

# Relationship Between Infant Colic, Maternal Sleep Disruption, and Postpartum Depression Symptoms in First-Time Mothers of Rawalpindi

Mishaal Noor<sup>1</sup>, Ahmed Mengal<sup>2</sup>, Saima Nawaz<sup>3</sup>, Raheela Hameed<sup>3</sup>, Ayesha Syed<sup>4</sup>, Sadia Afzal<sup>5</sup>, Muhammad Umar Zafar<sup>6</sup>

<sup>1</sup> Postgraduate Trainee Obstetrics and Gynecology, Shifa International Hospital, Islamabad, Pakistan

<sup>2</sup> Medical Officer, RHC Batto, Meer Gul Khan Naseer (MGKN) Teaching Hospital, Nushki, Pakistan

<sup>3</sup> Bolan Medical College, Quetta, Pakistan

<sup>4</sup> MBBS, Fatima Jinnah Medical University, Lahore, Pakistan

<sup>5</sup> MPhil Public Health, ISCS University of the Punjab, Lahore, Pakistan

<sup>6</sup> MBBS, Pak International Medical College, Peshawar, Pakistan

\*Corresponding author: Mishaal Noor, [mishaalnoor18@gmail.com](mailto:mishaalnoor18@gmail.com)

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## ABSTRACT

**Background:** Infant colic and sleep disruption are common early infancy concerns that may place substantial psychological strain on first-time mothers during the postpartum period. Persistent infant crying can fragment maternal sleep, increase caregiving burden, and contribute to emotional distress, yet local evidence from urban Pakistani settings remains limited. **Objective:** To assess the association between infant colic, maternal sleep quality, and postpartum depressive symptoms among first-time mothers in the Islamabad-Rawalpindi region. **Methods:** This cross-sectional observational study included 72 first-time mothers with infants aged 2 weeks to 6 months attending postnatal and pediatric follow-up clinics. Participants were recruited through consecutive sampling. Infant colic symptoms were assessed using a Wessel criteria-based crying assessment, while infant sleep behavior was evaluated using the Brief Infant Sleep Questionnaire. Maternal sleep quality was measured using the Pittsburgh Sleep Quality Index, and postpartum depressive symptoms were assessed using the Edinburgh Postnatal Depression Scale. Data were analyzed using SPSS version 26, with independent-samples t-tests and Pearson correlation applied at  $p < 0.05$ . **Results:** Infant colic symptoms were present in 31 infants (43.1%). Mean PSQI and EPDS scores were  $8.1 \pm 3.2$  and  $11.6 \pm 4.7$ , respectively, while elevated depressive symptoms were observed in 20 mothers (27.8%). Mothers of infants with colic had significantly higher PSQI scores ( $10.2 \pm 2.9$  vs.  $6.5 \pm 2.4$ ,  $p < 0.001$ ) and EPDS scores ( $14.1 \pm 4.3$  vs.  $9.7 \pm 3.8$ ,  $p < 0.001$ ) than mothers of infants without colic. Infant crying duration correlated positively with PSQI ( $r = 0.58$ ,  $p < 0.001$ ) and EPDS scores ( $r = 0.49$ ,  $p < 0.001$ ), while PSQI and EPDS scores were strongly correlated ( $r = 0.64$ ,  $p < 0.001$ ). **Conclusion:** Infant colic was significantly associated with poorer maternal sleep quality and higher postpartum depressive symptom burden among first-time mothers. Routine assessment of maternal sleep and emotional well-being during postnatal and pediatric visits may support early identification of mothers requiring additional counseling, sleep support, and mental health referral. **Keywords:** Infant Colic; Infant Crying; Maternal Sleep; Postpartum Depression; First-Time Mothers; Sleep Quality; Edinburgh Postnatal Depression Scale.

## INTRODUCTION

The postpartum period is a biologically and psychologically vulnerable phase during which mothers undergo substantial physical recovery, emotional adjustment, and adaptation to new caregiving responsibilities. These demands are often more pronounced among first-time mothers, who may have limited prior experience in interpreting infant cues, managing disrupted routines, and balancing personal recovery with continuous infant care (1). Sleep disturbance is one of the most frequent challenges during this period and has been associated with impaired emotional regulation, reduced coping capacity, fatigue, irritability, and increased vulnerability to depressive symptoms. Maternal sleep problems may begin during pregnancy and often persist or worsen after childbirth because of nighttime feeding, infant awakenings, and irregular infant sleep-wake patterns (2,3).

