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ORIGINAL ARTICLE

Knowledge regarding care of preterm babies among nurses working in a tertiary-level hospital

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Abstract

Introduction: A preterm baby is defined as a baby born alive before 37 weeks of pregnancy is completed. Preterm birth is challenging for both the infant and the family. The long-term morbidity of these infants is a serious public health concern. Nurses' critical thinking, knowledge, qualifications, attitude, and advanced skills are essential to provide good quality services and decrease the mortality and morbidity related to preterm babies. This study aimed to assess nurses' knowledge of preterm care.

Method: Using a descriptive cross-sectional study design with a self-administered, semi-structured questionnaire, 122 nurses from pediatric and obstetric units from Tribhuwan University Teaching Hospital were enrolled through total enumerative sampling in the study.

Result: The study revealed that the majority of respondents (82.8%) had a good level of knowledge about preterm care. The study found a statistically significant association between knowledge and socio-demographic characteristics, specifically current residence area (p = 0.045). Regarding knowledge and profession-related characteristics, the study revealed a significant association between knowledge and total working experience (p = 0.042).

Conclusion: In-service education and training on preterm care should be provided to educate nurses and enhance their knowledge of caring for preterm babies. A nurse is a crucial primary care provider, and therefore, her education and access to information on caring for preterm babies will help her provide adequate care and prevent complications.

Keywords: Knowledge, Care, Preterm, Nurses

INTRODUCTION

A preterm baby is defined as a baby born alive before 37 completed weeks of pregnancy.[1] Preterm birth is challenging for both the infant and the family. Preterm birth is one of the leading causes of neonatal morbidity and mortality and a significant public health burden.[2]

Major problems that may arise in preterm babies are hypothermia, perinatal asphyxia, respiratory distress, bacterial sepsis, apnea of prematurity, hypoglycemia, anemia, jaundice, feeding problems, and poor weight gain.[3] Some of the complications may be preventable after birth, such as hypothermia and hypoglycemia.[4] Babies who are born preterm need the same care as other babies, with a little more attention. This includes infection Prevention, Kangaroo Mother Care (KMC), feeding support, thermal care, neonatal resuscitation, care of a premature baby in an incubator, and care of a premature baby in phototherapy.[5]

In 2021, a descriptive quantitative study of 41 nurses purposively sampled from the premature unit at Kerbala Pediatric Teaching Hospital in Iraq found that nurses had high levels of knowledge regarding ideal care for preterm infants.[6] A hospital-based descriptive cross-sectional study using non-probability convenience sampling in the NICUs of King Fahd and Prince Bin Nasser hospitals in Saudi Arabia found that most nurses had adequate knowledge of preterm care, with 90% supporting KMC and teaching and supporting mothers to practice it.[7] A descriptive cross-sectional study of 275 NICU nurses across nine hospitals in Istanbul, Turkey, using a demographic form and a questionnaire on preterm infant oral feeding found particularly low knowledge on cue-based feeding and infant positioning, limited use of protocols for transitioning preterm infants to oral feeding, and a need for additional knowledge and practical training in evidence-based interventions to support the transition to oral feeding.[8] In Nepal, a descriptive cross-sectional study conducted at BPKIHS, Dharan, using a self-administered questionnaire across six domains among pediatric ward nurses found excellent knowledge regarding the care of low-birth-weight babies, with a higher educational level associated with better knowledge.[9]

The researcher, a pediatric nurse, observed that frequent staff turnover left only a few nurses with adequate knowledge to care for preterm infants, who are especially vulnerable and require meticulous care. These concerns motivated a study to assess nurses' knowledge of preterm care, with a focus on NICUs and neonatal units, where nurses are the primary caregivers. This study aimed to assess nurses' levels of knowledge regarding preterm care and to evaluate the association between knowledge levels and selected variables.

