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Original Research Article

Parental Stresses of Newborns Hospitalized in a Neonatal Intensive Care Unit in a Teaching Hospital of Nepal

Pramila Mahato[1], Chandani Malla[2], Sabita Rai[3], Richa Singh[4], Jafre Alam Ansari[5]

[1]Lecturer, Department of Child Health Nursing, National Medical College Teaching Hospital, Birgunj, Nepal.
[2]Associate Professor, Department of Child Health Nursing, National Medical College Teaching Hospital, Birgunj, Nepal.
[3]Associate Professor, Department of Obstetrical and Gynecological Nursing, National Medical College Teaching Hospital, Birgunj, Nepal.
[4]Associate Professor, Department of Community Health Nursing, National Medical College Teaching Hospital, Birgunj, Nepal.
[5]Lecturer, Department of Community Health Nursing, National Medical College Teaching Hospital, Birgunj, Nepal.

Corresponding Author: Pramila Mahato

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ABSTRACT

Introduction: The birth of a child is a joyful event; however, admission of a neonate to the NICU is often traumatic for parents. The unfamiliar environment, critical care setting, and use of complex medical equipment disrupt parents' expectations and contribute to emotional distress. Parental stress is frequently overlooked, as care primarily focuses on the infant's survival and treatment. The objective of the study was to examine the parental stress of newborns hospitalized in a neonatal intensive care unit.
Methods: Stress levels were assessed using the Parental Stressor Scale: Neonatal Intensive Care Unit (PSS: NICU) questionnaire among 107 parents of newborns admitted to the NICU through face-to-face interviews. Sampling was done by the purposive sampling method. Data was analyzed using Statistical Package for the Social Sciences version 16. Categorical variables were presented as frequencies and percentages, while numerical variables were expressed as mean and standard deviations. An independent sample t-test was used to examine mean stress scores with selected demographic variables.
Results: The total stress score, which indicates the degree of parental stress experienced, was 3.14±0.58, whereas the mean scores for the subscales sights and sounds, baby looks and behaves, and relationship with the baby and parental role were 2.78±1.04, 2.96±0.75 & 3.76±0.63, respectively. Parental stress scores were higher in the nuclear family (3.26±0.56, p-value=0.015) compared to the joint family (3.05±0.58) and among those with a monthly income above twenty thousand (3.25±0.55, p-value=0.002) compared to those earning less than twenty thousand per month (2.88±0.58).
Conclusions: Parents experience more stress when their newborns are admitted to NICU; appropriate support and counseling are required to reduce the stress.

Keywords: Parents, Stress, Neonatal Intensive Care Unit (NICU), PSS: NICU

INTRODUCTION

The neonatal period is the most critical phase for child survival, carrying the highest risk of death, with a neonatal mortality of 21 per 1000 live births in 2022 highlights the critical role in NICU. [1] NICU, being a critical care unit and an unforeseen scenario, is full of overwhelming stimuli, which intensifies the emotional, psychological, and financial burden on parents of neonates admitted to NICUs. [2] Despite the availability of subsidized care in government facilities, systemic challenges such as limited access, inadequate communication, and minimal parental involvement exacerbate parental stress, underscoring the urgent need for family-centered NICU care and strengthened neonatal health services. [3]

After a newborn is admitted to the NICU, the primary focus of care is often on the infant's survival and medical management, leading to the emotional needs of parents being largely overlooked. The significant physical burden and emotional distress experienced by parents during this period frequently remain unrecognized and insufficiently addressed. [4] Family-centered care is one strategy to assist the parents, lessen their stress, and improve the infant's growth. [5]

The study demonstrated that there was no difference in stress between father and mother. [6] However, some studies reported that mothers have the highest stress level as compared to fathers. [7- 9] However, both parents have deep concerns over the survivability and outcome of their baby. Depression, fear, and anxiety stay with parents throughout the hospitalization. [10] Research suggests parents' responses are not limited to the period of hospitalization and that the NICU experience is associated with disorders such as acute stress disorder and posttraumatic stress disorder (PTSD). [11]

Gaining greater insight into how parents of hospitalized high-risk infants perceive the NICU environment, along with a better understanding of their needs, can help NICU staff identify parents who are vulnerable to stress and design targeted interventions to support them and enhance family functioning. Accordingly, this study was conducted to assess the level of parental stress among newborns hospitalized in the NICU.

