INSIGHTS-JOURNAL OF
LIFE AND SOCIAL SCIENCES

INSIGHTS-JLSS
Insights-Journal of Life and Social Sciences

PREVALENCE OF ANXIETY AND SLEEP DISTURBANCES DURING THE THIRD TRIMESTER OF PREGNANCY

Original Article

Safia Ashfaq[1], Tahira Khalid[2], Ayesha Waheed Pirzada[3], Saman Shahzad[4], Ayaz Khan[5], Amna Emaan[6]*

[1]Assistant Professor, Riphah International University, Islamabad, Pakistan.
[2]Specialist Gynecologist & Obstetrician, Al-Madina Hospital & Maternity Home, Renala Khurd, Pakistan.
[3]Medical Officer, DUHS/Dow University Hospital, Karachi, Pakistan.
[4]Medical Officer, Almustafa Trust Hospital, Lahore, Pakistan.
[5]Lecturer, Baqai Institute of Medical Technology, Baqai Medical University, Pakistan.
[6]Graduate, International Islamic University, Islamabad, Pakistan.

Corresponding Author: Amna Emaan, Graduate, International Islamic University, Islamabad, Pakistan, amnaemaan.psy@gmail.com

Conflict of Interest: None

Grant Support & Financial Support: None

Acknowledgment: The authors thank all participants for their time and cooperation.

ABSTRACT

Background: The third trimester of pregnancy is associated with increased physiological and emotional stress, which often manifests as heightened anxiety and sleep disturbances. These conditions can adversely affect maternal health and fetal outcomes if left unaddressed.

Objective: To assess the prevalence and severity of anxiety and sleep disturbances among women in their third trimester of pregnancy and explore associated sociodemographic and obstetric factors.

Methods: A cross-sectional study was conducted over eight months at tertiary care hospitals and maternity clinics in Lahore, Pakistan. A total of 355 pregnant women in their third trimester were recruited through consecutive sampling. Data were collected using a structured questionnaire that included the Generalized Anxiety Disorder-7 (GAD-7) scale and the Pittsburgh Sleep Quality Index (PSQI). Descriptive statistics, t-tests, ANOVA, Pearson correlation, and multivariable linear regression were applied using SPSS version 26.

Results: Moderate to severe anxiety was observed in 44.8% of participants, while 72.7% reported poor sleep quality. Significant associations were found between higher anxiety scores and unemployment ($p = 0.003$), lower education levels ($p = 0.021$), and primigravida status ($p = 0.047$). Poor sleep quality also correlated positively with anxiety levels ($r = 0.41$, $p < 0.001$). Multivariable analysis confirmed employment status, education level, and parity as independent predictors of anxiety severity.

Conclusion: Anxiety and sleep disturbances are highly prevalent in the third trimester of pregnancy and are influenced by key sociodemographic and obstetric factors. Early identification and targeted interventions are essential for improving maternal mental health and ensuring better pregnancy outcomes.

Keywords: Anxiety, Cross-Sectional Studies, Pregnancy Trimester, Third; Prevalence; Pregnancy Complications; Risk Factors; Sleep Wake Disorders; Sleep Quality; Sociodemographic Factors.

INTRODUCTION

Pregnancy is a transformative period marked by profound physiological, psychological, and emotional changes. While it is often regarded as a time of anticipation and joy, it can also bring substantial psychological burdens. The third trimester, in particular, presents unique challenges due to increasing physical discomfort, approaching labor, and concerns about childbirth and parenthood (1). Amid these challenges, anxiety and sleep disturbances are frequently reported, yet their prevalence and clinical implications are often under-recognized in routine obstetric care (2). These conditions not only affect maternal well-being but also have the potential to influence obstetric outcomes and neonatal health, underscoring the need for focused research in this area. Anxiety during pregnancy, especially in the later stages, is a common mental health concern (3). Various studies have documented a high occurrence of anxiety symptoms among expectant mothers, with prevalence estimates ranging widely due to differing diagnostic criteria, cultural contexts, and assessment tools. Factors such as fear of labor, perceived lack of support, prior obstetric complications, and socioeconomic stressors are known contributors to antenatal anxiety (4,5). Moreover, anxiety during pregnancy has been associated with increased risks of preterm birth, low birth weight, and developmental issues in the offspring, making it a significant public health issue that extends beyond maternal mental health alone (6). Closely intertwined with anxiety is the issue of sleep disturbances, which are prevalent during pregnancy and often intensify during the third trimester. Sleep architecture undergoes noticeable changes as pregnancy progresses, influenced by hormonal shifts, physical discomfort, frequent urination, and fetal movements (7). While sleep difficulties are sometimes dismissed as a normal part of pregnancy, growing evidence suggests that poor sleep quality in late pregnancy is not only distressing but may also have clinical consequences. Sleep disturbances have been linked with elevated risks of gestational hypertension, gestational diabetes, and longer labor duration, as well as with increased maternal irritability and depressive symptoms (8).