METHOD

A descriptive cross-sectional study design was adopted for the study. The study was conducted at TUTH, a tertiary-level hospital located in Maharajgunj, Kathmandu, Nepal. It is a 1,000-bed hospital that was established in 1983, and 865 nurses are currently working there. The study area included the Pediatrics and Obstetrics Department. The Pediatric Department includes the Neonatal Intensive Care Unit (NICU), Pediatric Intensive Care Unit (PICU), Pediatric Cabin, Pediatric General Ward, Pediatric High Dependency Unit (PHDU), Neonatal High Dependency Unit (NHDU), Pediatric Emergency and Neonatal Unit (NNU), and the Obstetrics Department includes the Labor room (LR), Birthing Unit and Maternity Ward. A total of 77 staffs are working in the pediatric department and 45 in obstetrics at present.

The study populations were the nurses working as staff nurses in the Pediatric and Obstetrics Departments. The record of population was taken from the duty rosters of nurses in each department. A non-probability total enumerative sampling technique was used.

A total of 122 nurses were included as respondents in the study, drawn from the following wards: Pediatric Emergency (n=8), Pediatric General Ward and Neonatal HDU (n=14), Pediatric Cabin and Pediatric HDU (n=17), NICU (n=14), PICU (n=15), Neonatal Unit (n=9), Maternity Ward (n=15), Birthing Unit (n=15), and Labor Room (n=15).

The study included nurses working in the pediatric and obstetrics wards of TUTH who had been employed in their respective departments for at least 6 months and were willing to participate. Nurses were excluded if they were on leave during the data collection period or if they had been involved in the pre-testing phase.

Data were collected using a self-administered, semi-structured questionnaire that was developed and distributed to respondents. The instrument was constructed following an extensive literature review and iterative feedback from subject-matter experts and members of the research committee, and it was prepared in simple English. The tool comprised three parts: Part I included items on socio-demographic and profession-related variables; Part II contained 15 questions on preterm thermal protection and kangaroo mother care (KMC), with each item carrying one mark; and Part III comprised 15 questions on preterm infant feeding, also developed through an in-depth literature review, with each item carrying one mark.

Validity was maintained by ensuring the instrument measured the intended constructs through an extensive review of related literature and consultation with the research advisor, subject teachers, research experts, and members of the Research Committee. To further refine the tool, pre-testing was conducted on 10% of the overall sample (n=12) in the pediatric surgery ward and the pediatric surgical high dependency unit of TUTH, after which necessary modifications were made.

Data were collected after approval of the research proposal by the Research Committee of Yeti Health Science Academy (YHSA); a formal request letter for data collection was

obtained from YHSA, written permission was secured from TUTH, and additional permissions were obtained from the respective wards. A self-administered, semi-structured questionnaire was used, with the researcher overseeing distribution and collection and providing detailed written and verbal instructions to respondents. Completing the questionnaire took approximately 25–30 minutes. All questionnaires were collected on the same day and cross-checked on-site for completeness. The overall data collection was completed within two weeks.

The privacy and confidentiality of the information were maintained by keeping it accessible only to the researcher, and it was not disclosed to anyone except for research purposes. Anonymity of the respondents was maintained.

Collected data were checked, reviewed, and organized daily to ensure completeness and accuracy. The dataset was then coded and tabulated, and analyses were conducted in SPSS version 20 according to the research objectives. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize quantitative data, and the chi-square test was applied to assess associations between levels of knowledge and selected study variables. The analyzed results were presented in academic tables.

RESULT

A total of 122 respondents were in the study. Out of 122 respondents, 88(72.1%) were between 21 and 30 years of age. As age was normally distributed, the mean ± SD was used. The mean±SD of age was 28.06±3.68 years. Regarding ethnicity, 55 (45.1%) identified as Brahmin/Chhetri, and 104 (85.2%) respondents followed Hinduism. Concerning marital status, 70 (57.4%) participants were married. Regarding the current residence, 102 respondents (83.6%) resided in Kathmandu. Among the total, 95 (77.8%) had passed a bachelor's degree in nursing. Similarly, 77 (63.1%)