Infant colic represents one of the most distressing early infancy problems encountered by caregivers and is commonly characterized by recurrent, prolonged, and difficult-to-soothe crying in an otherwise healthy infant. Although colic is usually self-limiting, its impact extends beyond the infant because persistent crying can disrupt household routines, increase caregiver stress, and reduce maternal sleep continuity. For first-time mothers, repeated crying episodes may generate feelings of helplessness, self-doubt, anxiety, and emotional exhaustion, particularly when soothing attempts are unsuccessful. In this context, infant colic is not only a pediatric concern but also a potential maternal mental health stressor during the early postpartum months (4).

Postpartum depressive symptoms remain a major public health concern because they can affect maternal functioning, mother-infant bonding, breastfeeding practices, family relationships, and infant developmental outcomes. Symptoms such as persistent sadness, loss of interest, fatigue, irritability, guilt, and perceived inadequacy may overlap with the normal demands of early motherhood, making early recognition difficult in routine clinical settings.

Sleep disruption is especially important because it may intensify emotional distress and reduce resilience in mothers already coping with the demands of infant care. Emerging evidence suggests that maternal sleep quality and infant behavioral problems are closely linked with postpartum psychological well-being, but the direction and magnitude of these relationships may vary according to maternal experience, family support, and sociocultural context (5,6).

The relationship between infant crying, maternal sleep disruption, and depressive symptoms is clinically plausible because excessive crying may increase nighttime awakenings and caregiving burden, while fragmented sleep may lower maternal tolerance for stress and contribute to worsening mood symptoms. However, this relationship should be interpreted carefully because cross-sectional evidence can identify associations but cannot establish temporal sequence or causality.

A more precise understanding of these associations is nevertheless important for clinical practice, as mothers who present to pediatric or postnatal services with concerns about infant crying may also require assessment for sleep disruption and depressive symptoms. Screening for maternal distress in the context of infant colic may therefore offer an opportunity for earlier identification and supportive intervention (7).

First-time mothers represent a particularly important population for investigation because the transition to motherhood involves unfamiliar caregiving demands, changes in identity, reduced personal autonomy, and dependence on available family or social support. In urban Pakistani settings, including Rawalpindi and Islamabad, changing family structures, nuclear households, employment pressures, and reduced intergenerational support may increase the practical and emotional burden experienced by new mothers.

Cultural expectations that motherhood should be naturally fulfilling may also discourage women from openly reporting psychological distress, sleep deprivation, or difficulty coping with infant crying. These factors may contribute to under-recognition of postpartum depressive symptoms in routine maternal and child healthcare services (8).

Although international literature has examined postpartum depression, maternal sleep disturbance, and infant colic as separate or partially overlapping concerns, local evidence from Pakistan remains limited, particularly among first-time mothers in urban clinical settings.

Existing research has not sufficiently clarified how infant crying duration and infant sleep problems are associated with maternal sleep quality and depressive symptom severity in this population. This knowledge gap is important because locally generated evidence can guide context-sensitive screening strategies, counseling approaches, and early supportive interventions for mothers and infants attending postnatal and pediatric clinics (9,10).

Using a PICO framework, the present study focused on first-time mothers of infants aged 2 weeks to 6 months in the Islamabad-Rawalpindi region as the population of interest. The primary exposure was infant colic or increased infant crying burden, while mothers of infants without colic symptoms served as the comparison group. The main outcomes were maternal sleep quality and postpartum depressive symptom severity, assessed using standardized screening instruments. The study was therefore designed to examine the association between infant colic symptoms, maternal sleep disruption, and postpartum depressive symptoms among first-time mothers. It was hypothesized that mothers of infants with colic symptoms would report poorer sleep quality and higher postpartum depressive symptom scores than mothers of infants without colic symptoms, and that infant crying duration would be positively associated with both maternal sleep disturbance and depressive symptom severity (11,12).

