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Original Research Article

Stressful Experiences of Mothers of Neonates or Premature Infants in a Neonatal Intensive Care Unit

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Abstract

Introduction: When an infant is admitted to a neonatal intensive care unit (NICU), the parents experience psychological stress, primarily because of the NICU's culture and procedures. On the other hand, when the infant's condition is discussed openly and they are given permission to care for their child, they become calmed.

Objective: The study's goal is to evaluate mothers whose infants are admitted to the Neonatal Intensive Care Unit for psychological morbidity (NICU).

Methods: In the Neonatal Intensive Care Unit of the Katihar Medical College Hospital in Katihar, Bihar, India, a case control study with a sample size of 100 patients was done. The Edinburgh Postpartum Depression Scale (EPDS), State-Trait Anxiety Inventory (STAI), and PSS NICU [Parental Stressor Scale for Neonatal Intensive Care Unit] questionnaires were provided to study participants at the beginning of the 12-month period.

Results: According to the STAI-S, potential anxiety affected 23.0 percent of NICU mothers in our study, depression affected 46.0 percent of NICU mothers and stress affected 85.0 percent of NICU women, according to the PPSS-NICU.

Conclusion: A higher degree of maternal stress was substantially linked with the neonatal gestational age, birth weight, and length of NICU stay in NICU mothers ($P<0.05$). It was determined that there was no statistically significant difference in the State Trait Anxiety Inventory Score between mothers who did not have an anxiety condition and those who did ($p>0.05$).

Introduction

Preterm delivery is a significant public health concern that contributes significantly to global newborn mortality and morbidity. According to research, parents who experience a premature birth suffer post-traumatic stress symptoms for years on end

[1]. Mothers of newborns admitted to the NICU may become more anxious due to the surroundings there. Parental stress in NICUs is frequently ignored [2]. Infants are the primary focus of a lot of the care. Understanding the components of infants, parents, and the environment that can generate stress and quantifying parent stress levels may be helpful in supporting the medical staff in focusing on comprehensive family-centered care and enhancing quality of life [3]. The mother's psychological turmoil has a detrimental impact on the child's early development and academic performance as well as the relationships between parent and child. In addition to stressors related to the typical process of adjusting to parenting, NICU women suffer various stressors related to preterm birth, the baby's health, the complexity of the NICU environment, and the infant's perceived fragility [4, 5].

High levels of anxiety, despair, and hostility were found in a study of parents of neonates receiving care in NICUs, which also highlighted issues with the parents' psychosocial adjustment [5]. During hospitalisation, increased levels of anxiety symptoms are seen in about 50% of mothers of preterm newborns [6]. The contact between mothers and their infants can be negatively impacted by maternal worry, specifically mothers' capacity to develop an attachment to their child. The gender of the newborns and the length of their hospital stay were substantially correlated with maternal anxiety [7].

Mothers who experience postpartum depression (PPD) account for 15% of all cases. PPD prevalence ranges from 7 to 35 percent depending on the society and the screening method used. PPD has been shown to have long-term negative effects on children's health [8, 9]. A child's functioning in the cognitive, social, and developmental domains—including failure to thrive, poor physical and emotional/behavioral development—is negatively impacted by maternal depression [10, 11]. PPD and loss of confidence in nursing and child care have been linked in a small number of studies [12, 13, 14]. Breastfeeding is less likely to continue in depressed women. These relationships with urgent neonatal care have not been thoroughly investigated [15, 16]. It is challenging to determine when an intervention might begin in order to stop PPD's harmful effects on breastfeeding. There is enough data from industrialised nations to demonstrate that increased parent-infant engagement in the NICU leads to better newborn outcomes [17, 18]. Mother-infant separation also has a considerable detrimental influence on mother-infant bonding and causes mothers to experience high levels of psychological stress. By allowing parents to stay in the newborn unit, it may be possible to improve weight growth, speed up the start of breastfeeding and skin-to-skin care, decrease hospital stays, and perhaps even achieve better neurodevelopmental results [4, 8, 14]. Parents staying in the NICU from admission to discharge may shorten the overall length of stay for infants born prematurely, according to the Stockholm Neonatal Family-Centered Care Study, which compared outcomes of prematurely born infants assigned to family wards or standard NICU care (both level II units) [10, 17]. In a different study, at two months of corrected baby age, women in the Parent Empowerment programme reported much less stress in the NICU as well as less despair and anxiety compared to the control group.

