

# EFFECT OF ORAL STIMULATION ON FEEDING PERFORMANCE OF PRETERM BABIES

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## Abstract

A study was conducted to assess the effectiveness of oral stimulation on feeding performance among preterm babies in selected NICU. The study was conducted with the purpose of finding out whether the oral stimulation will help to improve the feeding performance and to assess the selected parameters like respiration, weight, and oxygen saturation. A quasi-experimental non-equivalent control group design was used to conduct the study. Total of 40 samples were selected by the non-probability purposive sampling technique. 20 samples were in the experimental group and 20 in the control group. Data was collected by using an observation checklist for assessing the feeding pattern and other parameters like spo<sub>2</sub>, respiration, and weight. Reliability of the tool was done by inter-rater method and calculated 'r' were 0.89 and calibration of the weighing machine was done by the biomedical department. Babies who are shifted to breastfeeding were taken as samples. Oral stimulation was given for 5 minutes in the morning and evening followed by breastfeeding. Pre-assessment was done on the first day for both groups. The intervention was carried out for the experimental group for 5 days on the 5th day post assessment was done for both groups. The analysis of feeding performance were done by using frequency and percentage, comparison of the two groups was done by using an unpaired t-test. Result showed that on 5th day the mean value of feeding performance was 11.30 in the experimental group whereas in the control group it was 10.40 with a p-value of 0.031. This shows there is a significant difference in the feeding performance of pre-term babies after oral stimulation. There were no changes observed the parameters of spo<sub>2</sub>, respiratory rate and weight between both the groups. The research concluded that oral stimulation is effective in improving the feeding skills of preterm babies and it did not have any positive effect on the parameters like spo<sub>2</sub> respiration rate and weight.

**Keywords:** Pre-term, Oral-stimulation, Feeding performance

## Introduction:

Premature baby is a traumatic incident for any family. Premature infants are babies born before 37 weeks of gestation. Feeding skills begin long before birth. Sucking and swallowing behavior starts at 13 weeks of gestation. By 34 weeks sucking, swallowing and breathing get coordinated.<sup>1</sup>

Oral feeding is frequently delayed in preterm newborns. Oral feeding is one of the recommended criteria for hospital discharge by the American Academy of Pediatrics. There is no well-defined scale for finding out the feeding skills of pre-term.<sup>2</sup> Feeding difficulties of preterm cause prolonged stay in the hospital, delayed

maternal-infant bond, and psychological disturbance of the family. Oral feeding problems of preterm infants are a major concern of the world. Statistics show that Prematurity is one of the major causes of neonatal death in India. The majority of premature babies who survive face physiological handicaps in later stages.<sup>2</sup>

An article published by WHO says approximately 15 million babies born are premature, which is one in every ten babies. Out of that one million die every year. Even though the technologies and health care system has improved, prematurity remains the leading cause of death. Among infants in the world and with reliable data, cases of prematurity increase in almost all countries. Reducing premature labor is the primary solution for this. Maternal infection, maternal nutrition, and maternal diseases are some of the reasons for premature labor. Survival of the preterm depends on the facility where they are born and the way they are taken care of.<sup>3</sup>

Preterm babies face a variety of problems like respiratory distress, thermoregulation, poor feeding because of underdeveloped sucking and swallowing, necrotizing enterocolitis, etc. Feeding problems remain the major concern after immediate care. Patients remain many months in the hospital together only for the transition from feeding to breastfeeding and weight gain.<sup>4</sup>

Oral feeding difficulties may include disorganized sucking patterns, incoordinated suck-swallow-breathe and hypersensitivity to touch in and around the mouth. This problem reminds the urgent need to facilitate the development of oral-motor skills. Various researchers have done different methods of oral stimulation to improve the feeding skills like non-nutritive sucking, oral stimulation, and sensory stimulation. These are cost-effective and which have shown improvement in feeding skills and increase the weight also. Across all the studies it shows oral stimulation through nonnutritive sucking or sensorimotor input to the oral structures before or during the feeding is more effective in improving feeding skills.<sup>5</sup>

The significance of the need to improve the normal development of the oral motor structures is highlighted by the effect of early motor difficulties on breastfeeding and the length of hospital stay. Various intervention techniques are used by the nutritionist to boost the oral feeding performance of premature infants.<sup>6</sup>

Oral feeding skills are expressed as the ability to remain engaged in feeding, must stay focused on feeding, arrange oral motor function, coordinate sucking, swallowing, and breathing, and keep physiology stable.<sup>7</sup>

