

ASSESS THE EFFECTIVENESS OF SENSORY NURSING INTERVENTIONS ON FEEDING PROGRESSION AMONG PRETERM INFANTS IN SELECTED SETTING, NAGERCOIL, K.K. DISTRICT

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ABSTRACT

Preterm birth is defined as childbirth occurring at less than 37 completed weeks or 259 days of gestation. Preterm birth is a global problem and evidently more than 60 % of preterm births occur in Africa and South Asia. In India preterm births is rising and presently around 21 % of babies were born preterm. Neonatal intensive care unit stimuli may interfere with brain development in premature infants and contribute to developmental delays. Statement of the Problem: A Quasi Experimental Study to Assess the Effectiveness of Sensory Nursing Interventions on Feeding Progression among Preterm Infants in Selected Setting, Nagercoil, K. K District. A Quantitative Research Approach- Quasi experimental research design was adopted. The study was conducted on 125 each on study and control group. The investigator provided Sensory Nursing Intervention care on study group preterm infants along with routine hospital and control group was obtaining routine hospital care. Both the group were assessed with Preterm Infant Breast feeding Behaviour scale. The study concludes that the mean feeding progression of the control group was 6.1 ± 1.5 on pretest to post test assessment was also improved as 17.0 ± 1.7 without sensory nursing intervention. The mean feeding progression of pretest to posttest assessment of the study group was 5.3 ± 1.1 and improvement after sensory nursing intervention was 19.8 ± 0.6 .

KEYWORDS: Preterm Infants, Sensory Nursing Intervention, Feeding Progression

INTRODUCTION

Preterm birth is defined as childbirth occurring at less than 37 completed weeks or 259 days of gestation. Late pre-term refers to infants born between 34 and 36 weeks of gestation.

An estimation states 15 million babies born worldwide were preterm that is almost one in 10 live births. About one million infants die on each year due to complications of preterm birth. Many preterm survivors face a lifetime disability, including learning disabilities, visual and hearing problems. (WHO, November 2015)

Preterm birth is a global problem and evidently more than 60 % of preterm births occur in Africa and South Asia. On average 12% of babies are born too early in low income countries compared with 9% in higher-income countries. (WHO, 2013)

In India preterm births is rising and presently around 21 % of babies were born preterm. States such as Goa,

Kerala and Manipur have infant and neonatal mortalities similar to that of developed nations, indicating advanced care of premature babies. Annually about 27 million babies were born in India, among them 3.6 million were born premature, of which 303,600 fail survival due to complications. (Indian Foundation of preterm babies, 2014).

The first and foremost of four weeks of neonatal period, is the transition time of infant from uterus to external environment, where the infant is supported entirely by the mother to independent existence. Early physical development during this transitional period includes physical growth, feeding development, brain, neuronal reflex behavior and early sensory capacity.

Preterm infant's neurodevelopment are proactively enhanced by avoidance of overstimulation, stress, pain, isolation, and deprivation. This can be enhanced by supporting the infant's self-regulatory competence through steady availability of reliable, consistent and familiar caregivers who supports the infant's foremost nurturers in initial transitional life.

In the intrauterine environment, rhythmic stimuli are provided by maternal activity, hormonal cycles, auditory, cutaneous and kinesthetic input through the amniotic fluid and sac. One of the common experiences for the fetus is the intermittent, regular exposure to the mother's voice. The maternal voice is minimally distorted and the intonation and melodic contour are identical to the external voice, factors critical for postnatal responsiveness to voice. These stimuli provide support for function and organization for the developing fetus.

Preterm infants have been noted to benefit from massage therapy. Massage therapy using moderate pressure showed weight gained of 31 % to 49% in average. Some studies have also shown length of preterm infants, head circumference and bone mineral density increases with massage therapy.

The rhythmic stimulation of movement and intermittent speech experienced during fetal development continues even after birth. The mother's regulatory role for system organization is significantly different for infants born prematurely than for term infants, because premature infants do not experience extended contact with their mothers early in life. Evidence exists that mother's voice can be an important positive stimulus for premature infants in the neonatal intensive care unit (NICU).

Normal sensory development requires stimulation during periods of rapid brain growth. Neurodevelopment processes evolve with consistent patterns of sensory input. A premature birth represents an abrupt change in experience for the infant's developing nervous system. In the NICU, sensory stimulation is not consistent, patterned or congruent with the types of stimulation that are required for normal neonatal development. Neonatal intensive care unit stimuli may interfere with brain development in premature infants and contribute to developmental delays.

