

Quality of sleep and its association with depression among postpartum women in an urban slum, bengaluru: a cross-sectional study

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ABSTRACT

Background

Sleep is essential for physical and mental health, and its quality is affected by numerous factors. Postpartum women, especially those living in urban slums, often encounter increased sleep disruptions, raising their risk of depression. Around 10-42% of women worldwide suffer from postpartum depression.

Objectives

To assess the association of poor sleep quality with postpartum depression, social, environmental and psycho-cultural factors among postpartum women in an urban slum of Bengaluru.

Materials/Methods

A cross-sectional study was done among postpartum women in an urban slum in Bengaluru in 2024. 100 postpartum women were selected using a simple random sampling method, based on a study by Iranpour et al. written informed consent was obtained, and the participants were interviewed using a semi-structured, pretested questionnaire, along with the Pittsburgh Sleep Quality Index and the Edinburgh Postnatal Depression Scale.

Results

The mean age of the mothers was 26 ± 3.9 years, with 16% reporting poor sleep quality and 18% experiencing depression. Poor sleep quality was significantly associated with depression ($p = 0.001$), mood swings ($p = 0.008$), intimate partner violence ($p = 0.001$), pressure to have a male baby ($p < 0.0001$), and emotional support ($p = 0.0005$).

Conclusion

This study highlights a significant prevalence of poor sleep quality and depression among postpartum women in an urban slum in Bengaluru. There is a strong association between poor sleep, depression, and various socio-environmental factors, emphasising the need for targeted interventions like improving living conditions, creating safe environments, addressing substance abuse, and regular mental health screening and counselling to support maternal mental health in underserved communities.

Keywords: Depression, Postpartum women, Quality of sleep, Socio-environmental factors, Urban slum

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INTRODUCTION

Sleep is a fundamental human need, vital for maintaining good health and optimal functioning. Despite its importance, modern lifestyles and environmental challenges often disrupt sleep, leading to physical fatigue, elevated blood pressure, and cognitive issues such as poor concentration and irritability.⁽¹⁾ In the long run, insufficient sleep can contribute to cardiovascular problems and impaired mental performance.⁽²⁾ Postpartum women, in particular, face unique challenges due to the demands of caring for a newborn, making sleep quality critical for their well-being and that of their baby.^(3,4)

Postpartum sleep disturbances are often linked to higher rates of depression, a condition affecting 10–42% of women globally⁽⁵⁾ and around 29% in India.⁽⁶⁾ Symptoms include persistent sadness, changes in sleep or appetite, irritability, anxiety, and even suicidal thoughts in severe cases.⁽⁷⁾ This period of recovery is crucial for mothers, as their mental and physical health directly influences the healthy development of their infants. Adequate rest plays a key role in mitigating stress and promoting mental resilience during this phase.⁽⁷⁾

Despite the importance of sleep quality among postpartum women, research addressing this issue, particularly in urban slum settings in India, remains limited. This study aims to assess the prevalence of poor sleep quality and its association with postpartum depression among women in an urban slum in Bengaluru. The findings are expected to guide interventions that enhance maternal and infant health outcomes during this vulnerable period.

Materials and Methodology

In 2024, a cross-sectional study was conducted among postpartum women in an urban slum in Bengaluru. A sample of 100 women was selected through simple random sampling, with the sample size determined based on a 53.1% prevalence rate from Iranpour et al.⁸ research, using a 10% margin of error and a 95% confidence interval.

Assesment tools

- a. Semi-structured and pretested questionnaire- socio-demographic details, psycho-cultural factors and environmental factors
- b. Edinburgh Postnatal Depression Scale: is a globally validated tool for screening postpartum depression, with reported sensitivity ranging from 70% to 88% and specificity from 78% to 96%. In India, the EPDS has been standardized and validated in several studies, with a commonly used cut-off score of ≥ 13 showing a sensitivity of 100% and specificity of 85% in a South Indian population, indicating good validity and reliability for use among Indian postpartum women.⁹
- c. Pittsburgh Sleep Quality Index: is a self-reported questionnaire used to assess sleep quality over the past month. It evaluates seven components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. The total PSQI score ranges from 0 to 21, with a score above 5 indicating poor sleep quality. The PSQI is a globally validated tool, with reported sensitivity of 89.6% and specificity of 86.5% in distinguishing good and poor sleepers. In the Indian context, the PSQI has been standardized and validated in various populations, with Cronbach's alpha values ranging from 0.70 to 0.83, indicating good internal consistency and reliability for use among Indian adults, including postpartum women.¹⁰

The study included women between 4 weeks and 1 year postpartum, excluding those with pre-existing mental health conditions or ongoing treatment. Participants were randomly chosen using a number generator, and data were collected using a semi-structured, pre-tested questionnaire (includes socio-demographic details, environmental details, and psycho-cultural factors) and standardized tools, including the Edinburgh Postnatal Depression Scale (EPDS)⁹ and the Pittsburgh Sleep Quality Index (PSQI).¹⁰

Statistical methods

The data collected and entered in Microsoft Excel and analyzed using SPSS version 26.0. Sociodemographic data presented using



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descriptive statistics namely mean, median, standard deviation, interquartile range, percentage wherever applicable. Chi Square test used to determine the association between the qualitative variables, $p < 0.05$ considered statistically significant. Data presented in the form of tables, and figures wherever necessary.