Early feeding scale helps identify each preterm term in cases which are developed and areas which require support.<sup>8</sup>

## Materials and Methods

A quantitative research approach was adapted for the present study with quasi-experimental nonequivalent control group pretest-posttest design. The independent variable was the oral stimulation and the dependent variable was the feeding performance of preterm babies. Research variables are spo<sub>2</sub>, respiration, and weight. Reliability was done by using the inter-rater method. Preterm babies between 28-32 weeks of gestation, mothers of babies who are willing to participate, who are shifted to breastfeeding, and with weight of 1.5 kg to 2 kg were included in the study. Preterm babies with congenital anomalies like cleft lip and cleft palate, preterm babies who were hemodynamically unstable evaluated by Neonatologists, and mothers of preterm babies who have flat nipples or cracked nipples or engorged breasts were excluded from the study. The sample size was calculated by using power analysis. The sample size was 40 preterm babies which were equally distributed to the control and Experimental group 20 each. The samples were selected by using a non-probability purposive sampling technique.

The tool contained two sections, Section I: - demographic variables It consisted of a baseline of information about the preterm babies like gestational age (in weeks), gender, and age (in days). Section II:- Observation scale for assessing feeding performance Section II:- had two sub-sections, section a for assessing feeding performance, which had 14 statements which got 3 subdivisions as Pre-feeding behavior, oral feeding skills, observation at the end of feeding with Options of yes or no, each yes were given 1 mark with a total score of 14. It was divided into three grades i.e. poor (0-5), fair (6-9), and good (10-14). Section II (b):- parameters, i.e. respiration (b/min), saturation (spo<sub>2</sub>), and weight in (kg) to know whether any changes occur in these parameters because of oral stimulation. .

Observation of feeding performance and parameters was done on the day when the baby was included in the study in both groups. In the experimental group, 5 minutes of oral stimulation were given in the morning and evening followed by breastfeeding, and the procedure was continued for 5 days. Post-assessment was done on the fifth day for both groups

## Result and Discussion

Based on the objective of the study collected data were analyzed by using frequency percentage, standard deviations.

**Table No 1: Frequency and percentage distribution of demographic variables**  
n=20+20

Sr. No.	Variable	Groups	Experimental		Control	
			Freq.	%	Freq.	%
1	Gestational Age (in weeks)	28	6	30.00	6	30.00
		29	6	30.00	7	35.00
		30	7	35.00	6	30.00
		32	1	5.00	1	5.00
2	Gender	Male	10	50.00	11	55.00
		Female	10	50.00	9	45.00
3	Age (in days)	Below 10	3	15.00	3	15.00
		11-20	10	50.00	9	55.00
		21-28	7	35.00	8	40.00

Table no 1 shows that in the experimental group 35% were at 30 weeks of gestation, In the control group, 35% were at 29 weeks. In age, the category maximum was between 11-20 days both in the experimental and control groups. In the gender category, it was distributed equally.

**Table No 2: Feeding performance before intervention (Day 1)**

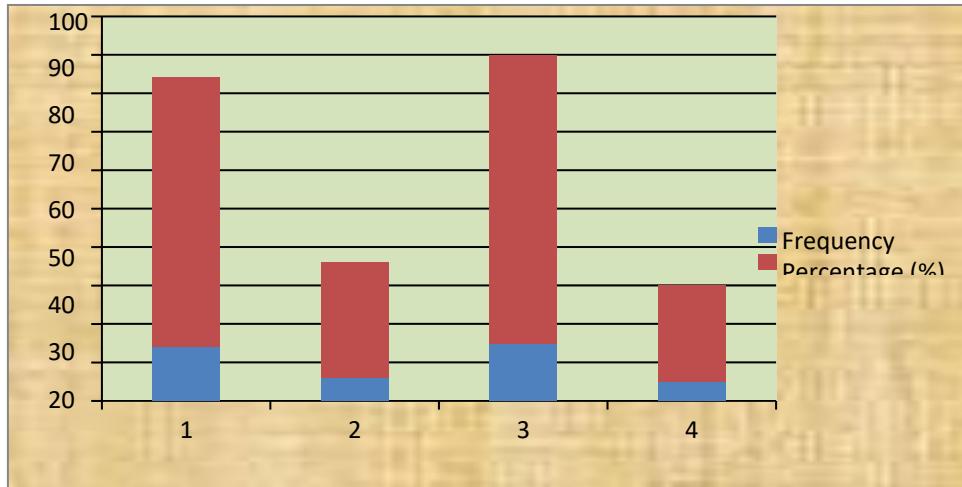
n=20+20

Group	category	Frequency	Percentage (%)
Control group	Fair (6-9)	14	70
	Good(10-14)	6	30
Experimental group	Fair (6-9)	15	75
	Good(10-14)	5	25