Despite the known associations between anxiety and sleep disturbances in pregnancy, research examining both conditions concurrently in the third trimester remains limited. Most existing studies either focus on one domain or assess broader timelines without isolating the specific vulnerabilities of the third trimester. This gap in the literature is particularly important, as the final weeks of pregnancy are often the most challenging and are marked by the culmination of physical and emotional strain (9,10). Understanding the prevalence and severity of both anxiety and sleep disturbances in this specific period could provide critical insights for early detection, preventive strategies, and targeted interventions (11). Furthermore, little is known about how sociodemographic and obstetric factors intersect with these mental health issues during late pregnancy. Variables such as maternal age, education level, employment status, parity, and history of pregnancy complications may influence psychological well-being and sleep quality, yet are inconsistently explored across different populations (12). Identifying these associations could aid in recognizing at-risk subgroups and tailoring antenatal care practices to better support them. Given the widespread impact of maternal mental health on both mother and child, the need for comprehensive, context-specific research is imperative. This is particularly vital in settings where mental health remains stigmatized and under-addressed in perinatal care. A nuanced understanding of how anxiety and sleep disturbances manifest in the third trimester could facilitate more empathetic, holistic, and informed clinical practices, ultimately improving maternal and neonatal outcomes. The present study aims to assess the prevalence and severity of anxiety and sleep disturbances among women in their third trimester of pregnancy and to explore their association with sociodemographic and obstetric characteristics. By doing so, it seeks to fill a critical gap in maternal mental health research and contribute to more responsive and effective antenatal care strategies.

METHODS

This cross-sectional study was conducted over a period of eight months in selected tertiary care hospitals and maternity clinics within the Lahore region of Pakistan. The primary aim was to assess the prevalence and severity of anxiety and sleep disturbances among women in their third trimester of pregnancy and to explore their association with sociodemographic and obstetric factors. A structured methodology was employed to ensure the reliability and validity of findings, with careful consideration given to participant selection, data collection tools, and statistical analysis. Participants were recruited using a non-probability consecutive sampling technique. Women attending antenatal outpatient departments for routine third-trimester check-ups were approached. The inclusion criteria were: women aged 18 to 40 years, currently in the third trimester of a singleton pregnancy (defined as 28 weeks of gestation onward), and willing to provide informed consent. Exclusion criteria included women with known psychiatric disorders diagnosed before pregnancy, those taking anxiolytic or antidepressant medications, high-risk pregnancies requiring hospitalization, and women with diagnosed sleep disorders unrelated to pregnancy. These criteria ensured a homogenous sample, focusing specifically on pregnancy-related anxiety and sleep disturbances. Based on a presumed prevalence rate of anxiety during late pregnancy of approximately 30% reported in regional

literature, with a 95% confidence interval and a 5% margin of error, the minimum sample size was calculated to be 323. Allowing for a 10% non-response or incomplete data rate, the final targeted sample size was adjusted to 355 participants (2). This sample size was deemed adequate to detect statistically significant relationships between the psychological outcomes and the associated demographic and obstetric variables. Data collection was carried out using a self-administered questionnaire format, with assistance provided by trained female research assistants for participants with literacy challenges. The questionnaire was divided into three parts. The first section gathered sociodemographic data, including age, marital status, education level, employment status, household income, and residential setting. The second section included obstetric information such as gravidity, parity, gestational age, mode of previous deliveries (if applicable), and history of pregnancy complications.

