Research Article

Effectiveness of Educational Intervention on Knowledge Regarding Newborn Care among Nurses Working in Maternity Units of B. P. Koirala Institute of Health Sciences, Nepal

Gayatri Rai[1], Mangala Shrestha[1], Nirmala Pokharel[1], Sunita Bhandari[2]

[1]Department of Maternal Health Nursing, College of Nursing, B.P. Koirala Institute of Health Sciences, Dharan, Nepal, [2]Department of Pediatric Nursing, Norvic Institute of Nursing, Kathmandu, Nepal

ABSTRACT

Introduction: Globally, 2.5 million children died in the 1st month of life in 2017. An estimated 23,000 children die in Nepal each year before reaching their fifth birthday with three out of five babies dying within 28 days after birth. Children who die within the first 28 days of birth suffer from conditions and diseases associated with lack of quality care at birth or skilled care and treatment immediately after birth and in the 1st day of life. **Objective:** The objective of the study was to assess the effectiveness of educational intervention about newborn care among nurses. **Materials and Methods:** A pre-experimental one-group pretest-posttest design was employed in the study. Forty-four nurses working in maternity units of B. P. Koirala Institute of Health Sciences were selected through convenient sampling method. A pre-tested structured self-administered questionnaire was used to collect the data. Frequency, percentage, mean, standard deviation, Chi-squared test, and Spearmen correlation were used to analyze the data. **Results:** The findings showed that most of the knowledge lacking areas in pretest were cord care, temperature of birth room, first sponge bath, and second follow-up visit for newborn care. The mean±SD knowledge scores were 21.93±7.20 and 33.68±4.31 in pre-test and post-test, respectively. The pre-test and post-test knowledge scores were positively correlated (r_s=0.136). **Conclusion:** The findings indicated that educational intervention was effective for enhancing nurses' knowledge of newborn care. Continue nursing education and training for nurses would be beneficial to increase nurses' knowledge on newborn care.

Keywords: Educational intervention, Knowledge, Newborn care, Nurses

Address for Correspondence: Gayatri Rai, Department of Maternal Health Nursing, College of Nursing, B.P. Koirala Institute of Health Sciences, Dharan 56700, Province No. 1, Nepal. Phone: 977 025 525555. Ext. 2084 (O), 3139 (R). Mobile: 9779842352153. Fax: 977-25-520251. E-mail: gytr_rai@yahoo.com

Introduction

Globally, 2.5 million children died in the 1st month of life in 2017 – approximately 7000 newborn deaths every day with about 1 million dying on the 1st day and close to 1 million dying within the next 6 days. A child's risk of dying is highest in the first 28 days of life, during the neonatal period. In 2017, 47% of all under-5 child deaths were among newborn infants – up from 40% in 1990.[1] In Nepal, an estimated 23,000 children die each year before reaching their fifth birthday with three out of five babies dying within

28 days after birth.[2] Nepal's childhood mortality rates have declined since 1996. Infant mortality has decreased by more than half from 78 deaths per 1000 live births in 1996 to 32 in 2016. During the same time period, under-5 mortality has declined 3-fold from 118 to 39 deaths per 1000 live births. The neonatal mortality rate has declined from 50 deaths per 1000 to 21 deaths per 1000 live births in 2016.[3]

Children who die within the first 28 days of birth suffer from conditions and diseases associated with lack of quality care at birth or skilled care and treatment immediately after birth and in the 1st day of life. Preterm birth, intrapartum-related complications (birth asphyxia or lack of breathing at birth), infections, and birth defects cause most neonatal deaths.[1] In Nepal, more than 80% of all newborn deaths result from three preventable and treatable condition – complications due to prematurity, intrapartum-related deaths (including birth asphyxia), and neonatal infections.[4,5]

Access to skilled birth attendants and delivery in facilities equipped for emergency obstetric and newborn care are core requirements for pregnant women. Many countries in South Asia have recognized the need to train more midwives, as the availability of skilled birth attendants – day and night – is crucial to scaling up proven, inexpensive interventions.[6] Nepal's every Newborn Action Plan focuses on building a strengthened health system supported by fully trained and skilled health workers in all tiers of health facilities that are adequately resourced. This includes strengthening the quality and accessibility of public and private service providers with targeted interventions to reach communities.[2] Competent nurse practitioners and skilled delivery care within health-care system are crucial to ensure quality health services for saving lives of mothers and newborns. However, still low coverage of skilled birth attendants (55.6%) and institutional delivery (55.2%) indicating poor health-care markers in Nepal. Although health-care providers' knowledge is essential for improving the newborn health, there has been a wide gap in recommended knowledge of maternity health services among them in developing countries.[7]

A Nepalese study revealed that majority of the nurse-midwives have had inadequate (poor or some) level of knowledge in most of the components of maternal and newborn care services.[7] A Zambian study indicated that knowledge and skills of the nurse-midwives improved significantly in post-training.[8] Hence, the researchers were willing to conduct this study to improve the nurses' knowledge of newborn care. The study aims to assess the effectiveness of educational intervention on knowledge of newborn care among nurses working in maternity units of B. P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal.

