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FACTORS INFLUENCING PARENTAL SATISFACTION WITH NEONATAL INTENSIVE CARE UNIT SERVICES IN A TERTIARY CARE HOSPITAL IN NEPAL

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ABSTRACT

Background: Neonatal intensive care units (NICUs) are units that are specifically designed for premature and very ill newborns with different diagnoses. Measuring patient satisfaction has become an integral part of hospital management strategies for quality assurance and accreditation processes in most countries. Therefore, the aim of this study **was** to assess the level of parent satisfaction and factors that influence NICU services.

Methods: A cross-sectional descriptive study was conducted among 400 parents of hospitalized neonates using the purposive sampling technique to select the sample. Satisfaction levels were assessed using the Neonatal Intensive Care Parent Satisfaction Instrument (EMPATHIC-38-NICU) questionnaire through face-to-face interviews. Categorical data were summarized using frequencies and percentages, whereas continuous data were described using means and standard deviations. Binary logistic regression analysis was employed to analyze the data in SPSS version 23.

Results: The overall parental satisfaction rate was 54.5%. Parental age (AOR = 5.81; 95% CI: 1.88-17.90; p = 0.002), parental sex (AOR = 39.28; 95% CI: 10.76-143.36; p = 0.000), a history of previous hospitalization (AOR = 401.53; 95% CI: 78.04-2065.92; p = 0.000), and duration of hospital stay (AOR = 0.042; 95% CI: 0.01-0.11; p = 0.000) were factors affecting overall parental satisfaction.

Conclusion: More than half of the participants were satisfied with the NICU services and were significantly influenced by multiple factors, providing critical insights for health care professionals and hospital administrators to optimize NICU care quality and enhance parental satisfaction.

Keywords: Neonatal Intensive Care Unit (NICU), Parents, Satisfaction, Services

1 INTRODUCTION

Neonatal Intensive Care Units (NICUs) are areas where preterm and sick newborn babies requiring intensive medical care and treatment are admitted, which offer sophisticated equipment and specialized newborn care services [1]. The newborn baby stays for days, weeks, or possibly longer, depending on the gestational age and health condition. Being admitted to a NICU is a traumatic event for parents. They may be overwhelmed by a critical health condition, an unforeseen scenario, and the unfamiliar environment of a NICU [2]. Parents need time, proper information, psychological support, and encouragement to cope with the difficult situation [3].

Satisfaction is an attitude and belief regarding a particular service that an organization provides. Parental satisfaction with care is an effective parameter in improving neonatal care quality and identifying areas that need improvement. Assessing parent experiences and satisfaction in neonatal intensive care units (NICUs) is essential for evaluating clinical procedures and improving the care given to both infants and parents [4-6]. Parental involvement is important in the delivery of high-quality care to newborns. However, parental participation is not always possible, so effective communication, treatment skills, environmental conditions, and emotional support from the health care professional will improve parental satisfaction [7].

Parental satisfaction was found to improve when collaboration with professionals improves [8]. Maternal involvement in newborn care and contact increases maternal confidence in taking care of the newborn after discharge, and consequently leads to maternal satisfaction [9]. Low parental satisfaction may result in discharge against medical advice, increased neonatal readmission, morbidity, and mortality [10]. Issues like inadequate communication, disrespectful and impolite behavior from the medical staff, inability to see their child, restrictions on family and siblings' visits, the physical setting of the hospital, the cost of care, and the accessibility of supplies and equipment were all known to have an impact on parental satisfaction [11,12].

Parental engagement and satisfaction are important factors for pediatric inpatient care, as they help parents better understand their health conditions and improve adherence to the treatment plan. Parent satisfaction was measured as 55% in Ethiopia, 69% in India, and moderate satisfaction in Nepal, with a median score of 3.4 [13-15]. Parent satisfaction with NICU services relates to maternal socio-demographics, provider communication and accessibility, laboratory procedures, availability of prescribed drugs and medications from the hospital pharmacy, cleanliness of toilets and bathrooms, and availability of drinking water [16].

The issues of parental satisfaction and the quality of neonatal care are less recognized in developing countries like Nepal, making less information available. It is important to identify the factors that influence parental satisfaction with Neonatal Care Unit services in order to identify the gaps related to satisfaction of the parents in NICUs. Therefore, the aim of this study **was** to assess the factors influencing parent satisfaction with the neonatal intensive care services in Nepal.

