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Knowledge Regarding Care of Low Birth Weight Babies among Nurses Working in Pediatric Wards of a University Hospital in Eastern Nepal

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Abstract

Background: Birth weight is the single most important factor determining a newborn's survival chance. Recent development in neonatal care demands nurses to have updated knowledge regarding the care of low birth weight (LBW) babies. We aimed to assess the knowledge regarding care of LBW babies among nurses.

Methods: In this descriptive cross-sectional study, we enrolled 54 nurses working in pediatric wards of BPKIHS. To assess their knowledge regarding the care of LBW babies, a pre-tested self- response questionnaire was administered with focus on six domains: knowledge about care of LBW babies, the kangaroo mother care, adequacy of breast feeding, vaccination, bathing of LBW babies, and prevention of infection. The chi-square test was used to examine the association between different categorical variables and their knowledge.

Results: The majority (83%) had a Proficiency Certificate in nursing education, 11% had a Bachelor of Science in nursing education and only 6% had completed Bachelor in general nursing. More than half (55.6%) of the nurses had a job experience of 1-5 years. The overall knowledge score (mean ± SD) among the nurses on care of LBW babies was 86.5 ± 2.3. Nurses with Bachelor level of education had better knowledge score (85.5 ± 15.4) compared to those with proficiency level of education (75.1 ± 15.9) ($p = 0.003$).

Conclusion: The knowledge regarding the care of LBW babies among the nurses working in pediatric wards of BPKIHS seemed excellent. Knowledge was better in nurses with higher educational level.

Keywords: Knowledge, Low birth weight, Nurse, Nursing care

Declarations

Ethics approval and consent to participate: Ethical approval obtained from the Institutional Review Committee, B. P. Koirala Institute of Health Sciences (Ref No. - IRC/ 1253/ 018). Written informed consent taken from each participant before enrollment.
Consent for publication: Not applicable
Availability of data and materials: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request. All relevant data are within the manuscript.
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Low birth weight (LBW) is defined as the birth weight of live-born infants below 2500 gm, regardless of gestational age [1]. It is the single most important factor determining the survival chances of a newborn [2]. In South Asia, 9.8 million live births in 2015 were LBW, which accounted for nearly half of the total prevalence worldwide [3]. Maternal education, occupation, weight, age ≥ 30 years, height, previous history of LBW or preterm delivery, presence of anemia or hypertension during pregnancy, time to first antenatal care visit and its frequency, mode of delivery, and gestational age were independent predictors of LBW [4, 5].

Maternal knowledge on care of a baby reflects the health and nutritional status of her baby. Nurses from neonatal care centers/ wards play an important role in empowering mothers with knowledge about specialized care to LBW babies. The recent developments in neonatal care technology demand nurses have up-to-date knowledge regarding care of LBW babies. Therefore, this study was conducted to assess the existing knowledge of the nurses working in pediatric wards of B. P. Koirala Institute of Health Sciences (BPKIHS) on the care of LBW babies.

METHODS

After ethical approval from the Institutional Review Committee, this descriptive, cross-sectional study was carried out in the pediatric wards including Nursery, Pediatric Intensive Care Unit and Neonatal Intensive Care Unit of BPKIHS, from March till May 2020. All the nurses working in the study area and agreeing to participate were enrolled. A total enumerative sampling technique was used. The demographic characteristics of nurses, and their educational level were recorded. To assure confidentiality, participants' information were kept anonymous.

A pretested semi-structured self-reporting questionnaire was used to assess the knowledge of nurses regarding care of the LBW babies. The questionnaire had six areas of inquiry: prevention of infection, knowledge about care of LBW babies, bathing of LBW babies, vaccination, adequacy of breast feeding, and the kangaroo mother care (KMC). Each of the six domains had several questions to assess the knowledge in the respective domain. The knowledge of participants was scored based on the techniques described elsewhere [2]. Briefly, each correct response was given a score of one while a wrong or unsure response was scored zero. The maximum score expected for each domain was 100 irrespective of the number of questions. For example, if there were 8 questions in a domain then each question of that domain carried a value of 12.5 [12.5 x 8 (no. of questions) = 100 weighted]. Weighted values of all questions of each domain were summed up and then categorized into different levels of knowledge. The total knowledge scores in each domain were categorized as poor (< 40), below average (41 to 50), average (51 to 60), good (61 to 70) and excellent (> 70).

