Original Research Article

A Study to Assess Effectiveness of Nesting on Bio-Physiological Parameters and Sucking Response Among Low Birth Weight Babies in J.K. Loan Hospital Jaipur with a View to Develop an Educational Video

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ABSTRACT

Low Birth Weight babies have higher morbidity and mortality because they having the complaints of altered bio-physiological parameters and poor sucking response. The nesting is a nursing skill used ordinarily within the developmental care of low-birth-weight (LBW) babies. The study aimed to assess effectiveness of nesting. A quantitative research approach and pre-experimental one group pre & post test research design was used to conduct this study. The sample consisted of 30 LBW babies who are admitted at J. K. Loan Hospital Jaipur and purposive sampling technique was used to select the samples. The Bio-physiological parameters and modified feeding assessment observational checklist were used to collect data from samples after getting consent analyzed using descriptive and inferential statistics. The findings of the study showed that –

This study assessed the pre-test and post-test scores of bio-physiological parameters and sucking response in low birth weight babies admitted to J K Loan Hospital Jaipur. The pre-test mean scores for temperature, heart rate, respiratory rate, and oxygen saturation were 98.49, 168.33, 48.53, and 81.16, respectively. The majority of participants (60%) had poor sucking response with a mean score of 4.16.

After applying nesting, the post-test mean scores for temperature, heart rate, respiratory rate, and oxygen saturation were 98 (SD 0.34), 139.6 (SD 5.03), 39.46 (SD 5.28), and 95.93 (SD 0.53), respectively. The post-test results revealed that a significant improvement occurred in heart rate, respiratory rate, and oxygen saturation, as evidenced by the calculated "paired t" values (16.59, 3.74, and 6.83, respectively). These values were greater than the tabulated "paired t" value (2.045) at 29 degrees of freedom and 0.05 level of significance, suggesting the effectiveness of nesting in maintaining these parameters.

Regarding sucking response, the majority of participants (66.67%) had good sucking response post-nesting, with a mean score of 9.33. The "paired t" value for sucking response (13.79) was also greater than the tabulated value, indicating a significant improvement in sucking response after nesting application.

Keywords: Low Birth Weight, Bio- physiological parameters, Sucking response, Effectiveness, Nesting, Educational video.

INTRODUCTION

Newborns, particularly those with low birth weight, face challenges in adapting to the extrauterine environment. This vulnerable group requires a smooth transition period, typically the first few months of life, to adjust from an aquatic to aerial environment. The importance of facilitating better adaptation for neonates in the early post-natal environment is crucial for their growth and development. Premature birth and intrauterine growth retardation contribute to low birth weight. Preterm infants, who have not reached adequate fetal development for life outside the womb, often face higher morbidity and mortality rates.

The first minute after birth is a critical period for both mother and newborn, and the care provided during this time significantly impacts their immediate survival and long-term health. Low birth weight babies face challenges such as temperature regulation, stress management, and difficulties in breastfeeding. Nesting, a comfortable measure that mimics in-utero conditions, can help reduce discomfort and improve adaptation for these vulnerable infants.

As stated by the World Health Organization, children's health is essential for future prosperity, and birth weight is a vital indicator of a child's susceptibility to illness and survival chances. The incidence of low birth weight has been recognized as a significant indicator for monitoring major health goals by the World Summit for Children. Therefore, understanding and implementing appropriate care methods for low birth weight newborns during the transition period is crucial for their well-being and overall development.

Need of the study:

Low birth weight (LBW) infants, weighing less than 2500 grams at birth, pose significant health risks and contribute to high infant mortality rates, particularly in developing countries like India. This abstract discusses the global prevalence of LBW, its impact on infant health, and the importance of newborn care in promoting proper growth and development. The study highlights India's high number of LBW babies and the need for empowering women to combat this issue. A descriptive longitudinal study conducted in a medical college hospital in Bhubaneshwar, India, reveals the underdeveloped physical, physiological, and neurobehavioral maturity of LBW infants. The research emphasizes the crucial role of nurses in maintaining proper posture and providing a safe environment for LBW babies to enhance their survival rates and improve bio-physiological parameters. Future research should focus on evaluating the effectiveness of nesting interventions for LBW infants and their impact on overall health and development.

