

An Experimental Study to Evaluate the Impact of a Targeted Educational Programme on Skilled Regarding Care of Low Birth Weight Neonates among Nursing Staff Working in Selected Hospital at Bijnor, U.P.

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Abstract

Introduction : Low birth weight neonates (LBWN) are infants born weighing less than 2,500 grams, irrespective of gestational age. This condition is a significant public health issue, particularly in low- and middle-income countries, where its prevalence is the highest. LBWN are at increased risk for various health complications, including respiratory distress, infections, feeding difficulties, and long-term developmental delays, all of which contribute to elevated neonatal morbidity and mortality rates globally.

Methodology : A quasi-experimental pre-test post-test design was used, involving 300 nursing staff members selected through purposive sampling. Data were collected using a structured questionnaire to assess baseline practices before and after the intervention. Descriptive and inferential statistics, including paired t-tests, were used to analyze the data and evaluate the effectiveness of the programme.

Results : The study showed a significant improvement in practice after the intervention. The mean pre-test practice score was 13.46 (53.84%), which increased to 20.95 (83.80%) in the post-test, with a mean improvement of 7.49 (29.96%). The paired t-test value of 44.80 confirmed the statistical significance of the improvement. Educational level and years of experience were significantly associated with pre-test practice scores, with more experienced and higher-educated nurses demonstrating better initial practice levels.

Conclusions : The targeted educational programme effectively enhanced the practical skills of nursing staff in caring for LBW neonates. The study highlights the importance of ongoing, structured training to maintain and further improve neonatal care quality.

Keywords : LBWN; Nursing staff; KMC.

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Introduction

Low birth weight neonates (LBWN) are defined as infants born weighing less than 2,500 grams, regardless of gestational age. This condition is a major public health concern, especially in low- and middle-income countries, where the prevalence is highest. LBWN are more vulnerable to a range of health complications, including respiratory distress, infections, feeding difficulties, and long-term developmental delays. These complications contribute significantly to neonatal morbidity and mortality rates globally. According to the World Health Organization (WHO), approximately 15-20% of all births worldwide are classified as low birth weight, equating to more than 20 million infants annually. LBWN remain a critical focus of neonatal care due to their heightened risk of early death, impaired growth, and long-term disability¹.

The causes of low birth weight are multifactorial and can be broadly classified into maternal, fetal, and environmental factors. Maternal factors such as malnutrition, infections, chronic diseases (e.g., hypertension, diabetes), and substance abuse (including tobacco and alcohol) play a crucial role in increasing the risk of delivering a low birth weight baby². In addition, poor maternal health, inadequate prenatal care, and high levels of stress have been linked to preterm birth, which is a leading cause of LBWN³. Fetal factors include intrauterine growth restriction (IUGR) and congenital abnormalities, both of which can impair fetal development and result in LBWN⁴. Environmental factors, including socioeconomic status, access to healthcare, and exposure to pollutants, further exacerbate the risk⁵.

The immediate postnatal period is critical for the survival and well-being of LBWN. These infants often experience difficulties in maintaining body temperature, breathing, and feeding due to underdeveloped organ systems⁶. Respiratory distress syndrome, a common complication in LBWN, arises from immature lung development and insufficient surfactant production⁷. Additionally, LBWN are more susceptible to neonatal infections, including sepsis, pneumonia, and meningitis, which are major causes of mortality in this group⁸. Effective management strategies, including appropriate nutritional support, temperature regulation, and infection control, are essential to improving the outcomes of LBWN⁹.

Nutritional support is particularly important in the care of LBWN. These infants require adequate caloric intake and nutrients for growth and development. Human milk, especially breast milk, is considered the best nutritional source for LBWN due to its immunological and nutritional

properties¹⁰. However, exclusive breastfeeding may not fully meet the high nutritional demands of LBWN, necessitating the use of human milk fortifiers to supplement essential nutrients like protein, calcium, and phosphorus¹¹. Studies have demonstrated that fortified breast milk significantly improves growth and development outcomes in LBWN¹². For LBWN who cannot be breastfed, formula specifically designed for premature or low birth weight infants is recommended¹³.