Materials and Methods

Pre-experimental one-group pretest-posttest design was used to assess nurses' knowledge before and after an educational intervention. Forty-four nurses working in maternity units of BPKIHS were selected through convenient sampling method. Only those nurses willing to participate in the study were included in the study. Ethical clearance was obtained from the Institutional Review Committee, BPKIHS. Informed written consent was taken from each nurse; anonymity and confidentiality were maintained throughout the research process. A pre-tested structured self-administered questionnaire was used to collect the data which consisted two parts, the first part was sociodemographic information and the second part was knowledge regarding newborn care consisting 20 multiple-choice questions (MCQs) and two multiple response questions (MRQs). Validity of instrument was established by reviewing the related literature, seeking opinion from experts and colleagues. Two different about 3 h sessions of educational programs were introduced within a week by researchers themselves as per pre-design educational package. Pre-test was done before each session and post-test was conducted after a month of educational intervention in their respective job placement using the same research instrument.

Statistical analysis

The data were coded and entered into the Statistical Package for the Social Sciences-15 program and analyzed using frequency, percentage, mean, standard deviation, Chi-square (for categorical individual item), and Spearmen correlation (to observe the correlation between pre-test and post-test knowledge scores). *P*-value was calculated and considered statistically significant ($P \leq 0.05$). The analyzed data were presented in tables according to the objectives of the study. Regarding the knowledge scoring, score of "1" was assigned for the correct response and "0" for incorrect response.

Results

Table 1 shows that the majority (70.5%) of nurses were from the age group of 20 to 30 years. More than half (54.5%) were married. Regarding education, majority (72.7%) of the respondents had passed proficiency certificate level nursing and more than half (59.1%) of nurses had <5 years of work experience. About one-third (34.1%) of nurses were from antenatal ward followed by postnatal ward (22.7%), gyne ward (15.9%), tropical ward (15.9%), and maternal and child health ward (11.4%). Table 2 shows that nurses had good knowledge in most areas of newborn care, but they had poor knowledge in some areas such as proportion of neonatal death (36.4%), neonatal mortality rate (36.4%), decontamination (31.8%), cord care (29.5%), temperature of birth room (25%), first sponge bath for newborn (6.8%), and second follow-up visit for newborn (4.5%) before the intervention. Nurse's knowledge of newborn care was increased in all areas after the educational intervention but only few increments found in the first sponge bath for

newborn (43.2%) and second follow-up visit for newborn (34.1%) even the small increment in these two areas, there were significant differences in pre- and post-test scores. Regarding the statistical significance, nurses' post-test

Table 1: Sociodemographic characteristics of the nurses (*n*=44)

Variables	Frequency	Percentage
Age class (years)		
20–30	31	70.5
31–40	7	15.9
41–50	4	9.1
51–60	2	4.5
Marital status		
Married	24	54.5
Unmarried	20	45.5
Education		
Auxiliary nurse-midwife	7	15.9
Proficiency certificate level nursing (staff nurse)	72.7	32
B. N/B.Sc.	5	11.4
Work experience		
<5 years	26	59.1
5 and >5 years	18	40.9
Working area		
Antenatal/labor	15	34.1
Postnatal ward	10	22.7
Gyne ward	7	15.9
Tropical ward	7	15.9
Maternal and child health	5	11.4

knowledge scores were significantly higher than pre-test scores on proportion of neonatal death ($P = 0.000$), neonatal mortality rate ($P = 0.000$), decontamination ($P = 0.001$), immediate newborn care ($P = 0.000$), cord care ($P = 0.003$), temperature of birth room ($P = 0.000$), advantage of skin to skin contact ($P = 0.002$), first sponge bath for newborn ($P = 0.000$), first tub bath ($P = 0.000$), assessment of breastfeeding ($P = 0.035$), dose of Vitamin K ($P = 0.000$), newborn danger signs ($P = 0.006$), and second follow-up visit ($P = 0.000$). The mean±SD knowledge scores were 21.93±7.20 and 33.68±4.31 in pre-test and post-test, respectively. Table 3 shows that the nurses' pre-test and post-test knowledge scores were positively correlated (r_s=0.136).

Discussion

The discussions focus on the effectiveness of educational intervention on nurses' knowledge of newborn care. The purpose of this study was to assess the effectiveness of educational intervention on knowledge regarding newborn care among nurses working in maternity units of BPKIHS, Dharan, Nepal.