Objectives of the study:

1. To assess the bio-physiological parameters in terms of pre-test score among the low birth weight babies admitted in J.K. Loan hospital Jaipur.
2. To assess sucking response in terms of pre-test score among the low birth weight babies admitted in J. K. Loan hospital Jaipur.
3. To assess the bio-physiological parameters in terms of post-test score among the low birth weight babies admitted in J.K. Loan hospital Jaipur.
4. To assess sucking response in terms of post-test score among the low birth weight babies admitted in J. K. Loan hospital Jaipur.
5. To assess the effectiveness of nesting in terms of comparison of pre- test and post- test score of bio- physiological parameters among the low birth weight babies admitted in J. K. Loan hospital Jaipur.
6. To assess the effectiveness of nesting in terms of comparison of pre- test and post- test score of sucking response

among the low birth weight babies admitted in J. K. Loan hospital Jaipur.

7. To Develop an educational video for effectiveness of nesting on bio-physiological parameters and sucking response among low birth weight babies.

Hypotheses:

1. H1: There will be a significant difference between pre-test score and post-test score of nesting on biophysiological parameters in low birth weight babies at a 0.05 level of significance.

H01: There will be no significant difference between pre-test score and post-test score of biophysiological parameters in low birth weight babies at a 0.05 level of significance.

In this hypothesis, the researcher aims to determine if there is a significant difference in biophysiological parameters between the pre-test and post-test scores of nesting in low birth weight babies. The alternative hypothesis (H1) states that such a difference exists, while the null hypothesis (H01) suggests that there is no significant difference.

2. H2: There will be a significant difference between pre-test score and post-test score of nesting on the score of nesting on sucking response in low birth weight babies at a 0.05 level of significance.

H02: There will be no significant difference between pre-test score and post-test score of nesting on the score of nesting on sucking response in low birth weight babies at a 0.05 level of significance.

In this hypothesis, the researcher aims to investigate if there is a significant difference in the score of nesting on sucking response between the pre-test and post-test scores of nesting in low birth weight babies. Similar to the first hypothesis, the alternative hypothesis (H2) states that a difference exists, while the null hypothesis (H02) suggests that there is no significant difference.

MATERIALS & METHODS

The present study was utilized quantitative research approach and pre-experimental one group pre-test post-test research design to assess the effectiveness of nesting on bio-physiological parameters and sucking response among low birth weight babies admitted in J K Loan Hospital Jaipur and the sample size was 30. Bio-physiological parameters to assess the pre-test & post-test bio-physiological parameters scores among low birth weight babies and modified feeding assessment observational checklist was selected to assess the pre-test & post-test scores of sucking response among low birth weight babies.

The inclusion criteria for the study included low birth weight babies who were born with birth weight above 1000gms, born from 34 weeks to 40 weeks of gestation ,age less than 28 days and with no severe complications.

The tool consist of demographic variables, bio-physiological parameters and modified feeding assessment observational checklist those were validate from experts of medical, nursing and statistics and reliability of the tools were established by using inter-rater reliability method and KR20 method, were found 1 and 0.73.

The data was collected after obtaining the formal permission from competent authority and informed consent was taken from the participants before observed the bio-physiological parameters and sucking response.

STATISTICAL ANALYSIS

The collected data was analyzed by using descriptive and inferential statistics.

RESULT

Table No. 1 Description of socio demographic characteristics of mothers of low birth weight babies N=30

S. No.	Socio-Demographic Variables	Frequency	Percentage (%)
1	Age of mother-		
	a) Less than 25 years	10	6.00
	b) 25 to 30 years	15	50
	c) Above 30 years	5	16.67
2	Height of mother –		
	a) Up to 150 cm	18	60
	b) More than 150cm	12	40
3	Gravida-		
	a) Primi gravida	12	40
	b) Multi gravida	18	60
4	Mode of delivery -		
	a) Normal vaginal delivery	20	66.67
	b) Lower segment caesarean section	10	33.33
5	Birth spacing between the children-		
	a) < 3 years	7	23.33
	b) > 3 years	10	33.33
	c) Not applicable	13	43.33
6	Educational status-		
	a) Formal education	7	23.33
	b) Primary education	5	16.67
	c) Secondary education	12	40
	d) Graduation and above	6	20
7	Maternal occupational status-		
	a) Home maker	28	93.33
	b) Self employed	0	0
	c) Govt. job	1	3.33
	d) Private job	1	3.33

