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Effect of Nesting on Physiological Parameters and Neurobehavioral Patterns of Preterm Babies

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Abstract: ***Background:*** *Preterm birth* ***is the most important general health problem all over the world that is associated with neonatal mortality, morbidity and disability. As stated by World Health Organization babies are born before completion of 37 weeks of pregnancy or less than two hundred fifty - nine days of pregnancy that starts from the last menstrual period of a woman. Normally, a pregnancy lasts about 40 weeks.*** ***Aims:*** ***To assess the effectiveness of Nesting on biophysiological parameters and neurobehavioral patterns of preterm babies.*** ***Methodology:*** ***Quantitative research approach was adopted. Total 35 preterm babies were selected from NICU of Himalayan Hospital, Jolly grant, Dehradun, through purposive sampling technique. Data was collected by administrating the tools to the participants. Tools consist of socio - demographic profile, observational checklist for biophysiological parameters and neurobehavioral patterns. Nesting was provided to the preterm babies for 12 hours per day continuously for 7 days. The data was analyzed by using descriptive and inferential statistics.*** ***Results:*** ***The results revealed that after Nesting, the mean post interventional biophysiological parameters were stable, as compared to pre - interventional parameters and also increase the post interventional neurobehavioral patterns as compared to pre - interventional of preterm babies.*** ***Conclusion:*** ***The study concluded that Nesting helps in maintaining and stabilizing biophysiological parameters within the normal ranges and improves the neurobehavioral patterns (Reflexes) of preterm babies. Nesting also promoted the posture, sleep, early breastfeeding initiation and early discharge in newborns.***

Keywords: Nesting, Preterm babies, physiological parameters, neurobehavioral patterns

1. Background

Preterm birth is the most important general health problem all over the world that is associated with neonatal mortality, morbidity and disability. Neonatal intensive care unit can provide a stressful - provoking environment to sick and preterm babies. The aim of developmental care to implement the modification in care of baby and nursery environment that can improve neurological development, help to reduce stress and morbidity in neonates.[1]

According to World Health Organization report, the global birth rate of 2016 is an average of 18.5 per thousand live births.[2] 2018 report very clearly states that about 2.5 million newborns died in the world. According to UNICEF report 2016, the average mortality rate of neonates is 2.6 million global, in that around 6.4 lakh children died within 28 days of life.[3]

The infant death rate in India is 25.4 per thousand live births. So it is the 12th worst country among all the fifty–two lower middle - income countries. It also declared that in India the girl's mortality rate is higher than boys.[4]

Nesting procedure is a nursing ability that is commonly utilize in the growth of preterm babies.6 In this use rolled - up linen or blanket and prepare a nest that provides comfort, physiological and postural stability, also improves the neurobehavioral status of the baby. Nesting provides an intrauterine boundary for protection and proper positioning of the baby.[5]

Nesting is a key factor to maintain the position of a preterm baby through the positioning of hands near the hands and feet using positioning aids to provide a safe, warm & consoling cradle. The nesting technique maintains premature infants in a comfortable position.

According to an assessment detail declared by the sample registration system, the infant mortality rate in Uttarakhand has increased from thirty - four in every 1000 live born in 2015 to 38/1000 live born in 2016. It is also clear that in Uttarakhand; more than seventy - nine percent of infant mortality is within the neonatal period.[7]

The behavioral organization is the infant's ability to maintain a balance between physiological parameters and reflexes by which the infant is in constant contact with the infant's environment.

Developmental care for preterm babies and their families aims to reduce stress, consume energy and recover quickly, promote growth and well - being, support emerging behaviors at every stage of neurodevelopmental maturation.

2. Design and Method

Study design
A quantitative research approach was used in this study to evaluate the effects of Nesting on biophysiological parameters and neurobehavioral patterns of preterm babies and Quasi - Experimental – Multiple observation method was appropriate to conduct this research study. The sample was selected by using non - probability purposive sampling technique to choose the preterm babies who were hemodynamically stable.

Participants
The present study was conducted in Himalayan Hospital, Jolly grant, Dehradun. It is a teaching and research institution with 750 beds. The sample of the present study comprised all the preterm babies who fulfill the inclusion criteria and admitted in NICU of Himalayan hospital at the time of data collection and those who are hemodynamically stable

(Oxygen saturation >90%). Total 35 preterm babies were chosen for this study through purposive sampling technique.

