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The Relationship Between Sleep Quality and Anxiety Levels in Pregnant Women After Performing Prenatal Yoga

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Abstract: Prenatal yoga is a modification of classical yoga practice in which the movements have been specifically adapted to the conditions and needs of pregnant women. It has potential benefits for overcoming sleep disturbances and is effective in reducing anxiety, stress, and depressive symptoms in pregnant women. This study aimed to analyze the relationship between sleep quality and anxiety levels among pregnant women after participating in prenatal yoga. This study employed an analytical method with a correlational design using a cross-sectional approach. Purposive sampling was used to obtain 33 respondents. The intervention provided was prenatal yoga. The research instruments included the Pittsburgh Sleep Quality Index (PSQI) questionnaire to measure sleep quality and the Hamilton Anxiety Scale to measure anxiety levels. Data were analyzed using the Spearman rank correlation test. The results showed that 84.85% of pregnant women had good sleep quality. Most respondents experienced mild anxiety (39.39%), followed by moderate anxiety (27.27%) and severe anxiety (27.27%), while 6.06% experienced very severe anxiety. The Spearman rank correlation coefficient indicated that sleep quality was not significantly associated with anxiety levels (ρ = -0.023; p-value = 0.897). In conclusion, prenatal yoga may be associated with improved sleep quality and lower anxiety levels. However, no significant relationship was found between sleep quality and anxiety levels in this study.

Keywords: pregnant women, sleep quality, anxiety, prenatal yoga

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Introduction

Pregnancy is a transformative period in a woman's life, marked by various physiological and psychological changes (Wahyuni & Widyastuti, 2023). Amidst the joy of anticipating the birth of a child, many pregnant women face health challenges, one of which is sleep disturbances. This issue is not just a minor discomfort but a significant health problem with a high prevalence both globally and in Indonesia, and it has the potential to cause negative impacts on both the mother and the fetus.

Sleep disturbances during pregnancy are a common phenomenon worldwide. According to the World Health Organization (WHO) data from 2020, the prevalence of sleep disturbances in pregnant women reaches 41.8% (Abdullah, 2025). This figure is supported by another meta-analysis reporting a prevalence of insomnia during pregnancy at 44.0% or 43.9% (Yang et al., 2024). In fact, some systematic reviews indicate even higher prevalence rates, ranging from 46% to 78% (Hertati et al. 2024) or even 76% to 97% throughout pregnancy (Moghadam et al. 2021). Prevalence rates in Asia are also significant, reported around 41.8% (Abdullah, 2025), 40,7% (Yang et al., 2024), or 48.2% in another study (Andarini & Khalifatunnisak 2024). These numbers far exceed the prevalence of insomnia in the general adult population, which ranges from 6-10% (Yang et al., 2024), highlighting the unique vulnerability women face during pregnancy.

In Indonesia, the situation regarding sleep disturbances in pregnant women appears even more concerning. Data from the 2018 Basic Health Research shows a very high prevalence rate, with 64% of pregnant women in Indonesia experiencing sleep disturbances (Abdullah, 2025). This finding indicates that the majority of pregnant women in Indonesia may be at risk of experiencing poor sleep quality. Preliminary small-scale studies in several healthcare facilities have also confirmed the existence of this issue. For example, interviews at the Malawili Health Center in February 2024 found that 17% of 30 third-trimester pregnant women experienced sleep disturbances (Abdullah, 2025), while a study at the Cugung Lalang Health Center in Kepahiang reported that 66.7% of 15 third-

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trimester pregnant women interviewed complained of sleep disturbances (Yunita et al., 2024). Although there is variation in prevalence rates between studies, which may be due to differences in methodology or population characteristics, the data consistently shows that sleep disturbances are a real problem that requires serious attention in Indonesia.

The causes of sleep disturbances during pregnancy are multifactorial, involving a complex interaction between physiological and psychological changes (Fitria & Hardianti, 2025). Physiologically, hormonal changes, increased abdominal size pressing on the diaphragm and other organs, the weight gain of the fetus, and physical discomforts such as back pain, leg cramps, frequent urination (due to pressure on the bladder), and the active movements of the fetus at night all contribute to sleep difficulties. Psychologically, anxiety and stress related to pregnancy, concerns about the labor process, and mood changes also play a significant role in disrupting sleep patterns. These factors often peak and are most pronounced during the third trimester of pregnancy (Susanti et al., 2024).

