

## Effectiveness of targeted nurse-led interventions on breastfeeding practices among preterm neonates in a tertiary care hospital

Mrs. Veena Sharma, PG Tutor, RML College of Nursing, Shajahanpur, Uttar Pradesh

[Veenasharma6395@gmail.com](mailto:Veenasharma6395@gmail.com), contact:7985531457

### ABSTRACT

Preterm neonates often face significant challenges in establishing effective breastfeeding due to physiological immaturity, despite breast milk being the optimal source of nutrition. This quasi-experimental, non-randomized control group study aimed to evaluate the effectiveness of targeted nurse-led interventions on breastfeeding practices among preterm infants admitted to a tertiary care hospital NICU. A total of 60 preterm neonates were selected through purposive sampling and divided into a study group (n=30) and a control group (n=30). The study group received structured interventions including proper positioning, tactile-kinesthetic stimulation, and kangaroo mother care for 45 minutes twice daily over 14 days, while the control group received routine NICU care. Breastfeeding practices were assessed pre- and post-intervention using the Bristol Preterm Neonates Breastfeeding Scale, focusing on rooting, latch, sucking, and

swallowing. Statistical analysis using paired and independent t-tests and chi-square tests revealed a significant improvement in the study group, with mean scores increasing from 1.5 to 5.62; post-intervention, 96.6% demonstrated moderate and 3.3% good breastfeeding practices. No significant changes were observed in the control group. The findings indicate that targeted nurse-led interventions are effective in enhancing breastfeeding practices among preterm neonates in NICU settings.

**KEYWORDS**-nurse-led interventions, breastfeeding practices, preterm neonates, tertiary care hospital

### INTRODUCTION

One of the main causes of infant morbidity and mortality in the globe is preterm birth, which is defined as delivery before 37 weeks of gestation. An estimated 15 million preterm neonates are born each year, according to the World Health Organization.

Due to their undeveloped organ systems, poor breathing, swallowing, and sucking coordination, and heightened vulnerability to

infections, preterm neonates are physiologically susceptible. Establishing successful breastfeeding is one of the biggest obstacles for preterm newborns. Growth, gastrointestinal maturation, and neurodevelopment are all supported by breast milk's appropriate nutrition and vital immune components.

Despite the well-established advantages of breast milk, preterm neonates continue to have lower rates of effective breastfeeding than term neonates, especially during extended NICU stays. The start and continuation of breastfeeding in preterm neonates are frequently delayed by immaturity of the suck-swallow-breathe coordination, delayed maternal lactogenesis, insufficient institutional breastfeeding support, and maternal stress and exhaustion.

Earlier studies indicate that practices such as kangaroo mother care (KMC), early skin-to-skin contact, individualized lactation support, and guided positioning techniques can improve breastfeeding outcomes in preterm infants. Systematic reviews further highlight that parental education and supportive hospital policies play a crucial role in determining successful breastfeeding in this population. However, variations in how these approaches are applied, along with the absence of standardized nursing protocols, hinder their consistent use in neonatal care units.

There is a lack of information from resource-constrained tertiary care settings regarding the efficacy of a structured, focused nurse-led intervention to enhance breastfeeding practice and shorten the time

to establish it among preterm neonates, despite the existence of evidence-based strategies like positioning, KMC, and tactile–kinesthetic stimulation (TKS).

Recent randomized and systematic research shows that KMC significantly improves feeding outcomes and breastfeeding performance in low-birth-weight and preterm infants. Additionally, prefeeding and oral stimulation therapies have been shown to assist preterm newborns become ready for oral feeding more quickly and feed more effectively in addition to improving oral-motor coordination. Early improvements in feeding competence and neuromuscular system development have also been observed following structured stimulation-based therapies, suggesting that these interventions may help preterm infants successfully begin breastfeeding. However, these studies did not assess a full, nurse-led intervention package incorporated into normal bedside care in tertiary NICU settings since they primarily examined the benefits of discrete feeding-support modalities or single therapies.

Thus, the present study was focused to evaluate the effectiveness of a structured nurse-led intervention package—including positioning, TKS, and KMC to improve breastfeeding practice and reduce the time to establish it among preterm neonates admitted to a tertiary care hospital NICU.