The goal of this study is to compare the outcomes of these women with healthy term mothers by determining psychological morbidity, including depression and anxiety, in NICU mothers. The main goals of this study are to evaluate mothers' symptoms of anxiety, depression, and other psychological morbidities while they are in the hospital and after being discharged from the NICU, as well as to research and evaluate numerous perceived stressors in the NICU environment.

Methods

Study Design: The mothers of infants who were hospitalised to the NICU at the Katihar Medical College Hospital were the subjects of this case-control research. A mother who gave birth to a healthy full-term baby on the same day has been included as the control group for each pair of NICU infant mothers.

Study location: Neonatal Intensive Care Unit, Katihar Medical College Hospital, Katihar, Bihar, India.

Study Duration: 12 Months (01 January 2018 to 31 December 2018)

Sample Size: 100 patients

Inclusion Criteria: Mothers including preterm and term whose infants were admitted to the NICU were included.

Exclusion Criteria: Mothers with serious physical conditions that might have an impact on their psychological well-being as well as those who declined to provide written informed consent were excluded from the study.

Methodology

At one month after delivery, the study's participants completed a package of questionnaires that included the Beck Depression Inventory (BDI-II), the State-Trait Anxiety Inventory (STAI), the Edinburgh Postpartum Depression Scale (EPDS), and the Parental Stressor Scale for Neonatal Intensive Care Unit (PSS NICU). The questionnaire designed to fulfil the needs of the study was filled out via an interview. Physicians conducted all interviews in-person. All of the women in the study who consented to participate in this study, or their carers, were given instructions to complete the questionnaires on their own time and with no help from anyone else, reflecting only their own ideas and feelings. The doctor assisted caregivers who had trouble comprehending the processes and questionnaires by giving them additional instructions to ensure a reliable assessment. At one month after delivery, the mothers in the control and study groups underwent psychological testing.

Statistical Analysis

The database and graphics were made using Microsoft Excel, and the data was examined using SPSS version 23 for Windows, which is a statistical package for the social sciences. The information was displayed as means, standard deviations, and percentages. To find differences between two groups, the Student's t-test, Chi-square test, or Fisher's exact test were utilised. When the data were not normally distributed, nonparametric tests were applied. To assess the relationships between the overall EPDS scores and the STAI and other tool scales utilised in this work, Spearman's rho correlations were computed. The significance level was set at $P < 0.05$.

Results

Demographics profile

Only 18 (or 18.0 percent) of the patients have completed their college education, while the bulk of patients 43 (43.0 percent) were in the 22–25 age bracket and had only completed their primary education 44 (44.0 percent). The bulk of patients 50 (50%) came from rural areas, with the remaining patients (34%) and (16%) coming from semi-urban and metropolitan areas, respectively. The patients were primarily joint family members 63 (63.0 percent).

Table 1: Demographics profile of maternal details

Maternal Details		Frequency(n=100)	Percentage
Age	<= 21	7	7.0%
	22 – 25	43	43.0%
	26 – 30	33	33.0%
	>31	17	17.0%
Mean ± SD	**26.14 ± 4.49**		
Education	Primary	44	44.0%
	Secondary	38	38.0%
	College	18	18.0%
Residential Status	Rural	50	50.0%
	Semi Urban	34	34.0%
	Urban	16	16.0%
Family	Nuclear	37	37.0%
	Joint	63	63.0%

In the table below mostly 76 (76.0%) neonates were preterm, per vaginal were 63 (63.0%), breast feeding was 86 (86.0%), female newborns were 57 (57.0%), duration of stay 7-15 days NICU 52 (52.0%) and 69 (69.0%) were of low birth weight while very low birth weight were 17 (17.0%) studied patients.