2 METHODS

We conducted a descriptive cross-sectional study among parents of newborns admitted to the NICU at the National Medical College Teaching Hospital (NMCTH), Birgunj, from February 2025 to February 2026. NMCTH is a specialized tertiary-care hospital in southeastern Nepal with twenty-five beds in the NICU. We selected 400 parents of neonates admitted to the NICU using nonprobability purposive sampling, and all participants met the eligibility criteria. The study included parents of hospitalized neonates who had an inpatient length of stay of at least two days and not more than twenty-eight days in the NICU, newborns weighing over 1500 grams with a gestational age greater than 30 weeks, and those who were willing to participate and provided informed written consent.

The questionnaire consisted of two parts; the first part of the questionnaire was used to measure the parent-neonate demographic information and involved age, sex, ethnicity, religion, educational qualification, occupation, type of family, mode of delivery, parity, history of previous hospitalization, sex of neonate, gestational age of neonate, birth weight of neonate in grams, and duration of hospital stay in the NICU in days.

The second part consisted of a standard questionnaire to measure parental satisfaction with care in Neonatal Intensive Care Units: The Empowerment of Parents in The Intensive Care-Neonatal Intensive Care Unit-38 (EMPATHIC-NICU-38), which was developed by Lake ET, Smith JG, Staiger DO, Schownauer KM, and Rogowski JA in 2020 [17]. The tool comprised 38 items, categorized into five domains: Information (5 items), Care and treatment (12 items), Organization (5 items), Parental participation (8 items), and Professional attitude (8 items). Responses to 38 items were ordinal on a six-point Likert scale, where 1 indicates "certainly NO" and 6 indicates "certainly YES". An additional "not applicable"

(N/A) response was provided and was assigned a score of 0. The overall mean score was used as the cut-off point to determine the level of parental satisfaction. Participants with scores equal to or above the mean were categorized as having high satisfaction, whereas those scoring below the mean were classified as having low satisfaction with NICU services [18]. The tool was evaluated by pediatric nursing faculty and research experts. It was translated from English into Nepali and Bhojpuri, followed by back-translation into English to ensure accuracy and consistency, and the Bhojpuri version of the satisfaction tool was pretested before use. The Cronbach alpha value was 0.9, indicating acceptable internal consistency. Permission to use the tool was obtained from Eileen T. Lake via email.

Ethical clearance was obtained from the Institutional Review Committee of National Medical College (IRC-NMC) with the reference number: F-NMC/706/080-081, and written formal permission was obtained from the concerned authority. Informed written consent was obtained from each parent by introducing and clarifying the purpose of the study before data collection. Participants' autonomy and dignity were respected by ensuring their right to withdraw from the study at any time without any consequences. Participant's confidentiality was protected through the use of unique identification codes for each completed questionnaire. Voluntary participation was ensured, and collected information was used exclusively for research purposes. Data were collected through face-to-face interviews with parents in the NICU counselling room, which took about 25-30 minutes. The researcher documented the participants' responses on the questionnaire, which were reviewed for completeness and accuracy before finalizing the data.

The collected data were entered into Microsoft Excel 2013. The analysis was done using statistical software SPSS (Statistical Package for Social Science) version 23.0. Categorical data were summarized using frequencies and percentages, whereas continuous data were described using means and standard deviations. A p-value of ≤ 0.05 was considered statistically significant, with a 95% confidence interval. Odds ratios with 95% confidence intervals were calculated during bivariate and multivariate analysis. Multivariate analysis was carried out for those variables that were significant at the 95% confidence level through binary logistic regression and were adjusted for potential confounding factors.