Table 1. Socio-demographic characteristics of respondents (N=122)

Variables	*f* (%)
Age group (in years)	
21-30	88 (72.1%)
31-40	34 (27.9%)
Ethnicity	
Brahmin/ Chhetri	55 (45.1%)
Newar	37 (30.3%)
Others*	30 (24.6%)
Religion	
Hindu	104 (85.2%)
Other than Hindu	18 (14.7%)
Marital Status	
Married	70 (57.4%)
Unmarried	52 (42.6%)
Current Residence	
Kathmandu	102 (83.6%)
Outside Kathmandu	20 (16.4%)
Educational level	
Proficiency Certificate Level	27 (22.2%)
Bachelor in Nursing	95 (77.8%)
Working area	
Pediatric	77 (63.1%)
Obstetrics	45 (36.9%)
Total Experience	
≤ 5 years	56 (45.9%)
> 5 years	66 (54.1%)
Total experience in specific Department	
≤ 5 years	56 (45.9%)
> 5 years	66 (54.1%)
Training	
No	122 (100.0%)

** Janajati, Madheshi, Dalit, Muslim*

Table 2. Respondent's knowledge regarding preterm thermal care (N=122)

Statements	Correct Responses *f* (%)
A preterm baby is born at less than 37 weeks of gestation.	115 (94.3%)
Most common problem of premature babies is hypothermia.	105 (86.1%)
The normal temperature of a premature baby is 36.5-37.5 degrees Celsius.	121 (99.2%)
Premature babies lose body heat rapidly due to larger surface area.	87 (71.3%)
Drying and wrapping, KMC, and increased environmental temperature is used to maintain the temperature of premature baby.	122 (100.0%)
KMC is defined as skin-to-skin contact with the mother.	117 (95.9%)
The lower weight limit for providing KMC is 800 grams.	76 (62.3%)
Benefits of KMC include reduced mortality and morbidity, weight gain, and mother-baby bonding.	122 (100.0%)
A session of KMC should not be less than 60 minutes.	108 (88.5%)
KMC is to be done until the baby reaches 40 weeks or at least 2500 grams.	80 (65.6%)
When starting KMC, temperature should be measured every 6 hours until stable for 3 consecutive days.	78 (63.9%)
The semi-recumbent position is the best for the mother during KMC.	86 (70.5%)
The purpose of an incubator in preterm care is maintenance of a thermo-neutral environment, provision of desired humidity and, oxygenation, and isolation of newborn babies from unfavorable external environments.	112 (91.8%)
The infant's weight should be considered when deciding on the correct incubator temperature.	106 (86.9%)
The appropriate room temperature for premature babies is 22-26 degrees Celsius.	92 (75.4%)

Table 3. Respondents' knowledge regarding preterm infant feeding (N=122)

Statements	Correct Responses *f* (%)
Hypoglycemia is blood glucose level less than 40 mg/dl.	76 (62.3%)
It is necessary to determine the presence of esophageal atresia before the first feed.	114 (93.4%)
Mother's milk and intravenous (IV) fluid are preferred for premature infants.	80 (65.6%)
IV fluid is given to a baby born at less than 30 weeks.	59 (48.4%)
Cup feeding is given to a baby born between 30 and 32 weeks.	81 (66.4%)
A baby born after 32 weeks is fed through breastfeeding.	104 (85.2%)
Vomiting, abdominal distension, and residual milk indicate that the preterm infant does not tolerate feeding.	105 (86.1%)
Hypoglycemia risk can be decreased by feeding infants as soon as possible after birth.	109 (89.3%)
10% dextrose is given to a preterm baby on the first day of life.	102 (83.6%)
Salivating or rooting is an early sign that preterm infants need to be fed.	98 (80.3%)
Breast milk is best for infants with low birth weight.	122 (100.0%)
A preterm infant should be fed 12 times a day.	84 (68.9%)
A multivitamin of 0.3 ml is administered daily to preterm infants once they begin full feeding.	108 (88.5%)
Hypoglycemia may cause brain damage.	108 (88.5%)
Severe hypoglycemia can be treated by giving 10% dextrose via IV infusion.	118 (96.7%)