## MATERIALS AND METHODS

This cross-sectional observational study was conducted over four months, from June 2026 to September 2026, in postnatal and pediatric follow-up clinics of healthcare facilities in the Islamabad-Rawalpindi region. The cross-sectional design was selected to assess the contemporaneous association between infant colic symptoms, maternal sleep quality, and postpartum depressive symptoms among first-time mothers during the early infancy period.

The study setting was appropriate because postnatal and pediatric outpatient clinics routinely receive mothers seeking care for infant feeding, crying, sleep, and general postnatal concerns, thereby allowing recruitment of participants with varying levels of infant crying burden and maternal psychological distress.

The study population comprised first-time mothers aged 20 to 35 years who were living with their infants and attending routine postnatal or pediatric follow-up visits. Mothers were eligible if they had an infant aged between 2 weeks and 6 months and were willing to provide informed consent. First-time mothers were selected because the absence of previous caregiving experience may increase vulnerability to stress, sleep disruption, and uncertainty in managing persistent infant crying.

Mothers were excluded if they had a previously diagnosed psychiatric illness, chronic neurological disorder, or severe postpartum medical complication. Infants were excluded if they had congenital anomalies, chronic medical illness, history of neonatal intensive care admission, or any condition likely to independently affect crying behavior, sleep pattern, or maternal psychological well-being.

Participants were recruited using non-probability consecutive sampling. Eligible mothers attending the selected clinics during the study period were approached after completion of their clinical consultation. The purpose of the study was explained in clear language, and mothers who agreed to participate provided written informed consent before data collection.

Participation was voluntary, and confidentiality of responses was maintained throughout the study. Data were collected through a structured interviewer-administered questionnaire prepared in English and translated into Urdu to ensure participant comprehension. The questionnaire captured sociodemographic and clinical characteristics, including maternal age, educational status, employment status, family system, infant age, feeding practice, and infant colic status.

Infant colic was assessed using a Wessel criteria-based crying assessment, in which excessive crying was evaluated according to crying duration, frequency, and persistence in an otherwise healthy infant (10). Infant sleep behavior was assessed using the Brief Infant Sleep Questionnaire, which documented infant sleep duration, night awakenings, and sleep-related difficulty as reported by the mother (11). Maternal sleep quality was measured using the Pittsburgh Sleep Quality Index, a standardized instrument that assesses subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleep medication, and daytime dysfunction over the preceding month (12).

Postpartum depressive symptoms were assessed using the Edinburgh Postnatal Depression Scale, a 10-item screening instrument designed to identify depressive symptom burden during the postnatal period (13). Higher PSQI scores represented poorer maternal sleep quality, while higher EPDS scores represented greater depressive symptom severity.

The primary exposure variable was infant colic status, categorized as present or absent according to the crying assessment. Infant crying duration, expressed in hours per day, was also analyzed as a continuous exposure variable. The primary outcome variables were maternal sleep quality, measured by PSQI score, and postpartum depressive symptom severity, measured by EPDS score. Additional variables included maternal age, infant age, education, employment status, family system, and feeding practice. These variables were recorded because they may influence maternal sleep, psychological well-being, caregiving burden, and infant care routines.

To reduce information bias, data were collected using standardized instruments and a uniform interview approach. To reduce selection bias, consecutive eligible mothers were approached during the recruitment period. Potential confounding was addressed at the analysis stage by examining sociodemographic and infant-related variables in relation to maternal sleep and depressive symptom outcomes. The sample size was determined for a correlation-based cross-sectional analysis. Assuming a moderate expected correlation between maternal sleep quality and postpartum depressive symptom scores, with a two-sided alpha level of 0.05 and 80% statistical power, a minimum sample of approximately 62 participants was required.

After allowing for possible nonresponse and incomplete questionnaires, the recruitment target was increased, and 78 eligible mothers were approached. Of these, 72 mothers consented and completed the study questionnaire, yielding a response rate of 92.3%. Only fully completed questionnaires were included in the final analysis, and no item-level imputation was performed. Data were entered and analyzed using Statistical Package for the Social Sciences version 26. Continuous variables, including maternal age, infant age, infant crying duration, PSQI score, and EPDS score, were summarized as mean and standard deviation after assessment of distributional assumptions using the Shapiro-Wilk test.