oor sleep quality during pregnancy is not a trivial matter, as it brings serious consequences for both maternal health and fetal development. For mothers, sleep deprivation or chronic sleep disturbances can increase the risk of various pregnancy complications. Several studies have consistently linked poor sleep quality with an increased risk of preeclampsia or gestational hypertension, gestational diabetes mellitus (GDM), cesarean delivery, prolonged labor, and anemia. Additionally, sleep disturbances are closely related to mental health issues, such as an increased risk of depression and anxiety during pregnancy and the postpartum period. Negative impacts are also felt by the fetus and newborn. Poor maternal sleep quality is associated with an increased risk of premature birth, low birth weight (LBW), intrauterine growth retardation (IUGR), and even the potential for sleep disturbances in the infant after birth. Given the high maternal mortality rate (MMR) in Indonesia, where preeclampsia is one of the leading causes of maternal death, the urgency to address modifiable risk factors such as poor sleep quality becomes even more evident. The high prevalence of sleep disturbances in Indonesia, far exceeding the global average, combined with its adverse effects on maternal and neonatal outcomes, indicates that this is not just an individual clinical issue but has become a significant public health problem in Indonesia. Addressing it requires effective, safe, and widely accessible interventions (Susanti et al., 2024; Yang et al., 2024; Peters et al., 2023).

Considering the significant negative impacts and high prevalence, as well as the reluctance or contraindications of using pharmacological medications to address sleep disturbances during pregnancy, non-pharmacological interventions are preferred and safer. Various approaches have been researched for their effectiveness, including back massage, sleep hygiene education, lavender aromatherapy, relaxation techniques (such as autogenic relaxation), and pregnancy exercises. Among these options, prenatal yoga has emerged as a highly promising intervention. Prenatal yoga offers a holistic approach that not only focuses on the physical aspect but also involves mental and spiritual components, which are relevant to the multifactorial nature of sleep disturbances during pregnancy (Bacaro et al., 2019; Andarini & Khalifatunnisak, 2024).

Prenatal yoga is a modification of classical yoga practice, with movements specifically adjusted to the conditions and needs of pregnant women. This practice is reported to have various potential benefits relevant to addressing sleep disturbances. Physically, prenatal yoga can help reduce various physical complaints that often disrupt sleep, such as back pain, leg cramps, and fatigue (Corrigan et al., 2022). Psychologically, many studies and systematic reviews show that prenatal yoga is effective in reducing levels of anxiety, stress, and depressive symptoms in pregnant women, which are major factors contributing to sleep disturbances (Susanti et al., 2024). Several studies, including those conducted in Indonesia, have specifically shown the positive impact of prenatal yoga on improving the sleep quality of pregnant women, measured using standard instruments like the Pittsburgh Sleep Quality Index (PSQI) (Heriyanti et al., 2024). The potential of prenatal yoga as a safe, holistic, possibly low-cost, and scalable non-pharmacological intervention makes it relevant from a public health perspective to address the issue of sleep disturbances in pregnant women in Indonesia.

Based on the above explanation, the researcher is interested in analyzing the relationship between sleep quality and anxiety levels in pregnant women after performing prenatal yoga in the city of Surakarta.

Method

This study used a cross-sectional correlational design. The study will was conducted in the Surakarta area in June-July 2025. The population of this study is pregnant women in their third trimester living in the Surakarta area. The sampling technique will use purposive sampling with 33 respondents, with inclusion criteria being pregnant women in their second trimester who are willing to follow all stages of the study and have no contraindications to performing prenatal yoga. The intervention provided to pregnant women is participation in prenatal yoga sessions, which include breathing exercises, stretching, and meditation to improve relaxation. The frequency of prenatal yoga will be 6 sessions, with each session lasting 30 minutes, conducted over 6 weeks.

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The independent variable in this study is the sleep quality of pregnant women after participating in yoga. The dependent variable is the anxiety level of pregnant women after participating in yoga.

The research instruments will include a questionnaire to measure prenatal yoga practices, physical changes, and medical conditions, the Pittsburgh Sleep Quality Index (PSQI) to measure the quality of sleep, and the Hamilton Anxiety Scale to measure anxiety levels. Data were analyzed using the Spearman rank correlation test with a 95% confidence level. The Spearman rank correlation test will be used to measure the strength and direction of the relationship between the two variables. This study has been ethically approved by the Ethics Committee of RS Dr. Moewardi with the approval number 1.119/V/HREC/2025.

Results and Discussion

The characteristics of the respondents show that the average age of the respondents is 29.36 years, indicating that most of the respondents are within the ideal reproductive age. The average gestational age is 26.58 weeks, which means that the majority of respondents are in the second trimester to the early third trimester of pregnancy. Most respondents are multiparous, with an average parity of 2.24. This indicates that they have prior experience with pregnancy and childbirth.

