RESEARCH ARTICLE

The role of sleep deprivation due to frequent breastfeeding in the development of post-partum depression: A cross-sectional study

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Abstract

Objective: To identify the prevalence of and risk factors for postpartum depression associated with a lack of sleep due to breastfeeding.

Method: From June to December 2023, a cross-sectional study was carried out in the psychiatric units of Sahiwal Teaching Hospital and Allied Hospital Faisalabad, two tertiary care facilities in Pakistan. Women between the ages of 18 and 40 who were primigravidas during the first six months after giving birth were included in the study. The Edinburgh Postnatal Depression Scale (EPDS) and the Pittsburgh Sleep Quality Index (PSQI) were used to gather data, and SPSS version 30 was used for analysis.

Results: Out of 200 participants, 55 (27%) reported sleep disturbances (PSQI>5), of whom 25 (12.5%) also exhibited symptoms of postpartum depression (EPDS>10). The mean self-reported total sleep duration, including all naps within a 24-hour period, was 5±1.3 hours, with an average sleep efficiency of 60±14%. A statistically significant association was observed between sleep disturbances and postpartum depression (χ^2= 0.125, p<0.0001), indicating that participants with poor sleep quality were significantly more likely to experience depressive symptoms.

Conclusion: Nursing-related sleep deprivation was identified as a cause of postpartum depression. Improving sleep quality may aid in the reduction of postpartum depression.

Keywords: Postpartum depression, Sleep deprivation, Breastfeeding, Pittsburgh Sleep Quality Index, Edinburgh Postnatal Depression Scale, Maternal health, Sleep quality, Nursing, Psychological adjustment, Risk factors.

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Introduction

Postpartum depression (PPD) is a type of depression that happens after someone gives birth. PPD does not affect the birthing person alone, as it can affect surrogates and adoptive parents, too. People experience hormonal, physical, emotional, financial and social changes after having a baby. These changes can cause PPD symptoms.[1] The disorders of depression and sleep deprivation are connected and co-morbid. Sleep deprivation frequently precedes depression, and has a poor predictive value.[2] Compared to when they were pregnant and at previous times of reproductive age, postpartum women sleet less in the first few weeks after giving birth. These women also have a higher chance of developing depression.[3] Because maternal depression has harmful consequences for both the mother and the child, it is crucial to recognise it. Without assistance or treatment, the effects might be costly and time-consuming for the women, their families, and the healthcare system as a whole. Suicide is a possibility among those with severe depression, particularly those who also exhibit psychotic symptoms.[4] The child's cognitive, emotional and social development may be impacted by the mother's depression. Breastfeeding rates are lower in depressed women, and maternal depression is linked to stunted infant development in underdeveloped countries.[5]

The current study was planned to determine the relationship between inadequate sleep and PPD, and to assess whether a lack of sleep poses a stand-alone risk for PPD.

Subjects and Methods

This cross-sectional study was conducted between June and December 2023 in the psychiatric wards of two tertiary care hospitals in Pakistan, Allied Hospital Faisalabad and Sahiwal Teaching Hospital. After approval from the ethics review committee (No F,48-ERC/FMU/2022-23/263), the sample size was determined based on previous studies.[2-4] The sample was raised using non-probability sampling technique. Those included were primigravidas aged 18-40 years who were within the first six-month postpartum phase. Written informed consent was obtained from the subjects. Mothers with known psychiatric disorders, chronic illnesses, or those using sleep medication were excluded.

Data was collected using a structured questionnaire that included the Pittsburgh Sleep Quality Index (PSQI)[5] with cut-off value>5 and the Edinburgh Postnatal Depression

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Scale (EPDS)[6] with cut-off value>10. The PSQI scores are divided into seven sub-scores, each ranging 0-3. The sub-scores assess various aspects of sleep quality, such as sleep duration, sleep efficiency, sleep latency, sleep disturbances, use of sleep medication, and daytime dysfunction. Data was analysed using SPSS version 30.

Results

Of the 200 subjects, 40 (20%) had an EPDS score >10, indicating a higher likelihood of postpartum depression (PPD), compared to 160 (80%) mothers with EPDS scores <10 (Table 1). Additionally, 55 (27%) mothers had a PSQI score >5, classifying them as poor sleepers, compared to 145 (73%) good sleepers with PSQI scores <5 (Table 2). The prevalence of PPD among poor sleepers was 27 (49%), whereas among good sleepers, it was only 13 (8.9%) (Table 3). The prevalence ratio (49/8.9) was approximately 5.5, indicating that poor sleepers were over five times more likely to develop PPD compared to good sleepers. A chi-square test showed that this association between sleep quality and postpartum depression was extremely statistically significant (χ^2=40.125, p<0.0001) (Table 3). The mean self-reported nightly sleep duration was 5±1.3 hours (including total naps in 24 hours), and the mean sleep efficiency was 60±14% (Table 4). While several factors were identified as potentially affecting mothers' sleep quality during the postpartum phase, poor sleep was significantly associated with PPD (Table 5).

Table-1: EPSD score of primigravida mothers (n=200).

Number of Primigravida (n)	Without Post-partum Depression (EPSD≤10)	With Post-partum Depression (EPSD>10)
200	160 (80%)	40 (20%)

EPSD: Edinburgh Postnatal Depression Scale.

Table-2: PSQI score of primigravida mothers.

Number of Primigravida (n)	Good Sleeper (PSQI ≤ 5)	Poor Sleeper (PSQI > 5)
200	145 (73%)	55 (27%)

PSQI: Pittsburgh Sleep Quality Index.

Table-3: Prevalence-ratio calculation of postpartum depression (PPD) due to sleep deprivation.