MATERIALS & METHODS

A descriptive cross-sectional study was conducted among parents of newborns admitted to the NICU at the National Medical College Teaching Hospital (NMCTH), Birgunj, from January to July 2024. NMCTH is a super-specialty hospital situated in the south-eastern part of Nepal, with twenty-five beds in the NICU. A total of 107 parents of neonates admitted to the NICU were selected through a non-probability purposive sampling technique who met the eligibility criteria. Neonates parents staying in the NICU for more than three days and less than fourteen days, and who at least visited the NICU three times were included in the study.

A standard scale, the Parental Stress Scale: Neonatal Intensive Care Unit (PSS: NICU), which was developed by Dr. Margaret S. Miles in 1993, was used to measure parental stress. [12] The questionnaire consisted of two parts; the first part of the questionnaire was used to measure the parent-neonate demographic profile and involved age, sex, education qualification, occupation, religion, type of family, monthly income, previous experience of hospitalization of newborn, mode of delivery, sex of neonate, position of neonate, gestational age of neonate, birth weight of neonate, & length of hospital stay in days of neonate. The second part of the questionnaire was the PSS: NICU scale, which focuses on 3 subscales: a) Sights and Sounds (5 items), b) Infant Behavior and Appearance (14 items), c) Parental Role Alterations (7 items). The Cronbach alpha value was 0.7, indicating acceptable internal consistency. [12] Parents were instructed to evaluate how stressful each item on the PSS: NICU was, using a five-point Likert scale ranging from 1 (not at all stressful) to 5 (extremely stressful). An additional "not applicable (N/A) response was provided and was assigned a score of 0. Stress level was categorized as low (≤3) and high (>3), in accordance with the levels used in a prior study. [13]

Ethical approval was obtained from the Institutional Review Committee of National Medical College to conduct the study (Reference number: F-NMC/673/080-081). Informed written consent was obtained from each parent before initiating the study. Confidentiality and anonymity were ensured for all participants, and the participation was entirely voluntary. Data were gathered through face-to-face interviews with parents in the NICU waiting area. Each interview lasted approximately one hour for each parent. The researcher recorded the participant's response on the questionnaire, and all the questionnaires were reviewed for completeness and accuracy before the data were finalized.

Statistical Analysis

The collected data were entered into SPSS version 16 and cleaned before statistical analysis. Categorical variables were presented as frequencies and percentages, and numerical variables were presented as mean and standard deviations. An independent sample t-test was used to assess differences in mean stress scores across selected demographic variables, with a p-value of less than 0.05 considered statistically significant.

RESULT

Of 107 respondents, the mean age of parents was 25.91 ± 5.15 years, with 69.2% female. Around 40.2% had basic education, 63.6% were economically inactive, and 75.7% were of the Hindu religion. Most (58.9%) lived in joint families, 69.2% had a monthly income above twenty thousand, and 76.6% had no prior experience of newborn hospitalization. Vaginal delivery accounted for 67.3% of births. (Table 1)

Table 1: **Socio-demographic characteristics of respondents. (n=107)**

Characteristics	Category	Frequency	Percentage
Age in years	≤25 years	54	50.5
	>25 years	53	49.5
Mean±SD	25.91±5.15		
Sex	Male	33	30.8
	Female	74	69.2
Education qualification	Illiterate	29	27.1
	Basic education	43	40.2
	Secondary education	18	16.8
	Higher education	17	15.9
Occupation	Economically active	39	36.4
	Economically inactive	68	63.6
Religion	Hindu	81	75.7
	Muslim	26	24.3
Type of family	Nuclear	44	41.1
	Joint	63	58.9
Monthly income	≤20000	33	30.8
	>20000	74	69.2
Previous experience of hospitalizing their newborn	Yes	25	23.4
	No	82	76.6
Mode of delivery	Vaginal	72	67.3
	Cesarean section	35	32.7