Table 4. Association between respondents' knowledge regarding preterm care and socio-demographic characteristics (N=122)

Category	Poor *f* (%)	Fair *f* (%)	Good *f* (%)	χ^2	p-value
Age (years)					
21–30	2 (66.7%)	12 (75.0%)	74 (71.8%)	0.114	0.944
31–40	1 (33.3%)	4 (25.0%)	29 (28.2%)	0.114	
Ethnicity					
Brahmin/Chhetri	1 (33.3%)	7 (43.8%)	47 (45.6%)	4.508	0.922
Newar	1 (33.3%)	6 (37.5%)	30 (29.1%)		
Others*	1 (33.3%)	3 (18.7%)	26 (25.3%)		
Religion					
Hindu	2 (66.7%)	14 (87.5%)	88 (85.5%)	3.164	0.788
Other than Hindu	1 (33.3%)	2 (12.5%)	15 (14.5%)		
Marital status					
Married	2 (66.7%)	8 (50%)	60 (58.3%)	0.494	0.781
Unmarried	1 (33.3%)	8 (50%)	43 (41.7%)		
Current residence					
Kathmandu	2 (66.7%)	13 (81.2%)	87 (84.5%)	9.754	0.045
Outside Kathmandu	1 (33,3%)	3 (18.8%)	16 (15.5%)		

**Adibasi/ Janajati, Madhesi, Dalit, Muslim*

Table 5. Association between Respondents' Knowledge regarding Preterm Care and Profession-related Characteristics(N=122)

Category	Poor n (%)	Fair n (%)	Good n (%)	χ^2	p-value
Educational level					
PCL Nursing	1 (33.3%)	3 (18.8%)	23 (22.3%)	0.327	0.849
Bachelor Nursing	2 (66.7%)	13 (81.2%)	80 (77.7%)		
Working area					
Pediatrics	2 (66.7%)	12 (75.0%)	63 (61.2%)	1.155	0.561
Obstetrics	1 (33.3%)	4 (25.0%)	40 (38.8%)		
Total experience					
≤ 5 years	1 (33.3%)	12 (75.0%)	43 (41.7%)	6.362	0.042
> 5 years	2 (66.7%)	4 (25.0%)	60 (58.3%)		
Experience in specific department					
≤ 5 years	2 (66.7%)	13 (81.2%)	69 (67.0%)	1.32	0.517
> 5 years	1 (33.3%)	3 (18.8%)	34 (33.0%)		

worked in the pediatric department. Regarding work experience, 66(54.1%) had more than 5 years of nursing experience in their respective departments. It also showed that none of the respondents had received any training related to preterm care. Other demographic profiles of the respondents are given in Table 1.

Among 122 respondents, 122(100%) provided correct answers to the methods used to maintain the body temperature of a preterm baby and the benefits of KMC, and 76(62.3%) provided correct answers to the lower weight limit for providing KMC.

Regarding the knowledge on preterm infant feeding, all respondents provided the correct answer to the best milk for preterm, and 59(48.4%) provided the correct answers to the preferred type of feeding for an infant born before 30 weeks.

While assessing knowledge, 0-50% indicates poor, 51-75% indicates fair, and 75-100% indicates a good level of expertise regarding preterm care.

Knowledge of preterm care: 3 (2.5%) had poor knowledge, 18 (14.8%) had fair knowledge, and 101 (82.8%) had good knowledge.

The association between the respondent's knowledge regarding preterm care and socio-demographic characteristics was calculated using chi-square as the variables were categorical. Only the current residential area was statistically significant, that is, the people residing in Kathmandu had good knowledge regarding preterm care, as the p-value (0.045) was below the level of significance of 0.05. The remaining variables were not statistically significant with respect to knowledge level.