For the assessment of anxiety, the Generalized Anxiety Disorder-7 (GAD-7) scale was utilized. The GAD-7 is a validated screening tool that assesses the severity of generalized anxiety symptoms over the preceding two weeks. Scores range from 0 to 21, with cut-offs of 5, 10, and 15 representing mild, moderate, and severe anxiety respectively. To assess sleep disturbances, the Pittsburgh Sleep Quality Index (PSQI) was employed. The PSQI is a well-established tool for evaluating sleep quality over a one-month period, encompassing seven domains including sleep latency, duration, and disturbances (13-15). A global PSQI score greater than 5 indicates poor sleep quality. Both tools were translated into Urdu using a forward and backward translation method to maintain linguistic and cultural relevance and were pretested on a small sample to ensure clarity and comprehension. Ethical approval for the study was obtained from the Institutional Review Board (IRB) of the relevant institute. Written informed consent was obtained from all participants prior to their enrollment, and confidentiality was maintained throughout the study. Participation was voluntary, and participants were informed of their right to withdraw at any stage without any impact on their medical care. Data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 26. Descriptive statistics such as means, standard deviations, frequencies, and percentages were used to summarize demographic, obstetric, and outcome variables. The normality of the data was confirmed using the Shapiro-Wilk test. Inferential statistics included independent samples t-tests and one-way ANOVA to assess mean differences in GAD-7 and PSQI scores across categorical variables. Pearson's correlation coefficient was used to examine the relationship between continuous variables such as age and anxiety or sleep scores. Additionally, multivariable linear regression analyses were performed to identify independent predictors of anxiety and sleep disturbance scores, adjusting for potential confounders. A p-value of less than 0.05 was considered statistically significant.

RESULTS

The study enrolled a total of 355 pregnant women in their third trimester. The mean age of participants was 28.6 years (SD ± 4.3), with an average gestational age of 33.1 weeks (SD ± 2.1). Approximately 43.4% were primigravida, while 56.6% were multiparous. A majority resided in urban areas (64.5%), and 60.3% had attained tertiary education. Regarding employment status, 37.2% were employed, while 62.8% were not engaged in formal employment. Assessment of anxiety using the GAD-7 scale revealed that 20.6% of participants experienced minimal symptoms, 34.6% reported mild anxiety, 27.6% had moderate anxiety, and 17.2% demonstrated severe anxiety levels. The mean GAD-7 score was 8.9 (SD ± 4.6). These results indicate that over 79% of participants exhibited some degree of anxiety, with nearly 45% falling in the moderate to severe category. Sleep disturbances, assessed via the PSQI, showed that 72.7% of participants scored above 5, indicating poor sleep quality. Only 27.3% reported good sleep during the third trimester. The mean global PSQI score was 8.3 (SD ± 2.9), suggesting significant sleep disruption in the majority of respondents. Statistical analysis revealed several significant associations between sociodemographic variables and the presence of anxiety. Employment status showed a statistically significant correlation with anxiety scores ($p = 0.003$), indicating that unemployed participants had higher levels of anxiety. Similarly, lower educational attainment was associated with increased anxiety severity ($p = 0.021$). Parity also demonstrated a significant relationship ($p = 0.047$), with primigravida women reporting higher anxiety levels than multiparous women. Residence, however, did not show a statistically significant association ($p = 0.178$). Further analysis using multivariate linear regression confirmed that employment status, education level, and parity were independent predictors of anxiety severity. Sleep quality was also found to be significantly correlated with anxiety levels ($r = 0.41$, $p < 0.001$), suggesting a strong association between poor sleep and elevated anxiety. These findings highlight a high prevalence of both anxiety and sleep disturbances among women in the third trimester and underscore the importance of screening for mental health and sleep quality during routine antenatal visits.

