ORIGINAL ARTICLE

Parental satisfaction with quality of neonatal care services provided at Kamuzu Central Hospital, Ethel Muthalika Nursery Unit, Lilongwe, Malawi

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ABSTRACT

Background: Parental satisfaction is a crucial indicator of the quality of neonatal care standards. Satisfied parents comply with treatment, thereby reducing readmission and neonatal mortality rates. Malawi had a neonatal mortality rate of 24 per 1000 live births and minimal evidence of parental satisfaction levels with neonatal care services. The study assessed levels and factors associated with parental satisfaction with neonatal care at Kamuzu Central Hospital, Ethel Mutharika Nursery Unit, Lilongwe, Malawi.

Methods: The research involved 250 systematically selected parents and neonatal records following 48 hours of admission. Satisfaction was measured using an Empowerment of Parents in THe Intensive Care-Neonatology (EMPATHIC-N) questionnaire translated to Chichewa, and pre-testing was done. The collected data was analysed using SPSS version 22.

Results: The results showed overall parental satisfaction of 68%, with the highest satisfaction in the care and treatment domain (99.2%) and the lowest levels in the information domain (88.8%). Factors such as education level, tribe, neonate's health condition, and admission ward were associated with parental satisfaction with neonatal care. The Chewa tribe had AOD= 0.37; 95% CI: 0.17-0.78 of less satisfaction, parents living below the poverty line had AOD = 2.06; 95% CI: 1.02-4.14 of being satisfied, and parents in the separated admission ward had AOD = 3.23; 95% CI: 1.74-6.00 of more satisfaction compared to their counterparts.

Conclusion: The study found that parental satisfaction with neonatal care services is moderate at 68%, indicating a need for improved communication and overall satisfaction.

INTRODUCTION

Parental satisfaction is a crucial indicator for evaluating the quality of the healthcare system and a guide for improving neonatal care strategies.[1] Standardized tools like the Empowerment of Parents in THe Intensive Care-Neonatology (EMPATHIC-N) help obtain feedback from parents on health system performances to enhance quality of neonatal care.[2] Satisfied parents are more likely to adhere to treatment plans,[3,4] use the health facility in future and recommend the health facility to other

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parents.[1,3] Meeting parents' expectations is essential for improving neonatal care quality, reducing mortality, and increasing access to neonatal care services. The Malawi Health Sector Strategic Plan III (2023-2030) highlighted low client satisfaction surveys in health facilities.[5] Poor-quality healthcare is a significant cause of preventable neonatal deaths in developing countries.[6] According to Valentine *et al*, neonatal mortality at the Ethel Mutharika Nursery Unit (EMNU) was 23.1% in (2017-2018), slightly higher than other African NICUs.[7, 8, 9] Mgusha *et al*. recorded 20% neonatal mortality in (2019-2020) at EMNU.[10] Hospital records from the Sick Neonate Register and Nest360, a comprehensive database and monitoring system for neonatal health, indicate that in 2024, neonatal mortality was at 22.1%, up from 19.97% and 20.2% in 2022 and 2023, respectively.[11] Parental satisfaction is vital in reducing the high national neonatal mortality, which is currently at 24 per 1000 live births.[12]

There are diverse factors influencing parental satisfaction, which range from neonatal to parental socio-demographics, hospital environment, and processes.[13] Young mothers with extended hospitalization had low satisfaction levels.[14] Language differences, poor interactions, and poor neonatal health status reduced satisfaction levels.[15, 16] On the contrary, higher levels of satisfaction were reported among parents with formal education, young women from rural areas, married couples, breastfeeding parents with a single baby admitted outside the infection isolation room, and parents with premature infants.[4, 16] Numerous strategies, such as family-centred care (FCC), a clean and safe environment, and respectful maternal and neonatal care, improved parental satisfaction.[15, 17, 18] The family-centred care approach is considered a gold-standard medical concept in the NICU,[19] emphasizing respect, information sharing, collaboration, and participation in care and decision-making.[20] However, it is rarely used in developing countries like Malawi. Current approaches to promoting FCC may face challenges such as physical space, staff knowledge, attitude, and community awareness.