Table No. 2 Description of socio demographic characteristics of low birth weight babies N=30

S.No.	Socio-Demographic Variables	Frequency	Percentage (%)
1	Age of baby-		
	a) Day 1	3	10
	b) Day 2	3	10
	c) Day 3	1	3.33
	d) Day 4 or more	23	76.67
2	Gender-		
	a) Male	22	73.33
	b) Female	8	26.67
3	Birth weight-		
	a) 1kg to 2kg	16	53.33
	b) 2kg to 2.49kg	14	46.67
4	Gestational age at birth –		
	a) Less than 37 weeks	18	60
	b) 37 weeks to 42 weeks	12	40
	c) More than 42 weeks	0	0
5	Ordinal position of child –		
	a) First	13	43.33
	b) Second	9	30.00
	c) Third	7	23.33
	d) Four or more	1	3.33

Table No. 3: Mean and Standard Deviation of Bio-Physiological Parameters among the Low Birth Weight Babies N=30

S. No.	Bio-Physiological Parameters		Mean	Standard Deviation
1	Temperature	Pre-test	98.49	2.06
		Post-test	98	0.34
2	Heart rate	Pre-test	168.33	7.23
		Post-test	139.6	5.03
3	Respiratory rate	Pre-test	48.53	10.93
		Post-test	39.46	5.28
4	Oxygen saturation	Pre-test	81.16	11.15
		Post-test	95.93	0.53

- Table No. 3: Data presented in table NO. 3 and figure 1 indicated that, Regarding mean scores of temperature, there is an decrease in post test (98) than pretest (98.49).
- Regarding mean scores of heart rate, there is a decrease in post test (139.6) than pretest (168.33).
- Regarding mean scores of respiratory rate, there is a decrease in post test (39.46) than pretest (48.53).
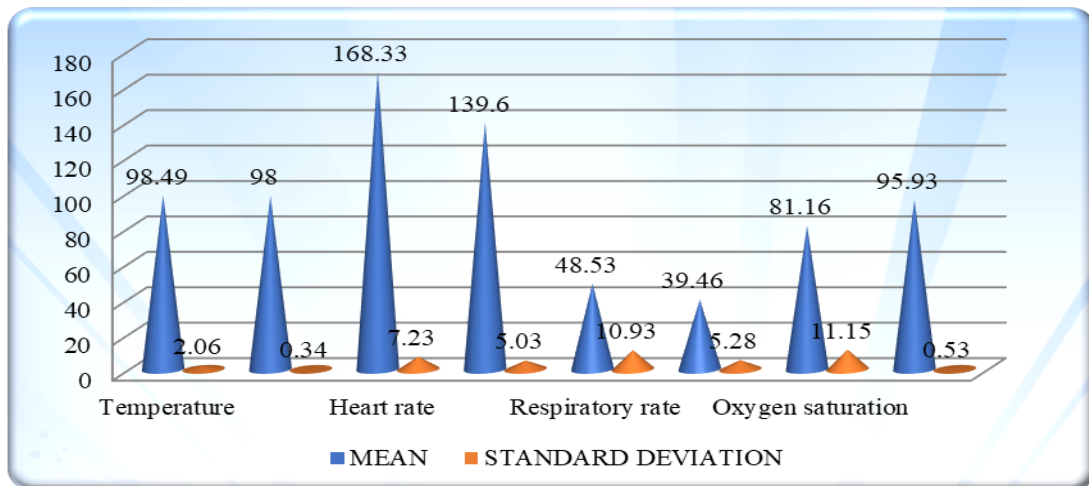- Regarding mean scores of oxygen saturation, there is an increase in post test (95.53) than pretest (81.6)