Table 1: Participant Demographics (N = 355)

Variable	Value
Age (mean ± SD)	28.6 ± 4.3
Gestational Age (weeks)	33.1 ± 2.1
Primigravida	154 (43.4%)
Multiparous	201 (56.6%)
Residence	
Urban	229 (64.5%)
Rural	126 (35.5%)
Education Status	
Secondary or below	141 (39.7%)
Tertiary	214 (60.3%)
Occupation Status	
Employed	132 (37.2%)
Unemployed	223 (62.8%)

Table 2: Distribution of Anxiety Severity (GAD-7)

Severity	Frequency	Percentage
Minimal (0–4)	73	20.6%
Mild (5–9)	123	34.6%
Moderate (10–14)	98	27.6%
Severe (15–21)	61	17.2%

Table 3: Sleep Quality Based on PSQI Scores

PSQI Score Range	Frequency	Percentage
≤5 (Good Sleep)	97	27.3%
>5 (Poor Sleep)	258	72.7%

Table 4: Association Between Sociodemographic Factors and Anxiety (GAD-7 scores)

Variable	p-value	Significant
Employment Status	0.003	Yes
Education Level	0.021	Yes
Residence	0.178	No
Parity	0.047	Yes

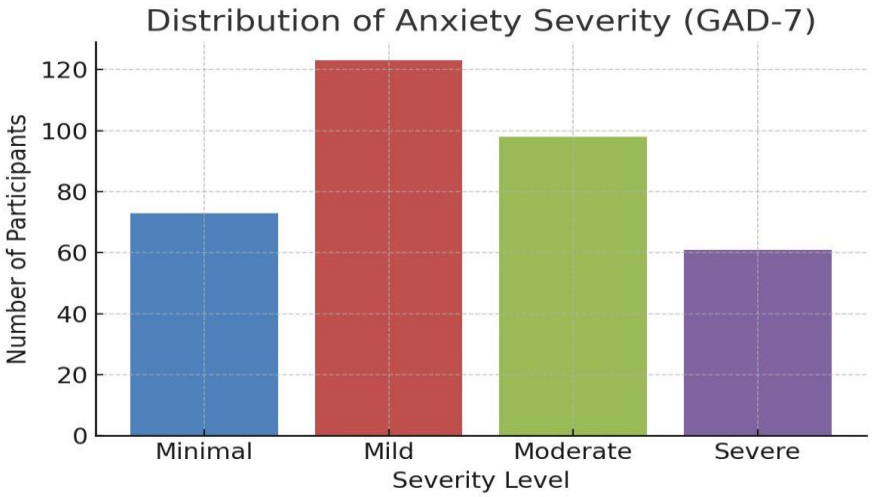

Figure 1 Distribution of Anxiety Severity (GAD-7)

Figure 2 Sleep Quality Distribution (PSQI1)

DISCUSSION

The present study found a high prevalence of anxiety and poor sleep quality among women in their third trimester of pregnancy, with 44.8% experiencing moderate to severe anxiety and 72.7% reporting poor sleep as measured by standardized instruments. These findings are consistent with prior research highlighting the psychological vulnerability of pregnant women in late gestation and reinforce the significance of routine screening for anxiety and sleep disturbances during antenatal care. Multiple studies from diverse populations have reported similar outcomes. For instance, a study reported that 75.2% of third-trimester women experienced poor sleep quality, with a notable co-occurrence of moderate to severe anxiety in approximately 19% of participants (15). Comparable prevalence rates were echoed in a study which, identified a significant relationship between anxiety and sleep quality in primigravida women during the third trimester (16). Another cohort study, reported that 51.9% of pregnant women in late gestation experienced sleep disturbances, and anxiety levels were significantly associated with sleep quality (17). A notable strength of this study lies in its use of validated tools—GAD-7 and PSQI—which enhance the reliability and comparability of findings across different populations. The relatively large sample

size and inclusion of diverse sociodemographic variables allowed for more nuanced analysis of risk factors, revealing that unemployment, lower educational attainment, and primigravida status were significantly associated with higher anxiety levels. These findings are in agreement with recent data from an Italian cohort study, which identified financial strain and limited social support as key contributors to antenatal anxiety and comorbid symptoms (18).