Studies on neonatal care satisfaction in the NICU vary across countries, with high satisfaction rates of 76% in Norway, 79.57% in India, 91.7% in South Africa, and 93.6% in Sri Lanka.[15, 19, 21, 22] Lower satisfaction levels were in Ethiopia at 47.9% and 42%.[13, 20] The inconsistent findings necessitated the need to assess parental satisfaction with the aim of measuring levels of parental satisfaction, identifying associated factors and assessing the association between parents' satisfaction with hospital processes, neonatal and parental characteristics. The current study measured parental satisfaction using a validated instrument, and Donabedian's Structure-Process-Outcome model, to evaluate the quality of healthcare: structure (organizational and physical infrastructure), process (provider-patient interactions and care activities), and outcome (impact of care on parent satisfaction). The null hypothesis for the study was that there is no association between parental satisfaction levels with neonatal and parental sociodemographic characteristics, hospital structure and processes.

METHODS AND MATERIALS

This study employed a facility-based quantitative cross-sectional study at KCH EMNU, Lilongwe, Malawi. The NICU operates as a level II facility, providing some activities at level III but not advanced life support. In 2023, about 3109 babies were admitted, with a monthly admission mean of 259 neonates.[11] The study population consisted of parents and clinical records for their neonates following 48 hours of admission. Parents who were critically ill and those whose neonates were critically ill or died were excluded from the study. The sample size of 247 parents was determined using the Modified Cochran formula: $N = Z^2P(1-P)/e^2$. Where Z= standard normal value at 95%, confidence interval = 1.96, P = prevalence of 50 %, which is 0.5, q = 1-p = 1-0.5 = 0.5, e = desired level of precision ± 5 % = 0.05. However, the study recruited n = 250 parents and their neonate's records.

The University of Zambia, Biomedical Research Ethics Committee (No. 5215-2024) and Kamuzu University of Health Sciences, College of Medicine Research Ethics Committee (P.07/24-0930)

approved the study. The study participants, the Hospital Director, through the Research and Ethics Committee, provided permission for the study. In addition, the research team ensured confidentiality, privacy, voluntariness, and anonymity throughout the study.

The starting point was a random sampling of the first number, followed by a systematic selection of participants with replacement. Sampling involved numbering case files, identifying the parent, and approaching every second parent to participate in the study. When the eligible participant refused, the next systematically selected one was recruited. The procedure was repeated daily to accommodate the new admissions and those not selected, without replacing those already interviewed. Parents were provided information about the study before obtaining a signature/fingerprint. There were 475 parents and neonatal records during the data collection period. Figure 1 depicts the participants' recruitment for the current study.

