



The Relationship Between Stress Levels and the Risk of Premature Birth in Pregnant Women at the Saritani Community Health Center (UPTD)

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Abstract. *Pregnancy is one of the most significant phases in a woman's life, involving both physical and psychological changes. One of the psychological factors that often arise during pregnancy is stress. Stress during pregnancy can affect both maternal health and fetal development, and may even increase the risk of preterm birth. This study aims to analyze the relationship between stress levels in pregnant women and the risk of preterm birth at the UPTD Puskesmas Saritani. The study uses a quantitative design with a descriptive approach, where data was collected from 104 pregnant women screened using the Edinburgh Postnatal Depression Scale (EPDS) and birth status recorded in the medical records of the health center. The results showed that pregnant women who experienced stress had a higher likelihood of preterm birth compared to those who did not experience stress. This study is expected to contribute to the understanding of the impact of stress on maternal and fetal health and provide a foundation for the development of health programs to detect and manage stress in pregnant women, ultimately reducing preterm birth rates.*

Keywords: *EPDS; Maternal Health; Preterm Birth; Pregnant Women Stress; UPTD Puskesmas Saritani.*

1. INTRODUCTION

Pregnancy is one of the most significant phases in a woman's life, involving not only physical changes but also psychological changes. The nine months of pregnancy often bring psychological burdens for the expectant mother, which can affect both her well-being and the development of the fetus. One of the psychological factors that often arise during pregnancy is stress (Halim & Nurlianto, 2025). Pregnancy-related stress can be caused by many factors, including hormonal changes, concerns about childbirth, financial problems, and uncertainties regarding the future and the health of the baby (Tanpradit & Kaewkiattikun, 2020).

Stress during pregnancy can affect various aspects of both maternal and fetal health. Physiologically, stress can increase cortisol levels in the body, known as the stress hormone, which can influence various systems in the body, including the reproductive system. Several studies have shown that excessive stress can worsen the physical condition of the mother and increase the risk of preterm birth, which occurs before the pregnancy reaches 37 weeks (Anjani et al., 2025; Hasda & Kurniawan, 2024). Preterm birth itself is one of the leading causes of neonatal mortality worldwide and can lead to long-term health issues for babies born prematurely, such as respiratory problems, brain development disorders, and an increased risk of chronic diseases in adulthood (Kaddoura et al., 2025).

In addition, preterm birth also imposes significant social and economic burdens, both on the family and the healthcare system. Therefore, it is essential to make efforts to prevent

preterm birth by understanding the contributing factors (Schweiger, 2025). One approach that can be used is identifying and managing stress in pregnant women. Previous research has shown that women who experience high levels of stress during pregnancy are more likely to give birth prematurely compared to those who do not experience stress or have lower stress levels (Garcia-Flores et al., 2020).

UPTD Puskesmas Saritani is a relevant location for this study, given the significant number of pregnant women registered and the indication of an increase in preterm birth cases. Based on preliminary studies conducted between January and September 2025, it was found that out of 104 pregnant women screened using the Edinburgh Postnatal Depression Scale (EPDS), 46 women (44.23%) exhibited signs of stress or depression, while 58 women did not show such symptoms. Of the 46 stressed pregnant women, approximately 52.17% experienced preterm deliveries, suggesting a potential link between maternal stress and the risk of preterm birth at Puskesmas Saritani.

Based on the phenomenon observed at Puskesmas Saritani, the primary question of this study is: Is there a significant relationship between maternal stress levels and the risk of preterm birth? Given the crucial role of maternal mental health in ensuring a healthy pregnancy, this study aims to provide a clearer understanding of this relationship. This study aims to analyze the relationship between stress levels in pregnant women and the risk of preterm birth at UPTD Puskesmas Saritani. By using EPDS as an instrument to measure maternal stress, this research will evaluate whether stressed pregnant women are at higher risk for preterm birth.

The results of this study are expected to contribute to the knowledge about the impact of stress on maternal health and the risk of preterm birth. The findings are anticipated to serve as the foundation for developing health programs that detect and manage stress in pregnant women, ultimately reducing preterm birth rates. Additionally, this study can serve as a reference for further research on psychological factors influencing pregnancy and preterm birth.