Figure 1: Bar Diagram showing Mean and Standard Deviation of Bio- Physiological Parameters among the Low Birth Weight Babies

Table No 4: Distribution of Sucking Response among Low Birth Weight Babies N = 30

S.No.	Sucking Response	Pre-Test		Post-Test	
		Number	Percentage (%)	Number	Percentage (%)
1	Good sucking response	2	6.67	20	66.67
2	Average sucking response	10	33.33	8	26.67
3	Poor sucking response	18	60	2	6.66

Data presented in table 4 and figure 2 indicated that, The sucking response among the LBW babies, In pretest, 2(6.67%) of them had good sucking response, 10(33.33%) of them had average sucking response and 18 (60%) of them had poor sucking response. In post test 20 (66.67%) of them had good sucking response, 8 (26.67%) of them had average sucking response and 2(6.67%) of them had poor sucking response.
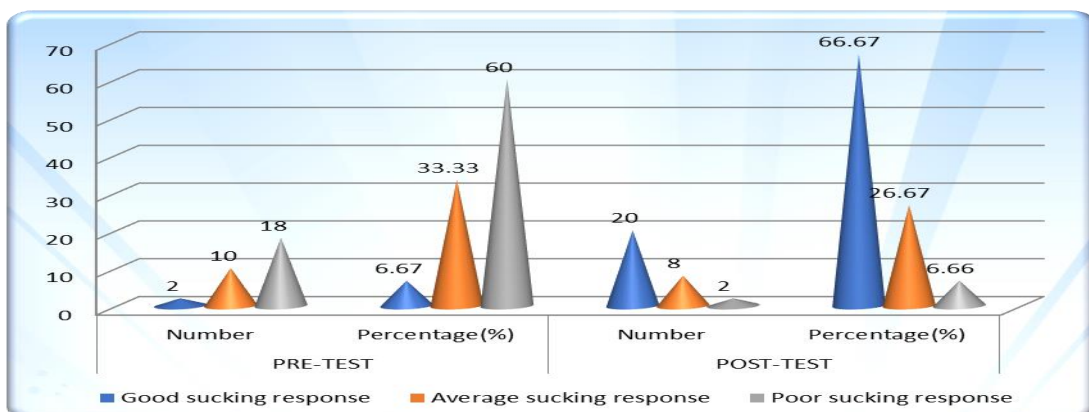

Figure 2: Bar Diagram showing Distribution of Sucking Response among the Low Birth Weight Babies

Table No 5: Effectiveness of Nesting on Bio – Physiological Parameters among the Low Birth Weight Babies Test of Significance/ Hypothesis Testing (PAIRED 't' TEST) N = 30

Bio-physiological Parameters		Mean	Standard deviation	Calculated value of t test	Tabulated value of t test @ df 29	Statistical significance
Temperature	Pre-test	98.49	2.06	0.55	2.045	NS
	Post-test	98	0.34			
Heart rate	Pre-test	168.33	7.23	16.59	2.045	S
	Post-test	139.6	5.03			
Respiratory rate	Pre-test	48.53	10.93	3.74	2.045	S
	Post-test	39.46	5.28			
Oxygen saturation	Pre-test	81.16	11.15	6.83	2.045	S
	Post-test	95.93	0.53			

Level of significance- 0.05 S – Significant NS – Not Significant

Table 5 shows that, in comparison of pre test and post test scores on temperature, the calculated value of paired t test was lesser than the tabulated value of paired t test at 5% level of significance. So the null hypothesis accepted. Therefore, there was a no significant difference between pretest and post test scores on temperature among the LBW babies. Hence it was proven that nesting was not effective in maintaining the thermal balance for the LBW babies.

In comparison of pretest and post test scores on heart rate, the calculated value of paired t test was greater than the tabulated value of paired t test at 5% level of significance. So the null hypothesis was rejected. Therefore, there was a highly significant difference between pre test and post test scores on heart rate among the LBW babies. Hence it shows that nesting was effective in stabilizing the heart rate for the LBW babies.

In comparison of pretest and post test scores on respiratory rate, the calculated value of paired t test was greater than the tabulated value of paired t test at 5% level of significance. So the null hypothesis rejected. Therefore, there is a highly significant difference between pre test and post test scores on respiratory rate among the LBW babies. Hence it implied that nesting was effective in stabilizing the respiratory rate for the LBW babies.