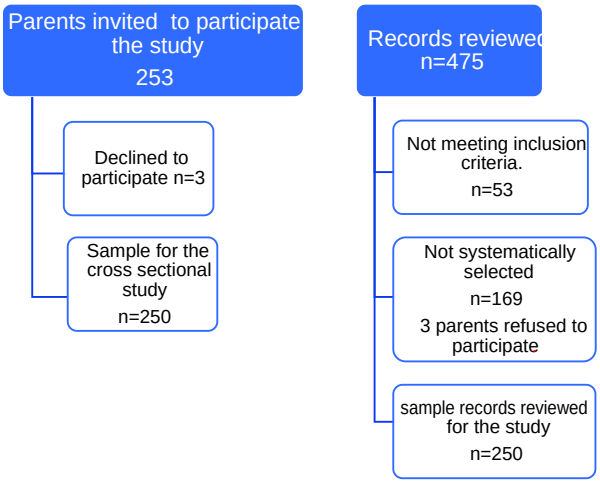

Figure 1: Flow diagram on participant recruitment

A structured questionnaire was adopted, with a Cronbach alpha of 0.82 to 0.95.[2] Clinical, academic and language experts translated the tool following Wild *et al.*'s guidelines to ensure correctness and clarity of the test items.[23] A pilot test was conducted at the same facility using 25 randomly selected participants, corresponding to 10% under power probability in the main study. The overall Cronbach's Alpha was 0.941. Minor wording adjustments were made to enhance proper alignment of the questionnaire with our clinical setting. The data from the pilot study were not included in the main study. In addition, the interviews were done during admission or immediately after discharge to reduce recall bias. A checklist assessed sociodemographic data for parents and neonates, including age, marital status, income, birth weight, health status, and admission ward. The wards were further classified as separated wards (Isolation A, High risk A and B) and combined wards (Isolation B and KMC). The EMPATHIC-N questionnaire measured satisfaction using a six-point Likert scale and 57 close-ended questions in five dimensions: Information (12), Care and Treatment (17), Parental Participation (8), Organization (8), and Professional Attitude (12). Two more questions evaluated the parents' overall experience with neonatal care. Parents' views about returning for treatment in future and recommending the NICU to others. The five dimensions and overall satisfaction used a six-point Likert scale where: 1 = Strongly Dissatisfied, 2 = Dissatisfied, 3 = Slightly Satisfied, 4= Slightly Satisfied, 5 = Satisfied, and 6 = Highly Satisfied for ease of scoring. Scores from 1-3 indicated dissatisfaction, while scores of 4-6 denoted satisfaction. Finally, parents rated the performance of nurses and doctors using a scale of 1 to 10.

Data collection was done between August and October 2024 through face-to-face interviews using a structured questionnaire uploaded in Open Data Kit (ODK). Two research assistants not directly involved in neonatal care (to avoid social desirability bias) underwent two days of training led by the researcher. The training focused on study objectives, ethical considerations and the use of a questionnaire. Emphasis was on standardizing questions, managing responses without bias, and handling unclear or missing responses. The principal investigator conducted and supervised initial field interviews and provided feedback to reinforce adherence to standardized procedures. To ensure data accuracy and consistency, the data collector reviewed each entry before submission to the Kobo Toolbox database. Additionally, the

investigator conducted daily checks on the submitted data and followed up with the data collector to clarify any inconsistencies by referring to the source files and interview notes. The consent and information forms were checked and locked in a trunk for security. Data transfer was limited, and only the researcher had access to the Kobo toolbox software database.

The collected data were analysed using the Statistical Package for Social Sciences (SPSS) version 22. Descriptive statistics were calculated and presented as frequencies, percentages, mean (M) and standard deviation (SD). The chi-square test examined associations when the assumption for the Chi-square was violated; Fisher's exact test was used. Multivariable binary regression analysis determined predictors of parental satisfaction with the quality of neonatal services. Spearman's rank measured the correlation between parental satisfaction and the five EMPATHIC-N dimensions.

RESULTS

Parental and neonatal sociodemographic characteristics and other clinical information

Table 1: Parental and neonatal socio-demographic characteristics and other clinical information

Characteristics/Information	Category	Frequency (n)	Percentage (%)
Age	15 to 24 Years	126	50.4
	25 to 39 years	117	46.8
	40 and Above	7	2.8
Residence	Rural	138	55.2
	Urban	112	44.8
Level of Education	Uneducated	13	5.2
	Primary	121	48.4
	Secondary	96	38.4
	Tertiary	20	8
Marital Status	Married	229	91.6
	Single	21	8.4
Tribe	Chewa	174	69.6
	other	76	30.4
Income per day	Less than $1.9	174	69.6
	More than $1.9	76	30.4
Gestation Age	Preterm	133	53.2
	Term	117	46.8
Birth Weight	Low Birth Weight	141	56.4
	Normal Birth Weight	109	43.6
Health Status of Neonate	Improvement	208	83.2
	No improvement	39	15.6
	Deteriorating	3	1.2
Admission ward	High risk A	113	45.2
	High risk B	69	27.6
	Isolation A	26	10.4
	Isolation B	22	8.8
	Kangaroo Mother Care	20	8

The study involved 250 parents and records of their neonates, representing a recruitment rate of 101.2%. Table 1 presents the sociodemographic characteristics and clinical information for parents and neonates. Overall, the mean age of participants was 25.86 years, ranging from 15 to 47 years. On average, family's daily income was $2.3 (MK4, 000.00), with some having no money and the highest acquisition being $28.5 (MK50, 000.00). The majority (n = 223), 89.2% had family support. However, only (n = 34), 17.2% of fathers were allowed to see their newborn in the unit. The neonates' gestation age ranged from 26 to 41 weeks with a mean of 34.7 weeks. Similarly, birth weight ranged from 780 to 4600 grams, with a mean of 2245.3 grams. The mean length of hospital stay was 6.6 days, with a minimum of 2 days and a maximum of 150 days.