Categorical variables, including educational status, employment status, family system, feeding practice, and infant colic status, were summarized as frequencies and percentages. Independent-samples t-tests were used to compare mean PSQI scores, EPDS scores, and infant crying duration between mothers of infants with and without colic symptoms.

Pearson correlation analysis was used to assess the strength and direction of associations among infant crying duration, maternal sleep quality score, and postpartum depressive symptom score. One-way analysis of variance was planned for comparison of outcome scores across sociodemographic categories with more than two groups. Statistical significance was set at  $p < 0.05$  for all analyses.

Data quality was maintained through standardized questionnaire administration, review of completed forms before data entry, and cross-checking of entered values for range and consistency. Participant identifiers were not included in the analytical dataset, and study records were handled confidentially. The study was conducted in accordance with ethical principles for human participant research, and written informed consent was obtained from all enrolled mothers before participation.

## RESULTS

Out of 78 eligible first-time mothers approached during the study period, 72 consented and completed the questionnaire, giving a response rate of 92.3%. The mean maternal age was  $27.4 \pm 3.8$  years, and the mean infant age was  $3.1 \pm 1.4$  months. Most mothers had undergraduate education, accounting for 39 participants (54.2%), while 18 (25.0%) had secondary education and 15 (20.8%) had postgraduate education. Homemakers represented 50 participants (69.4%), and 22 mothers (30.6%) were employed. Nuclear family structure was reported by 42 mothers (58.3%), while 30 mothers (41.7%) lived in joint

families. Exclusive breastfeeding was reported by 44 mothers (61.1%), and mixed feeding by 28 mothers (38.9%). Infant colic symptoms were present in 31 infants (43.1%) and absent in 41 infants (56.9%) (Table 1).

**Table 1. Baseline Demographic and Clinical Characteristics of Participants (N=72)**

Variable	Category	n (%) / Mean ± SD
Maternal age, years		27.4 ± 3.8
Infant age, months		3.1 ± 1.4
Educational status	Secondary	18 (25.0%)
	Undergraduate	39 (54.2%)
	Postgraduate	15 (20.8%)
Employment status	Homemaker	50 (69.4%)
	Employed	22 (30.6%)
Family system	Nuclear	42 (58.3%)
	Joint	30 (41.7%)
Feeding practice	Exclusive breastfeeding	44 (61.1%)
	Mixed feeding	28 (38.9%)
Infant colic symptoms	Present	31 (43.1%)
	Absent	41 (56.9%)

Assessment of maternal sleep quality and postpartum depressive symptoms showed a substantial burden of sleep and mood disturbance. The mean PSQI score was 8.1 ± 3.2, with observed scores ranging from 3 to 15, indicating poor sleep quality in many participants. The mean EPDS score was 11.6 ± 4.7, with scores ranging from 2 to 21. Elevated depressive symptoms were identified in 20 of 72 mothers, corresponding to 27.8% of the sample, with an estimated 95% confidence interval of 18.8% to 39.0%. Infant crying duration averaged 3.9 ± 1.5 hours per day, with a range of 1 to 8 hours per day (Table 2).

**Table 2. Maternal Sleep, Depressive Symptoms, and Infant Crying Outcomes**

Outcome Measure	Mean ± SD	Minimum	Maximum
PSQI score	8.1 ± 3.2	3	15
EPDS score	11.6 ± 4.7	2	21
Elevated depressive symptoms	20/72 (27.8%)		
Infant crying duration, hours/day	3.9 ± 1.5	1	8

Mothers of infants with colic had consistently worse sleep and depressive symptom scores than mothers of infants without colic. The mean PSQI score was 10.2 ± 2.9 in the colic-present group compared with 6.5 ± 2.4 in the colic-absent group, giving a mean difference of 3.7 points and a 95% confidence interval of 2.42 to 4.98. This difference was statistically significant (t=5.77, p<0.001) and represented a large standardized effect size (Cohen’s d=1.41). Similarly, the mean EPDS score was 14.1 ± 4.3 among mothers of infants with colic and 9.7 ± 3.8 among mothers of infants without colic, producing a mean difference of 4.4 points with a 95% confidence interval of 2.45 to 6.35. This association was statistically significant (t=4.52, p<0.001), with a large effect size (Cohen’s d=1.09). Infant crying duration was also markedly higher in the colic-present group, with a mean of 5.4 ± 1.2 hours/day compared with 2.8 ± 1.0 hours/day in the colic-absent group. The mean difference was 2.6 hours/day, with a 95% confidence interval of 2.07 to 3.13, and the group difference was statistically significant (t=9.77, p<0.001), with a very large effect size (Cohen’s d=2.38) (Table 3).