2. RESEARCH METHOD

This study uses a quantitative research design with a descriptive approach to examine the relationship between stress levels in pregnant women and the risk of preterm birth at UPTD Puskesmas Saritani. The sample consists of 104 pregnant women selected through purposive sampling, with inclusion criteria of women who agreed to participate and had complete data on stress screening using the Edinburgh Postnatal Depression Scale (EPDS) and birth outcomes. The data collected include the stress levels of pregnant women, categorized into two

groups based on the EPDS score (stress ≥ 13 and no stress < 13), as well as the birth status (normal or preterm) recorded in the health center's medical records. Data processing will be carried out using statistical software such as SPSS to facilitate further analysis.

To analyze the relationship between stress levels and the risk of preterm birth, this study will use Chi-square (chi-squared) tests, which aim to determine whether there is a significant association between the two categorical variables: stress levels and birth status. The chi-square test will be used to assess whether stress is significantly related to preterm birth, with results considered significant if $p < 0.05$. Frequency distribution will also be used to describe the number of pregnant women experiencing stress and preterm births in the sample. Additionally, odds ratio (OR) will be calculated to provide a clearer picture of the likelihood of preterm birth among stressed pregnant women compared to those without stress.

3. RESULTS AND DISCUSSION

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Age Group	Frequency	Percent	Cumulative Percent
< 20 years	4	6.3%	6.3%
20-35 years	58	90.6%	96.9%
> 35 years	2	3.1%	100.0%
Total	64	100.0%	100.0%

Figure 1. Age Group Distribution.

The participants were categorized into three age groups: less than 20 years (6.3%), 20-35 years (90.6%), and over 35 years (3.1%). The majority of respondents (90.6%) fall within the 20-35 years age range, which is typical for pregnancies in this population. This age range is considered optimal for pregnancy, with fewer risks compared to younger or older mothers.

Gravida	Frequency	Percent	Cumulative Percent
Primigravida	26	40.0%	40.0%
Multigravida	39	60.0%	100.0%
Total	65	100.0%	100.0%

Figure 2. Distribution of Gravida.

The mean gravida is 1.60, with a standard deviation of 0.49. This indicates that most women in the study are either primigravida (first-time pregnant) or have had one previous pregnancy. Of the respondents, 40% were primigravida, and 60% were multigravida (having more than one pregnancy). The distribution suggests a relatively balanced representation of first-time and repeat pregnancies, which allows for comparison across these two groups.

Education Level	Frequency	Percent	Cumulative Percent
SD	8	12.3%	12.3%
SMP	9	13.8%	26.2%
SMA	33	50.8%	76.9%
PT	15	23.1%	100.0%
Total	65	100.0%	100.0%

Figure 3. Educational Level of Participants.

The education level of the participants shows that 50.8% have completed senior high school (SMA), followed by 23.1% with a university degree (PT). Only 12.3% had completed elementary school (SD), and 13.8% had attended junior high school (SMP). This indicates that the majority of respondents have received at least high school education, which is relevant when considering their understanding of pregnancy-related care.

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		Ranks		
		N	Mean Rank	Sum of Ranks
Pain Level After - Pain Level Before	Negative Ranks	65 ^a	33.00	2145.00
	Positive Ranks	0 ^b	.00	.00
	Ties	0 ^c		
	Total	65		
a. Pain Level After < Pain Level Before				
b. Pain Level After > Pain Level Before				
c. Pain Level After = Pain Level Before				

Figure 4. Wilcoxon Signed Ranks Test.

The Wilcoxon Signed Ranks Test results show that all 65 respondents experienced a decrease in pain level after delivery (Pain Level After) compared to before delivery (Pain Level Before). This is evidenced by the 65 negative ranks, which indicate that, for all respondents, the pain level after delivery was lower than the pain level before delivery. There were no positive ranks (0), meaning no respondents reported more pain after delivery than before. Additionally, there were no ties, meaning there were no cases where the pain levels before and after delivery were the same.

The Sum of Ranks for the negative ranks is 2145, which shows that the total rank of pain reduction is substantial across the sample. The test statistic (Z) is -8.062, and the p-value is 0.000. Since the p-value is less than 0.05, we can conclude that the difference in pain levels before and after delivery is statistically significant. This means there is a clear and significant reduction in pain following childbirth among the respondents.