However, several limitations must be acknowledged. The cross-sectional design restricts causal interpretations, making it impossible to determine whether anxiety led to sleep disturbances or vice versa. Moreover, self-reported measures, while validated, are subject to recall and reporting biases, particularly in cultures where mental health stigma may inhibit full disclosure. Another limitation is the lack of biological or behavioral data (e.g., cortisol levels, actigraphy) that could offer a more objective insight into sleep patterns and stress physiology, as explored in other studies (19-21). Interestingly, the relationship between anxiety and sleep quality appears to be bidirectional and synergistic. A meta-analysis, confirmed that insomnia symptoms peak in the third trimester and correlate closely with anxiety levels, suggesting a cyclical interplay that exacerbates both conditions (22). These findings align with those of a study which demonstrated partial improvement in sleep quality through psychoeducational interventions, though anxiety levels remained relatively unaffected (23). From a clinical perspective, these results underscore the importance of integrating psychological assessments into routine prenatal visits, especially during the third trimester. Interventions such as psychoeducation, stress management training, and complementary approaches like prenatal yoga or cognitive-behavioral therapy have shown promise in improving maternal well-being (24). Future research should prioritize longitudinal designs to clarify causality and track symptom progression from early pregnancy into the postpartum period. Additionally, exploring culturally adapted interventions and identifying barriers to mental health care utilization in low-resource settings such as Pakistan would be essential steps toward reducing the burden of perinatal mental health issues.

CONCLUSION

This study revealed a high prevalence of anxiety and poor sleep quality among third-trimester pregnant women, with significant associations to sociodemographic and obstetric factors. These findings underscore the importance of integrating routine mental health and sleep assessments into antenatal care. Targeted interventions addressing anxiety and sleep disturbances may enhance maternal well-being and improve pregnancy outcomes, especially in resource-constrained settings.

AUTHOR CONTRIBUTION

Author	Contribution
Safia Ashfaq	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Tahira Khalid	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Ayesha Waheed Pirzada	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Saman Shahzad	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Ayaz Khan	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Amna Emaan*	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