SD: standard deviation

Among the distribution of infant characteristics, the majority (72.0%) of neonates were male. About 42.1% were of birth order one. The majority were term infants (74.8%) and had a birth weight ≥2500 g (72.9%). The mean hospital stay was 5.79 ± 2.73 days. (Table 2)

Table 2: **Socio-demographic characteristics of the neonate. (n=107)**

Characteristics	Category	Frequency	Percentage
Sex of neonate	Male	77	72.0
	Female	30	28.0
Position of the neonate	First	45	42.1
	Second	34	31.8
	Third & above	28	26.2
Gestational age	Preterm	27	25.2
	Term	80	74.8
Birth weight of the neonate in kilograms	<2500	29	27.1
	≥2500	78	72.9
Length of hospital stay in days	<7	72	67.3
	≥7	35	32.7
Mean±SD	5.79±2.73		

SD: standard deviation

As presented in Table 3, more than half of the respondents (58.9%) experienced a high level of stress related to their newborn's hospitalization in the NICU.

Table 3: Level of parental stress of newborns hospitalized in NICU. (n=107)

Variable	Category	Frequency	Percentage
Level of parental stress	High (>3)	63	58.9
	Low (≤3)	44	41.1

The overall parental mean stress score was 3.14 ± 0.58. The highest parental stress was related to the relationship with the baby and parental role, followed by the baby's looks and behaves, while sights and sounds caused the least stress. (Table 4)

Table 4: **Parent stress scale: NICU subscale and total mean score. (n=107)**

Parental stressor subscale	Overall stress score
	Mean score ± SD
Sights and sounds	2.78±1.04
Baby looks and behaves	2.96±0.75
Relationship with the baby and parental role	3.76±0.63
Total parental stress score	3.14±0.58

SD: standard deviation

Data presented in tables 5 and 6 showed that there was a significant difference in parental stress between nuclear family (3.26±0.56) and joint family (3.05±0.58) [p≤ 0.05 with 95% confidence interval (-0.01614, 0.43548)] and among those with a monthly income above twenty thousand (3.25±0.55) and those earning less than twenty thousand per month (2.88±0.58) [p≤ 0.05 with 95% confidence interval (-0.59967, -0.13173)].

Table 5: Mean stress score by parents' demographic variables. (n=107)

Variables	Category	Stress Score	95% CI of mean differences		P-value*
		Mean±SD	**Lower**	**Upper**	
Age in years	≤25 years	3.18±0.61	-0.13046	0.31964	0.407
	>25 years	3.09±0.56			
Sex	Male	3.18±0.50	-0.18087	0.30739	0.608
	Female	3.12±0.62			
Occupation	Economically active	3.10±0.58	-0.28908	0.17956	0.644
	Economically inactive	3.16±0.59			

Religion	Hindu	3.15±0.61	-0.19353	0.33222	0.602
	Muslim	3.08±0.51			
Type of family	Nuclear	3.26±0.56	-0.01614	0.43548	**0.015**
	Joint	3.05±0.58			
Monthly income	≤20000	2.88±0.58	-0.59967	-0.13173	**0.002**
	>20000	3.25±0.55			
Previous experience of hospitalizing their newborn	Yes	3.10±0.53	-0.22519	0.30814	0.199
	No	3.14±0.60			
Mode of delivery	Vaginal	3.08±0.56	-0.39429	0.08318	0.758
	Cesarean section	3.24±0.61			

SD: Standard deviation; *Independent sample t-test; * p significant ≤ 0.05 level of significance; CI: Confidence interval

Table 6: Mean stress score by neonates' demographic variables. (n=107)