Table 2: Neonatal details

Neonatal Details		Frequency(n=100)	Percentage
Gestation age (in Week)	<37 Weeks	76	76.0%
	≥37 Weeks	24	24.0%
Mean ± SD (in week)	**35.39 ± 1.53**		
Type of Feeding	Tube	14	14.0%
	Breast feeding	86	86.0%
Type of Delivery	Cesarean (C/S)	37	40.0%
	Per vaginal (P/V)	63	60.0%
Type of Condition	Medical	72	72.0%
	Observation	21	21.0%
	Surgical	7	7.0%
Sex of infant	Male	43	40.0%
	Female	57	60.0%
Birth weight	Normal (2.5 kg)	14	14.0%
	Low (<1.5-2.4kg)	69	69.0%
	Very Low (<1.5 kg)	17	17.0%
APGAR (at 5 min)	<8	17	17.0%
	8	65	65.0%
	>8	18	18.0%
Duration of NICU stay (in days)	7-15 Days	52	52.0%
	16-30 Days	37	37.0%
	>30 Days	11	11.0%

PSS: NICU and their accompanying parent stress score are shown in Table 3 of the table below. Mothers reported moderate levels of stress in the NICU environment, with the relationship with the baby and parental role receiving the highest scores (mean: 3.77), followed by the baby's appearance and behaviour (mean: 3.75) and the baby's sight and sound (mean: 2.97), where the median, minimum, and maximum values were also discovered.

Table 3: Postpartum Specific Anxiety Scale

Sub Scale	Mean±SD	Median	Min	Max
PPSS NICU-Sight & Sound	2.97±0.52	2.80	2.2	4.4
PSS NICU- Looks and Behaviour	3.75±0.47	4.0	3.0	4.5
PSS-NICU-Parental role	3.77±0.55	4.0	2.1	4.4
Total	3.49±0.04			

Following table shows comparison of State Trait Anxiety Inventory Score with Neonatal profile between non-Anxiety and Anxiety disorder and the association were non-significant (p>0.05).

Table 4: STAI Comparison with Neonatal profile

Neonatal	Groups	Frequency (n=100)	State Trait Anxiety Inventory Score		P-Value	Remarks
			Non- Anxiety (<40)	Anxiety (>40)		
Gestational Age	**< 37 Weeks**	76	57 (57.0%)	19 (19.0%)	>0.05	**Non-Significant**
	≥37 Weeks	24	20 (20.0%)	4(4.0%)		
Feeding	**Tube**	14	8 (8.0%)	6 (6.0%)	>0.05	**Non-Significant**
	Breast feeding	86	69 (69.0%)	17 (17.0%)		
Delivery	**Cesarean (C/S)**	37	29 (29.0%)	8 (8.0%)	>0.05	**Non-Significant**
	Per vaginal (P/V)	63	48 (48.0%)	15 (15.0%)		
Condition	**Medical**	72	54 (54.0%)	18 (18.0%)	>0.05	**Non-Significant**
	Observation	21	16 (16.0%)	5 (5.0%)		
	Surgical	7	7 (7.0%)	0 (0.0%)		
Sex of Infant	**Male**	43	33 (33.0%)	10 (10.0%)	>0.05	**Non-Significant**
	Female	57	44 (44.0%)	13 (13.0%)		
Birth weight	**Normal (2.5kg)**	20	17 (17.0%)	3 (3.0%)	>0.05	**Non-Significant**
	Low (1.5-2.4kg)	63	47 (47.0%)	16 (16.0%)		
	Very Low (<1.5kg)	17	13 (13.0%)	4 (4.0%)		
APGAR	**<8**	17	13 (13.0%)	4 (4.0%)	>0.05	**Non-Significant**
	8	65	48 (48.0%)	17 (17.0%)		
	>8	18	16 (16.0%)	2 (2.0%)		
Duration	**7-15 Days**	52	38 (38.0%)	14 (14.0%)	>0.05	**Non-Significant**
	16-30 Days	37	30 (30.0%)	7 (7.0%)		
	>30 Days	11	9 (9.0%)	2 (2.0%)		

Following table shows the comparison of Edinburgh Postnatal Depression Scale with neonatal profile between non-Anxiety and Anxiety disorder and the association was found to be insignificant (p>0.05).