Data collection instruments and procedure

After obtaining the ethical and administrative permission in order to obtained true response from the participant's mothers. The samples were selected by using purposive sampling technique. The aim of the research was described to the participant's mother and assured for confidentiality. A pre - interventional socio - demographic profile was collected from the mothers. Before and after providing Nesting, biophysiological parameters and neurobehavioral patterns were assessed. Nesting was provided 12 hours to the babies under supervision for 7 days.

3. Result

The data and the findings have been divided under three headings:

Section A – Socio - demographic profile of preterm babies and their mother.

Section B – Analysis of the effectiveness of Nesting.

Section C – Correlation between biophysiological parameters & neurobehavioral patterns of preterm babies.

Section B

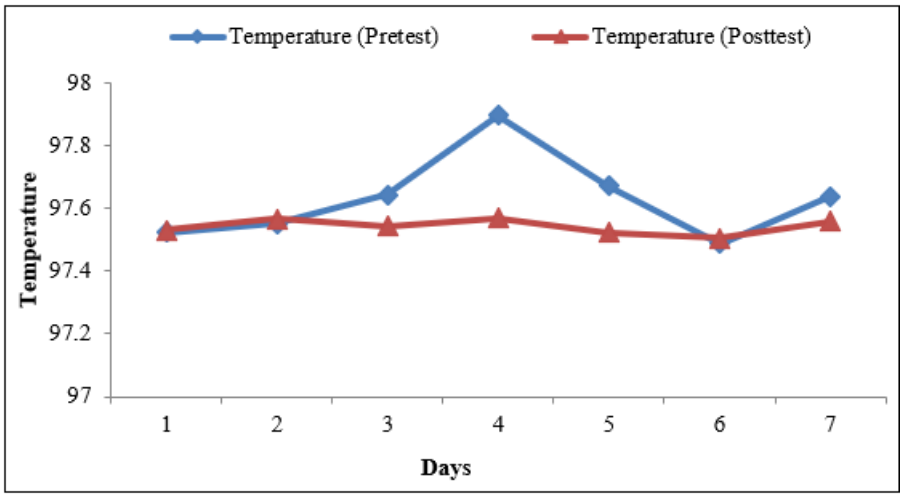

Figure 2: (a) Line graph representation of effectiveness of Nesting on temperature of preterm babies

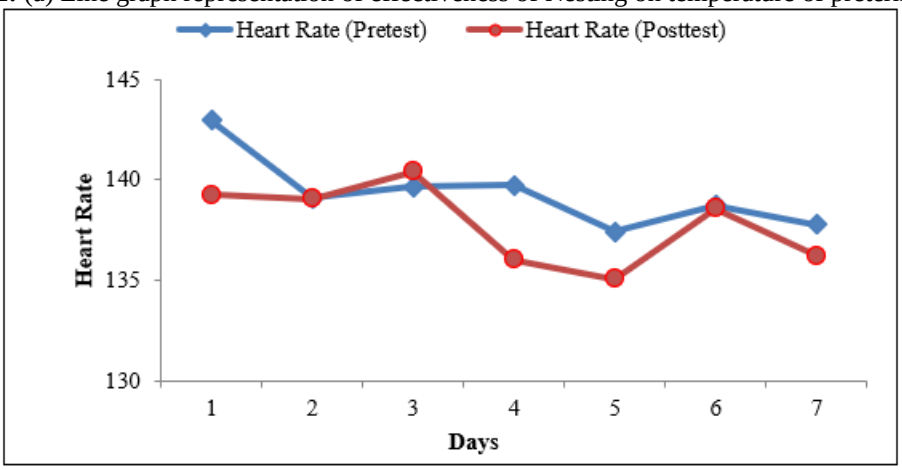

Figure 2: (b) Line graph representation of effectiveness of Nesting on heart rate of preterm babies

