Effectiveness of Kangaroo Mother Care on Level of Physiological Parameters among Preterm Infants at Selected Hospitals, Nagercoil

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Abstract

Aim and Objective: To assess the effectiveness of Kangaroo Mother Care on level of physiological parameters among preterm infants. Methodology: Quantitative approach, Quasi experimental pre and post-test research design was adopted to assess the effectiveness of Kangaroo Mother Care on level of physiological parameters among 60 preterm infants (30 in study and 30 in control group) who satisfied the inclusion and exclusion criteria in the Neonatal Intensive Care Unit (NICU) at Dr.Jayasekaran and Dr. Jayaharan Hospitals, Nagercoil. Non-probability purposive sampling technique was used to select the samples. Kangaroo Mother Care along with hospital routine (warmer care) was performed in the study group and hospital routine (only warmer care) was given to the control group. The pre and post-test level of physiological parameters was assessed by using World Health Organization (WHO) guidelines. Results: The study findings revealed that there was no significant difference in the pre-test level of physiological parameters among preterm infants between study and control group. The calculated unpaired ‘t’ value of physiological parameters such as temperature, heart rate, respiratory rate, oxygen saturation and weight of preterm infants after providing KMC for 30 minutes for three consecutive days, was 11.29°C; 13.48 beats per minute; 14.85 breath per minute; 8.59% respectively which shows that there was a high statistically significant difference between the study and control group at p<0.001 level. Conclusion: The results revealed that the Kangaroo Mother Care for 30 minutes for three consecutive days was effective in improving the physiological parameters among preterm infants. Hence, this duration of KMC can be practiced as a part of routine nursing care for stable preterm infants during hospitalization. Keywords: kangaroo mother care, preterm infants, physiological parameters, WHO guidelines.
I Introduction

Preterm infants are born before they reach their full gestational age of 40 weeks, in which the preterm infant’s loss of time to grow in their mother’s womb leads to structural and physiological immaturity\textsuperscript{[1]}. As a consequence, preterm infants look very thin, red, smooth, wrinkled, with fragile skin and weightless appearance because of minimal deposition of subcutaneous fat. Preterm infants are vulnerable to many impediments and complications in the first few weeks of life due to immaturity of the body system\textsuperscript{[2]}. The structural and functional immaturity of neuro behavioural development of the preterm infants results in dishevelment of nervous system, physiological function, stress and behaviour\textsuperscript{[3][11]}. The adaptation of postnatal preterm infants in their extra uterine life challenges to maintain the physiological parameters of body temperature, heart rate, respiration, oxygen saturation, weight in their new environment and higher risk for potential complications\textsuperscript{[5]}. Thus, preterm infants need additional energy to stay warm, as support for feeding, to be free from infection and to maintain the stable physiological parameters in their postnatal period of life. There are various measures that are used to stabilize the preterm infants like radiant warmer, incubators, mummification, nesting, swaddling and KMC\textsuperscript{[6]}.. Kangaroo Mother Care is a non-invasive, cost effective, therapeutic, mother based care and its promotes breast-feeding, maintains thermal stability, promotes physiological and behavioural effects and promotes weight gain, reduces the length of hospital stays, also enhancing the humanization, and bonding between the mother and the preterm infants.

The investigator during her clinical experience identified that preterm infants are unable to maintain the physiological parameters within normal limits. They need assistance and supportive measures to maintain normal physiological parameters. Many studies have focused on the effectiveness of KMC with 24 hours, 8hours, 4 hours, 2 hours and 1hour of duration\textsuperscript{[10]}.Maternal factors such as stress, anxiety in handling the preterm infants\textsuperscript{[9]}, pain due to birth process and comorbid illness of preterm infant have increased their stay in the NICU. Therefore, mothers of preterm infants are unable to perform KMC for longer durations. Hence, the research investigator wanted to minimize the time duration, reduce the constraints and assess the effectiveness of Kangaroo Mother Care for 30 minutes for three consecutive days, on the level of physiological parameters among preterm infants\textsuperscript{[7]}.

Objectives
1. To assess and compare the pre and post-test level of physiological parameters among preterm infants in study and control groups.
2. To assess the effectiveness of KMC on level of physiological parameters among preterm infants.
3. To associate the selected demographic variables with the mean differed score of physiological parameters among preterm infants in study and control groups.