3 RESULTS

Table 1: Socio-demographic information of respondents (n=400)

Variables	Category	Frequency	Percentage
Age (in completed years) Mean±SD	≤25 years	181	45.3
	>25 years	219	54.8
	27.58±6.29		
Sex	Male	149	37.3
	Female	251	62.8
Ethnicity	Brahmin/ Chhetri	41	10.3
	Janajati	46	11.5
	Madhesi	224	56.0
	Muslim	89	22.3
Religion	Hinduism	313	78.3
	Islam	87	21.8
Educational qualification	Illiterate	110	27.5
	Basic education	205	51.3
	Secondary education	56	14.0
	Higher & above	29	7.3
Occupation	Agriculture	75	18.8
	Business	62	15.5
	Household	199	49.8
	Service holder	15	3.8

	Daily wages earner	23	5.8
	Others*	26	6.5
Type of family	Nuclear	121	30.3
	Joint	279	69.8
Mode of delivery	Vaginal	230	57.5
	Caesarean section	170	42.5
Parity	Primiparous	159	39.8
	Multiparous	241	60.3
History of previous hospitalization	Yes	141	35.3
	No	259	64.8

SD: Standard Deviation *:migrant employees, entrepreneurship

Table 1 depicts the socio-demographic information of respondents. Of 400 respondents, the mean age of parents was 27.58±6.29 years, and females accounted for 62.8% of the respondents. More than half (56.0%) belonged to the Madhesi ethnic group, while the most (78.3%) followed the Hindu religion. Approximately 51.3% had a basic education, and nearly half (49.8%) were engaged in household activities. The majority (69.8%) lived in joint families, 57.5% had undergone vaginal delivery, 60.3% were multiparous, and 64.8% had no prior experience of newborn hospitalization.

Table 2: Socio-demographic information of the neonate (n=400)

Variables	Category	Frequency	Percentage
Sex of neonate	Male	241	60.3
	Female	159	39.8
Gestational age	Preterm	119	29.8
	Term	281	70.3
Birth weight of the neonate in grams Mean±SD	<2500	115	28.8
	≥2500	285	71.3
	2.7±0.55		
Duration of hospital stay in the NICU in days Mean±SD	≤7	165	41.3
	>7	235	58.8
	8.45±5.04		

SD: standard deviation

Table 2 demonstrates the information related to neonate characteristics. The majority (60.3%) were male, while 70.3% were born at term and had a birth weight of 2,500 grams or above (71.3%). The average duration of hospital stay was 8.45±5.04 days.

Table 3: Level of parental satisfaction with NICU services (n=400)

Variable	Category	Frequency	Percentage
Level of parental satisfaction	Satisfied	218	54.5
	Dissatisfied	182	45.5

Table 3 reveals that more than half of the respondents (54.5%) experienced a high level of satisfaction with NICU services.

Table 4: Parental satisfaction with care in NICU subscale and total mean score (n=400)

Parental satisfaction subscale	Overall satisfaction score
	Mean score ± SD
Information	4.85±0.92
Care & treatment	4.84±0.89
Organization	4.59±0.01
Parental participation	4.70±1.09
Professional attitude	4.57±0.99
Total parental satisfaction score	4.72±0.76

SD: standard deviation

Table 4 shows that the overall parental satisfaction mean score was 4.72±0.76. Among the satisfaction subscales, information received the highest rating, whereas professional attitude caused the least parental satisfaction related to NICU services.

Table 5: Factors associated with parental satisfaction with NICU services (n=400)

Variables	Category	COR with 95% CI	AOR with 95% CI	P-value
Age(in completed years)	≤25 years	1	1	
	>25 years	0.505 (0.33, 0.75)*	5.816 (1.88, 17.90)**	0.002
Sex	Female	1	1	
	Male	8.849 (5.33, 14.68)*	39.28 (10.76, 143.36)**	0.000
Ethnicity	Madhesi	1	1	
	Others	1.631 (1.09, 2.42)*	0.856 (0.31, 2.33)	0.762
History of previous hospitalization	No	1	1	
	Yes	12.8 (7.26, 22.56)*	401.527 (78.04, 2065.92)**	0.000
Duration of hospital stay in the NICU in days	≤7	1	1	
	>7	13.87 (8.19, 23.46)*	0.042 (0.01, 0.11)**	0.000

COR: crude odds ratio; AOR: adjusted odds ratio; CI: confidence interval; *Variables that are significant at p-value ≤0.05 in bivariate analysis; ** Variables that are significant at p-value ≤0.05 in multivariate analysis; 1: reference.

Table 5 presents bivariate and multivariable logistic regression of variables associated with parental satisfaction with NICU services. After assessing multicollinearity and adjusting for potential confounders, four factors were statistically significant in the final regression model ($p \leq 0.05$).