In terms of long-term outcomes, LBWN are at increased risk for neurodevelopmental issues, cognitive impairments, and chronic health problems such as cardiovascular diseases and diabetes later in life¹⁴. Early intervention programs, including physical therapy, developmental monitoring, and nutritional support, are critical for mitigating these risks and improving the quality of life for LBWN as they grow older¹⁵. Additionally, research indicates that socioeconomic factors significantly influence the long-term outcomes of LBWN, underscoring the need for comprehensive care strategies that address both medical and social determinants of health¹⁶.

Need for The Study

Low birth weight (LBW) neonates, defined as infants weighing less than 2,500 grams at birth, are at an increased risk for complications such as infections, respiratory distress, and long-term developmental issues¹⁷. These infants require specialized care, which demands a high level of skill and knowledge from healthcare providers, particularly nursing staff who are at the forefront of neonatal care. In many settings, including hospitals in rural areas such as Bijnor, U.P., the challenges in providing optimal care for LBW neonates are further compounded by a lack of resources and targeted training programs¹⁸. It is essential to equip nursing staff with the skills required to provide comprehensive and evidence-based care for these vulnerable infants.

Research has shown that targeted educational programs can significantly improve nursing knowledge and skills, leading to better patient outcomes¹⁹. Despite the growing body of evidence supporting the need for continuing education and skills development in neonatal care, there remains a gap in the training provided to nursing staff, especially in lower-resourced settings. This gap underscores the necessity for targeted educational interventions aimed at enhancing the competencies of nursing staff in caring for LBW neonates. Such interventions can improve the quality of neonatal care, reduce the incidence of complications, and ultimately lower neonatal mortality rates²⁰.

Objectives of the study

1. To assess the existing practice regarding care of low birth weight neonates among nursing staff of selected hospital.
2. To findout the effectiveness of targeted educational programme on practice regarding care of low birth weight neonates among nursing staff of selected hospital
3. To determine the association between practice score regarding care of low birth weight neonates among nursing staff with their selected demographic variables.

Hypotheses

H₁ : There is a significant different between pre and post-test practice score on care of low birth weight neonates among nursing staff of selected hospital.

H₂ : There is a significant association between pre-test practice score with their selected socio demographic variables.

Operational definitions

Evaluate : To assess the effectiveness of a targeted educational programme in improving nursing staff skills for caring for low birth weight neonates through systematic measurement and analysis.

Targeted Educational Programme : A focused training initiative designed to address specific knowledge or skill gaps in neonatal care, aimed at enhancing nursing staff's competencies in managing low birth weight neonates.

Skill : The practical ability of nursing staff to effectively perform tasks related to the care of low birth weight neonates, developed through training and hands-on experience.

Low Birth Weight Neonates (LBWN) : Infants born weighing less than 2,500 grams, at higher risk for health complications, requiring specialized care from trained healthcare providers.

Nursing Staff : Healthcare professionals, including nurses and midwives, responsible for providing direct patient care,

particularly focused on managing and caring for low birth weight neonates.

Selected Hospital : The specific hospital chosen for the study in Bijnor, U.P., where the targeted educational programme is implemented and evaluated among the nursing staff.

Methodology

Research approach : Quantitative Research Approached was used for this study

Research design : A quasi-experimental pre-test post-test design,

Sample : Nursing staff

Sample Size : 300

Sample Techniques : 300 nursing staff members, chosen through purposive sampling.

Population : Nursing staff from two specified hospitals in Bijnor, Uttar Pradesh.

Setting : Government & pandit chandrakant atray memorial multispeciality hospitals in Bijnor, U.P

Tools & Data Collection : Data collection was conducted using a structured tool, with Part A collecting socio-demographic data and Part B assessing practical skills in LBW neonate care. The educational programme focused on key practical aspects such as feeding techniques, infection control, and temperature management. Descriptive and inferential statistics, including frequency, percentage, mean, standard deviation, paired t-test, and Chi-square test, were used to evaluate and compare pre- and post-intervention practice scores.