Table 5: EPDS Comparison with Neonatal profile

Neonatal	Groups	Frequency (n=100)	Edinburgh Postnatal Depression Scale		P-Value	Remark
			Non-Depression (<13)	Depression (>13)		
Gestational Age	< 37 Weeks	76	38 (38.0%)	38 (38.0%)	>0.05	Non-Significant
	≥37 Weeks	24	16 (16.0%)	8 (8 .0%)		
Feeding	Tube	14	5 (5.0%)	9 (9.0%)	>0.05	Non-Significant
	Breast feeding	86	49 (49.0%)	37 (37.0%)		
Delivery	Cesarean (C/S)	37	19 (19.0%)	18 (18.0%)	>0.05	Non-Significant
	Per vaginal (P/V)	63	35 (35.0%)	28 (28.0%)		
Condition	Medical	72	43 (43.0%)	29 (29.0%)	>0.05	Non-Significant
	Observation	21	9 (9.0%)	12 (12.0%)		
	Surgical	7	2 (2.0%)	5 (5.0%)		
Sex Of Infant	Male	43	23 (23.0%)	20 (20.0%)	>0.05	Non-Significant
	Female	57	31 (31.0%)	26 (26.0%)		
Birth weight	Normal (2.5kg)	20	10 (10.0%)	10 (10.0%)	>0.05	Non-Significant
	Low (1.52.4kg)	63	35 (35.0%)	28 (28.0%)		
	Very Low (<1.5kg)	17	9 (9.0%)	8 (8.0%)		
APGAR	<8	17	8 (8.0%)	9 (9.0%)	>0.05	Non-Significant
	8	65	35 (35.0%)	30 (3.0%)		
	>8	18	11(11.0 %)	7 (7.0%)		
Duration	7-15 Days	52	33 (33.0%)	19 (19.0%)	>0.05	Non-Significant
	16-30 Days	37	18 (8.0%)	19 (19.0%)		
	>30 Days	11	3 (3.0%)	8 (8.0%)		

Discussion

The goal of the current study was to evaluate the psychological morbidity among mothers whose infants were admitted to the Neonatal Intensive Care Unit. It was a descriptive cross-sectional study. In their own investigations, Mukherjee A et al [19], Agrawal R [20], and Magliyah AF [21] also used a similar methodology.

Moretta P et al. [22] undertook a small number of cohort studies on this subject to examine the long-term effects of hospitalisation on psychiatric morbidity in mothers of newborns admitted to neonatal intensive care units (NICU). In our situation, it was impossible because the study was so brief. The Edinburgh Postpartum Depression Scale (EPDS) is frequently used to assess postpartum depression (PPD) in the care of puerperal

patients, according to Schardosim Juliana Machado et al [23] in their comprehensive review of postpartum depression (PPD) screening tools. For appropriate measurement of mother depression scores, the Edinburgh Postnatal Depression Scale (EPDS) is also employed in a similar prospective European multicenter trial. The Edinburgh postpartum depression scale (EDPS), State Trait Anxiety Inventory (STAI), and Parental stressor scale for neonatal intensive care unit have also been utilised by Ziya Yurdakul et al. [24]. (PSS NICU). The measure focuses on certain postpartum depression symptoms. The measure has been shown to have good postpartum sensitivity and specificity in the UK. This technique was also used by Ziya Yurdakul et al [24] and Margaret E et al [25] to assess the severity of anxiety symptoms. According to Laura J. Julian [26], who evaluated anxiety measurement techniques, some patient populations require the use of larger-scale tools for identifying a variety of signs of psychological distress. Parental stressor scale for neonatal intensive care unit (PSS NICU), a cross-sectional study of the parental stress in the neonatal ICU, has been validated by Varghese M et al [27]. According to the STAI-S, potential anxiety affected 23.0% of NICU mothers in our study, depression affected 46.0% of NICU women, stress affected 85.0%, and mild, moderate, and severe depression affected 32.0%, 23.0%, and 11.0% of NICU mothers, respectively, according to the BDI-II.