Levels of parental satisfaction and reliability of the EMPATHIC-N questionnaire

Figure 1 presents the proportions of the overall parental satisfaction, which was recorded at 68% [95% CI= (62.2-73.8)]. The lowest proportion was in the information domain at 88.8% [95% CI= (84.9-92.7)], while the highest was in the care and treatment domain at 99.2% [95% CI= (98.0-100)]. Parental participation, organization, and professional attitude had similar parental satisfaction proportions. The EMPATHIC-N showed good internal consistency with a Cronbach's Alpha ranging from 0.60 to 0.81 for the five domains and 0.92 for the total questionnaire.

The individual item performance for all the domains was highlighted to identify areas contributing to satisfaction or dissatisfaction with neonatal care. The overall highest performing item was in the professional attitude domain, where item "We were received well by the staff" had a mean score of 5.58. The lowest score was in the organization, 1.32 on the item "We would communicate with the nursery staff

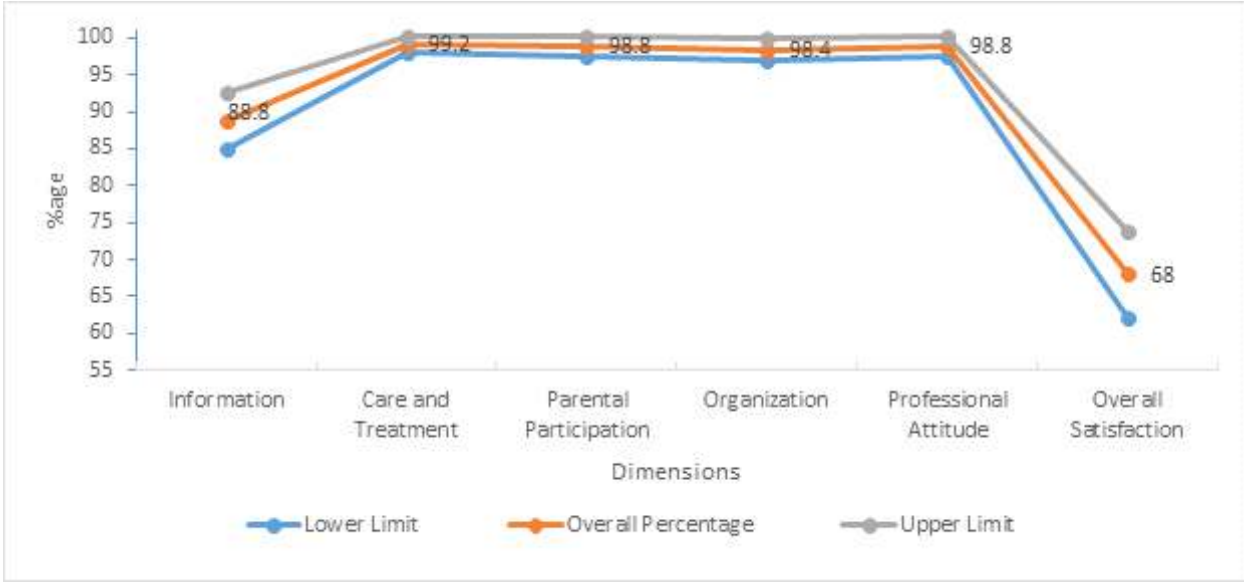

Figure 1: Levels of overall parental satisfaction with neonatal care and the five domains

through phone". Phone communication is rarely used in the unit. The overall satisfaction measuring questions asked parents if they would: recommend the unit to others (mean = 5.47, SD = 0.89), return in future (mean = 5.43, SD = 0.99), rate the general performance of doctors 7.44 out of 10 (SD = 1.69) and performance of nurses was at 7.28 (SD = 1.94).

Factors associated with parental satisfaction and correlation between satisfaction and the domains

Chi-square test denoted tribe (P=0.014), health status of neonate (P=0.007), and admission ward (P=0.002) to be statistically associated with satisfaction at a 5% significance level. Variables with frequencies fewer than 5 (the neonate's health status and admission status) were subjected to Fisher's exact test, as it is not very sensitive to fewer observations than the chi-square test.