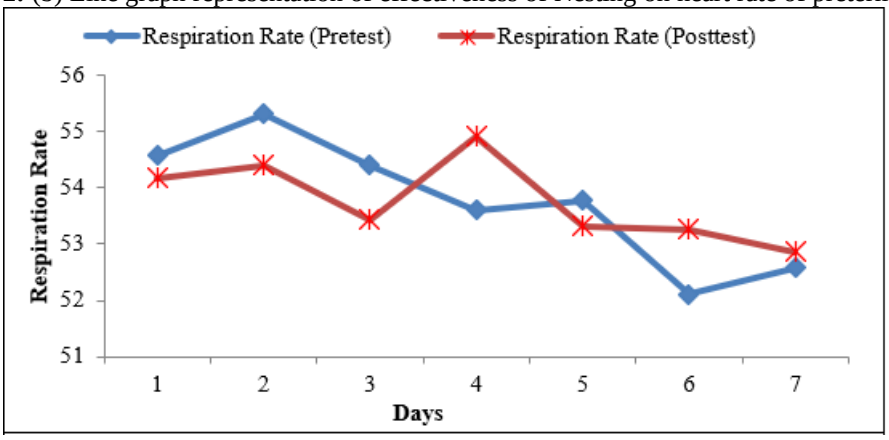

Figure 2: (c) Line graph representation of effectiveness of Nesting on respiratory rate of preterm babies

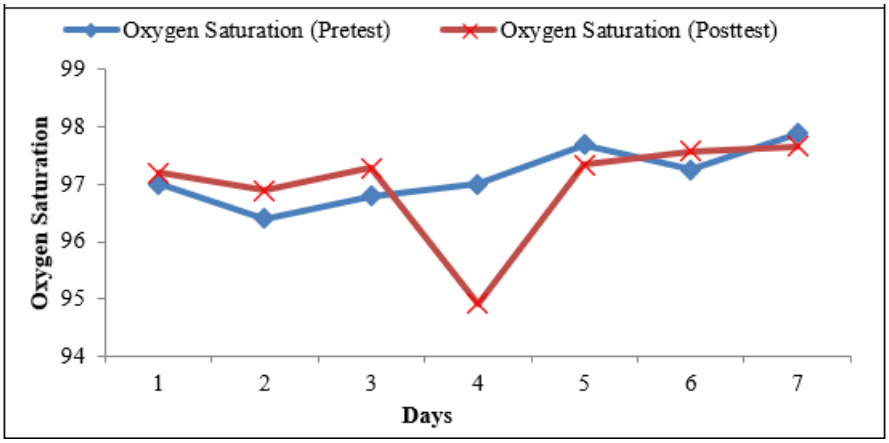

Figure 2: (d) Line graph representation of effectiveness of Nesting on SpO_2 of preterm babies

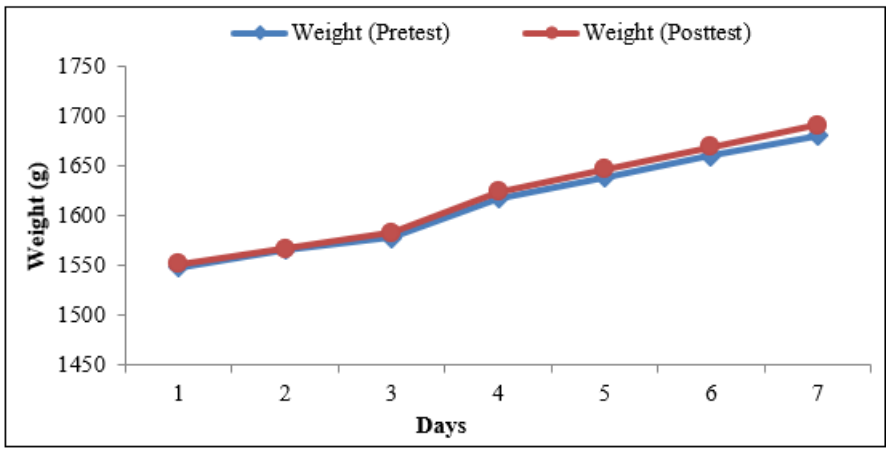

Figure 2: (e) Line graph representation of effectiveness of Nesting on weight of preterm babies

