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# EFFECTIVENESS OF CONVENTIONAL CARE (CONTROL GROUP) VERSUS NESTING (EXPERIMENTAL GROUP) ON SELECTED PHYSIOLOGICAL PARAMETERS AMONG PRETERM NEONATES IN NICU

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**Abstract**
**Introduction:** The preterm babies are born before their body and organ systems mature. Their body organs are not ready for extra uterine life. Nesting is a comfortable measure that stimulates in-utero feeling & make the baby less jittery. It transforms the sleep pattern from erratic disturbed spells, to deep peaceful nights and flexed posture conserves the energy and minimizes the weight loss.
**Aim:** To evaluate the effectiveness of conventional care versus nesting on selected physiological parameters among preterm neonates in NICU.
**Methods:** A quasi-experimental time series design was adopted for this study. 60 preterm neonates are selected by using a non-probability purposive sampling technique.
**Result:** In preterm neonates on conventional care F value for skin temperature (1.695), respiratory rate (1.000), oxygen saturation (0.753) is lesser than the table value of F and heart rate (2.155) is higher than the table value of F. Here significant difference found in means of heart rate as p-values are < 0.05. In preterm neonates on nesting F value for respiratory rate (1.303), heart rate (1.307) is lesser than the table value of F and for skin temperature (26.278) and oxygen saturation (17.078) is higher than the table value of F. Here statistical significant difference is found between means of skin temperature, oxygen saturation as p-values are <0.05. While comparison was done between preterm neonates on conventional care and on nesting, nesting has a better effect on skin temperature and oxygen saturation ($p<0.05$).

**Keywords:** Conventional Care, Nesting, Physiological Parameters, Preterm Neonate.

## Introduction

"A baby is born with the need to be loved,
A preemie or sick newborn are born with the need to fight on,
An angel is born and leaves a footprint upon many hearts"
- JULIA TOIVONEN[1]

**Introduction:** Neonate refers to an infant in the first twenty-eight days after birth. The neonatal period is a highly vulnerable time for the infants as they are completing many of the physiologic adjustments required for extra uterine existence. These neonates are anatomically & functionally immature, and due to that the neonatal mortality rate is high.[1] The high neonatal morbidity & mortality rates attest to the fragility of life during this period. Of all deaths occurring in the first year of life; in that 45% deaths are in the neonatal period. (WHO-2015).[2]

According to WHO "Live born baby delivered before 37 weeks from the first day of the last menstrual period are termed premature."[3] They are born before their body and organ systems mature. Such infants are extremely vulnerable and most of their body organs are not ready for extra uterine life; therefore, they might not function properly due to extreme immaturity.[5] Respiration of preterm neonates is rapid, shallow, and irregular with periods of apnea & cyanosis. They are vulnerable to develop chronic pulmonary insufficiency due to bronchopulmonary dysplasia. Weak respiratory muscles, poor development & expansion of lungs, inefficient respiratory centre& deficiency of surfactant in the alveoli are responsible for respiratory problem which leads to increase neonatal mortality rate.[4]

Nesting comes from the word nest which means the cage. Nesting or hive is one of the methods of environmental management within developmental care. Nesting is a comfortable measure that stimulates in-utero feeling of lack of space & make the baby less jittery. Nesting facilities transformation of sleep pattern from erratic disturbed spells, to deep peaceful nights.[7]

In India, 3,341,000 babies are born too soon each year and 329,900 children under five die due to direct preterm complications. As per sample registration system data for 2013, annual birth is 25,794,000, in that 695,850 dies during neonatal period (28 per 1000 live births). Studies have shown that, premature neonates who receive developmental positioning through applying nesting technique by placing simple sheet rolls to provide supports and boundaries, they can feel something protective around them and stay in hospital for less time in addition gain weight better[6]

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**Research Methods or Methodology**

**Method and Materials**

**Design & Sampling:** A Quasi- experimental time series design was used to conduct this study at Shri Vinoba Bhave College of Nursing, Silvassa, Dadra & Nagar Haveli among 60 samples.

Samples were chosen by using Non-probability purposive sampling technique. Among them 30 were assigned to control group and 30 to experimental group.

**Ethical consideration:** Prior getting permission, the tool was presented before the ethical committee and got the approval. Then to conduct study, permission was taken from the Director of Medical and Health Services, Dadra and Nagara Haveli and also informed to the H.O.D. of NICU about the same. Informed consent was obtained from the parents and they were assured of total confidentiality of information and assured that it is solely used for the purpose of the present study only.

**Data collection tool:** The data was collected from NICU of Shri Vinoba Bhave Civil Hospital Silvassa, Dadra & Nagar Haveli by using a physiological parameters observation tool

Data collection instrument (Tool) used were:

- Demographic data
- Physiological parameters observation tool

**Reliability:**The reliability of an observation tool on physiological parameter Inter rater method was used. Correlation co-efficient for skin temperature was 0.9, for respiratory rate was 0.8, for heart rate was 0.9, for oxygen saturation was 0.9.