REFERENCES

1. Reschini M, Buoli M, Facchin F, Limena A, Dallagiovanna C, Bollati V, et al. Women's quality of sleep and in vitro fertilization success. Sci Rep. 2022;12(1):17477.
2. Yuan K, Zheng YB, Wang YJ, Sun YK, Gong YM, Huang YT, et al. A systematic review and meta-analysis on prevalence of and risk factors associated with depression, anxiety and insomnia in infectious diseases, including COVID-19: a call to action. Mol Psychiatry. 2022;27(8):3214-22.
3. Ng CM, Kaur S, Kok EY, Chew WL, Takahashi M, Shibata S. Sleep, light exposure at night, and psychological wellbeing during pregnancy. BMC Public Health. 2023;23(1):1803.
4. Cunningham JEA, Qureshi AR, Green SM, Frey BN, Slyepchenko A. Sleep, biological rhythms and anxiety in the perinatal period: a systematic review protocol. BMJ Open. 2021;11(8):e046767.
5. King CE, Wilkerson A, Newman R, Wagner CL, Guille C. Sleep, Anxiety, and Vitamin D Status and Risk for Peripartum Depression. Reprod Sci. 2022;29(6):1851-8.
6. Aukia L, Paavonen EJ, Karlsson L, Pelto J, Perasto L, Karlsson H, et al. Sleep duration and sleep loss during pregnancy: a longitudinal FinnBrain birth cohort study. Arch Gynecol Obstet. 2024;310(5):2541-52.
7. Peltonen H, Paavonen EJ, Saarenpää-Heikkilä O, Vahlberg T, Paunio T, Polo-Kantola P. Sleep disturbances and depressive and anxiety symptoms during pregnancy: associations with delivery and newborn health. Arch Gynecol Obstet. 2023;307(3):715-28.
8. Loret de Mola C, Carpena MX, Dias IM, Meucci R, Goicochea-Romero A, Cesar J. Sleep and its association with depressive and anxiety symptoms during the last weeks of pregnancy: A population-based study. Sleep Health. 2023;9(4):482-8.
9. Gueron-Sela N, Shahar G, Volkovich E, Tikotzky L. Prenatal maternal sleep and trajectories of postpartum depression and anxiety symptoms. J Sleep Res. 2021;30(4):e13258.
10. Okun ML, Lac A. Postpartum Insomnia and Poor Sleep Quality Are Longitudinally Predictive of Postpartum Mood Symptoms. Psychosom Med. 2023;85(8):736-43.
11. Rubio E, Levey EJ, Rondon MB, Friedman L, Sanchez SE, Williams MA, et al. Poor sleep Quality and Obstructive Sleep Apnea are Associated with Maternal Mood, and Anxiety Disorders in Pregnancy. Matern Child Health J. 2022;26(7):1540-8.
12. Dai Y, Trout KK, Liu J. Perinatal Physiological and Psychological Risk Factors and Childhood Sleep Outcomes: A Systematic Review and Meta-analysis. J Dev Behav Pediatr. 2022;43(9):e629-e44.
13. Lucena L, Frange C, Pinto ACA, Andersen ML, Tufik S, Hachul H. Mindfulness interventions during pregnancy: A narrative review. J Integr Med. 2020;18(6):470-7.
14. Cai S, Phua DY, Tham EKH, Goh DYT, Teoh OH, Shek LPC, et al. Mid-pregnancy and postpartum maternal mental health and infant sleep in the first year of life. J Sleep Res. 2023;32(3):e13804.
15. Tikotzky L, Volkovich E, Meiri G. Maternal emotional distress and infant sleep: A longitudinal study from pregnancy through 18 months. Dev Psychol. 2021;57(7):1111-23.
16. Çolak S, Gürlek B, Önal Ö, Yılmaz B, Hocaoglu C. The level of depression, anxiety, and sleep quality in pregnancy during coronavirus disease 2019 pandemic. J Obstet Gynaecol Res. 2021;47(8):2666-76.
17. Palagini L, Cipriani E, Caruso V, Sharma V, Gemignani A, Bramante A, et al. Insomnia During the Perinatal Period and its Association with Maternal and Infant Psychopathology: A Systematic Review and Meta-Analysis. Curr Psychiatry Rep. 2023;25(11):617-41.
18. Kalmbach DA. The emerging role of prenatal insomnia therapy in the prevention of perinatal depression and anxiety. Sleep. 2022;45(5).
19. Cevik A, Onat Koroglu C, Karacam Z, Gokyildiz Surucu S, Alan S. Effects of the Covid-19 Pandemic on the Prevalence of Insomnia, Anxiety, and Depression During Pregnancy: A Systematic Review and Meta-Analysis. Clin Nurs Res. 2022;31(8):1405-21.
20. Casas I, Nakaki A, Pascal R, Castro-Barquero S, Youssef L, Genero M, et al. Effects of a Mediterranean Diet Intervention on Maternal Stress, Well-Being, and Sleep Quality throughout Gestation-The IMPACT-BCN Trial. Nutrients. 2023;15(10).
21. Cox RC, Aylward BS, Macarelli I, Okun ML. Concurrent and prospective associations between sleep duration and timing and postpartum anxiety symptoms. J Affect Disord. 2025;388:119523.
22. van der Wekken-Pas L, Nassiwa S, Malaba T, Lamorde M, Myer L, Waitt C, et al. Comparison of dolutegravir and efavirenz on depression, anxiety and sleep disorders in pregnant and postpartum women living with HIV. Aids. 2024;38(7):975-81.
23. Miller HE, Simpson SL, Hurtado J, Boncompagni A, Chueh J, Shu CH, et al. Associations between anxiety, sleep, and blood pressure parameters in pregnancy: a prospective pilot cohort study. BMC Pregnancy Childbirth. 2024;24(1):366.
24. Ma S, Yin X, Tao R, Jiang X, Xie J, Li P, et al. Association of maternal prenatal depression and anxiety with toddler sleep: the China-Anhui Birth Cohort study. Arch Womens Ment Health. 2022;25(2):431-9.