Sleep Quality	Postpartum Depression (Yes)(EPDS > 10)	Postpartum Depression (No)(EPDS < 10)	Total	χ^2	p-value
Poor Sleepers (PSQI>5)	27	28	55		
Good Sleepers (PSQI<5)	13	132	145	40.125	0.0001
Total	40	160	200		

EPSD: Edinburgh Postnatal Depression Scale, PSQI: Pittsburgh Sleep Quality Index, SD: Standard deviation.

Table-4: PSQI scores and self-reported sleep variables identified by the mothers.

	Mean PSQI Score of Primigravida (n=200) (SD)	With no Post-partum depression EPDS<10 n=145 Mean±SD	With Post-partum Depression EPDS ≥ 10 n=55 Mean±SD
PSQI total (0-21)	6.86 (3.75)	4.64±2.7	11.83 (2.5)
PSQI Sub Score Content:	Sub scores (0-3):	Sub scores (0-3):	Sub scores (0-3):
1: Sleep quality	0.85 (0.6)	0.7±0.6	2.0±0.7
2: Sleep latency	0.75 (0.7)	0.5±0.8	1.1±1.1
3: Sleep duration	1.21 (0.5)	0.9±0.8	1.7±0.8
4: Habitual sleep efficiency	1.1 (0.8)	0.5±1.1	1.8±1.3
5: Sleep disturbances	1.8 (0.4)	1.3±0.5	1.5±0.7
6: Use of sleep medication	0.05 (0.6)	0.04±0.2	0.13±0.8
7: Daytime dysfunction	1.1 (0.8)	0.7±0.6	1.9±0.9
Sleep variables, by PSQI			
Sleep onset latency, minutes	23 (33)	17±31	26±38
Sleep at night, hours	5 (1.3)	6.6±1.2	5.8±1.3
Sleep efficiency (%)	60 (14)	74±14	68±15

EPSD: Edinburgh Postnatal Depression Scale, PSQI: Pittsburgh Sleep Quality Index, SD: Standard deviation.

Table-5: Variables associated with poor global sleep quality (PSQI >5) in post-partum mothers

Characteristics	Total (n=200) n (%)	Good Sleeper (n=145) n (%)	Bad Sleeper)n=55) n (%)
PSQI score			
≤ 5	160 (80)	120 (83)	40 (73)
> 5	40 (20)	25 (17)	15 (27)
Previous sleep problems			
No	160 (80)	120 (83)	40 (73)
Yes, 1-4	40 (20)	25 (17)	15 (27)
Feeding method			
Breastfeeding only	70 (35)	40 (28)	30 (55)
Breastfeeding and supplement	120 (60)	102 (70)	18 (33)
Not breastfeeding	10 (5)	3 (2)	7 (13)
Gender of newborn			
Female	90 (45)	80 (55)	10 (18)
Male	110 (55)	65 (45)	45 (82)
Place sleeping at night			
Infant in mother's bed	50 (25)	18 (12)	32 (58)
Separate bed	150 (75)	127 (88)	23 (42)
Relationship to partner			
Very content	115 (58)	75 (52)	30 (55)
Content	45 (23)	30 (21)	15 (27)
Some/very discontent	30 (15)	23 (16)	7 (13)
Do not have a partner	10 (5)	7 (5)	3 (5)
Depression during pregnancy			
No	170 (85)	135 (93)	35 (64)
Yes	30 (15)	10 (7)	20 (36)
Previous depression			
No	160 (80)	140 (97)	20 (36)
Yes	40 (20)	5 (3)	35 (64)
Stress factors last year, rating			
0	135 (67.5)	115 (79.3)	25 (45.5)
1-5	25 (12.5)	10 (6.9)	15 (27.3)
> 5	40 (20)	10 (6.9)	30 (54.5)

Discussion

PPD is a serious mental health condition that affects many new mothers. Although often ignored as a side effect of pregnancy, there is growing evidence linking significant sleep disruption, characterised by insomnia symptoms and/or poor sleep quality, to negative outcomes such as an increase in depressive symptoms or the development of PPD. The current results showed that mothers who reported frequent breastfeeding and sleep deprivation were more likely to experience PPD symptoms, that the frequency of breastfeeding and the duration of sleep were significant predictors of PPD. These findings are consistent with previous research.[7]

Inadequate sleep may raise the likelihood of depression in some women, but because previously established risk variables are also linked, mothers diagnosed with PPD tend to avoid reporting symptoms of persistent sleep deprivation.[8] A study reported that poor sleep maintenance, as measured by wrist actigraphy, was associated with EPDS scores during the postpartum period, rather than a lack of sleep, and that subjective sleep assessments may be more accurate predictors of PPD symptoms than wrist actigraphy.[9] Furthermore, rising pregnancy age has been associated with an increased incidence of PPD.[10] Early postpartum sleep problems predict the emergence of later PPD in an independent manner. This has clinical significance and emphasises the significance of sleep interventions as a postpartum recovery tool.[11]

The current study has limitations of a small sample size, which may have affected the generalisability of the findings. As a cross-sectional study, it provides only a snapshot of the association between sleep deprivation and PPD, limiting causal inferences. The reliance on self-reported data may have introduced potential bias, and the lack of longitudinal data prevented the assessment of long-term effects. Additionally, the study's regional focus may have impacted the applicability of the results to other settings.

Conclusion

New mothers often experience nursing-related sleep deprivation, which has been identified as a concealed cause of PPD. Regardless of other risk factors, lack of sleep was found linked to an increased risk of depression in new mothers. Women with known risk factors for PPD were at even greater risk if they experienced sleep deprivation.

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Author Contribution:

HA & HS: Concept, design, drafting, revision and final approval.
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FN: Data acquisition, analysis, drafting, revision and final approval.
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