Ethical considerations

Approval and clearance were obtained from the Institutional Ethics Committee (Ref: BMCRI/EC/55/2024). The study participants fulfilling the eligibility criteria were enrolled for the study

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after obtaining the written informed consent.

Results

The study included 100 postpartum women, with a mean age of 26 years. About 71% of the women had completed high school or higher education, 68% were Hindu, 81% were homemakers, and 62% came from nuclear families. Regarding socio-economic status, the majority were in the upper-lower class (44%), and 67% of the women lived in pucca houses (Table 1).

Table: 1- SOCIO-DEMOGRAPHIC DETAILS OF POSTPARTUM WOMEN

Variables		Frequency (N=100)
Age	<20 years	2
	20-25 years	37
	26-30 years	40
	>30 years	21
Religion	Hindu	68
	Muslim	31
	Christian	1
	Others	0
Education	Illiterate	9
	Primary school	6
	Middle school	14
	High school	48
	Intermediate/Diploma	17
	Graduate	5
Occupation	Postgraduate	1
	Homemaker	81
	Government employee	3
	Private employee	12
Type Of Family	Business	4
	Joint family	14
	3 generation family	24
Socio-Economic Status	Nuclear family	62
	Upper class	0
	Upper middle	5
	Lower middle	38
	Upper lower	44
Housing	Lower	13
	Kutcha	6
	Semi pucca	27
	Pucca	67

Among the participants, 88% had planned their pregnancies, and 31% gave birth to low birth weight babies. Sixteen percent of women had trouble breastfeeding, and 29% experienced irritability, dysmenorrhea, and mood swings during menstruation. Most participants (91%) reported no complications during pregnancy or postpartum. Only 12% of babies had been hospitalized previously. Eight percent of women never received emotional support from their families, 16% had faced intimate partner violence in the past, and 9% had family members with substance abuse issues. The study also revealed that 84% of participants had good quality of sleep (QOS), while 16% reported poor QOS. Depression was present in 18% of the women, and 2% reported a family history of

psychiatric illness. The association between QOS and various factors was analyzed using chi-square tests. Depression was significantly associated with poor QOS ($p = 0.001$). Similarly, intimate partner violence ($p = 0.001$) and pressure to have a male child ($p < 0.0001$) were also significantly linked to poor QOS. Family substance abuse showed an association ($p = 0.014$), while complications during pregnancy, previous hospital admissions of the baby, and complications before and after delivery were not significantly associated. The study highlights the multifactorial nature of poor sleep quality among postpartum women, with depression, interpersonal relationships, partner habits, and socio-cultural pressures playing critical roles (Table 2)

Table : 2 Association of Quality of sleep among postpartum women with socio-demographic , psycho-cultural factors and environmental factors

Variables		Good quality of sleep	poor quality of sleep	p-value
1. Pregnancy was desired	Yes	74	14	0.95
	No	10	2	
2. Parity	≤ 2	77	16	0.103
	> 2	7	0	
3. Previous hospitalization of baby	Yes	8	4	0.053
	No	76	12	
4. Complications before or after pregnancy	Yes	7	2	0.59
	No	77	14	
5. Premenstrual syndrome(Mood swings)	Yes	20	9	0.008*
	No	64	7	

6. Substance abuse in the family	Yes	5	4	0.014*
7. Psychiatric Illness	No	79	12	0.18
	Yes	1	1	
8. Intimate partner violence	No	83	15	0.001*
	Yes	9	7	
9. Interpersonal relationship with spouse	No	75	9	0.003*
	Good	56	7	
10. Pressure to have a male child	Satisfactory	27	6	<0.0001*
	poor	1	3	
	Yes	9	10	
11. Emotional support	No	75	6	0.0005*
	Yes most of the times	65	7	
	Sometimes	16	4	
12. Food restrictions after the delivery	No	3	5	0.014*
	Yes	14	7	
13. Depression	no	70	9	0.001*
	Present	9	9	
	absent	75	7	

*Indicates a statistically significant association (p -value < 0.05)

DISCUSSION

The findings of this study provide comprehensive insights into the prevalence of poor sleep quality and its significant association with postpartum depression among women in an urban slum. The observed prevalence of poor sleep quality (16%) is lower than global estimates, whereas the prevalence of postpartum depression (18%) aligns with global trends, suggesting that while sleep disturbances may be less reported in this setting, postpartum

depression remains a significant concern influenced by multifactorial determinants.^{11,12}

A strong bidirectional relationship between poor sleep quality and postpartum depression was evident, where poor sleep exacerbates depressive symptoms, and depression further disrupts sleep patterns. This cycle aligns with findings by Gessesse et al.¹³ and Park et al.¹⁴, who identified sleep