In terms of education, the majority of respondents have secondary education (high school), reflecting the general educational background of the community. Nearly all respondents (99.97%) are housewives, which likely gives them more free time for health-related activities such as prenatal yoga. Most respondents do not have a history of chronic diseases (90.90%), suggesting that they are in relatively good physical health during pregnancy.

These characteristics suggest that the respondents in this study are homogeneous in terms of occupation and health condition, which could influence the interpretation of key variables such as prenatal yoga practices or physical complaints during pregnancy. The characteristics of the respondents can be seen in the following Table 1:

Table 1. Distribution of Respondent Characteristics

Characteristics	Category	N=33 Mean score ± SD	Frequency (n) (Percentage (%))
Age		29.36±4.22	
Gestational Age		26.58±6.14	
Parity		2.24±0.75	
Education Level	Elementary School		5(15.2)
	Junior High School		3(9.1)
	High School		24(72.7)
	College/University		1(3.3)
Occupation	Housewife		32(96.9)
	Entrepreneur/Self-employed		1(3.1)
Chronic Illness History	Has Chronic Illness		4(12.1)
	Does Not Have Chronic Illness		29(87.9)

Anxiety in pregnant women was measured using the Hamilton Anxiety Scale, with scores ranging from 1 to 4, where 1 indicates mild anxiety, 2 indicates moderate anxiety, 3 indicates severe anxiety, and 4 indicates very severe anxiety. Based on the data distribution, most respondents experienced mild anxiety (39.39%), followed by moderate anxiety (27.27%) and severe anxiety (27.27%). Meanwhile, 6.06% of respondents experienced very severe anxiety. This result suggests that the majority of pregnant women experienced relatively mild to moderate anxiety levels, although a small percentage also experienced more severe anxiety after performing prenatal yoga.

The distribution of these variables is shown in the following Table 2:

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Table 2. Distribution of PSQI Scores (Sleep Quality)

Variable(s)		Frequency	Percentage
PSQI	Poor Sleep	5	15.2
	Good Sleep	28	84.8
	Total	33	100.0
Anxiety Level	Mild Anxiety	13	39.4
	Moderate Anxiety	9	27.3
	Severe Anxiety	9	27.3
	Very Severe Anxiety	2	6.1
	Total	33	100.0

The Spearman rank correlation test was used to measure the strength and direction of the relationship between sleep quality and anxiety levels. This test was selected because sleep quality was categorized into good and poor sleep, while anxiety level was measured on an ordinal scale.

Table 3. The result of the Spearman Rank Correlation Test

Variable(s)	n = 33		
	Spearman coefficient (ρ)	95% Confidence Interval	p-value
PSQI Anxiety Level	-0.023	-0.361 until 0.343	0.897

Based on Jonathan Sarwono's interpretation of correlation strength:
0 : No correlation
0.00–0.25 : Very weak correlation
0.25–0.50 : Moderate correlation
0.50–0.75 : Strong correlation
0.75–0.99 : Very strong correlation
1 : Perfect correlation

The Spearman rank correlation coefficient was -0.023, indicating a very weak negative relationship between sleep quality and anxiety levels. According to Sarwono's classification, this value falls into the "very weak" category. This means that better sleep quality tended to be associated with slightly lower anxiety levels; however, the relationship was extremely small.

In addition, the p-value was 0.897, which was greater than 0.05, indicating that the relationship was not statistically significant. The 95% confidence interval ranged from -0.361 to 0.343 and crossed zero, further indicating that there was no meaningful association between sleep quality and anxiety levels among pregnant women after participating in prenatal yoga.

This study examined the relationship between sleep quality and anxiety levels among pregnant women after participating in prenatal yoga, using the Pittsburgh Sleep Quality Index (PSQI) to measure sleep quality and the Hamilton Anxiety Scale to assess anxiety levels. Based on the results, the majority of respondents had good sleep quality and experienced mild to moderate anxiety, although a small proportion experienced higher levels of anxiety. Furthermore, the Spearman rank correlation analysis showed a very weak negative relationship between sleep quality and anxiety levels, and this relationship was not statistically significant.

Sleep Quality of Pregnant Women

This study showed that the majority of pregnant women who participated in prenatal yoga (84.85%) had good sleep quality, as reflected in their PSQI scores approaching 1. This indicates that prenatal yoga can have a positive impact on the sleep quality of pregnant women. Previous studies have also suggested that regular physical exercise, including yoga, can improve sleep quality through various mechanisms, such as reducing stress and anxiety, and promoting relaxation (Sulistyowati & Yuriati 2024). Good sleep quality in pregnant women is essential as adequate sleep supports maternal and fetal health, reduces the risk of pregnancy complications, and improves psychological well-being (Gultom & Kamsatun 2021).