**Table 3. Comparative Analysis Between Mothers With and Without Infant Colic**

Variable	Colic Present (n=31), Mean ± SD	Colic Absent (n=41), Mean ± SD	Mean Difference	95% CI for Difference	Test Statistic	Effect Size	p-value
PSQI score	10.2 ± 2.9	6.5 ± 2.4	3.7	2.42 to 4.98	t=5.77	Cohen’s d=1.41	<0.001
EPDS score	14.1 ± 4.3	9.7 ± 3.8	4.4	2.45 to 6.35	t=4.52	Cohen’s d=1.09	<0.001
Infant crying duration, hours/day	5.4 ± 1.2	2.8 ± 1.0	2.6	2.07 to 3.13	t=9.77	Cohen’s d=2.38	<0.001

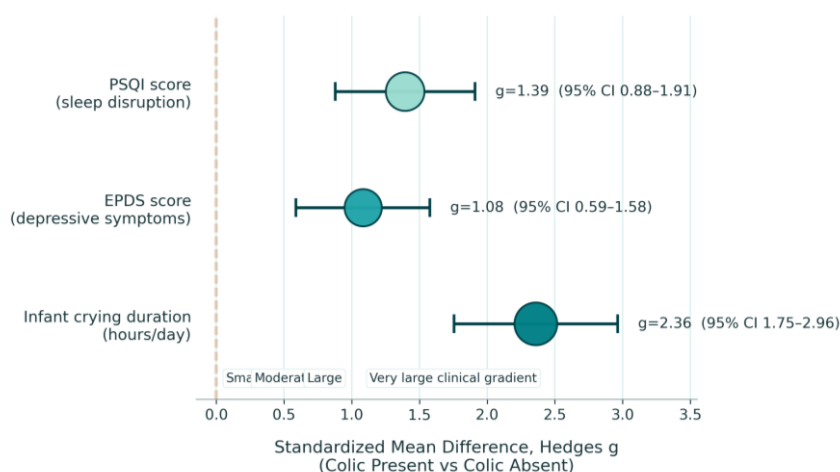
Correlation analysis demonstrated significant positive associations among infant crying duration, maternal sleep disruption, and postpartum depressive symptom severity. Infant crying duration showed

a moderate-to-strong positive correlation with PSQI score ( $r=0.58$ , 95% CI: 0.40 to 0.72,  $p<0.001$ ), indicating that longer infant crying duration was associated with poorer maternal sleep quality. Infant crying duration also showed a moderate positive correlation with EPDS score ( $r=0.49$ , 95% CI: 0.29 to 0.65,  $p<0.001$ ), showing that greater crying burden was associated with higher depressive symptom scores. The strongest observed association was between PSQI and EPDS scores ( $r=0.64$ , 95% CI: 0.48 to 0.76,  $p<0.001$ ), suggesting that poorer maternal sleep quality was closely associated with greater postpartum depressive symptom severity (Table 4).

**Table 4. Pearson Correlation Matrix of Main Study Variables**

Association	Correlation Coefficient (r)	95% CI	Direction and Strength	p-value
Infant crying duration with PSQI score	0.58	0.40 to 0.72	Positive, moderate-to-strong	<0.001
Infant crying duration with EPDS score	0.49	0.29 to 0.65	Positive, moderate	<0.001
PSQI score with EPDS score	0.64	0.48 to 0.76	Positive, strong	<0.001

Overall, the results showed that infant colic was common among first-time mothers in this sample, affecting 43.1% of infants. Mothers of infants with colic had substantially higher sleep disruption and depressive symptom scores than mothers of infants without colic, with large effect sizes for PSQI and EPDS differences and a very large effect size for crying duration. The correlation findings further supported a consistent positive relationship across the three principal variables: longer infant crying duration, poorer maternal sleep quality, and higher postpartum depressive symptom burden.