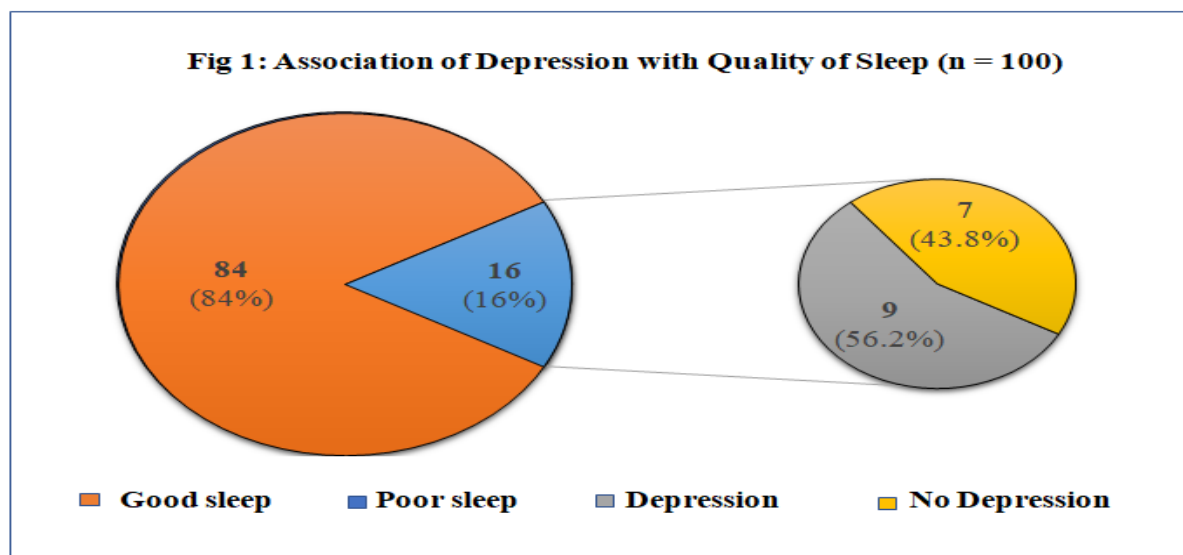


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maintenance problems as significant predictors of postpartum depression. Similarly, Tham et al.¹⁵ demonstrated that prenatal sleep disturbances could amplify postnatal depression, emphasizing the critical need for early interventions targeting sleep disorders during and after pregnancy. Socioeconomic vulnerabilities, including inadequate emotional support and cultural pressures, play a pivotal role in influencing sleep quality among postpartum women. Studies by Yang et al.¹² and Shivalli et al.⁵ corroborate these findings, indicating that women with lower income or education levels are disproportionately affected. Additionally, cultural factors, such as the expectation to bear a male child, emerged as significant stressors. Goyal et al.¹⁶ and Belete et al.¹⁷ also emphasized that such socio-cultural pressures can exacerbate mental health and sleep

disturbances. Interpersonal relationships and emotional support significantly impact postpartum sleep quality. Women with poor relationships with their spouses or insufficient emotional support reported worse sleep, consistent with findings by Sivertsen et al.¹⁸ and Rychnovsky et al.¹⁹. Cultural practices, such as food restrictions post-delivery, were also associated with poor sleep, as reported by Afshar et al.²⁰. This highlights the importance of addressing socio-cultural norms that negatively influence postpartum health. Poor sleep quality can impair maternal caregiving ability and bonding with the newborn, as noted by Dennis et al.²¹. Furthermore, studies by Cho et al.²² and Insana et al.²³ emphasize that chronic sleep disturbances may contribute to long-term mental health issues, necessitating early screening and intervention.



Conclusion

This study highlights the substantial connection between poor sleep quality and postpartum depression among women in an urban slum in Bengaluru. With 16% of participants experiencing poor sleep quality, the findings emphasize that these disturbances are not merely physiological consequences of the postpartum period but are closely linked to mental health challenges. The bidirectional relationship observed—where poor sleep exacerbates depressive symptoms and depression further disrupts sleep—creates a challenging cycle for postpartum women, affecting

their well-being and caregiving abilities.

Community-based interventions focused on maternal mental health, sleep hygiene education, and socio-economic supports are essential to mitigate the dual burden of sleep disturbances and postpartum depression. Integrating mental health and sleep assessments into routine postpartum care can enable early identification of at-risk women and ensure timely, targeted interventions. Future research should explore the effectiveness of integrated care models and culturally sensitive

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strategies in improving sleep and mental health in postpartum women. By addressing these challenges holistically, we can enhance maternal recovery, support healthy infant development, and promote overall family well-being, particularly in underserved communities.

Limitations

The study's cross-sectional design restricts causal inference between sleep quality and postpartum depression. Data were self-reported, which may lead to recall or reporting bias. The sample was confined

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to an urban slum, limiting wider applicability. Additionally, factors like cultural practices, seasonal variations, and detailed clinical evaluations were not considered.

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