**Data collection process:** Written permission was obtained from Director Of Medical And Health Services of Dadra and Nagar Haveli. The data was collected from 10/1/2018 to 24/2/2018. The investigator introduces her and explained the purpose and confidentiality of the study to the parents of preterm neonates. During data collection, the investigator established good rapport with the Parents of preterm neonates who participated in the study and have taken written consent from the parents and collected the demographic data. Selected 30 preterm neonates by using purposive sampling techniques for preterm neonates on conventional care (control group) who fulfill the inclusion and exclusion criteria. Recorded the readings of selected physiological parameters such as skin temperature, respiratory rate, heart rate and oxygen saturation every 8 hourly consecutively for 4 days. During that period conventional care was provided. Then selected 30 samples to provide nesting. Sample were selected based on inclusion and exclusion criteria where preterm neonates were on nesting for consecutively for 4 days during which parameters were recorded such as skin temperature, respiratory rate, heart rate, oxygen saturation for every 8hourly.

**Data analysis:**The data is obtained were analyzed in respect to the objectives of the study by using descriptive and inferential statistics which include two-way repeated measures of ANOVA and Chi-square test.

## Result

**Analysis and Interpretation**

**Section I: Analysis of frequency and percentage distribution of sample according to the demographic variables of preterm neonates on conventional care (control group) and on nesting (experimental group).**

Preterm neonates were distributed in to various categories like age in days, sex, gestational age, birth weight and duration of hospitalization in days. The majority of preterm neonates belongs to 0 to 7 days (96.67%) and none of them belongs to 15 to 21 and 22 to 28 days; the majority of preterm neonates on conventional care were males (66.67%), while those on nesting, were females (33.33%); the majority of preterm neonates born between 32 and 33weeks of gestation in both the group (60% preterm neonates on conventional care and 43.33% preterm neonates on nesting);most of the preterm neonates on conventional care were weighting from 1501 to 1750grams (36.66%) and those on nesting were weighting from 1001 and1250grams (46.67%);the duration of hospitalization in both the group was 0 to 7 days (96.67%).

**Section II: Analysis of selected physiological parameters of preterm neonates on conventional care in terms of skin temperature, respiratory rate, heart rate and oxygen saturation.**

**Two-way repeated measures ANOVA on mean and SD on physiological parameters of preterm neonates in terms of skin temperature, respiratory rate, heart rate and oxygen saturation at different points of time (every 8-hourly observation till 4 days)**

Degrees of freedom (df) for Skin temperature, respiratory rate, heart rate and oxygen saturation in preterm neonates on conventional care is (12, 348).Here F value for skin temperature (1.695), respiratory rate (1.000), oxygen saturation (0.753) are lesser than the table value of F and heart rate (2.155) is higher than the table value of F, which indicates that there was no significant difference between means of Skin temperature, respiratory rate and oxygen saturation as the *p*-valueare > 0.05 but there was

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significant difference found in means of heart rate as *p*-valueare < 0.05. Therefore, the conventional care has significant effect on heart rate hence forth the statistical result hypothesis $H_1$ is accepted for heart rate and rejected for the other parameters.

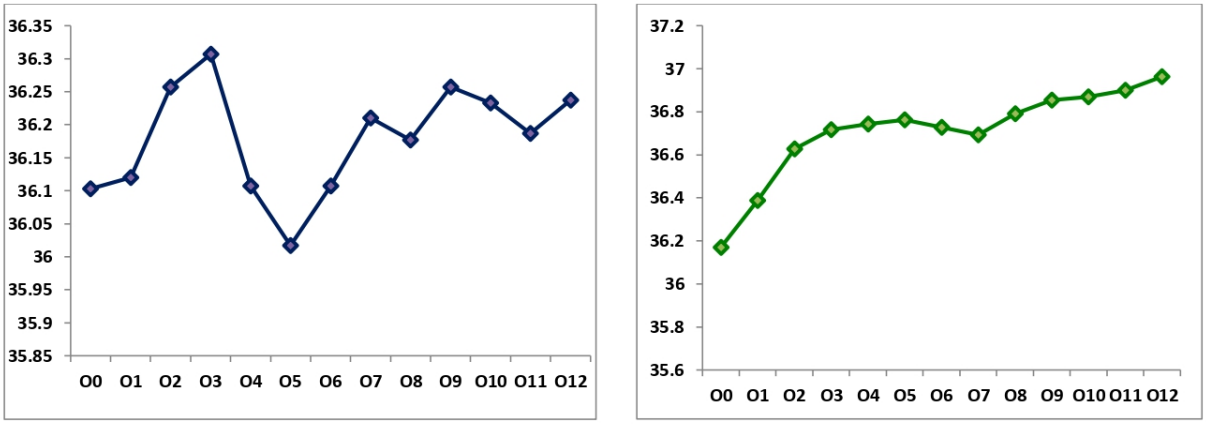
**Section III*:*Analysis of selected physiological parameters of preterm neonates on nesting in terms of skin temperature, respiratory rate, heart rate, oxygen saturation.**