## **NEED OF THE STUDY**

The need of this study arises in order to improve feeding behaviors, boost maternal confidence, and fortify mother-infant connection, nurse-led, structured

breastfeeding interventions must be a regular part of neonatal care given the increase in preterm births and the lengthening of NICU stays. In NICUs, nurse-led interventions can be utilized to enhance breastfeeding and strengthen the mother-infant bond. These interventions are not only affordable and grounded in scientific research, but they are also practical and effective. The use of a combined intervention package limited the assessment of the individual efficacy of each component, and the study was conducted in a single tertiary care hospital with a rather short follow-up time. The current study highlights even more how crucial it is for moms to actively participate in nursing practice and be mentally prepared. The researcher's consistent parental assistance and advice was crucial in helping parents develop self-efficacy, which is crucial for preterm infants to start and continue breastfeeding.

## PROBLEM STATEMENT

A study to assess the effectiveness of targeted nurse-led interventions on breastfeeding practice among preterm neonates in selected tertiary care hospitals at Kanpur, Uttar Pradesh.

## RESEARCH OBJECTIVES

- (1) To assess the pretest level of breastfeeding practices among preterm neonates in the study and control groups.
- (2) To assess the posttest levels of breastfeeding practices among preterm neonates in the study and control groups.

- (3) To evaluate the effectiveness of targeted nurse-led interventions on breastfeeding practice among preterm neonates.

- (4) To determine the association between post-test breastfeeding practices with selected demographic and clinical variables of parents of preterm neonates.

## HYPOTHESIS

**H<sub>1</sub>** – There will be significant difference between mean pretest and post test breastfeeding practices among preterm neonates.

**H<sub>2</sub>** – There will be significant association between post-test breastfeeding practices with selected demographic and clinical variables of parents of preterm neonates.

## METHODS AND MATERIALS

**RESEARCH APPROACH-** Quantitative Research Approach

**RESEARCH DESIGN-** Quasi-experimental Non-randomized pretest–post-test control group design

## VARIABLES-

**Independent Variable-** nurse-led interventions on breastfeeding practice among preterm neonates in selected tertiary care hospitals

**Dependent Variable-** breastfeeding practice among preterm neonates in selected tertiary care hospitals

**POPULATION-** In this study the population was preterm neonates.

**TARGET POPULATION-** In this study the target population was preterm neonates

admitted in specialized NICU in selected hospital, Kanpur.

**ACCESSIBLE POPULATION-** In this study the target population was preterm neonates admitted in specialized NICU in Government Hospital, Kanpur.

**SAMPLE-** The sample for this study was preterm neonates admitted in specialized NICU in Government Hospital, Kanpur who fulfils the inclusion and exclusion criteria that are accessible as subject of the study.

**SAMPLE SIZE-** The sample size of this study was 60 pretem neonates.

**SAMPLING TECHNIQUE-** In this study, Nonprobability purposive sampling technique was used to select the sample.

**INCLUSION CRITERIA-** The preterm neonates,

1. Whose gestational age is 28-37 weeks.
2. Who are admitted in NICU.

**EXCLUSION CRITERIA-** The mothers who are not available at the time of study.

#### **METHODS OF DATA COLLECTION-**

Breastfeeding practice was measured by the Bristol Preterm Neonates Breastfeeding Scale, an instrument that involve six areas (rooting, latch, sucking practice, longest sucking bursts, and swallowing). The scale scores vary between 0 and 20, where a higher score means better breastfeeding practice.

#### **DEVELOPMENT AND DESCRIPTION OF TOOLS USED IN THE STUDY**

#### **SECTION A- Socio Demographic Variable**

**SECTION B-** Bristol Preterm Neonates Breastfeeding Scale to measure the breastfeeding Practice among preterm neonates.

#### **INTERVENTION**

A focused nurse-led intervention that included positioning, TKS, and KMC for preterm infants was given to the experimental group. Over the course of 14 days, the neonate's position was changed from supine to prone, with the arms put beside the body and the head shifted laterally, for 10 to 15 minutes each day. For 14 days in a row, TKS was performed using light strokes and about 10 mL of oil massage. The oil was applied from head to toe for 10 to 15 minutes every morning. For 14 days in a row, the experimental group received a focused nurse-led intervention that included positioning, TKS, and KMC for 45 minutes each session, twice a day. The goals of these therapies were to support healthy weight growth, boost adaptive practice, promote brain development, and regulate body temperature.