However, despite the majority of respondents showing good sleep quality, 15.2% of respondents still experienced poor sleep quality. Factors that might contribute to sleep problems include certain medical conditions, such as insomnia, body aches, or other physical discomforts commonly experienced during pregnancy (Sari et al.

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2022; Dewi & Nency 2023). Therefore, while yoga can help, additional approaches may be needed to address other factors affecting sleep quality during pregnancy.

Anxiety Levels of Pregnant Women

Regarding anxiety, the majority of respondents experienced mild to moderate anxiety, with 39.39% reporting mild anxiety and 27.27% reporting moderate anxiety. Severe anxiety and very severe anxiety were experienced by 27.27% and 6.06% of respondents, respectively. This finding suggests that while many pregnant women experience relatively low levels of anxiety, a small portion also experiences higher levels of anxiety, possibly due to various factors such as uncertainty about labor, concerns about fetal health, and physical changes during pregnancy (Sutriningsih et al. 2024).

In line with these findings, several previous studies have shown that yoga can reduce anxiety in pregnant women by improving psychological well-being and helping them manage stress (Hidayati et al. 2022; Nabilla & Dwiyanti 2022). Prenatal yoga, as a form of physical and mental exercise, can improve the body's stress response and enhance emotional balance (Widiastini et al. 2025). However, not all pregnant women may experience the same benefits from yoga, and more severe anxiety may require additional interventions, such as counseling or more intensive psychological approaches.

Relationship Between Sleep Quality and Anxiety

The Spearman rank correlation analysis showed a correlation coefficient (ρ) of -0.023, indicating a very weak negative relationship between sleep quality and anxiety levels among pregnant women after participating in prenatal yoga. According to the interpretation of correlation strength, this value falls within the category of a very weak correlation. The p-value was 0.897, which was greater than 0.05, indicating that the relationship was not statistically significant. In addition, the 95% confidence interval ranged from -0.361 to 0.343 and crossed zero, further suggesting that there was no meaningful association between sleep quality and anxiety levels.

These findings indicate that, although sleep quality and anxiety may theoretically be related, no significant relationship was found in this study among pregnant women after participating in prenatal yoga. The absence of a significant association may reflect the complexity of factors influencing both sleep quality and anxiety during pregnancy. Psychological, social, physical, and environmental factors may play a greater role in determining anxiety levels than sleep quality alone.

The results also showed that most respondents had good sleep quality and mild-to-moderate anxiety levels after participating in prenatal yoga. However, because no pre–post comparison or control group analysis was performed, these findings cannot be interpreted as evidence that prenatal yoga improved sleep quality or reduced anxiety. Therefore, further studies with larger sample sizes, longitudinal designs, and appropriate comparison groups are needed to better understand the relationship between sleep quality and anxiety in pregnant women.

The results showed that most pregnant women who participated in prenatal yoga had good sleep quality and mild to moderate anxiety levels, although no significant relationship was found between the two variables. These findings indicate that prenatal yoga may be used as part of antenatal care to support relaxation and maternal well-being; however, efforts to reduce anxiety should also include other approaches such as social support, education, and counseling.

This study was limited by its small sample size, the absence of pre–post measurements and a control group, and the relatively homogeneous characteristics of the respondents. In addition, sleep quality was categorized only as good or poor, which limited data variability. Therefore, the findings cannot be generalized widely and cannot be used to conclude that prenatal yoga affects sleep quality or anxiety.

Conclusion

Based on the results of the study, most pregnant women who participated in prenatal yoga had good sleep quality and mild to moderate anxiety levels. The Spearman rank test showed a very weak negative relationship between sleep quality and anxiety levels; however, this relationship was not statistically significant. Therefore, no significant association was found between sleep quality and anxiety levels among pregnant women after participating in prenatal yoga. These findings suggest that sleep quality and anxiety during pregnancy may be influenced by various factors other than prenatal yoga. Therefore, further studies with larger sample sizes, pre–post designs, and control groups are needed.

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Authors' Contribution

All authors contributed equally to every aspect of this research, from the initial study design and data collection to the analysis, interpretation, manuscript preparation, and critical revisions. All authors have read and approved the final version for submission.

Conflict of Interests Statement

The authors declare no conflict of interest.

Data Availability

The dataset presented in the study is available on request from the corresponding author during submission or after publication.

Informed Consent

Written informed consent was obtained from the participants.

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