konsep Kecemasan (Anxiety) pada Lanjut Usia (Lansia). *Konselor*. 2016;5(2):93-99. doi:10.24036/02016526480-0-00
- 24. Fatmawati A, Wahyuni RJ, Imansari B. Pengaruh Psikoedukasi terhadap Penurunan Tingkat Postpartum Blues: Literature Review. *J Ilmu Keperawatan dan Kebidanan.* 2022;13(1):35-40. doi:10.26751/jikk.v13i1.1180
- Mamlukah, Kumalasari I. Efektivitas Psikoedukasi Zikir terhadap Penurunan Tekanan Darah, Kecemasan dan Depresi Postpartum Ibu Hamil di Masa Pandemi. *Wind Heal J Kesehat*. 2022;5(3):622-632. doi:https://doi.org/10.33096/woh.vi.50