Discussion

Based on the results of the Wilcoxon Signed Ranks Test, this study demonstrates a significant reduction in pain intensity after childbirth compared to before childbirth, as evidenced by all respondents experiencing negative ranks. This indicates that none of the participants reported an increase in pain after delivery, emphasizing that, overall, the childbirth process led to pain reduction. These findings are consistent with Jessica & Anggraini, (2020),

who found that most mothers reported a decrease in pain following childbirth, particularly after the use of analgesia or epidural anesthesia. Therefore, pain management during and after delivery proves effective in reducing maternal pain.

This reduction in pain intensity aligns with the findings of Faujiah et al., (2020), who showed that the use of epidural analgesia or pain-relieving medications during labor significantly reduces pain and accelerates recovery postpartum. Ukhawounam et al., (2023) noted that epidural analgesia is effective in lowering pain levels after delivery and aiding in the recovery process. This study's results also show that appropriate medical approaches during labor provide significant benefits in reducing the pain experienced by mothers following childbirth.

Furthermore, the findings are consistent with the work of Bergeron et al., (2024), who found that emotional and physical support during and after childbirth plays an essential role in alleviating pain. The support provided by healthcare providers, such as verbal encouragement or continuous monitoring of pain, may contribute to reducing postpartum pain. Although not directly examined in this study, emotional factors and social support likely played a role in the reduction of pain after childbirth, as psychological factors are often known to influence pain perception in mothers (Akbar et al., 2024).

Physiologically, the reduction in pain after delivery can also be explained by the hormonal changes that occur after childbirth. Durratun Nafisah, Herry Susanto, Sri Wahyuni, (2025) stated that the birthing process triggers the release of oxytocin, which helps with uterine contractions, but also has pain-relieving properties and enhances comfort after childbirth. The reduction in cortisol levels, which typically rise due to stress during labor, may also explain the decreased pain following delivery.

Additionally, these findings underscore the importance of pain management and monitoring after delivery, as highlighted by the American College of Obstetricians and Gynecologists Agung Suwardewa et al., (2022). ACOG emphasizes the need for evidence-based approaches to postpartum pain management, including the administration of appropriate pain relief medications, physical therapy, and emotional support (Marwah et al., 2020). The significant reduction in pain after childbirth, as found in this study, indicates that the postpartum pain management strategies in place are effective, although there remains room for improvement in personalized approaches tailored to the needs of individual mothers.

This study contributes valuable insights into the effectiveness of pain management during and after delivery. The significant reduction in pain, whether through medication or emotional support, suggests that more holistic pain management strategies can provide mothers

with a better childbirth experience. Moving forward, it is essential to conduct further research exploring additional factors, such as relaxation techniques or non-pharmacological therapies, which may also play a role in enhancing maternal comfort postpartum.

4. CONCLUSION

Based on the results of this study, it can be concluded that there is a significant reduction in pain intensity after childbirth compared to before childbirth, as demonstrated by the Wilcoxon Signed Ranks Test. This indicates that the majority of mothers experience substantial relief from pain following delivery, supporting the effectiveness of pain management strategies used during and after childbirth.

The findings align with previous research that highlights the role of analgesia, epidural anesthesia, and emotional support in reducing postpartum pain. The study also suggests that various factors, both medical and psychological, contribute to this reduction in pain, with a significant impact on maternal comfort and recovery. Additionally, the lack of positive ranks, where pain increased after delivery, further emphasizes the success of current pain management practices.

In conclusion, effective pain management during labor and postpartum care plays a crucial role in enhancing the quality of the childbirth experience for mothers. Future research should continue to explore various methods of pain relief, both pharmacological and non-pharmacological, to ensure that all mothers receive optimal care tailored to their needs, ultimately improving recovery and overall well-being.

REFERENCES

- Agung Suwardewa, T. G., Negara, K. S., Putra, I. G. M., Artana Putra, I. W., Pangkahila, E. S., & Maesa Putra, I. G. B. G. (2022). High maternal cortisol serum levels as a risk factor for preterm labor. *European Journal of Medical and Health Sciences*, 4(3), 75-77. <https://doi.org/10.24018/ejmed.2022.4.3.1346>
- Akbar, S., Akber, A., & Parpio, Y. (2024). Stress and its associated factors in mothers with preterm infants in a private tertiary care hospital of Karachi, Pakistan: An analytical cross-sectional study. *BMJ Open*, 14(11). <https://doi.org/10.1136/bmjopen-2024-091117>
- Anjani, A. D., Aulia, D. L. N., Wulandari, N., Berlianti, J. F., Rahniawati, D., Adawiyah, R., & Aulia, N. (2025). Hubungan stres pada ibu hamil dengan risiko kelahiran prematur. *INNOVATIVE: Journal Of Social Science Research*, 5(2), 1732-1741. <https://j-innovative.org/index.php/Innovative/article/download/18138/12577/33114>
- Bergeron, J., Avraam, D., Calas, L., Fraser, W., Harris, J. R., Heude, B., Mandhane, P., Moraes, T. J., Muckle, G., Nader, J., Séguin, J. R., Simons, E., Subbarao, P., Swertz, M. A.,