These variables included parental age, where parents aged over 25 years were 6 times more satisfied than those aged less than or equal to 25 years (AOR = 5.81; 95% CI: 1.88-17.90; p = 0.002). Male parents were 39.28 times more likely to report satisfaction with NICU services compared to female parents (AOR = 39.28; 95% CI: 10.76-143.36; p = 0.000). In addition, parents with a history of previous hospitalization were 401 times more likely to be satisfied than those without such a history (AOR = 401.53; 95% CI: 78.04-2065.92; p = 0.000). Furthermore, parents whose neonates stayed in the NICU for more than seven days were 96% less likely to report satisfaction with neonatal services (AOR = 0.042; 95% CI: 0.01-0.11; p = 0.000).

4 DISCUSSION

In this study, more than half of the parents were satisfied with services provided in the NICUs. This outcome aligns with previous studies conducted in Nepal [15], Ethiopia [10, 13, 16, 18, 21], and Norway [19]. This high level of parental satisfaction may reflect quality neonatal care, effective communication, and professional support from NICU healthcare providers. The findings of the study are in contrast to a study conducted in Ethiopia [1, 20], which showed a low level of satisfaction with NICU services.

The present study found that parents older than 25 years had six times higher odds of being satisfied compared to those aged 25 years or younger. Similar research from Nepal [15] and Ethiopia [10, 20] supports the same conclusion. This may be attributed to greater maturity, life experience, and a better understanding of healthcare services, which enable them to communicate effectively with the healthcare providers related to their newborns' care.

Parental sex came out to be significantly associated with satisfaction levels, with male parents shown to be thirty-nine times more likely to report satisfaction with NICU services compared to female parents. The findings corroborate studies in Ethiopia [10]. The findings differ from another study, which reported that females demonstrated the highest satisfaction [1, 18, 20]. This discrepancy may be explained by variations in parental expectations, social roles, health care experiences, and interactions with the healthcare professionals.

In the present study, parental satisfaction demonstrated an association with a previous hospitalization history. Parents with a history of hospitalization had a 401-fold higher satisfaction than those without a history. This contrasts with previous studies [10], which reported that parents of neonates with a history of readmission were 66% less likely to be satisfied with the care received compared to their counterparts. These differences could be explained by differences in the research population, clinical settings, and experiences of parents. Past hospitalization may improve parental acquaintance with healthcare services, while repeated readmissions may escalate stress, strain, and discontent.

Another factor associated with parental satisfaction was duration of hospital stay. Parents whose neonates stayed in the NICU for more than seven days were 96% less likely to be satisfied compared to those whose infants stayed for fewer than seven days. This is analogous to a study conducted in Ethiopia [1, 10, 20, 21]. Reasonably speaking, longer NICU stays may indicate a lack of recovery as well as intensify parental distress and financial burden, thereby increasing dissatisfaction with NICU services.

In the current study, findings revealed that the parents of neonates admitted to the NICU were satisfied with the care provided. Regarding the different subscales measured by EMPATHIC-NICU-38, the information subscale received the highest satisfaction related to NICU services. Dissimilarity is noted, with information recorded the lowest satisfaction [18], and organization caused the most satisfaction [1, 18]. The highest satisfaction in the information subscale likely shows the proactive counseling efforts of health care providers to reassure anxious parents about their seriously ill newborns, whereas lower scores in other settings may be due to language barriers, heavy workloads, and/or parental expectations regarding communication.

Though this study provides innovative findings, multiple limitations should be acknowledged. Firstly, this study is entirely facility-based and focused on admitted newborns; generalizing the results to all newborns may not be applicable. Secondly, this study was conducted exclusively in a private hospital, preventing an assessment of parental satisfaction with NICU services in public hospitals. Finally, this study relied on cross-sectional data, which limits the ability to establish causal relationships.

5 CONCLUSION

The study concluded that more than half of the respondents were satisfied with the NICU services, which was significantly influenced by parental age, parental sex, a history of previous hospitalization, and duration of hospital stay. In order to deliver a high-quality service and satisfy parents, healthcare professionals as well as hospital administrators should work together to strengthen NICU services.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The authors declare no conflict of interest regarding this manuscript.

Statement of ethical approval

Approved by the Institutional Review Committee of National Medical College (IRC-NMC).

Statement of informed consent

Written formal permission was obtained from the concerned authority. Informed written consent was obtained from each parent included in the study.

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