Results

The data was presented under the following sections:

Section I : Distribution of sample characteristics according to demographic variables.

Section II : Analysis of practice regarding care of low birth weight neonates among nursing staff

Section III : Analysis of association of pretest level of practice regarding care of low birth weight neonates with selected bio socio-demographic variables among nursing staff.

Table-1 : Classification of Study Participants by Socio-Demographic Variables. (N=300)

Sl.No.	Socio Demographic Variables	Categories	Frequency	Percentage of Frequency
1	Age	Below 25 years	72	24.00
		26-35 years	134	44.66
		36-45 years	56	18.66
		Over 46 years	38	12.66
2	Gender	Male	124	41.33
		Female	176	58.66
3	Education qualification	Diploma in Nursing	196	65.33
		B.Sc./PB B.Sc. Nursing	98	32.66
		MSc Nursing	6	02.00
4	Years of Experience	Less than 1 year	77	25.66
		1-5 years	124	41.33
		6-10 years	76	25.33
		More than 10 years	23	07.66
5	Monthly Income	>10000/-	15	05.00
		10001-20000/-	170	56.66
		20001-30000/-	65	21.66
		>30000/-	50	16.66
6	Type of Employment	Permanent	195	65.00
7	Position in Hospital	Contractual	42	14.00
		Part-time	63	21.00
		Staff nurse	204	68.00
		Senior Nurse	69	23.00
		Nursing Supervisor	21	07.00
		Nurse educator	6	02.00
8	Previous knowledge in neonatal care	Yes	185	61.66
		No	115	38.33
9	Shift typically worked	Morning	85	28.33
		Evening	129	43.00
		Night	59	19.66
		Rotational	27	09.00
10	Source of Information	Periodical training in hospital	114	38.00
		Internet	76	25.33
		Book & Magazines	38	12.66
		Peer group & Seniors	72	24.00

The socio-demographic profile of the 300 study participants reveals that the majority (44.66%) are aged between 26-35 years, with a significant proportion being female (58.66%), indicating a predominance of young female professionals in the nursing workforce. In terms of educational qualifications, a large majority (65.33%) possess a Diploma in Nursing, while only a small percentage (2%) have attained an MSc in Nursing, highlighting a potential area for educational advancement. Regarding professional experience, 41.33% of participants have 1-5 years of experience, and 25.66% have less than one year, reflecting a relatively junior workforce. In terms of income, over half (56.66%) earn between ₹10,001 and ₹20,000 monthly, with 65% holding permanent employment positions. Most participants (68%) work as staff nurses, and 61.66% reported having previous knowledge of neonatal care. The majority work evening shifts (43%), and hospital training serves as the primary source of information on neonatal care for 38% of the participants, underlining the importance of ongoing institutional education.

Table-2: Comparison of distribution of nursing staff by their pre-test and post-test level of practice regarding care of low birth weight neonates. (n=300)

Level of practice	Practice scores	Frequency		Percentage of frequency	
		Pre-test	Post-test	Pre-test	Post-test
Inadequate	0-12	99	0	33.00%	0.00%
Moderate	13-18	199	30	66.33%	10.00%
Adequate	19-25	2	270	0.67%	90.00%
TOTAL		300	100.00%	300	100.00%

Table-3: Mean, mean %, sd and cv of overall pre-test, post-test and enhancement practice scores among nursing staff. (n=300).