In this study, the researcher decided to find the response of physiological parameters such as Feeding Progression of infants after Sensory Nursing Intervention by the mothers towards there preterm infants.

OBJECTIVES

- To assess the pre and post test level of feeding progression among preterm infants in study and control group.
- To determine the effectiveness of sensory nursing interventions on feeding progression among preterm infants.

- To associate the level of feeding progression with their selected demographic variables in study and control group.

RESEARCH HYPOTHESIS

- H₀₁- There is significant difference in feeding progression between pre test and post test in study and control group.
- H₀₂-There is significant difference in the feeding progression among preterm infants between the study and control group.
- H₀₃- There is significant association between feeding progression among preterm infants with demographic variables in study and control group.

METHODOLOGY

Quantitative Research Approach- Quasi experimental research design. The study was conducted at neonatal preterm ICU's at Government Medical College and Hospital, Asaripallam at Kanyakumari District. Necessary ethical approval was obtained. The sample consisted of 250 patients preterm infants between the gestational ages 34 to 36 weeks who fulfil the inclusion criteria were chosen for the study by using non probability convenient sampling technique. The tool used was a demographic variable, Preterm Infant Breast feeding Behaviour scale.

Section A

A semi structured interview based questionnaire was included to assess the background variables which consists of items related to demographic data of the mother and child such as; Maternal data (age, mother's educational status, occupation, parity, type of family), Neonatal data further categorized to demographic data (gender of baby, gestational weeks during birth) and Clinical (hemodynamic stability, type of birth, infant weight) data.

Section B

It consists of assessment of neonatal parameter on Preterm Infant Breast feeding Behaviour scale.

Preterm Infant Breast Feeding Behavior Scale

Preterm Infant Breast feeding Behaviour scale is with six items such as rooting, areolar grasp, latch on fixed to the breast, sucking, longest sucking burst and swallowing.

Scoring of Preterm Infant Breast Feeding Behavior scale

The elements of Preterm Infant Breast Feeding Behavior scale are scored individually, minimum of score 0 was given for each element and among highest scores longest sucking burst was 6, sucking with 4, areolar grasp (how much of the breast was inside the baby's mouth) and latch on fixed to the breast are 4, rooting and swallowing are 2. The total least score was 0 and total highest score was 24.

DATA COLLECTION PROCEDURE

- The ethical clearance of the study setting was obtained.
- Preterm infants who met inclusion criteria were selected through non probability convenient sampling technique in both control group and study group.
- Before approaching parents for informal consent, consent is obtained from the attending neonatologist confirming that the infant is medically stable and the consent was obtained from the mother.
- Control group infants was selected first and concern obtained from the mother, The control group preterm babies was getting routine hospital care during observational period and periodic assessment was done as per the study.
- Following Control Group, Study group infants were identified. A pre test was assessed and following the assessment study group preterm infants received 15 minutes of intervention twice daily for 5 days.
- The sensory nursing intervention was taught to study group preterm infant mothers and procedure was demonstrated. The preterm infant mothers were observed by the researcher while doing the intervention at hospital.
- The preterm infant's mother initiates directed talk through soothing voice (auditory stimulation) to her preterm infant and massages the preterm infant for 10 minutes (tactile stimulation) following massage a 5 minutes of horizontal rocking (vestibular stimulation) was performed. Throughout the 15-minute period, the mother engages eye contact with the preterm infant (visual stimulation).
- If an infant exhibited negative disengagement cues such as hiccoughing, finger play, crying, fussing, or spitting/vomiting during the intervention, that part of the technique was discontinued and the next portion of the technique was attempted.
- Intervention was initiated 1 hour before the next scheduled feeding.
- The parameter on Preterm Infant Breast Feeding Behaviour Scale was assessed before and after sensory nursing intervention on Day 1st, 6th, 18th and 30th of procedure.
- Study group preterm infant mothers maintained diary every time after demonstrating sensory nursing intervention and was observed by researcher.
- The study group preterm infant mothers performed sensory nursing intervention till late neonate period (28 days) and maintained daily diary on intervention and progress on babies.