**Figure 1. Comparative Burden Gradient Associated with Infant Colic**

The figure demonstrates a consistent colic-associated clinical burden gradient across infant crying duration, maternal depressive symptoms, and maternal sleep disruption. The largest standardized difference was observed for infant crying duration, with mothers of infants with colic reporting substantially greater crying burden than those without colic (Hedges  $g=2.36$ , 95% CI 1.75–2.96). Large gradients were also observed for maternal sleep disruption, measured by PSQI score ( $g=1.39$ , 95% CI 0.88–1.91), and postpartum depressive symptom severity, measured by EPDS score ( $g=1.08$ , 95% CI 0.59–1.58). The pattern indicates that infant colic was associated not only with increased crying duration but also with clinically meaningful elevations in maternal sleep disturbance and depressive symptom burden.

## DISCUSSION

The present study demonstrated that infant colic was common among first-time mothers in the Islamabad-Rawalpindi region and was associated with substantially poorer maternal sleep quality and higher postpartum depressive symptom scores. Infant colic symptoms were identified in 43.1% of infants, while elevated depressive symptoms were observed in 27.8% of mothers. Mothers of infants with colic had markedly higher PSQI scores than mothers of infants without colic, indicating greater sleep

disruption, and they also had higher EPDS scores, reflecting greater postpartum depressive symptom burden. The magnitude of these differences was clinically meaningful, with large standardized effects for both maternal sleep disruption and depressive symptoms. These findings support the concept that excessive infant crying during early infancy may coexist with significant maternal psychological strain, particularly among first-time mothers who are adapting to infant care without previous parenting experience (14).

The observed association between infant colic and poor maternal sleep quality is biologically and behaviorally plausible. Persistent crying episodes often require repeated soothing, feeding, carrying, or nighttime attention, all of which may fragment maternal sleep and reduce total restorative sleep time. In the present analysis, mothers of infants with colic reported a mean crying duration of  $5.4 \pm 1.2$  hours per day compared with  $2.8 \pm 1.0$  hours per day among mothers of infants without colic. This difference of 2.6 hours per day indicates a substantial caregiving burden that may interfere with maternal recovery, daytime functioning, emotional regulation, and perceived parenting competence. The positive correlation between infant crying duration and PSQI score further suggests that longer crying duration was associated with progressively poorer maternal sleep quality. This pattern is consistent with the clinical understanding that postpartum sleep disruption is not only a consequence of routine infant care but may be intensified when infant crying is prolonged, unpredictable, or difficult to soothe (15).

Maternal sleep disruption also showed a strong positive association with postpartum depressive symptom severity. The correlation between PSQI and EPDS scores was the strongest among the main study variables, indicating that mothers with poorer sleep quality tended to report higher depressive symptom scores. This finding is important because fatigue, irritability, reduced concentration, emotional sensitivity, and low mood may overlap during the postpartum period, making it difficult to distinguish normal adjustment from emerging depressive symptoms. Poor sleep may reduce maternal coping capacity and increase vulnerability to emotional distress, while depressive symptoms may further impair sleep continuity, creating a reinforcing cycle of fatigue and psychological burden. Although the cross-sectional design does not establish temporal direction, the strength and consistency of the association indicate that maternal sleep quality should be considered an essential component of postpartum mental health assessment (16).

The relationship between infant crying duration and EPDS score further highlights the psychological relevance of infant behavioral difficulties. Infant crying duration showed a moderate positive correlation with depressive symptom severity, suggesting that greater crying burden was associated with higher maternal distress. For first-time mothers, persistent infant crying may be interpreted as a sign of caregiving failure or inability to meet the infant's needs, especially when soothing attempts are unsuccessful. This may contribute to feelings of helplessness, guilt, frustration, and reduced maternal confidence. These emotional responses may be intensified in the early postpartum period, when mothers are also experiencing physical recovery, hormonal changes, breastfeeding demands, and altered household roles. The findings therefore indicate that infant colic should not be approached solely as a transient infant condition but also as a potential marker of maternal vulnerability requiring supportive assessment (17).