#### **DATA COLLECTION PROCEDURE**

Parents or guardians were given a brief introduction at the beginning of data collection, and each participant was assigned a unique identity number. After explaining the goals and methods of the study to the parents, written informed consent was acquired. Purposive sampling was used to find preterm infants who fit the criteria and place them in the experim

ental and control groups. A standardized form was used to collect clinical and demographic data. The Bristol Preterm Infant Breastfeeding Scale (BPIBS) was used to assess baseline breastfeeding practices in both groups. While the control group got standard NICU care, the study group received a nurse-led intervention in which the researcher

administered TKS, proper posture, and kangaroo mother care. A trained research assistant assessed posttest breastfeeding practice on day 14 using the same BPIBS instrument. Standardized procedures were implemented to ensure consistency and reduce the possibility of bias.

**DATA ANALYSIS**

Data analysis was conducted through Descriptive and Inferential Statistics. Demographic and clinical variables were described by frequencies and percentages. Since the data were normally distributed, parametric tests were used. A paired *t*-test was employed to compare pre- and posttest scores within each group, an independent *t*-test was used to compare mean scores

between the study and control groups, and a chi-square test was used to evaluate the association between posttest breastfeeding practices and selected demographic and clinical variables. A *P*-value of less than 0.05 was regarded as statistically significant.

**RESULTS AND FINDINGS**

**Table 1** shows the demographic variables of the study participants. This study summarized the demographic and clinical characteristics of preterm neonates and their parents in the control (*n* = 30) and experimental (*n* = 30) groups. The majority of families consisted of a few members, Hindus, and urban residents, with parents holding graduate-level-focused education and a monthly family income above 15,000. Most mothers were in excellent health and had pregnancies without medical intervention. The gestational age at birth ranged between 34 and 37 weeks, the majority of the newborns weighed 1401–1500 g, and their Apgar scores ranged between 7 and 8.

**SECTION A - Frequency and Percentage Distribution of Demographic and Clinical Variables of Preterm Neonates and Parents (*n* = 60)**

**TABLE 1**

S.NO.	DEMOGRAPHIC VARIABLE	CLASS	CONTOL GROUP (N=30)		STUDY GROUP (N=30)	
			f	%	f	%
<b>DEMOGRAPHIC VARIABLES OF PRETERM NEONATES</b>						
1.	Age of neonate	Birth to 10 days	4	13.3%	4	13.3%
		11-15 days	17	56.7%	20	66.7%
		16-21 days	8	26.7%	1	3.33%
		22-28 days	1	3.33%	5	16.7%
2.	Gender of the neonate	Male	8	26.7%	24	80%
		Female	22	73.3%	6	20%

3.	Birth Order	First Child	20	66.7%	18	60%
		Second Child	6	20%	8	26.7%
		Third or more	4	13.3%	2	6.7%
4.	Number of siblings	None	23	76.7%	19	63.3%
		One	7	23.3%	11	36.7%
<b>Demographic Variable of Parents</b>						
5.	Religion	Hindu	18	60%	22	73.3%
		Muslim	7	23.3%	6	20%
		Christian	5	16.7%	2	6.7%
6.	Type of Family	Nuclear	23	77%	25	83.3%
		Joint	7	23.3%	5	16.7%
7.	Occupation of Mother	Employed	20	67%	24	80%
		Unemployed	10	33.3%	6	20%
8.	Monthly income of the family	15000-20000/month	18	60%	22	73.3%
		20000-30000/month	12	40%	8	26.7%
<b>Clinical Variables Of Preterm Neonates</b>						
9.	Birth Weight	1101-1300gm	8	26.7%	3	10%
		1301-1400 gm	6	20%	7	23.3%
		1401-1500 gm	16	53.3%	20	66.7%
10.	Apgar Score	0-3	4	13.3%	3	10%
		4-6	8	26.7%	22	7.73%
		7-10	18	60%	5	16.7%
11.	Head Circumference	28cm	3	10%	1	3.3%
		30 cm	21	70.3%	23	76.6%
		31 cm	2	6.7%	2	6.7%
		32 cm	4	13.3%	4	13.3%
12.	Chest Circumference	30 cm	4	13.3%	3	10%
		31 cm	5	16.7%	4	13.3%
		32 cm	21	7.70%	23	76.6%
13.	Length of Newborns	42 cm	4	13.3%	4	13.3%
		44 cm	10	33.3%	9	30%
		46 cm	13	43.3%	15	50%
		48 cm	3	10%	2	6.77%
<b>Clinical Variables of Mother</b>						
14.	Maternal Illness	Diabetic Mellitus	7	23.3%	2	6%
		Systemic Illness	4	13.3%	1	3.3%
		None	19	63.3%	27	90%
15.	Type of Conception	Normal	23	76.6%	25	83.3%
		Assisted Reproductive Technique	7	23.3%	5	16.7%
16.	Gestational Week	28-30 week	2	6.7%	3	10%
		31-33 week	7	23.3%	8	26.7%
		34-37 week	21	70.3%	19	63.3%
17.	Mode of Delivery	Normal Vaginal Delivery	22	7.73%	26	86.6%
		Assisted birth (Vaccum or Forceps)	0	0%	1	3.3%
		Lower Segment Caesarean Section	8	26.7%	3	10%