**Two-way repeated measures ANOVA on mean and SD on physiological parameters of preterm neonates in terms of skin temperature, respiratory rate, heart rate and oxygen saturation at different points of time (every 8-hourly observation till 4 days)**

Degrees of freedom for skin temperature, respiratory rate, heart rate and oxygen saturation in preterm neonates on nesting is (12, 348). Here F value for respiratory rate (1.303), heart rate (1.307) is lesser than the table value of F. The F value of skin temperature (26.278), oxygen saturation (17.078) is higher than the table value of F. It indicates that there is no significant difference in means of respiratory rate and heart rate as the *p*-valueare > 0.05, but there is statistical significant difference found between means of skin temperature and oxygen saturation as *p*-valueare < 0.05. It shows that nesting has significant effect on skin temperature and oxygen saturation. As per statistical result hypothesis $H_2$ is accepted for skin temperature and oxygen saturation rejected for the remaining parameters.

**Section IV: Analysis of effectiveness of conventional care versus nesting on preterm neonates in terms of skin temperature, respiratory rate, heart rate, oxygen saturation.**

**Graphical representation of Skin Temperature of preterm neonates on conventional care (control group) vs nesting (experimental group).**

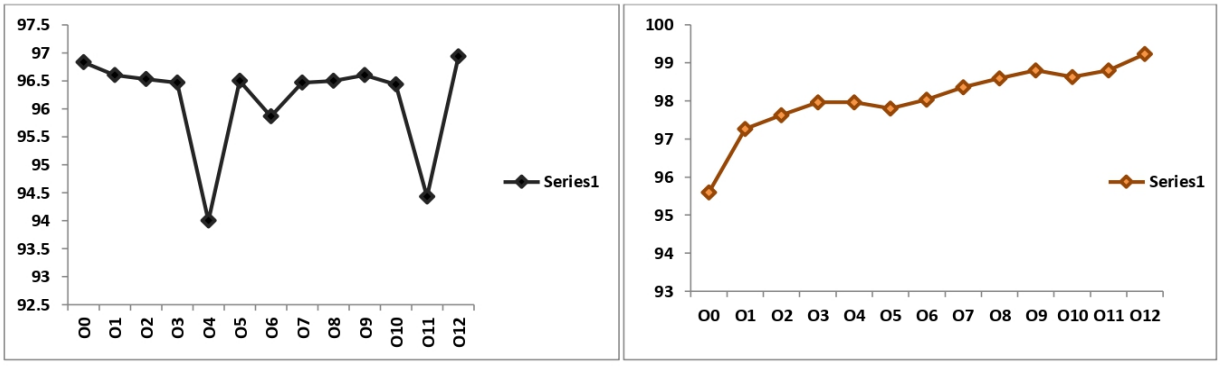



Preterm neonates on conventional care

Preterm neonates on nesting

**Figure: Graphical representation of skin temperature**

**Graphical representation of *Oxygen Saturation* of preterm neonate on conventional care (control group) vs nesting (experimental group).**




Preterm neonates on Conventional Care

Preterm neonates on Nesting

**Figure: Graphical representation of *Oxygen Saturation***

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**Table: Evaluating the effectiveness of Conventional Care Vs Nesting in terms of selected physiological parameters n=60**

| Two way repeated measures of ANOVA | Preterm neonates on conventional care | | Preterm neonates on conventional care | |
|---|---|---|---|---|
| **Physiological parameters** | **F value** | ***p* Value** | **F value** | ***p* Value** |
| Skin temperature | 1.695 | 0.066 | **26.278** | **0.000** |
| Respiratory rate | 1.000 | 0.448 | 1.303 | 0.215 |
| Heart rate | **2.155** | **0.013** | 1.307 | 0.213 |
| Oxygen saturation | 0.753 | 0.699 | **17.078** | **0.000** |

**Section V:Association between first observation findings of selected physiological parameters with selected demographic variables of preterm neonates on conventional care (control group) and on nesting (experimental group).**

In the present study preterm neonates on nesting the gestational age ($\chi^2$=10.2) is significantly associated with first observation findings of oxygen saturation.

**Discussion:**The findings of the study have been discussed with reference to the objectives and hypotheses stated in introduction and in relation with the findings of other studies.