Nurses had some knowledge of most areas of newborn care even before educational intervention, but they had poor knowledge in some areas such as proportion of neonatal death, neonatal mortality rate, decontamination, cord care, temperature of birth room, first sponge bath for newborn, and second follow-up visit for newborn. Nurse's knowledge of newborn care had increased after

Table 2: Nurse's knowledge regarding newborn care before and after educational intervention

Description	Pre-test (*n*=44)		Post-test (*n*=44)		*P*-value
	Score	%	Score	%	
Proportion of neonatal death	16	36.4	42	95.5	0.000*
Neonatal mortality rate	16	36.4	39	88.6	0.000*
Decontamination	14	31.8	30	68.2	0.001*
Handwashing	37	84.1	40	90.9	0.508
Immediate newborn care	31	70.4	43	97.7	0.000*
Normal color of newborn	42	95.5	44	100.0	1.000
Normal respiratory rate	27	61.4	33	75.0	0.180
Indication of resuscitation	40	90.9	43	97.7	0.375
Appropriate cord length for the first tie	35	79.5	43	93.2	0.146
Cord care	13	29.5	28	63.6	0.003*
Temperature of birth room	11	25.0	39	88.6	0.000*
Methods of heat loss in newborn	33	75.0	35	79.5	0.791
Advantage of skin to skin contact	29	65.9	41	93.2	0.002*
First sponge bath for newborn	3	6.8	19	43.2	0.000*
First tub bath	25	56.8	40	90.9	0.000*
Immediate breastfeeding	40	90.9	43	97.7	0.375
Assessment of breastfeeding	32	72.7	41	93.2	0.035
Time for BCG vaccine	41	93.2	43	97.7	0.625
Dose of Vitamin K	25	56.8	42	95.5	0.000*
Newborn danger signs	32	72.7	42	95.5	0.006*
Second follow-up visit for newborn	2	4.5	15	34.1	0.000*
Special focus for follow-up care at the 28th day	21	47.7	42	95.5	0.096
Mean±SD	21.93±7.20		33.68±4.31		

*=Chi-square value <0.05 (statistically significant), BCG: Bacillus Calmette–Guérin

Table 3: Correlations between nurses' pre-test and post-test knowledge score

	Post-test	
	r score	***P*-value**
Pre-test	0.136	0.380*

*=Positive correlation (correlation coefficient >0)

education intervention in most of the areas. However, only a few increments observed in post-test knowledge score on the first sponge bath and second follow-up visit for newborn, even few increment, it was significantly higher than that of pre-test score. One nurses' knowledge score was declined in post-test than the pre-test. It could be due to the carelessly attempted the MCQ and MRQ during test.

The mean±SD knowledge scores were 21.93±7.20 and 33.68±4.31 in pre-test and post-test, respectively. The pre-test and post-test knowledge scores were positively correlated. Findings of various studies are consistent with this study. A study from Zambia showed that knowledge and skills of the nurse-midwives improved significantly were mean of 65% correct pre-training and 84% correct post-training, respectively.[8] Similarly, another study about Online Neonatal Training and Orientation Programme in India – the way forward for distance education in developing countries reveals that significant increase in knowledge (MCQ test: Mean difference was 6.4 (95% confidence interval [CI]: 5.6–7.17).[9] A study from Nepal is also consistent with these study findings which showed that educational intervention was effective for improving nurses' knowledge and practice regarding newborn care, and a positive correlation between knowledge and practice.[10] The finding was also consistent with Indian study on evaluation of a multimodal teaching method on essential newborn care among health providers at a tertiary care hospital which revealed that significant improvement in the knowledge scores on MCQs after the workshop.[11] Another similar kind of study showed that pre-training mean knowledge scores about essential newborn care in webinars and participatory learning group (mean ± SD) (30.96 ± 5.62 vs. 31.43 ± 4.74, *P* = 0.42) and skill scores (19.14 ± 3.37 vs. 19.20 ± 3.71, respectively, *P* = 0.77) were comparable. Training methods resulted in equal gain in knowledge in both groups.[12]

Conclusion

There was a significant improvement in nurses' knowledge of newborn care in post-test. The study concluded that the educational intervention is effective in increasing nurses' knowledge of newborn care. Educational and training program for nurses about newborn care would be beneficial to increase the knowledge of newborn care.

Conflicts of Interest

All authors have participated in conception and design, or analysis and interpretation of the data, drafting the article or revising it critically for important intellectual content, and approval of the final version. All the authors are agreed on the following.
- This manuscript has not been submitted to, nor is under review at, another journal or other publishing venue
- The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.

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