The structured questionnaire was pre-tested in one of the wards of BPKIHS on 10% of the nurses and checked for completeness, clarity, sensitiveness, and consistency. Finally, corrections were done accordingly before commencing the actual data collection. The principal investigator checked the completeness of the data collected.

The data entry was carried out using MS-Excel Program 2007. Frequencies were used to check for outliers and data cleaning was done. The data were analyzed using Statistical Package for the Social Sciences for windows version 11.5 (SPSS Inc; Chicago, IL, USA). For descriptive statistics, frequency, percentage, mean, and standard deviation were used. The chi-square test was used to examine the association between knowledge and different categorical variables. The Independent t-test was used to compare the significance difference between the knowledge score of bachelor level of nursing education and proficiency level nursing education. A p-value < 0.05 was considered as statistically significant.

RESULTS

A total of 54 participants were enrolled. The majority of the nurses (61%) belonged to the age group of 20-25 years, and 43.6% were married. The majority (83%) had a Proficiency Certificate level education in Nursing (PCL Nursing), 11% had a Bachelor in Science in nursing education (B.Sc. Nursing) and only 6% were from Bachelor in General Nursing (BN). The majority (96%) were staff nurses while 4% were senior staff nurses. More than half (55.6%) of the nurses had a job experience of 1-5 years. All the nurses felt the need for a refresher training on the LBW babies (**Table 1**).

All the participants had heard about six domains of care of LBW babies. Most of the participants had good to excellent knowledge in six domains of care of LBW babies (**Table 2**). The knowledge score (mean ± SD) among nurses regarding the care of LBW babies

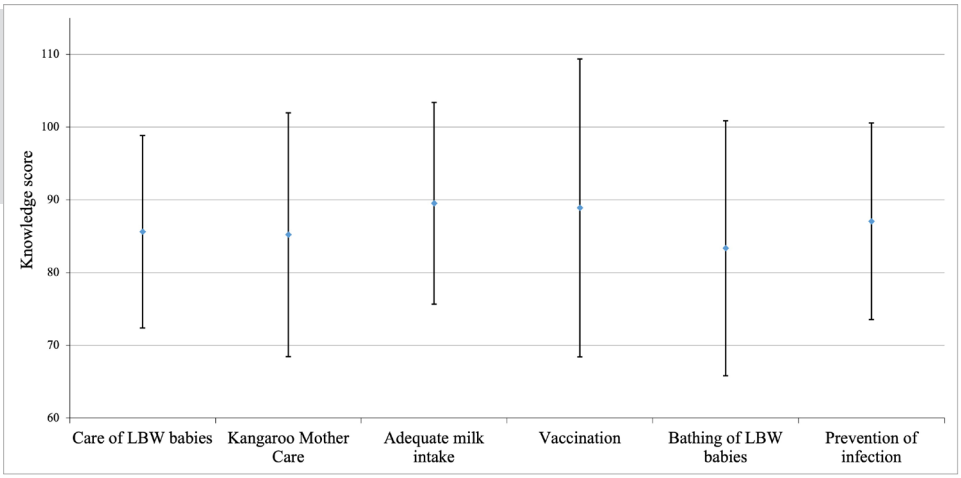

Figure 1: Nurses' knowledge score on six domains related to care of LBW babies (n = 54). Values are expressed as mean and SD.