Variables	**Category**	**Stress Score Mean±SD**	**95% CI of mean differences**		**P-value***
			Lower	**Upper**	
Sex of neonate	Male	3.17±0.54	-0.12200	0.37820	0.312
	Female	3.04±0.68			
Gestational age	Preterm	3.23±0.64	-0.38385	0.13370	0.340
	Term	3.10±0.56			
Birth weight of the neonate in kilograms	<2500	3.20±0.63	-0.33600	0.17095	0.520
	≥2500	3.11±0.56			
Length of hospital stay in days	<7	3.13±0.61	-0.25265	0.22858	0.921
	≥7	3.14±0.52			

SD: Standard deviation; *Independent sample t-test; * p significant ≤ 0.05 level of significance; CI: Confidence interval

DISCUSSION

Overall, the findings of the study revealed that the admission of the neonate to a NICU is stressful for parents (mean = 3.14 ± 0.58) [6, 10, 11, 14], which was consistent with findings from studies conducted in the United States, India, and Nepal. Regarding different subscales of stress measured by PSS: NICU, the results of this study were in line with those of previous studies [2, 10, 11, 14-16, 18, 19], which indicate that the most stressful aspect of having a newborn admitted to the NICU is the relationship with the baby and the parental role for parents. Stated, the critical care environment makes it hard for parents to perform their parenting roles. This is due to a highly technical setting, strict routines, medical equipment, and the infant's fragile condition, which often limits parental involvement in basic caregiving activities such as feeding, holding, and comforting their baby.

The second most affected subscale concerned how the baby looked and behaved. These findings were consistent with studies [2, 11, 14-16]; however, they differed from those of [3, 20], which reported that the highest level of parental stress was associated with the subscale "baby looked and behaved". In contrast, the study [6, 17, 18], showed that the baby looked and behaved subscale was associated with the lowest level of stress in parents. This may be due to the limited interaction during visiting hours, which was insufficient for parents to develop a bond and closely observe the baby's behavior.

The least stress subscale for parents in this study is sights and sounds; similar findings are reflected in other studies [3, 10, 11, 14, 15, 19, 20], which is in contrast with the study done in India, which identified this subscale as the most significant source of stress. [6] The lower stress levels may be explained by parents perceiving the environment as essential for sustaining their baby's life. Additionally, in this technological era, parents tend to adjust to the NICU setting as an integral part of their infant's overall care. Although this subscale was less stressful compared to the relationship with the baby and the parental role, it remains an important contributor to overall stress.

A statistically significant difference in parental stress levels was found between parents from nuclear families and those from joint families ($p<0.05$); this could be because nuclear families might have less support in caring for a hospitalized newborn. Also, a significant difference in parental stress levels was found between parents with a monthly income above twenty thousand and those earning less than twenty thousand ($p<0.05$); this may seem counterintuitive, but it could reflect higher expectations and responsibilities in higher-income families. These findings contradict the study [14], where a significant difference in parental stress levels was found between planned and unplanned pregnancy, vaginal and caesarean section delivery, and preterm and term neonates.

The findings of this study should be interpreted in light of its limitations. A non-probability purposive sampling method was employed, and the study was confined to a single hospital within one geographic area, which restricts the generalizability of the results. Additional studies in varied settings are recommended to design more comprehensive stress-reduction interventions for parents of newborns admitted to the NICU. Also, the variation in the timing of tool administration was a limitation of this study, as different neonatal health outcomes may occur at specific stages during the NICU stay.

CONCLUSION

The study findings reveal that admission of neonates to the NICU is a significant source of stress for parents. The highest levels of stress were related to the relationship with the baby and the parental role. Therefore, health professionals in NICU should encourage and facilitate active parental involvement in the care and nurturing of their newborns. Additionally, providing adequate counseling and clear information about the neonate's condition and treatment plan can help to reduce parental stress.

Declaration by Authors

Ethical Approval: The study was approved by Institutional Review Committee of National Medical College.

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