Null hypotheses
\textbf{NH\textsubscript{1}}: There is no significant difference between effectiveness of KMC on level of physiological parameters among preterm infants in the study and control group at \(p<0.05\) level.
\textbf{NH\textsubscript{2}}: There is no significant association of selected demographic variables with mean differed score of physiological parameters among preterm infants in the study and control group at \(p<0.05\) level.
II Materials and methods

A quasi-experimental pre and post-test control group research design was adopted in order to assess the effectiveness of Kangaroo Mother Care on level of physiological parameters among preterm infants. The independent variable of this study was Kangaroo Mother Care. The dependent variables were physiological parameters. The study was conducted in the NICU of Dr. Jayasekaran and Dr. Jayaharan Hospitals, Nagercoil. The study population included preterm infants between 26-36 weeks of gestation admitted in the NICU. The sample size consisted of 60 preterm infants (who fulfilled the inclusion and exclusion criteria) selected by non-probability purposive sampling technique. The study included the preterm infants who were hemodynamically stable, birth weight more than 1500 grams and admitted in the NICU. The study excluded mothers of preterm infants who were affected with contagious disease and who were not willing to provide KMC.

The tool consisted of two parts i.e., data collection tool and intervention tool. The data collection tool used in this study was structured interview schedule and medical record review for demographic data. WHO guidelines was used to assess the level of physiological parameters of the preterm infants. After preparation of articles, environment, preterm infant and mothers of preterm infants, the investigator wore a cap and mask, performed hand hygiene and monitored the physiological parameters such as temperature, heart rate, respiratory rate, oxygen saturation and weight of the preterm infants. The investigator assisted the mother to perform KMC with the preterm infants for 30 minutes by placing the preterm infant between the mother’s breast, in a perpendicular position such that the head is turned to one side in slightly extended position, flexed and adducted the arms, hip in a frog like position. The investigator placed the preterm infant’s abdomen at the level of mother’s epigastrium, asked the mother to hold the preterm infant and then the investigator supported both the mother and the preterm infant with an autoclaved cotton sheet for 30 minutes for three consecutive days. After the intervention of KMC, the preterm infant was placed in a comfortable position. The investigator checked and documented the physiological parameters after the procedure for three consecutive days. Preterm infants were allowed to perform their routine activities.

Ethical considerations

Ethical approval was obtained from the Institutional Ethics Review Board. Formal permission was obtained from the mothers of preterm infants. The researcher followed the fundamental ethical principles of right to freedom from harm and discomfort to the samples and respect for human dignity and informed consent was obtained from the mothers of preterm infants. The researcher kept confidentiality in data collection and did not disclose information to people other than the researchers. The researcher maintained justice while providing intervention to the experimental and control groups.

Statistical analysis

Statistical analysis was performed using the Statistical Package for Social Sciences Programme (SPSS) version 17.0. Descriptive statistics was used to describe the demographic variables. Paired ‘t’ test was used to compare the pre and post-test level of physiological parameters among preterm infants within the experimental and control group. Unpaired ‘t’ test was used to compare the post-test level of physiological parameters among preterm infants between experimental and control group. One way ANOVA was used to find the association between the level of physiological parameters and the demographic variables.
III Results

In the experimental group, 60% of the preterm infants were in the age group of 35-36 weeks and 53.3% were male. 66.7% belonged to the weight of 2001-2500 grams; predominantly, 40% of the preterm infants were born with 1st and 2nd birth order. 100% of preterm infants were fed with direct breast-feeding and formula feeding through paladai and direct breast-feeding. 73.3% of them received the drugs of Cefotaxime Amikacin and 63.3% of them stayed for 1-3 days in the hospital.

In the control group, 60% of the preterm infants were in the age group of 35-36 weeks and 56.7% were female. 66.7% belonged to the weight of 2001-2500 grams; predominantly, 46% of the preterm infants were born with 1st birth order. 100% of preterm infants were fed with direct breast-feeding and formula feeding through paladai and direct breast-feeding. 80% of them received the drugs of cefotaxime amikacin and 63.3% of them stayed for 1-3 days in the hospital.

The findings of the study revealed that KMC for 30 minutes for three consecutive days among preterm infants has no significant difference in pre-test level of physiological parameters among preterm infants in the study and control groups.