The correlations between the five domains and parental satisfaction were significant at the 0.05 level (two-tailed). The range was from r=0157 to r=0.530. The highest correlation was between healthcare attitude and recommending the NICU to others (r=0.530), while the weakest was between parental participation and rating of doctors (r=0.157). Moderate correlations were found for healthcare attitude, recommendations to others, and return to the unit in the future (r=0.530 and 0.524). Before the multiple binary logistic analysis, Variance Inflation Factors (VIFS) showed acceptable levels of multicollinearity between independent variables, ranging from 0.845 to 4.782, supporting the inclusion of all variables in the regression model.

Regression analysis

Table 2: Multiple Binary logistic regression of satisfaction levels and parental and neonatal sociodemographic characteristics and clinical information

		Satisfaction Levels		Adjusted Odds Ratio	
	Factors	**Not Satisfied**	**Satisfied**	**OR[95%CI]**	**P-Value**
Residency	Rural	50	88	0.83[0.40-1.72]	0.617
	Urban	30	82	1	
Education level	Primary Below	50	84	0.72[0.35-1.49]	0.374
	Secondary Above	30	86	1	
Tribe	Chewa	64	110	**0.37[0.17-0.78]**	**0.010**
	Other Tribe	16	60	1	
Period of stay	Short Stay	62	147	1.62[0.68-3.85]	0.276
	Long Stay	18	23	1	
Income	<Poverty Line	52	122	**2.06[1.02-4.14]**	**0.042**
	>Poverty Line	28	48	1	
Health Condition of neonate	Improvement	58	150	4.10[0.33-9.04]	0.278
	No change	20	19	1.71[0.13-7.03]	0.675
	Deteriorating	2	1	1	
Status of respondent	Admitted	74	148	1.20[0.24-4.56]	0.785
	Discharged	1	11	4.72[0.37-13.51]	0.155
	Follow up care	5	11	1	
Admission ward	Separated Care	61	147	**3.23[1.74-6.00]**	**<0.001**
	Combined Care	19	23	1	

The multiple binary logistic regression analysis denoted tribe, income and admission ward as significant predictors of parental satisfaction. Mothers from the Chewa tribe had 0.37 odds of being less satisfied than others, while those living below the poverty line were 2.06 times more likely to be satisfied than others. Finally, parents separated from their neonates were 3.23 times more satisfied than those in combined care.

DISCUSSION

The study assessed levels and factors associated with parental satisfaction using a culturally adopted EMPATHIC-N questionnaire. More than half of the participants were from rural areas, like the results in Ethiopia.[24] Similar healthcare delivery systems and unestablished neonatal units in rural areas contribute to an increase in referrals for neonatal care. Most parents were married, and the results were consistent with findings in Ethiopia and Greece.[24, 25] The study respondents were all mothers, challenging the assessment of the impact of gender on parental satisfaction in neonatal care. The results align with a systematic review in Ethiopia, where fathers were less involved.[26] In Malawi, mothers are more involved in newborn care, and fathers are limited to one visit during neonatal admission. This lack of male involvement may lead to higher stress and reduced satisfaction in mothers.[27]

The study found parental satisfaction level at 68%, indicating strong and weak areas for improvement. The satisfaction level is slightly higher than previous studies in Ethiopia, where satisfaction was 42%, 60%, and 47.9%.[13, 20, 28] The differences may be due to higher early neonatal mortality rates in Ethiopia.[29] On the contrary, satisfaction was 76% in Norway,[19] and 87.8% in Greece.[30] Advanced clinical neonatal settings, higher standards of care, different measuring instruments and small sample sizes of 102 parents in Greece could have contributed to the differences in satisfaction levels. In addition, India had 79.6% of 100 parents of preterm babies,[31] Sri Lanka had 93.65%,[22] and South Africa had 91.7% among 100 parents.[15] There is better access to clinical resources, a stable economy, technological advancements, and higher parental literacy levels in the other developing countries compared to the study site. Furthermore, the smaller sample sizes in India and South Africa could have contributed to higher satisfaction levels.