	No. of Items	Minimum	Maximum	Range	Mean	Mean %	SD	co-efficient of variance	Paired t Test Value
PRE-TEST	25	7	20	13	13.46	53.84%	2.26	16.81%	44.80 (S) df=299
POST-TEST	25	16	24	8	20.95	83.80%	1.73	8.26%	
ENHANCEMENT	25	1	14	13	7.49	29.96%	2.90	38.66%	

Table-4: Association between pre-test level of practice regarding care of low birth weight neonates among hypertensive nursing staff and their selected socio-demographic variables (n=300)

Sl. No.	Socio demographic variables	Categories	Pre-test level of practice		Calculated chi square value	df	P value
			<Median	≥Median			
1	Age	Under 25 years	36	36	1.22 (NS)	3	0.747
		25-35 years	68	66			
		36-45 years	24	32			
		Over 45 years	20	18			
2	Gender	Male	64	64	0.04 (NS)	1	0.842
		Female	84	88			
3	Educational Level	Diploma in Nursing	101	97	6.07 (S)	2	0.048
		B.Sc./PB B.Sc. Nursing	47	49			
		M.Sc. Nursing	0	6			

4	Years of Experience in Nursing	Less than 1 year	41	36	11.36 (S)	3	0.009
		1-5 years	68	57			
		6-10 years	35	40			
		More than 10 years	4	19			
5	Monthly income (Per month)	> 10000/-	6	9	0.67 (NS)	3	0.881
		10001-20000/-	87	85			
		200001-30000/-	31	32			
		>30000/-	24	26			
6	Type of Employment	Permanent/Regular	93	102	0.76 (NS)	2	0.684
		Contractual	21	21			
		Part-time	34	29			
7	Position in Hospital	Staff Nurse	103	100	2.56 (NS)	3	0.465
		Senior Nurse	30	39			
		Nursing Supervisor	13	9			
		Nurse Educator	2	4			
8	Previous Training in Neonatal Care	Yes	92	93	0.03 (NS)	1	0.862
		No	56	59			
9	Shifts Typically Worked	Morning	47	38	2.25 (NS)	3	0.523
		Evening	60	70			
		Night	27	32			
		Rotational	14	12			
10	Source of information	Periodical training in hospital	56	56	3.97 (NS)	3	0.264
		Internet	34	43			
		Books and magazines	24	14			
		Peer group and seniors	34	39			

Nursing Implication

The findings of the study will help the investigator in the following ways:

Developing positive practice regarding care of low birth weight neonates. The finding of the study can be used in the following areas of nursing profession.

Nursing Practice : The study underscores the importance of ongoing professional development to enhance the skills of nursing staff in the care of low birth weight (LBW) neonates. Improved training on feeding, infection control, and temperature management ensures better outcomes for vulnerable neonates. Nursing staff should implement evidence-based practices learned from the educational programme, contributing to a higher standard of neonatal

care. Nursing Administration: Administrators play a crucial role in facilitating continuous education for their nursing teams. This study highlights the need for hospital management to support targeted educational programmes focused on LBW neonate care. Administrators should allocate resources for training sessions, establish policies for regular skill assessments, and encourage nurses to participate in such programmes.

Nursing Education : The findings of this study emphasize the need to incorporate specialized neonatal care, particularly for LBW infants, into nursing curricula. Educational institutions should design and deliver targeted modules that focus on critical areas such as neonatal feeding, infection prevention, and temperature regulation.

Nursing Research : This study opens avenues for further research on the long-term impacts of targeted educational programmes on nursing practices related to neonatal care. Future research can explore the retention of skills gained through training, the impact on patient outcomes, and the development of new interventions that can be incorporated into nursing education.

Conclusions

The study concluded that the targeted educational programme significantly improved the skills of nursing staff in caring for low birth weight (LBW) neonates at a selected hospital in Bijnor, U.P. Pre-test results indicated that the majority of nursing staff had inadequate or moderate practice levels, with only 0.67% demonstrating adequate skills. However, after the educational intervention, 90% of participants achieved adequate practice, demonstrating the programme's effectiveness in enhancing practical competencies. Factors such as higher education and years of experience were significantly associated with better pre-test practice levels, underscoring the importance of continuous learning. The findings highlight the need for ongoing, structured training to improve the care provided to LBW neonates, who are at increased risk of complications. Overall, the study demonstrates that investing in targeted educational programmes for nursing staff can lead to substantial improvements in neonatal care practices, ensuring better health outcomes for vulnerable infants.

Conflict of interest : No

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