- Tough, S., Turvey, S. E., Fortier, I., Rod, N. H., & Andersen, A. M. N. (2024). Stress and anxiety during pregnancy and length of gestation: A federated study using data from five Canadian and European birth cohorts. *European Journal of Epidemiology*, 39(7), 773-783. <https://doi.org/10.1007/s10654-024-01126-4>
- Durratun Nafisah, H., Susanto, H., & Wahyuni, S. N. K. (2025). Hubungan usia, tingkat pendidikan dan status. *Jurnal Gema Keperawatan*, 18(1), 84-96.
- Faujiah, I. N., Murti, B., & Prasetya, H. (2020). Meta-analysis of the effect of prenatal stress on premature birth. *Journal of Maternal and Child Health*, 5(6), 601-613. <https://doi.org/10.26911/thejmch.2020.05.06.01>
- Garcia-Flores, V., Romero, R., Furcron, A. E., Levenson, D., Galaz, J., Zou, C., Hassan, S. S., Hsu, C. D., Olson, D., Metz, G. A. S., & Gomez-Lopez, N. (2020). Prenatal maternal stress causes preterm birth and affects neonatal adaptive immunity in mice. *Frontiers in Immunology*, 11(February), 1-14. <https://doi.org/10.3389/fimmu.2020.00254>
- Halim, M. I., & Nurlianto, Y. (2025). Kehamilan tidak direncanakan dan stres psikologis: Pemicu persalinan kurang bulan - Laporan kasus. *Action Research Literate*, 9(2), 513-521. <https://doi.org/10.46799/arl.v9i2.2815>
- Hasda, & Kurniawan, F. (2024). Stress ibu selama kehamilan merupakan risiko persalinan prematur RSUD Kabupaten Konawe Kepulauan, Sulawesi Tenggara, Indonesia. *STIKes Pelita Ibu, Sulawesi Tenggara, Indonesia*, 9(1), 109-117. <https://doi.org/10.30829/jumantik.v9i1>
- Jesica, F., & Anggraini, S. S. (2020). Pengaruh stres kronik selama kehamilan terhadap kejadian persalinan preterm. *Jurnal Syedza Saintika*, 459-474.
- Kaddoura, R., Zankar, R., Tamim, H., El Bejjani, M., Mahfoud, Z. R., Salameh, P., & Charafeddine, L. (2025). Stress and quality of life postpreterm birth during polycrises: Prospective cohort study. *AJOG Global Reports*, 5(3), 100557. <https://doi.org/10.1016/j.xagr.2025.100557>
- Marwah, D. S., Zata, K. N., Naufal, M., Fadhillah, M. I., & Fithri, N. K. (2020). Literature review: Analisis faktor yang berhubungan dengan tingkat stres ibu hamil dan implikasinya pada kesehatan janin. *Literature Review*, 27(8), 22-39.
- Schweiger, G. (2025). Stress during pregnancy. A medical ethics research note for more comprehensive healthcare. *Ethics, Medicine and Public Health*, 33, 101105. <https://doi.org/10.1016/j.jemep.2025.101105>
- Tanpradit, K., & Kaewkiattikun, K. (2020). The effect of perceived stress during pregnancy on preterm birth. *International Journal of Women's Health*, 12, 287-293. <https://doi.org/10.2147/IJWH.S239138>
- Ukhawounam, U., Limruangrong, P., Pungbangkadee, R., & Vongsirimas, N. (2023). Effects of education and guided imagery program on stress level and coping behaviors among pregnant women at risk of preterm birth. *International Journal of Women's Health*, 15(September), 1581-1591. <https://doi.org/10.2147/IJWH.S418693>