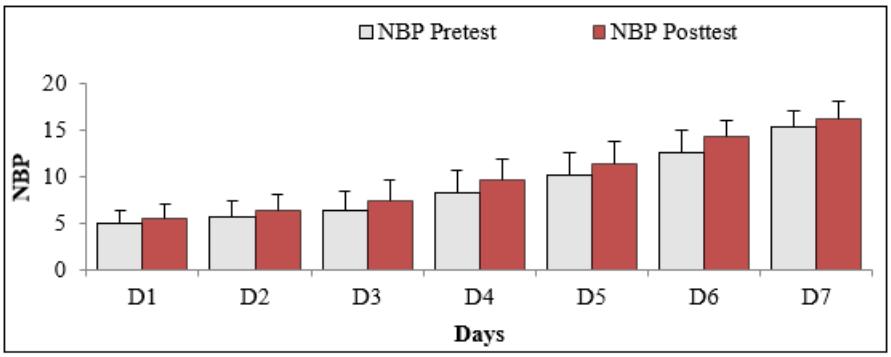

Figure 2: (f) Line graph representation of effectiveness of Nesting on neurobehavioral patterns of preterm babies

In this, the analysis was done by recording the biophysiological parameters and neurobehavioral parameters for continues 7 days. Through the graphs, it is clearly revealed that biophysiological parameters (Temperature, heart rate, respiratory rate, SpO_2 and weight) were come near to normal & stabilized and also improves the neurobehavioral patterns (Reflexes) of preterm babies after Nesting.

Section- C

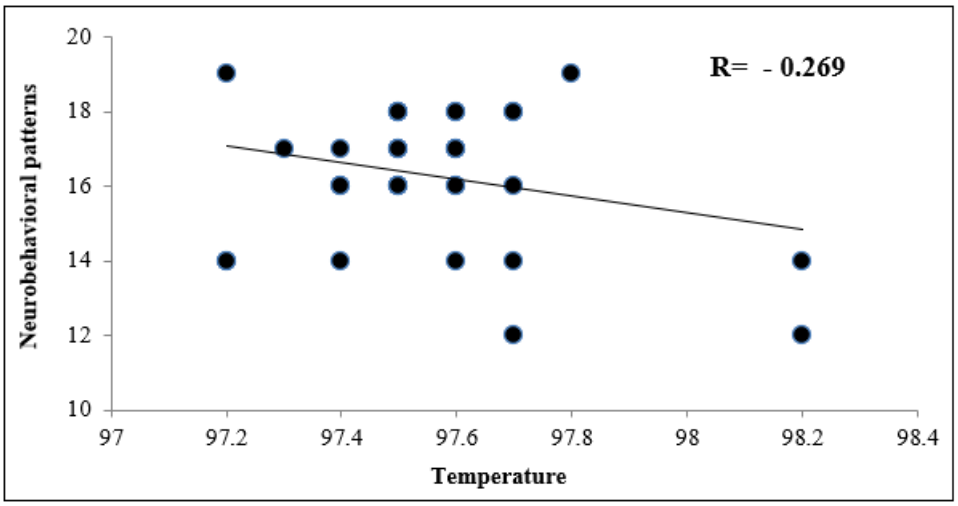

Figure 3 (a) Graph representation of correlation between neurobehavioral patterns with temperature of preterm babies

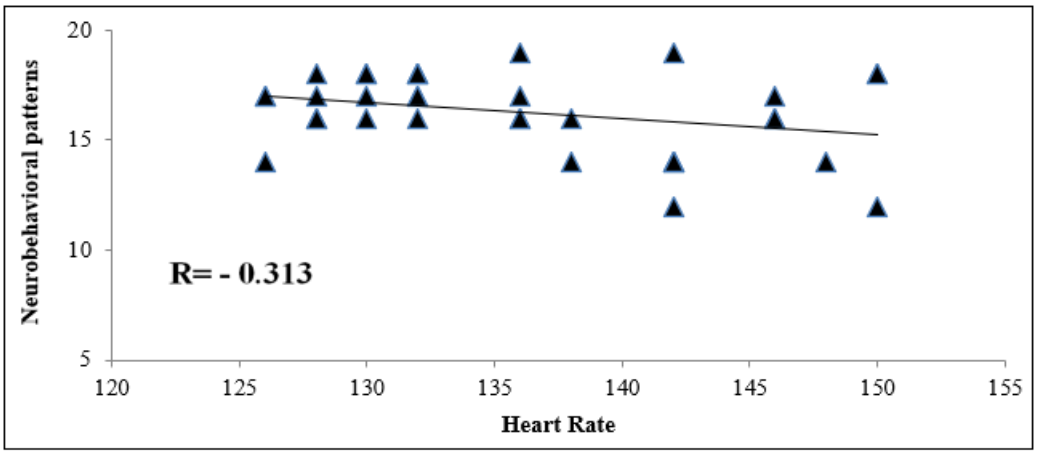

Figure 3 (b) Graph representation of correlation between neurobehavioral patterns with heart rate of preterm babies