The focus on first-time mothers adds clinical importance to these findings. First-time mothers may have limited experience differentiating normal infant crying from excessive crying, fewer established coping strategies, and greater uncertainty in responding to infant sleep and feeding patterns. In the study sample, most participants were homemakers and more than half belonged to nuclear family systems, which may have influenced the amount of practical and emotional support available during infant care. In settings where extended family support is limited, repeated nighttime awakenings and prolonged crying may place a greater burden on the mother as the primary caregiver. Cultural expectations surrounding motherhood may also discourage women from expressing distress, as sleep loss and emotional exhaustion are often normalized as routine aspects of early parenting. These factors may

contribute to delayed recognition of postpartum depressive symptoms and reinforce the need for active screening in postnatal and pediatric care settings (18).

The findings have practical implications for maternal and child healthcare services. Pediatric visits for infant crying, sleep difficulty, or feeding concerns may provide an important opportunity to identify maternal sleep disruption and depressive symptoms. Similarly, postnatal visits should include targeted questions about infant crying duration, maternal nighttime awakenings, perceived sleep quality, and emotional coping. The combined use of brief screening tools such as the PSQI and EPDS may help clinicians identify mothers who require counseling, sleep support, mental health referral, or family-based assistance. Interventions focused on infant soothing techniques, parental reassurance, feeding support, sleep hygiene, and shared caregiving responsibilities may reduce maternal distress and improve overall family functioning. Integrating maternal mental health screening into routine infant care may be especially valuable in urban Pakistani settings, where mothers may initially seek care for infant symptoms rather than for their own psychological distress.

Several strengths enhance the clinical relevance of this study. The use of standardized instruments for maternal sleep quality and depressive symptoms allowed systematic assessment of two important postpartum outcomes. The study also focused on first-time mothers during the early infancy period, a group that may be particularly vulnerable to sleep disruption and emotional distress. In addition, the analysis examined both categorical infant colic status and continuous infant crying duration, providing a broader understanding of how crying burden relates to maternal outcomes. The results consistently showed worse maternal sleep and depressive symptom scores among mothers exposed to greater infant crying burden, strengthening the internal coherence of the findings.

The study also has limitations that should be considered when interpreting the findings. The cross-sectional design limits causal interpretation and does not determine whether infant crying preceded maternal sleep disruption and depressive symptoms or whether maternal psychological distress influenced the perception and reporting of infant crying. The sample was recruited from healthcare facilities in a single urban region, which may limit generalizability to rural populations, mothers not attending clinical services, or families with different socioeconomic and support structures. The use of self-reported measures may introduce recall bias, particularly for infant crying duration and sleep patterns. In addition, factors such as marital relationship quality, social support, paternal involvement, financial stress, breastfeeding difficulties, obstetric complications, and prior subclinical mood symptoms were not comprehensively modeled, although these variables may influence postpartum depressive symptoms and sleep quality.

Overall, the study provides locally relevant evidence that infant colic, maternal sleep disruption, and postpartum depressive symptoms are closely interrelated among first-time mothers. The findings indicate that mothers caring for infants with colic experience a greater burden of sleep disturbance and depressive symptoms than mothers of infants without colic. Clinically, these results support a more integrated approach to postpartum care in which infant crying complaints prompt attention not only to infant well-being but also to maternal sleep quality and emotional health. Early recognition of maternal distress in the context of infant colic may help reduce psychological burden, strengthen mother-infant functioning, and improve postpartum outcomes.

## CONCLUSION

Infant colic was significantly associated with poorer maternal sleep quality and higher postpartum depressive symptom burden among first-time mothers in the Islamabad-Rawalpindi region. Mothers of infants with colic reported longer infant crying duration, higher PSQI scores, and higher EPDS scores than mothers of infants without colic, while correlation analysis showed that increasing infant crying duration was positively associated with both maternal sleep disruption and depressive symptom severity. The strong association between PSQI and EPDS scores further indicates that poor sleep quality is closely

linked with postpartum psychological distress in this population. These findings highlight the need for integrated postnatal and pediatric care approaches that assess maternal sleep and emotional well-being when mothers present with infant crying or colic-related concerns. Early identification of sleep disruption and depressive symptoms, combined with supportive counseling on infant soothing, shared caregiving, and maternal rest, may help reduce postpartum distress and improve maternal-infant health outcomes.

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