In comparison of pretest and post test scores on oxygen saturation, the calculated value of paired t test was greater than the tabulated value of paired t test at 5% level of significance. So the null hypothesis rejected. Therefore, there was a highly significant difference between pre test and post test scores on oxygen saturation among the LBW babies. Hence it signified that nesting was effective in stabilizing the oxygen saturation for the LBW babies.

Table No 6: Effectiveness of Nesting on Sucking Response among the Low Birth Weight Babies Test of significance/ Hypothesis testing (PAIRED 't' TEST) N = 30

	Pre- test score		Post- test score		Calculated value of t test	Tabulated value @ df 29	Statistical significance
Sucking response	Mean	S.D.	Mean	S.D.			
	4.16	2.8	9.33	2.65	13.79	2.045	S

Level of significance- 0.05   S – Significant   NS – Not Significant

Table 6 shows that, in comparison of pre test and post test, the calculated value of paired t test is greater than the tabulated value of paired t test at 5% level of significance. So the null hypothesis rejected. Therefore, there was a highly significant difference between pre test and post test score on sucking response among the low birth weight babies. Hence it was proven that nesting was effective in improving the sucking response of the low birth weight babies.

DISCUSSION

This study aimed to examine the bio-physiological parameters and sucking response among low birth weight babies admitted to J K Loan Hospital Jaipur. The initial findings revealed that the mean

temperature was 98.49°F (SD 2.06), heart rate was 168.33 beats per minute (SD 7.23), respiratory rate was 48.53 breaths per minute (SD 10.93), and oxygen saturation was 81.16% (SD 11.15). In terms of sucking response, 60% of the participants exhibited poor sucking, while 6.67% had good sucking, and 33.33% had average sucking response.

In contrast, the subsequent study reported different results, with a mean temperature of 98°F (SD 0.34), heart rate of 139.6 beats per minute (SD 5.03), respiratory rate of 39.46 breaths per minute (SD 5.28), and oxygen saturation of 95.93% (SD 0.53). The updated findings showed that 66.67% of low birth weight babies had good sucking response, 6.66% had poor sucking response, and 26.67% had average sucking response. These findings contribute to the understanding of the bio-physiological parameters and sucking response among low birth weight babies, which can help healthcare professionals in devising appropriate care strategies.

This study investigates the impact of nesting on bio-physiological parameters and sucking response among low birth weight babies. Pre-test study results revealed significant differences in heart rate, respiratory rate, oxygen saturation, and sucking response post-nesting intervention. The calculated "t" values for these parameters were greater than the tabulated value at a 29 degree freedom and 0.05 level of significance, indicating their statistical significance. In contrast, the temperature showed no significant change after nesting application. The research hypothesis was accepted for all parameters, suggesting that nesting is an effective intervention to stabilize bio-physiological parameters and improve sucking response among low birth weight babies, as supported by Phebe Esther Philomina's study conducted in Coimbatore hospitals.

CONCLUSION

This study investigates the influence of nesting on the bio-physiological parameters and sucking response in subjects who were initially suspected of altered bio-physiological parameters and poor sucking response in a pre-test experimental setting. The research aimed to explore the effectiveness of nesting as a potential intervention to improve these parameters.

The study involved a sample of subjects who were assessed for their initial bio-physiological parameters and sucking response before the introduction of nesting. Data was collected using standardized methods and analyzed statistically to determine any significant differences in the subjects' parameters before and after the implementation of nesting.

The results demonstrated that nesting played a crucial role in maintaining and improving the bio-physiological parameters and sucking response in the majority of the study subjects. This suggests that nesting could be an effective tool in supporting subjects with suspected altered bio-physiological parameters and poor sucking response, contributing to overall well-being and development.

In conclusion, this study highlights the importance of nesting as a potential intervention for subjects in pre-test experimental settings, where bio-physiological parameters and sucking response are initially suspected to be compromised. Further research is recommended to explore the long-term effects of nesting and its application in various experimental contexts.

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