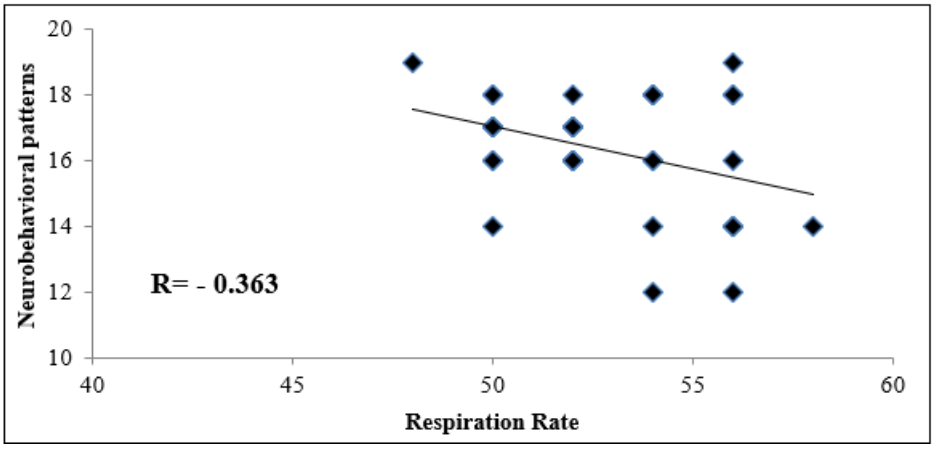

Figure 3 (c): Graph representation of correlation between neurobehavioral patterns with respiratory rate of preterm babies

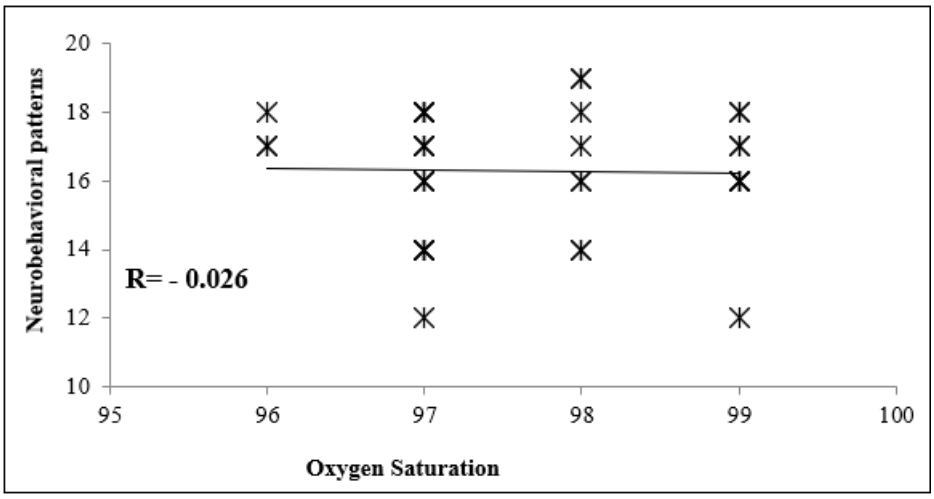

Figure 3 (d) Graph representation of correlation between neurobehavioral patterns with SpO_2 of preterm babies