The association between the respondent's knowledge about preterm care and profession-related characteristics, in which only total experience in the nursing field was statistically significant, as the p value (0.042) was below the level of significance, i.e., 0.05, and the rest of the variables were not statistically significant with the knowledge level. The association is shown in Table 5.

No statistical computations for training were done as none of the respondents had received training.

DISCUSSION

This study showed that 72.1% of the participants belonged to the 21-30 years age group, with a mean age of 28.06±3.68 years, which is similar to the 76% reported by Asma Abdallah AR.[10] It may be because most nursing officers are in their active working years, within this age group.

In this study, the majority of the respondents had completed a bachelor's in nursing, and 63.1% were working in the pediatric department. Regarding the experience of the nurses, 54.1% had more than 5 years of work experience, and 45.9% had less than 5 years of experience. Regarding training, no respondents reported having received any training. Since the study site is a governmental hospital, compared to a private hospital, the wages in this type of hospital are higher, and the job is also a permanent one, which can be a reason for the findings that the nursing staffs have more than 5 years of experience.

This study showed that there is a statistically significant difference between the level of knowledge and work experience ($p<0.05$). In contrast to our finding, a study conducted among nurses at Koshi Hospital showed no significant link between qualification and knowledge.[11] It could be because the study site is an academic institute, but in contrast, the Koshi hospital is not, which may lead to discontinuity of the knowledge.

In this study, the level of knowledge was classified into three categories based on the obtained scores: 2.5% had a poor level of knowledge, 14.8% had a fair level of knowledge, and 82.8% had a good level of knowledge regarding preterm care. The findings of the study were similar to those of a study conducted at BPKIHS, Dharan, which revealed an adequate knowledge score among nurses, i.e., 86.5%.[9] A cross-sectional study assessed the knowledge of 60 Nepalese nurses regarding the care of low-birth-weight neonates at Koshi Hospital, Biratnagar. Using semi-structured interviews, 63.3% had high levels of knowledge.[11] Although the nurses do not have a formal program, their knowledge can be based on their work experience gained during their university studies and in the wards. A cross-sectional survey of 72 NICU nurses with at least 6 months of experience at Jafeer Ibn Ouf Pediatric Hospital in Khartoum, Saudi Arabia, employed questionnaires. Findings showed 44.4% knew about preterm neonates, with poor knowledge overall.[12] The difference observed in our study could be due to differences in work experience between the nurses at the two hospitals, located in entirely different geographical areas.

The study findings showed that respondents' knowledge level was significantly associated with their socio-demographic characteristics, specifically current residence area ($p = 0.045$), and profession-related characteristics, including total experience in the nursing field ($p = 0.042$). This is likely because the opportunity for most exposure is limited to cities in Nepal, with the Kathmandu region being the most common, and work experience itself is a good source of knowledge.

The study was conducted exclusively in the indoor departments of a single tertiary-level hospital, which limited the ability to gather information from nurses in the outdoor departments and from nurses at other hospitals. Using the standard research tool might have made the questionnaire lengthy, requiring respondents to spend more time reading statements, understanding them, and providing responses.

Similar studies can be conducted at different time intervals in the future, making them helpful for comparing and evaluating improvements and drawbacks. In-service

education and training on preterm care can be arranged to educate nurses and enrich their knowledge of caring for preterm babies.

CONCLUSION

The study revealed that the majority of the respondents had a good level of knowledge regarding preterm care. The study found a statistically significant association between knowledge and current residence area, as well as total experience in the nursing field.

DECLARATIONS

Acknowledgement
The researcher gratefully acknowledges the statistical advisor of YHSA.

Conflict of Interest
None

Funding
None

Ethical Clearance
Ethical clearance was obtained from YHSA (Ref. No: 079/048). A formal request letter for data collection was obtained from YHSA, and written permission was secured from TUTH. Additionally, permissions were obtained from the respective wards.

Consent of the Study
Verbal and written consent was taken from the participants.

Consent for Publication from Authors
All author/s and participants consented to the publication of the findings.

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