### **Section B- Assessment and Comparison Section of the Effect of Targeted Nursing Intervention on Breastfeeding Behavior.**

**Table 2A** illustrates the pretest and posttest distribution of breastfeeding practices. In the control group, only 16.7% of the mothers improved from poor to moderate breastfeeding practice. On the other hand, the mothers in the study group responded very well to the intervention by the researcher, as after the focused targeted nursing intervention, 96.6% of the mothers reached a moderate level of breastfeeding

practice, and 1% of them achieved good breastfeeding practice in the posttest.

**Table 2B** shows that the result of the paired preterm *t*-test analysis showed a statistically significant increase in breastfeeding practice scores in the study group ( $P < 0.0001$ ) This highlights the impact of targeted nurse-led interventions

<b>Table 2A Pre-Posttest Breastfeeding Practice (n=60)</b>				
<b>Breastfeeding Behaviour Pattern</b>	<b>Control Group Pretest (%)</b>	<b>Control Group Posttest (%)</b>	<b>Study Group Pretest (%)</b>	<b>Study Group Posttest (%)</b>
Poor Breastfeeding Behaviour	30 (100%)	25 (25.5%)	30 (100%)	0 (0%)
Moderate Breastfeeding Behaviour	0 (0%)	5 (16.7%)	0 (0%)	29 (96.6%)
Good Breastfeeding Behaviour	0 (0%)	0 (0%)	0 (0%)	1 (3.3%)

  

<b>Table 2B Paired t-test comparison on the effect of Targeted Nursing Intervention on Breastfeeding Behaviour (n=60)</b>						
<b>Group</b>	<b>Test</b>	<b>Mean</b>	<b>SD</b>	<b>T value</b>	<b>Df</b>	<b>P value</b>
Control Group	Pretest	1.5				
	Posttest	2.17	1.49	7.98	29	<0.001
Study Group	Pretest	1.5				
	Posttest	5.62	0.63	48.87	29	<0.0001

**Section C - Association Between Posttest Breastfeeding Behavior with Selected Demographics and Clinical Variables of Parents Preterm Neonates in the NICU (n = 60).**

In demographic variables the mode of delivery and consanguinity status were significantly associated with breastfeeding practice outcomes. Other factors like maternal health, the week of gestation, and the weight of the newborn influenced breastfeeding practice were not statistically significant. Hence the Research Hypothesis H<sub>2</sub> was accepted and Null Hypothesis H<sub>02</sub> was rejected.

**CONCLUSION**

Most preterm newborns had really poor nursing practices at first, according to the study. Breastfeeding preterm infants in the NICU was made much easier by combining KMC with a nurse-led intervention that included positioning and TKS. The results emphasize how important it is for nurses to consistently offer well-researched

breastfeeding support to mothers of preterm infants.

Considering the rise in preterm births and the extension of NICU stays, there is a need to incorporate nurse-led, structured breastfeeding interventions as a regular feature of neonatal care to enhance feeding practices, promote maternal confidence, and strengthen mother–infant bonding. Longitudinal and multicenter studies will be crucial in the future to determine the degree to which favorable breastfeeding outcomes are maintained and to investigate the distinct impacts of each component of the intervention.

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