The satisfaction scores ranged from 88.8% in the information domain to 99.2% in the care and treatment domain, highlighting the need for enhanced communication with parents. Within the framework of Donabedian's model, this issue pertains to the process component, specifically, the interactions between healthcare providers and parents.[32] The findings were slightly lower than those reported by Latour *et al* [2] but higher than those recorded in Ethiopia.[4, 24] Parents expressed dissatisfaction with the lack of timely communication regarding their neonate's deteriorating condition, diagnosis, treatment plans, and potential treatment effects. They also reported frustration over their inability to reach nursery teams by phone, denoting structural limitations (e.g., lack of communication infrastructure) and process failures. Similar findings were in Ethiopia.[4] Poor communication, both a process and structural issue, can negatively impact the outcome by hindering parental involvement in critical care decisions, ultimately affecting parental satisfaction and potentially the health outcomes of the neonate.

In the current study, tribe, health status of the neonate, and admission ward were associated with parental satisfaction at a 0.5% significance value. Tribe was the only significant parental socio-demographic variable associated with parental satisfaction ($P = 0.014$). As the p-value is less than 0.05, we reject the null hypothesis. Cultural background influences perceptions of the quality of care.[15] The differences in cultural beliefs, communication, and expectations may affect parental satisfaction. Culturally sensitive approaches are needed to improve satisfaction across diverse groups and ensure equitable, family-centred neonatal care. Future studies should explore the effect of tribe on parental satisfaction using a

qualitative method. Parental satisfaction was highly associated with the neonate's health status (p = 0.007). As the P-value is less than 0.05, we reject the null hypothesis. This implies that parents are more satisfied when their newborns have better health outcomes. This is possibly due to the anticipation of discharge, good outcomes and gratitude. These results were like those in Vietnam and Australia where evidence demonstrated strong relationship between neonatal health condition and maternal satisfaction.[16, 33] Enhancing standards of neonatal care could help improve parental satisfaction with neonatal services.

In addition, the admission ward was associated with parental satisfaction (p = 0.002). Since the p-value is less than 0.05, we reject the null hypothesis. The differences in ward environment, level of care, staff interaction, or care processes may influence parental satisfaction, highlighting the need for consistent quality standards across all wards. Similarly, Reiter *et al* recommended integrating parents into the hospital care teams in Low Middle-Income Countries (LMIC) to improve the quality of care due to a low ratio of health workers to patients.[34] The evidence is supported by Gulo *et al*, who denoted high parental satisfaction in level II NICU compared to level I or III.

In Spearman Rank Correlation, the results show that all domains were statistically significant with a moderate to weak positive relationship. The moderate to weak correlations denote an association between parental satisfaction and the hospital processes. The results further support Donabedian's assumption that the hospital structure and processes influence the model outcomes (parental satisfaction).[32] The study found a moderate relationship between healthcare providers' attitudes and parents recommending the facility to others. However, the relationship is not exceptionally strong. Parental involvement in neonatal care has a weak link to physician performance, with factors like confidence, and experience influencing participation. Parents' evaluation of doctors' performance may be influenced by their opinions on clinical results and communication abilities. Improving interaction between parents and doctors during ward rounds is recommended. Parents engage more with nurses than doctors, but satisfaction levels are lower than the 80% target for both, indicating the need for improvement.[5]

Multiple binary logistic regression identified tribe, income, and admission ward as predictors of parental satisfaction. Mothers from the Chewa tribe (a dominant tribe in the study setting) were 0.37 times less likely to be satisfied with neonatal care. No evidence supported the finding; however, higher expectations for quality neonatal care and the assumption that everyone knows their beliefs and values may impact neonatal health. In South Africa, language and cultural differences influenced interactions between parents and healthcare providers and contributed to miscommunication and higher stress levels.[15] The results differ from the present study as mothers with similar backgrounds were less likely to be satisfied with neonatal care. The study's non-exploratory nature influences the identification of the cause of dissatisfaction. Future research should involve respondents sharing their experiences during their admission in the unit.