Table 1

Age of New Born (in days)	Sensory Nursing Intervention	
	Morning	Evening

- The day of discharge is noted for both study and control group.
- The neonatal parameter was assessed on every post test.

RESULTS

In both study and control groups the maximum proportions (63.2 % and 64.4 %) of mothers were in the age bracket of 25-29 years. Regarding educational status of preterm mothers 37.6% were secondary school and 34.4 % were graduates in study group whereas 45.6% and 48.8 % of preterm mothers had attained secondary and graduates in control group respectively. the house wife / unemployed were 68.8 % in study group and 88.0 % in control group. in both groups the joint family contributions were 64 % and 76 % respectively. Regarding the parity of mother 64 % and 68 % of subjects were study and control group respectively.

The mean age of mothers in both group were 27.7± 3.3 years and 26.9±3.2 years and were not differed significantly (P>0.05). The assessment mean ages of the two groups were also not significantly different (P>0.05). The feeding progression of study group 10.9 of mean improvement of control group and was considered due to effectiveness of Sensory Nursing Intervention. All the demographic characteristics of mothers and preterm infants were not associated with feeding progression in both study and control groups.

The first objective of the study was to assess the pre and post test feeding progression of among preterm infants in study and control group.

The parameter such as feeding progression was assessed between study and control groups in pre test and post tests.

Table 2: Frequency and Percentage Distribution of Pre and Post Test Level of Feeding Progression among Preterm Infants in Study and Control Group: N=250

Feeding Progression	Study Group as Per Assessment N=125				Control Group as per Assessment N=125			
	Pretest		Post Test 1		Pretest		Post Test 1	
	f	%	f	%	f	%	f	%
1-05	23	18.4	0	0.0	13	10.4	0	0.0
05-10	102	81.6	0	0.0	112	89.6	0	0.0
10-15	0	0.0	0	0.0	0	0.0	6	4.8
15-20	0	0.0	125	100.0	0	0.0	119	95.2
Total	125	100.0	125	100.0	20	100.0	125	100.0

The table tabulates the feeding progression of study and control groups. In Post test 100 % of study group preterm infants attained highest score whereas only 95.2 % control group preterm infants attains high score.

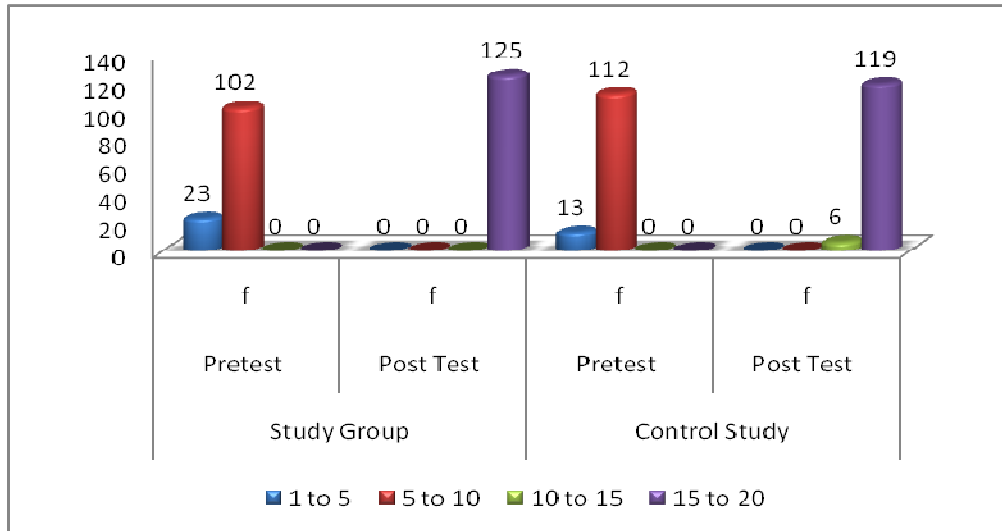


Figure 1: Bar Diagram Depicts Frequency and Percentage Distribution of Pre and Post Test Level of Feeding Progression among Preterm Infants in Study Group and Control Group

The second objective of the study was to determine the effectiveness of sensory nursing interventions on neonatal reflex and reactivity among preterm infants in study and control group.