Table 1. Demographic characteristics of study participants (n = 54)

Demographic characteristics	Categories	Frequencies n (%)
Age (years)	20 - 25	33 (61.0)
	26 - 30	16 (30.0)
	31 - 35	5 (9.0)
Marital status	Married	23 (43.6)
	Unmarried	31 (57.4)
Academic level	PCL Nurse	45 (83.0)
	BN	3 (6.0)
	B. Sc. Nursing	6 (11.0)
Designation	Staff Nurse	52 (96.0)
	Senior Staff Nurse	2 (4.0)
Total duration of job experience in nursing field	< 1 Years	6 (19.1)
	1- 5 Years	30 (55.6)
	> 5 Years	18 (33.3)
Duration of service in pediatric units	< 1 Years	18 (33.3)
	1- 5 Years	24 (44.4)
	> 5 Years	12 (22.2)
Area of work	Pediatric-I	9 (17.0)
	Pediatric-II	9 (17.0)
	Neonatal ward	6 (11.0)
	NICU/ PICU/ Nursery	30 (55.0)
Work experience at the present ward	< 1 Years	16 (29.6)
	1- 5 Years	27 (50.1)
	> 5 Years	11 (20.4)
Received training on any subject related to care of LBW baby	Yes	18 (33.0)
Need of refresher training to nurses on LBW babies	Yes	54 (100)

was 85.6 ± 13.2. The knowledge score (mean ± SD) regarding the KMC was 85.1 ± 16.7, adequate volume of milk intake was 89.5 ± 13.8, vaccination of LBW babies 88.8 ± 20.4, bathing LBW babies was 83.3 ± 17.5, and the prevention of infection was 87.0 ± 13.5 (**Fig. 1).**

No difference was observed in the knowledge about care of LBW babies between junior and senior staff nurses. Nurses having bachelor level of nursing education (B.Sc. Nursing and BN) had better knowledge (85.5 ± 15.4) compared to the nurses having proficiency level of nursing education (75.1 ± 15.9) (p = 0.003) while no significant association was found with age, designation, marital status, professional experience in the nursing field, and job experience in the pediatrics unit.

DISCUSSION

This study found that all the nurses were familiar with the six domains of the care of LBW babies, and the majority had an excellent knowledge regarding the care of LBW babies. We also found that nurses with bachelor level of education had better knowledge compared to nurses with proficiency level education in nursing which is statistically significant irrespective of their designation, marital status, or professional experiences. This finding is consistent with another report [6]. However, a study reported that there is no statistically significant association between duration of work or educational level and respondents' level of knowledge regarding care of LBWs [7].

Our nurses knew the correct definition of LBW while only 45.4% of nurses in Uganda could tell the correct definition [8]. Similarly, 98.1% of our nurses knew the definition of intrauterine growth retardation (IUGR). The majority (79.6%) had heard of Ballard

Table 2: Knowledge of nurses regarding six domains of care of LBW babies (n = 54)

Domain of care	Correct response n (%)
Care of LBW babies	
Meaning of LBW	54 (100)
Difference between pre-term and IUGR	53 (98.1)
How does LBW babies differ from a normal newborn babies?	32 (59.3)
IUGR babies have birth weight (< 10th percentile of expected birth weight)	50 (92.6)
Have you heard about Ballard score?	43 (79.6)
Feature of prematurity	29 (53.7)
Reasons of difficulty in maintaining normal body temperature in LBW	47 (87.0)
Meaning of hypothermia of babies (if less than 36.50C)	53 (98.1)
Best way to keep LBW babies warm (placing on mother's chest)	54 (100)
Kangaroo Mother Care	
Temperature of baby to be maintained in KMC	54 (100)
Does KMC facilitates breast feeding?	52 (96.3)
Correct techniques of KMC	42 (77.8)
Best position for mother during KMC	44 (81.5)
LBW babies should have KMC from birth	45 (83.3)
Criteria for weaning of babies from KMC	42 (77.8)
Adequate volume of milk	
Is a LBW baby to start commercial feeds immediately?	39 (72.2)
Condition to stop giving feeding to the baby	49 (90.7)
Time to provide expressed breast milk to LBW babies	54 (98.1)
Correct technique of cup and spoon feeding to LBW babies	53 (98.1)
Correct technique of tube feeding to LBW babies	47 (87.0)
Initiation of non-nutritive sucking to the babies	44 (81.5)
Vaccination	
Pre-term babies should be vaccinated at the same chronological age as full-term babies	47 (87.0)
Breast feeding is contraindicated for LBW babies during vaccination	48 (88.9)
Dose of vaccine should be reduced for LBW babies	49 (90.7)
Bathing	
LBW babies are given sponging bath only unless the weight of 2.5 kg	30 (55.6)
Bathing water should feel pleasantly warm to the elbow or wrist before bathing	50 (92.6)
Bathing should proceed from soiled to the cleanest area of the body	47 (87.0)
Bathing and drying should be done quickly	53 (98.0)
Prevention of infection	
Not allow the personnel with active infection be in contact with baby in special care unit	54 (100)
Wash hand before and after caring for a baby and before any procedure	53 (98.0)
Incubators are wiped with disinfectant solution weekly	28 (51.9)
With each diaper change, the area is washed using cotton soaked in warm after and dried carefully	53 (98.0)