Table no 2 shows that before the intervention 75% in experimental group were in faircategory and in control group 70 % were in fair category

**Figure No. 2 Feeding performance before intervention (Day 1)**



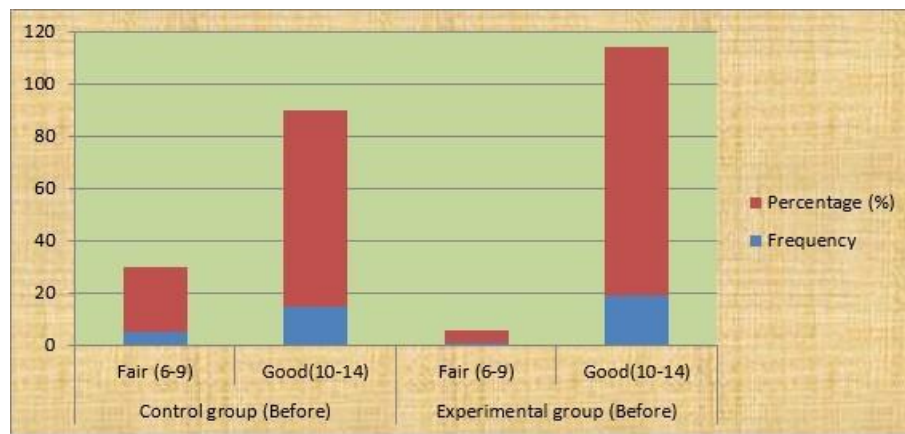
**Table No 3: Feeding performance after intervention (Day 5)**

n=20+20

Group	level	Frequency	Percentage (%)
Control group	Fair (6-9)	5	25
	<u>Good(10-14)</u>	15	75
Experimental group	Fair (6-9)	1	5
	<u>Good(10-14)</u>	19	95

Table shows that after the intervention 95% in experimental group were in good category butin control group only 75% were in good category

**Figure No. 3 Feeding performance after intervention (Day 5)**



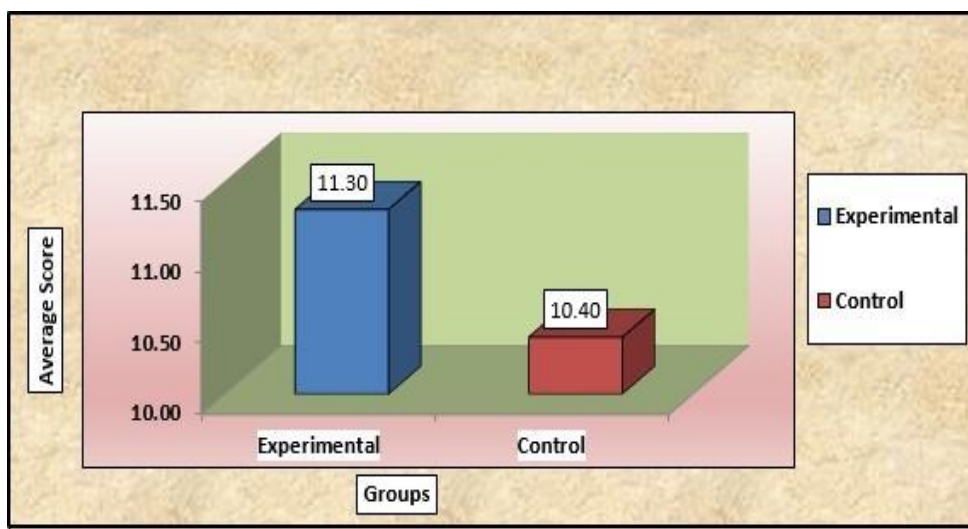
**Table No 4: Comparison of the feeding performance after intervention among Experimental and Control group.**

n=20+20

Sr. No.	Groups	Mean	S.D.	t value	P value
1	<b>Experimental</b>	11.30	1.26	2.25	0.031
2	<b>Control</b>	10.40	1.27		

The above table shows the comparison of feeding performance between experimental and control on day 5. It shows that there is significant difference in the feeding performance in the experimental and control group as the p value is 0.031 which is less than 0.05. Which shows oral stimulation is effective in improving feeding performance