Table 3

Feeding Progress	Time of Assessment	From		TO		Improvement		“t”	df	Significance
		Mean	SD	Mean	SD	Mean	SD			
Control Group	Pre test to Post test	6.1	1.5	17.0	1.7	10.9	2.3	52.562	124	P<0.001 s = ***
Study Group	Pre test to Post test	5.3	1.1	19.8	0.6	14.5	1.4	118.974	124	P<0.001 s = ***

P <0.001= *very highly significant**

The improvements of feeding progression of the control group is mentioned as follows, the mean feeding progression of the control group was 6.1± 1.5 on pretest to post test assessment was also improved as 17.0± 1.7 without sensory nursing intervention. The improvement 10.9±2.3 was statistically very highly significant (P<0.00).

The improvement of feeding progression of the study group preterm infants before and after introduction nursing sensory were 14.5±1.4 and was statistically very highly significant (P<0.001). The mean feeding progression of pretest to posttest assessment of the study group was 5.3±1.1 and improvement after sensory nursing intervention was 19.8± 0.6.

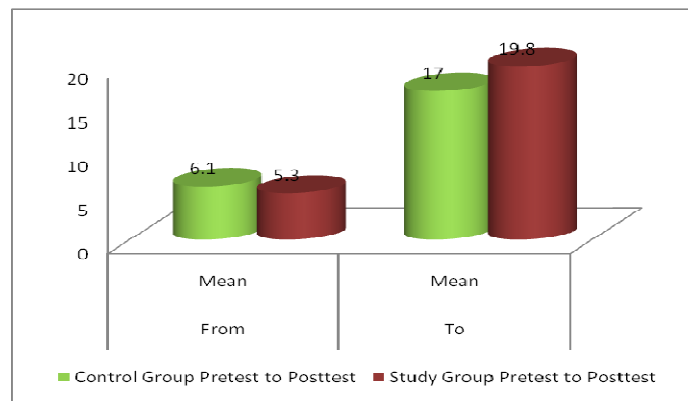


Figure 2: Bar Diagram Depicts Effectiveness of Sensory Nursing Interventions on Neonatal Reflex and Reactivity among Preterm Infants in Study and Control Group

The third objective of the study was to associate the feeding progression with their selected demographic variables in study and control group.

The demographic characteristics of study subjects of study groups were associated with their pretest assessment neonatal statistic and outcome such as age, occupation, education, type of family and parity of mother and gestational age, birth and sex of neonatal.

Table 4: Association between Feeding Progression of Preterm Infants with Their Selected Demographic Variables in Study and Control Group N=250

Sl. No	Demographic Variables	Study Group (N =125)				Control Group (N = 125)			
		≤ Med	>Med	Total	Result	≤ Med	>Med	Total	Result
I	Maternal Data								
1	Maternal Age (in yrs)								
	20-29	50	44	94	$\chi^2 = 3.016$	63	42	105	$\chi^2 = 4.557$
	30-39	22	9	31	df = 1	17	3	20	df = 1
	Total	72	53	125	P>0.05 s=ns	80	45	125	P<0.05 n=s
2	Educational Status								
	Non Educated	1	1	2	$\chi^2 = 5.305$	-	-	-	$\chi^2 = 1.235$
	Primary school Education	24	9	33	df = 3	4	3	7	df = 2
	Secondary school Education	27	20	47	P>0.05 s=ns	34	23	57	P>0.05 s=ns
	Degree and above Education	20	23	43		42	19	61	
	Total	72	53	125		74	51	125	
3	Occupation								
	Skilled	11	11	22	$\chi^2 = 0.708$	5	4	9	$\chi^2 = 0.890$
	Non Skilled	7	10	17	df = 2	3	3	6	df = 2