**Section I:** Analysis of frequency and percentage distribution of samples according to the demographic variables of preterm neonates on conventional care (control group) and on nesting (experimental group).

In the present study preterm neonates were distributed in to various categories like age in days, sex, gestational age, birth weight and duration of hospitalization in days. The majority of preterm neonates belongs to 0 to 7 days (96.67%) and none of them belongs to 15 to 21 and 22 to 28 days; the majority of preterm neonates on conventional care were males (66.67%), while those on nesting, were females (33.33%); the majority of preterm neonates born between 32 and 33weeks of gestation in both the group (60% on conventional care and 43.33% on nesting); most of the preterm neonates on conventional care were weighting from 1501 to 1750grams (36.66%) and those on nesting were weighting from 1001 and 1250grams (46.67%); the duration of hospitalization in both the group was 0 to 7 days (96.67%).

**Section II:**Analysis of selected physiological parameters of preterm neonates on conventional care in terms of skin temperature, respiratory rate, heart rate, oxygen saturation.

In the present study F value for skin temperature is 1.695(t=1.780), respiratory rate is 1.000(t=1.780), oxygen saturation is 0.753(t=1.780) which are lesser than the table value, whereas heart rate is 2.155(t=1.780) higher than the table value of F. It indicates that there was no significant difference between means of Skin temperature, respiratory rate and oxygen saturation as the p-values are > 0.05 but there was significant difference found in means of heart rate as p-values are < 0.05, which indicates the conventional care has significant effect on heart rate.

**Section III:**Analysis of selected physiological parameters of preterm neonates on nesting in terms of skin temperature, respiratory rate, heart rate, oxygen saturation.

In the present study F value for respiratory rate is 1.303(t=1.780), heart rate 1.307(t=1.780) is lesser than the table value of F. The F value for skin temperature 26.278(t=1.780), oxygen saturation 17.078(t=1.780) is higher than the table value of F, It indicates that there is no significant difference in means of respiratory rate and heart rate as the p-values are > 0.05, but there is statistical significant difference is found between means of skin temperature, oxygen saturation and as p-values are <0.05 which indicates the nesting has significant effect on skin temperature and oxygen saturation.

**Section IV:**Analysis of the effectiveness of conventional care versus nesting on preterm neonates in terms of skin temperature, respiratory rate, heart rate and oxygen saturation.

In the present study nesting has significant effect on skin temperature and oxygen saturation whereas conventional care has significant effect on heart rate. Here F value of preterm neonates on conventional care vs nesting for skin temperature is 1.695 vs

26.278, heart rate is 2.155 vs 1.307, oxygen saturation is 0.753 vs 17.078 respectively. There was significant difference in both the group but as per statistical result nesting has better effect on skin temperature and oxygen saturation as compared to conventional care.

**Section V:**Association between first observation findings of selected physiological parameters with selected demographic variables of preterm neonates on conventional care (control group) and on nesting (experimental group).

In the present study preterm neonates on nesting the gestational age ($\chi^2$=10.2) is significantly associated with first observation findings of oxygen saturation.Similar study was conducted to assess the effect of nesting on posture discomfort & physiological parameters of LBW infant. Result indicated that a significant improvement in posture (t=12.64) was observed in experimental group during application of nesting. A significant reduction in the discomfort was observed in experimental group as compared to control group (t=10.65). A study concludes that Low birth weight infants exhibit comparatively stable physiological parameters during the period of nesting.

**Conclusion**

The preterm babies are born before their body and organ systems mature. Their body organs are not ready for extra uterine life; therefore, they might not function properly and general activity is poor with sluggish, incomplete neonatal reflexes. Nesting is a comfortable measure that stimulates in-utero feeling of lack of space. Therefore, this study was selected. The aim of this study was to evaluate the effectiveness of conventional care versus nesting on selected physiological parameters among preterm neonates in NICU. A quasi-experimental time series design was adopted for this study, where 60 preterm neonates (30 on conventional care and 30 on nesting) are selected by using a non-probability purposive sampling technique. Provide conventional care to preterm neonates observe them (30 preterm neonates) consecutively for 4 days and recorded the findings of physiological parameters in terms of skin temperature, respiratory rate, heart rate, oxygen saturation, every 8 hourly. Provide nesting to preterm neonates on nesting (for another 30 preterm neonates) consecutively for 4 days and recorded the findings as mentioned above. In the present study nesting has significant effect on skin temperature, oxygen saturation whereas conventional care has significant effect on heart rate. Here F value of preterm neonates on conventional care vs nesting for skin temperature is 1.695 vs 26.278, heart rate is 2.155 vs 1.307, oxygen saturation is 0.753 vs 17.078 respectively. There was significant difference in both the group but as per statistical result nesting has better effect on skin temperature and oxygen saturation as compared to conventional care.

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