LBW: Low birth weight, IUGR: Intrauterine growth retardation, KMC: Kangaroo mother care

score. Similarly, 87% of respondents knew that LBW babies have difficulty in maintaining normal body temperature because of less body fat. While all our nurses had a knowledge that the best way to keep LBW babies warm is on the mother's chest, around 2% did not know the correct definition of hypothermia which is way less than 19% of respondents from Ethiopia who also could not tell the correct definition of hypothermia [9].

All our nurses knew that the KMC method helps in maintaining body temperature. The majority (96%) knew that it also facilitates breast feeding. Similarly, 77.8% responded correctly about techniques of the KMC and 81.5% responded correctly about the best position for the KMC. The majority (83.3%) knew that LBW babies should receive the KMC from birth; this finding is also consistent with another study in which 75.6% of respondents knew about maintaining a skin-to-skin contact of a baby with its mother [9]. Among our nurses, 77.8% knew the correct criteria of weaning from the KMC whereas only 19.7% of health personnel in another study believed that KMC could be done at home [10].

In our study, around 72% of nurses were aware that commercial feeds should not be started immediately in LBW babies. Similarly, 91% knew when to stop feeding a baby. The majority (98.1%) knew the time to provide expressed breast milk to LBW babies. Our findings are better than a study from Ethiopia where 19% of midwives felt that mothers should exclusively breastfeed beyond six months [11].

The majority (87%) of our nurses knew that preterm infants should be vaccinated at the same

chronological age as full term. In contrast, a study conducted in India suggested that babies with LBW were vaccinated with a significant delay [12]. Similarly, the majority (88.9%) of our nurses knew that breast feeding is not contraindicated during vaccination and the majority (90.7%) knew the correct dosing of vaccines for LBW babies.

Regarding our nurses' knowledge about nutritional supplements of LBWs infants, we found that 87% knew the correct technique of tube feeding to LBW babies. Interestingly, only less than half of healthcare providers correctly knew the technique of tube feeding to LBW babies in affluent countries as well [13].

More than half (55.6%) of our nurses knew that LBW babies should not be bathed unless they weigh 2.5 kg. The majority (92.6%) of our nurses responded correctly on the way of checking the temperature of the water before bathing. Similarly, the majority (87%) knew the correct procedure of bathing. Almost 98% correctly responded that bathing and drying should be done quickly. The findings of our study are consistent with a similar study conducted in the western part of Nepal [7].

All of our nurses knew that they should not allow a person with active infection to be in contact with the baby in the special care unit. Similarly, 98% of our nurses knew about hand washing practices before and after taking care of a baby. A little more than half (51.9%) of our nurses responded correctly on timing for wiping of incubators. The majority (98%) knew the correct way of changing diapers.

This study has some limitations. First, the sample size for this study is low and the findings of the study cannot be generalized among all the nurses working at BPKIHS. The main reason for a small sample size was to include the nurses who were working in the pediatric wards only. Second, we did not find any standardized criteria to distinguish knowledge as good and poor. However, we took median value as a cut off value and categorized knowledge as good and poor based on the literature review.

CONCLUSION

The knowledge regarding the care of LBW babies among the nurses working in pediatric wards of BPKIHS seemed excellent. Knowledge was better in nurses with higher educational level.

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