Furthermore, the study found that parents living below the poverty line were 2.06 times more satisfied than those above poverty line. The trend is like previous research in Vietnam and Ethiopia.[13, 16] The National Health Policy in Vietnam provides equal treatment for neonates, thereby increasing satisfaction among low-income parents. Similar trends could be attributed to similar health systems in Ethiopia and Malawi. However, parents living above the poverty line may also perceive care standards as low compared to private hospital services. However, the research did not address parents' financial constraints in NICUs, recommending future studies to explore the area. Contrary to the findings, satisfaction levels were reported as low among parents with low income per day.[35] However, the study focused only on premature infants whose parents are mostly dissatisfied, hence reduced satisfaction levels.

Financial constraints, such as stock-out medications and daily food costs, were reported as financial challenges for parents in the NICU.[36] Similar challenges are anticipated in a low-income country like Malawi. However, the research design did not explore parents' experiences and challenges. Future studies should utilise a mixed method to explore parents' unique views and experiences.

The study found that separated mothers had 3.23 times higher satisfaction levels with neonatal care than rooming-in mothers. The separation of parents and neonates increases parental satisfaction compared to combined care. The results contrast with previous evidence, where the separation of parents and neonates was stressful and negatively impacted bonding and exclusive breastfeeding post-delivery.[37] The higher satisfaction may be due to contextual care quality differences where there is increased contact between neonate and healthcare providers, unlike minimal contact in combined care, as mothers assume most neonatal care responsibilities, as most of the neonates in combined care are stable than the separated neonates. Due to a shortage of staff and structural design, nurses and doctors spend more time in the separate wards than in the combined ward. Collaboration between healthcare workers and parents reduces length of hospital stay, promotes breastfeeding and satisfaction levels.[26, 38] On the other hand, a qualitative study reported parents challenges in family integrated care model such as power conflicts with the staff; prioritizing care for themselves, siblings, or the newborn; feelings of isolation; and lack of sleep. These challenges may contribute to low satisfaction in the combined care group. The study differs from existing literature, suggesting the need for exploratory research and an intervention study to assess the effect of integrated maternal and neonatal care on parents' empowerment and satisfaction levels.

There were some patterns observed, even though there were insignificant results. For example, mothers who stayed in the ward for shorter periods and those whose babies were doing well were more likely to be satisfied with care than those with extended stays and deteriorating neonatal conditions. Similar results were recorded in a systematic review where mothers were three times more likely to report care satisfaction than those with extended hospital stays.[26]

Limitations

The study relies on self-reported data, which may be subject to social desirability and recall biases. Conducting the study in a single facility restricts the extent to which the findings can be applied to other contexts. Future research involving multiple sites, interventions, and longitudinal data could provide a more comprehensive understanding and support universally applicable practices in neonatal care.

CONCLUSIONS

Parental satisfaction with neonatal care services was at 68%, denoting strength and areas for improvement. Factors associated with satisfaction include tribe, the health status of the neonate, and the admission ward. Low-income status, separated care, and the Chewa tribe were significant predictors of parental satisfaction with neonatal care. Future research should focus on multiple sites, healthcare providers, and interventions to improve communication with parents through phone, thus increasing satisfaction levels. There is a need to improve on male involvement, comprehensive communication and documentation systems to reduce neonatal mortality and parental satisfaction with neonatal care.

What is known about the topic?

- Parental satisfaction is a key indicator of the quality of neonatal care.
- Parental satisfaction significantly influences care outcomes and parents' ability to utilise the health facility in future.
- Parental satisfaction is associated with factors such as cultural, institutional, clinical and parental involvement in care.

What this study adds

- Provides local data on levels of parental satisfaction (68%) with the quality of neonatal care services at 68%
- Identifies factors such as the neonate's health status, admission ward, income and tribe as significant indicators of parental satisfaction in the context of newborn care.
- The study draws attention to the necessity of ward-specific and culturally sensitive interventions to enhance parental experiences.

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Author's contribution

Mary C Mkandawire conceptualized and designed the study, conducted data collection, analysis, interpretation and manuscript writing. Dr. Bertha Chakhame and Samantha Munang'andu assisted with proposal development, data analysis and revision of the manuscript. Dr. Sebean Mayimbo contributed significantly from conception, proposal development, data analysis, critical revisions, and final approval of the manuscript.

Competing interests

None declared.

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