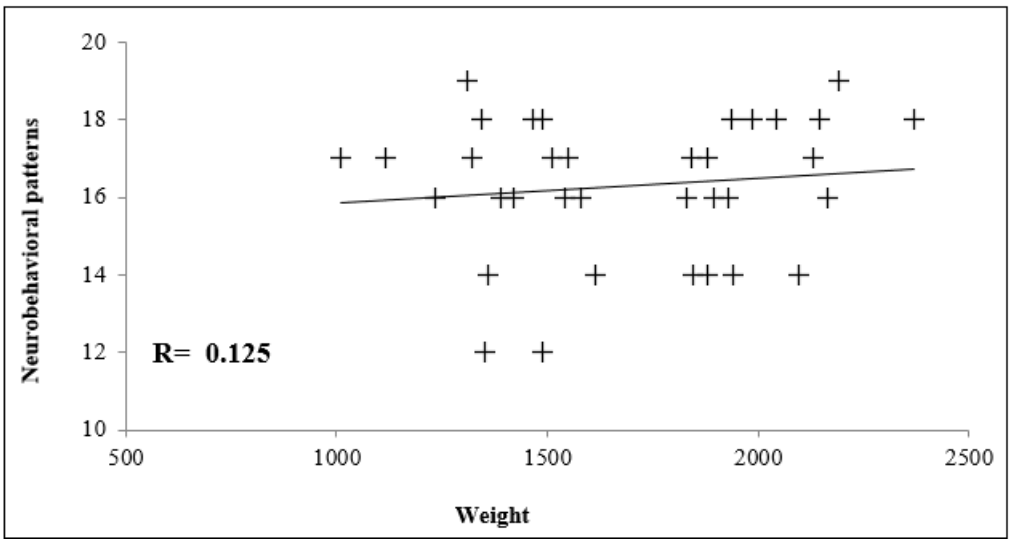

Figure 3 (e): Graph representation of correlation between neurobehavioral patterns with weight of preterm babies

This data revealed that weak negative and no correlation between neurobehavioral patterns and biophysiological parameters of preterm babies.

4. Other Findings

- During the study, Nesting was also improved the posture, sleep, early breastfeeding initiation and early discharge of preterm babies.
- There were no episodes of apnea, bradycardia during Nesting among preterm babies.

5. Discussion

The main concept of the study was to explore the effect of Nesting on biophysiological parameters and neurobehavioral patterns of preterm babies. The result of the study was discussed based on the objectives of the present study.

The present study illustrated that the post - test mean score of biophysiological parameters were temperature (97.56±0.21), Heart rate (136.23±7.69), respiratory rate (52.86±2.53), SpO_2 (97.66±0.97) and weight (1691.29±346.69) after Nesting significant at $p<0.05$. The result was consistent with the study performed by **Sr. Mony K., et. al.** (2018), this is an observational education to examine the outcome of Nesting on the sleeping system and physiologic boundaries of premature neonates, Kerala, India. In this study twenty - one preterm randomly assigned in two group nest and routine care. Study findings illustrated that there was a refinement & balance in vital signs – pulse rate, breathing rate, temperature, and O_2 saturation in all phases of sleep of newborns with intervention as compared to procedure care. The study ended that Nesting assists to continue secure vital parameters and wellness of premature newborns.[8]

The present study revealed that the post - test mean score of neurobehavioral patterns was (16.29±1.81) after Nesting significant at $p<0.05$. The findings were consistent with the study carried out by **Nahed Saied Mohamed El - Nagger, et. al.** (2016) this is an exploratory research to evaluate the outcome of applying the Nesting technique on the physiological functioning and neurobehavioral organization of preterm babies. The analysis revealed that there were high statistically significant differences ($p<0.05$) in vitals parameters and had a positive effect in neurobehavioral state of premature babies. The study concluded that Nesting is a successful technique to normalize the vital signs, reduction of pain, and stress, refine the reflexes and growth of neonates.[9]

Implication for Practice and Research

Nursing personnel who are working in antenatal ward, post - natal ward and NICU can provide education to the mothers and help them in providing Nesting and also explain the benefits and procedure of Nesting. It is a wide area to conduct the research study in various aspects of health parameters of preterm babies and impact of Nesting on preterm babies.

6. Conclusion

- Study concluded that the Nesting is improving the neurobehavioral patterns (Reflexes) of preterm babies. Nesting also promoted the posture, sleep, early breastfeeding initiation and early discharge in newborns. Neurobehavioral patterns score gain in preterm babies that was observed after 4th day of regular Nesting.
- Preterm babies persistently maintain their biophysiological parameters within normal ranges during the study.

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