	House wife/ unemployed	45	41	86	P>0.05 s=ns	72	38	110	P<0.05 s=ns
	Total	63	62	125		80	45	125	
4	Type of Family								
	Nuclear	18	27	45	$\chi^2 = 8.918$	17	13	30	$\chi^2 = 0.921$
	Joint	54	26	80	df = 1	63	32	95	df = 1
	Total	72	53	125	P<0.05 s=ns	80	45	125	P>0.05 s=ns
5	Parity								
	Primi	42	38	80	$\chi^2 = 2.492$	51	34	85	$\chi^2 = 2.181$
	Second Delivery	27	14	41	df = 2	28	11	39	df = 2
	Third (or) above	3	1	4	P>0.05 s=ns	1	0	1	P>0.05 s=ns
	Total	72	53	125		80	45	125	
II	Neonatal Data								
6	Gender								
	(i) Male	27	25	52	$\chi^2 = 0.083$	39	35	74	$\chi^2 = 3.170$
	(i) Female	36	37	73	df = 1	35	16	51	df = 1
	Total	63	62	125	P>0.05	74	51	125	P>0.05
7	Gestational Weeks during Birth								
	Babies born between 34 to 35 weeks of gestation	37	32	69	$\chi^2 = 0.997$	49	29	78	$\chi^2 = 0.125$
	Babies born between 35 to 36 weeks of gestation	35	21	56	df = 1	31	16	47	df = 1
	Total	72	53	125	P>0.05 s=ns	80	45	125	P>0.05 s=ns
III	Clinical Data								
8	Type of Birth								
	Normal vaginal delivery	40	27	67	$\chi^2 = 0.261$	46	21	67	$\chi^2 = 1.359$
	Cesarean Birth	32	36	58	df = 1	34	24	58	df = 1
	Total	72	53	125	P>0.05 s=ns	80	45	125	P>0.05 s=ns

P <0.001= *very highly significant, ns = P >0.05- no significant, s = P <0.05-significant**

The table describes the association between demographic variables such as ages, education, occupation, parity of preterm infant mothers and their type of family with Feeding Progression of preterm infants. Similarly genders, type of birth, gestational week on birth of preterm infants were also been associated with Feeding Progression. On pre test assessment there was no significant association mentioned between demographic variable and Feeding Progression of preterm infants on both study and control group (P>0.05) were not significant.

CONCLUSIONS

The effectiveness of Sensory Nursing Intervention was analyzed and interpreted by measuring the Feeding Progression of the babies. The feeding progression of baby was statistically significant. The above statistics were compared within the groups to assess the improvement of Sensory Nursing Intervention and its effectiveness and was also compared between the study and control groups of the respective statistics.

REFERENCES

1. Hannah Blencowe et, al. Born Too Soon: The global epidemiology of 15 million preterm births. *Reproductive health* 2013 Nov 15 ; 10
2. Kounteya Sinha. India shares highest preterm birth burden. *The Times of India* 2012 June 8.
3. Polit Dense, F. *Nursing research – principles and methods.* (2010). Philadelphia: Lippincott Company.
4. Polit D, Hungler B. *Data analysis and interpretation. Nursing Research,* Lippincott, 2012 London.
5. Melinda Caskey, Bonnie Stephens, Richard Tucker, Betty Vohr. Adult Talk in the NICU with Preterm Infants and Developmental Outcomes. *American Academy of Pediatrics,* 2014 March, 133 (3).
6. Alexandra R. Webb, Howard T. Heller, Carol B. Benson, and Amir Lahav. Mother's voice and heart beat sounds elicit auditory plasticity in the human brain before full gestation. *Proceedings of the National Academy of sciences of United States of America,* 2015 Jan 28: 112 (10): 3152 – 3157.
7. Ulrika Aden. Maternal singing for preterm infants during kangaroo care comforts both the mother and baby. *Acta Paediatrica,* 2014 Sep 11: 103 (10): 995 – 996.
8. Miguel A. Diego, b, Tiffany Field, b, Maria Hernandez-Reif. Preterm infant weight gain is increased by massage therapy and exercise via different underlying mechanisms. *Early human development.* 2014. Mar; 90 (3): 137 -140
9. Bahia Abdallaha, Lina Kurdahi Badrb, Mirvat Hawwari. The efficacy of massage on short and long term outcomes in preterm infants. *Infant behavior and development.* 2013 Dec; 36(4): 662 – 669.
10. Medoff-Cooper, Barbara et al., Multisensory Intervention for Preterm Infants Improves Sucking Organization. *Advances in Neonatal Care* 2015 April: 15(2) : 142 -149.
11. Jakob Frie et al. Extremely Preterm-Born Infants Demonstrate Different Facial Recognition Processes at 6-10 Months of Corrected Age. *The Journal of Pediatrics.* 5 March 2016:
12. Manuela Filippa et al, Live maternal speech and singing have beneficial effects on hospitalized preterm infants. *Acta Paediatrica* October 2013: 102 (10): 1017 – 1020.
13. Odoardo Picciolini et, al. Early exposure to maternal voice: Effects on preterm infants development. *Early Human development.* June 2014; 90 (6) 287 -292