According to the research, the prevalence of PPD is between 10 and 15 percent, and among pregnant women it is between 10 and 15 percent for various anxiety disorders. According to a research by Carter JD et al [28], 22% of NICU mothers may have had depression based on the EPDS. According to the EPDS study by Ziya Yurdakul et al. [24], 29.5% of NICU mothers may have had depression. According to a research by Vigod et al. [29], mothers of premature infants have a 40% higher risk of developing PPD. In a review of the literature, Mounts KO [30] notes that mothers with infants admitted to the NICU have consistently higher rates of PPD, ranging from 28 percent to 70 percent. According to Carter et al. [31], parents of infants in the NICU experienced more anxiety than parents of healthy babies. Higher anxiety scores and an unsecure attachment style were also discovered in the NICU mothers by Ziya Yurdakul et al. [24]. Experience with neonatal intensive care is a key cause of relationship discontinuity between a mother and child.

In our study, neonatal gestational age, birth weight, and length of stay in the NICU were substantially (P 0.05) linked with higher levels of maternal stress in NICU mothers, but other characteristics were not significantly associated (P > 0.05). As anticipated, the mothers' stress response was substantially correlated with how serious they thought the baby's sickness was. It was important to have quick equipment to screen mothers because a previous study by Amin AA et al [32] had revealed a high patient to nurse ratio in Gujarat. The maternal stress reaction was highly correlated with other situational factors, such as the baby's exceptionally low birth weight (1000 g) and the requirement for ventilator support. Mothers of very low birth weight (VLBW) newborns experienced more psychological distress one month after delivery than mothers of term infants, according to Singer et al. A monitoring of mothers of high-risk VLBW infants was also suggested, along with the inclusion of psychiatric assessment and support services for mothers of VLBW infants in the immediate postnatal period. According to Davis L et al [34], a lack of social support, or the perception of a lack of support, is one of the biggest predictors of postpartum depression among mothers of preterm and low birth weight infants. Lack of social support, along with self-esteem and relationship intimacy, were important predictors of depression among mothers of preterm infants, according to Logsdon MC

and Usui W [35]. According to Gonulal D et al [36], mothers of high-risk infants may experience sadness as a result of their stay in the NICU. The mothers' Edinburgh depression scores were positively linked with the infants' illness severity upon NICU admission.

In the current study, the association between State Trait Anxiety Inventory Score and maternal demographic characteristics and neonatal characteristics between non-anxiety and anxiety disorders was shown to be statistically insignificant ($p>0.05$). Prematurity was linked to postnatal depression scores on the Hospital Anxiety and Depression Scale in mothers, according to Carter JD et al. [31]. When their newborns had lower birth weights and younger gestational ages at birth, women's anxiety increased significantly, according to a study by Zelkowitz, P. et al. [37]. Researchers discovered that a woman's anxiety was positively correlated with her education level, marital status, place of origin, social support, and marital relationship quality. [38]

Limitations

This straightforward focused study included 100 participants. A more comprehensive multicenter research would have been more representative of NICU patients in general. We also failed to take into account a number of variables that might be included in the parental NICU stress model, including uncertainty about the prognosis, concurrent life events, cognitive and financial resources, perceptions of staff support, etc. Additionally, in contrast to earlier studies, our interviews took place at various stages of the investigation. Additionally, significant psychiatric problems were not formally examined in mothers.

Conclusion

In the current study, we investigated the demographic profiles of the patients who were enrolled, and we found that (43%) most of the mothers were in the 22–25 age range and had primarily completed primary education (44 percent). Regarding neonatal facts, 76 (76.0%) of the newborns were preterm, 57 (57.0%) of the babies were female, and 69 (69.0%) had low birth weights. PSS: NICUs were represented, along with the appropriate parent stress score. The NICU environment was moderately stressful for mothers. The relationship with the baby and parental role category received the highest score from mothers (mean = 3.77), followed by the baby's appearance and behaviour category (mean = 3.75) and the baby's sight and sound category (mean = 2.97) for baby behaviour. Maternal stress levels were evaluated in relation to sociodemographic variables, and a link with family age and work status was shown to be statistically significant ($p<0.05$). A higher degree of maternal stress was substantially linked with the neonatal gestational age, birth weight, and length of NICU stay in NICU mothers (P0.05). It was determined that there was no statistically significant difference in the State Trait Anxiety Inventory Score between mothers who did not have an anxiety condition and those who did ($p>0.05$). Therefore, it can be stated that all types of psychiatric morbidity scores showed considerable improvement one month after discharge, indicating that more patients had returned to normal ranges following treatment. This correlation was also determined to be statistically significant ($P<0.05$).

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