The post-test mean difference and calculated unpaired ‘t’ value found after the intervention of KMC along with the hospital routine for physiological parameters such as temperature was 0.93,11.29 & heart rate was 9.96,13.48 & respiratory rate 8.26,14.85 &oxygen saturation was 2.63,8.59 and weight was -12.43,-0.18 respectively. The calculated unpaired ‘t’ value shows there was a statistically high significant difference in the post-test level of physiological parameters among preterm infants between study and control groups at p<0.001 level. The results also revealed that the effectiveness of KMC for 30 minutes for three consecutive days among preterm infants between study and control group [Table 1].
Table 1: Effect of Kangaroo Mother Care (KMC) on level of physiological parameters among preterm infant between study and control group

<table>
<thead>
<tr>
<th>Physiological parameters</th>
<th>Study Group Effect Size (r)</th>
<th>Control Group Effect Size (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>0.87</td>
<td>0.85</td>
</tr>
<tr>
<td>Heart rate</td>
<td>0.97</td>
<td>0.79</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>0.93</td>
<td>0.86</td>
</tr>
<tr>
<td>Oxygen Saturation</td>
<td>0.97</td>
<td>0.93</td>
</tr>
<tr>
<td>Weight gain</td>
<td>0.99</td>
<td>0.67</td>
</tr>
</tbody>
</table>

Figure II: Comparison of pre and post-test level of Heart Rate among preterm infants between the study and control group

Figure III: Comparison of pre and post-test level of respiratory rate among preterm infants between the study and control group
The findings of the study clearly indicate that Kangaroo Mother Care effectively improved the physiological parameters of the preterm infants when administered for 30 minutes for three consecutive days.

These findings were consistent with the study conducted by Sivapriya, Jayagowri, 2015[12] who reported that after providing Kangaroo Mother Care, preterm infants improve their physiological parameters of temperature, heart rate, oxygen saturation and weight. Sharma MadabhaviI, et al, 2015[12]. Supported the findings that identified the effect of Kangaroo Mother Care as significantly improving the physiological and behavioural response of stable preterm infants.

The study findings were analyzed by using one way analysis of variance. In the study group, the calculated ‘F’ value indicated that there was significant association of physiological parameters of temperature with gestational age, weight, drugs given during the study period, duration of hospital stay and frequency of feeding. The physiological parameter of respiratory rate was associated with the variable of occupation of the mothers of preterm infants. The physiological parameter of oxygen saturation was associated with the variables of gender and occupation and physiological parameter of weight was associated with the variable of drugs given during the study period. In the control group, the calculated ‘F’ value indicated that there was significant association of the physiological parameter of temperature with the variable of weight, respiratory rate associated with the variable of gestational age, heart rate associated with the variable of drugs given during the study period and oxygen saturation associated with the variables of weight and frequency of feeding.

The current study is limited because the researchers faced difficulty in seeking permission and the number of samples within the scheduled time and it was rectified by selecting samples from two hospitals. The researcher gives a strong recommendation to nurses, healthcare providers and mothers to participate in the teaching of 30 minutes for three consecutive days.
of the KMC procedure, to maintain levels of physiological parameters among preterm infants, which helps to prevent various other neonatal complications.

V Conclusion
The findings proved that KMC for 30 minutes for three consecutive days effectively improved the physiological parameters among preterm infants. Kangaroo Mother Care also improved the behavioural and psychological wellness of the preterm infants. Health care providers, in their practice while caring for the preterm infants in the NICU, postnatal ward and home settings, can utilize KMC. Hence, it can be used as a simple, cost effective, mother based nursing measure for improving the physiological parameters of preterm infants and it can be used as routine care of preterm infants.

VI References


7. Effect of Kangaroo Mother Care on Heart rate, Respiratory rate and Temperature in low birth weight babies


VII Source of support: None

VIII Conflict of interests: None declared

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X Contributors
CE: Conceptualisation of the study, collection, analysis of the data, writing the manuscript, finalised the manuscript and will act as the guarantor of the paper; NP: Conceptualization of the study, analysis of the data, writing the manuscript, finalised the manuscript, edited and critically evaluated the manuscript; RJ, KS, CD: Edited and critically evaluated the manuscript.