**Figure no. 4: Comparison of the feeding performance – Experimental vs Control Group(Day 5)**



**Table No 5: Assessment of selected parameters before & after intervention in experimental and control group.**

**n=20+20**

GROUP	PARAMETERS	BEFORE		AFTER	
		MEAN	SD	MEAN	SD
EXPERIMENTAL GROUP	Weight(kg)	1.64	0.13	1.65	0.13
	Spo2 (%)	98.15	1.26	98.50	1.00
	Respiration(b/min)	50.50	2.23	50.40	2.21
CONTROL GROUP	Weight(kg)	1.64	0.12	1.64	0.12
	Spo2 (%)	98.05	1.39	97.95	1.35
	Respiration(b/min)	50.95	2.37	51.10	2.29

Above table shows the parameters i.e., respiration, oxygen saturation and weight in both groups before and after. Analysis showed there is no significant difference in both groups.

## Discussion

In pre-assessment, in the control group 70% were in fair category and 30% in the good category. Whereas in the experimental group 75% were in the fair category and 25% were in a good category. No one was there in the poor category both in the experimental group. In post-assessment, in the control group, 25% were in fair category and 75% in the good category. Whereas in the experimental group 5% were in the fair category and 95% were in a good category. None present in either group belonged to the poor category.

In comparison between both groups, on day 5, showed that the mean value of feeding performance in the experimental group was 11.30 with an SD of 10.40 and with SD of 1.27. P value was 0.031, as it is less than 0.05, showing a significant difference in the feeding performance. The researcher concluded that oral stimulation is effective in reducing feeding problems by improving feeding performance.

A similar study conducted by Pragya Paramita Sahoo, Niyati Das, Kalyani rath, et.al for assessing the effect of oral stimulation also showed that oral stimulation was effective in the reduction of feeding problems among preterm babies. by improving feeding skills.<sup>3</sup>

Similar Study conducted by Hadiseh Ghomi, Fariba Yadegari et.al in 2019. The aim of the study was to assess the effectiveness of premature infant oral motor intervention (PIOMI)..

All neonates in the study were monitored for vital signs and SPO<sub>2</sub> routinely. 10 days of 5 minutes intervention using this method can have a positive impact on the development of oral motor skills. Feeding performance, and reduction in the duration of hospitalization in this age group.<sup>9</sup> In parameters SPO<sub>2</sub>, respiration rate and weight didn't show any major changes between the experimental and control group. In the above also these parameters were assessed. So the researcher concluded that oral stimulation did not produce any positive or adverse effect on SPO<sub>2</sub>, respiration rate and weight.

## Conclusion

During the process of research, the researcher has undergone various experiences. The researcher felt the extent and depth of the problems and the feelings and severity of the Problem faced by the parents of the preterm babies. It helped the researcher to understand the importance of oral stimulation for improving the feeding skills of preterm babies, thereby improving the health of the baby which leads to early discharge. Comparison between the experimental and control group showed statistical differences in the feeding performance on day 5. Because of a limited period of data collection, the researchers could not maintain homogeneity of samples. The Researcher has taken samples of the experimental group from one setting and control from two different hospitals. So there was a mixture of samples with different gestational weeks and even weights. The researcher felt the need of more specified criteria, especially in gestational weeks. As even one week difference also can make changes in sucking and swallowing reflexes. In the case of gender, researchers tried to maintain the same frequency in both groups. But in the weight and age on the first day were different. It may also have affected the feedings. Parameters i.e. respiration, SPO<sub>2</sub>, and weight didn't show any difference on day and day 5 both in the experimental and control groups these parameters should show the difference which can be observed in any newborn with increasing age. In all the previous studies, the researcher assessed all these parameters, but no major effect was shown due to oral stimulation. In the present study, the researcher assessed these parameters because the researcher wanted to make sure that, the oral stimulation doesn't cause any adverse effects on the neonates.

During the period of research, the researcher faced many difficult situations. Making the mother to understand the procedure of oral stimulation and its use, was a difficult task for the researcher. Doing the intervention according to the feeding time was also difficult as the settings were different. So the researcher decided to take an experimental group from one hospital for the feasibility. After the completion and looking at the result the researcher felt that the intervention needs to be continued for more days so that it may be helpful for reducing the feeding problems and it may increase the weight at the pre-term also. The intervention of the result as there was no change in the parameters which shows that there were no adverse effects because of oral stimulation.

## Ethical Consideration

Institutional ethical committee approval was received from Bharati Vidyapeeth Deemed to Be University College of Nursing, Sangli

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