A Study on the Effect of Kangaroo Mother Care on Neonatal Temperature and Weight among Newborns in Cuttack

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Abstract

A quasi-experimental study was undertaken to study the effect of Kangaroo Mother Care (KMC) on neonatal temperature and weight among newborns in SCB Medical College and Hospital, Cuttack. A sample of 40 newborns in the post-natal wards was selected among which 20 were put in the control group and 20 in experimental group. The mothers of the experimental group were educated about KMC, and made to practice the KMC method on their babies. Thereafter the temperature and weight of the babies were checked for 4 consecutive days. Mean, standard deviation, standard error and paired 't' test were compared from the row score obtained in pre-test and post-test. It was observed that the babies in the experimental group showed better thermoregulation and weight gain than those in the control group. The study concluded that KMC promotes good temperature control and better growth for pre- and term newborns.

Kangaroo Mother Care (KMC) was first practiced in 1978 in Bagota, Colombia. This method of care was introduced and popularised by Dr Martinez and Dr Charpak in late 1970s. The care is started with the aim of reducing the neonatal mortality and morbidity rate.

Pre-term birth is estimated to be the direct cause of 28 percent of neonatal deaths worldwide. In India, about 30-40 percent of all neonates are born low birth weight. Approximately 80 percent of all neonatal deaths and 50 percent of infant deaths are related to low birth weight. Caring low birth weight baby is a great challenge for the neonatal care unit and the family. The cost of quality management of these babies is increasing day by day.

Kangaroo mother care is costless care of low birth weight baby which helps reduce the overall neonatal mortality by 27.5 percent, infant mortality rate by 25 percent and low birth weight neonatal mortality rate by 30 percent. It is a special way of caring low birth weight infants by skin-to-skin contact; its benefits for the baby are numerous; thermal control, metabolism reduced risk of hypothermia, increased duration and rate of breast-feeding, help in more regular breathing and less pre-disposition to apnoea. It protects against nosocomial infection, reduces incidence of severe illness including pneumonia. Daily weight gain is better, facilitates better mother-infant bondage, satisfies all five senses of infant i.e. baby feels warmth through skin-to-skin contact (TOUCH), listens to mothers voice and heart beat (HEARING), sucks the breast to feed (TASTE), smells the mother's odour (OLFACTION) and makes eye contact with mother' vision.

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Objectives

The study was conducted with the following objectives: (1) To assess the effectiveness of Kangaroo Mother Care on the (a) crying states of newborn & frequency of breastfeeding; (b) newborn's temperature; (c) newborn's weight gain; and (2) To compare the effect of Kangaroo Mother Care and conventional methods of care on newborn's weight gain and temperature regulation.

Hypothesis

H1- There will be significant difference in the temperature readings of the newborns before and after the KMC.

H2- There will be significant difference in the weight measurements of the newborns before and after the KMC.

H3- There will be significant difference in the newborns weight gain between the experimental and control group.

Review of Literature

Conde-Agudelo A1, Diaz-Rossello JL (2014) conducted randomised controlled trials comparing KMC/conventional neonatal care or early onset of KMC (starting within 24 hour after birth) versus late onset KMC (starting 24 hours after birth) in low birth weight infants. Post-menstrual age, KMC was associated with a reduction in the risk of mortality (typical risk ratio 0.60, 95%

confidence interval 0.39-0.92, 8 trials 1736 infants), nosocomial infection/sepsis/typical risk ratio 0.45, 95% (10.27-0.76), hypothermia typical risk ratio 0.34, 95% (10.17-0.67) and length of hospital stay typical mean difference 2.2 days, 95% (10.6-3.7). KMC was found to increase some measures of infant growth, breastfeeding and mother-infant attachment.

MD Shanti, Kakilavani (2013): Considering multiple, long term benefits of KMC, a study compared the weight reduction and temperature of neonates on maternal kangarooing and professional mummification and also co-relate these with demographic variables. The sample consisted of 50 post-natal mothers with term neonates, both from experimental and comparison group. The experimental group gained 30 gm of weight but comparison group showed weight reduction of 40 gm on day 3 of post-observation. It was concluded that KMC leads to better weight gain, temperature and shorter hospital stay.

P Kavitha, R Aroun Prasath (2012) did a study to assess the knowledge on KMC among post-natal mothers. It reveals that out 20 samples 48.15 percent of post-natal mothers have good knowledge on KMC. Regarding meaning of KMC, 55 percent had good knowledge and 45 percent had poor knowledge. Regarding need of KMC 36.25 percent had good knowledge and 63.75 percent had poor knowledge.

Methodology

An evaluative approach was used and a quasi-experimental design was adopted in this study conducted at Gynaecology department of SCB Medical College and Hospital, which is one of the premier District Hospital of Odisha. Data was collected from new-borns of the mothers of post-natal ward of SCB Medical College & Hospital. A purposive sampling technique was used to select the samples due to the unavailability of samples involved in the study. Among the 40 samples, 20 mothers were randomly taken into the experimental group and 20 into the control group.

Then the mothers of the experimental group were educated with demonstration about kangaroo mother care technique, its procedure and benefits with the help of various AV aids. Thereafter they were advised to do it every 3 hour intervals for 20 minutes. The temperature and weight of the newborns in both control group and experimental groups were assessed daily in morning and evening (at same time) for 4 days consequently using the bio-physiological methods of using standardised digital thermometer and infant meter. Apart from that the frequency of breast feeding and crying episodes were noted.

After 4 days of data collection, the data between experimental and control group were compared by using descriptive and inferential statistics. After collecting the data it was planned to analyse and interpret data by using descriptive statistics and inferential statistics. Mean, standard deviation, standard error and paired 't' test were compared from the row score obtained in pre-test and post-test. The value was then compared to assess the impact of KMC on temperature and weight gain. Also the temperature and weight gain readings of the experimental and control group were compared to note the difference in both the groups.

Results & Discussion

Related to effectiveness of KMC on the crying states of newborn & frequency of breastfeeding: In control group, frequency of breastfeeding was observed as 6 to 7 times a day and crying state was increased to 14 times a day whereas in experimental group frequency of breastfeeding was observed to be 10 to 11 times a day and crying state was decreased to 5 to 6 times for 4 consecutive days (Tables 1 & 2) (Fig 1 & 2).

Related to the effectiveness of KMC on the newborn's temperature: The highest mean and standard deviation of neonatal temperature for experimental group newborns were observed in 4 consecutive days (Table 3). In means and deviation for day 1, pre-observation was 35.675±0.48 while in post-assessment it was 35.691±1.837. On day 1, the mean difference shows 0.24°C after implementation of Kangaroo mother care. On day 4 the mean and standard deviation of pre observation shows it was 36.15±0.525 and in post-assessment it increased to 36.255±0.525. Thus the mean difference was 0.105, whereby it was proved that the KMC had effects on

Table 1: Mean difference of frequency of crying states of Experimental group and Control group

Mean difference of crying state	Experimental group	Control group
Day 1	17	17
Day 2	14	15
Day 3	11	15
Day 4	07	12

Table 2: Mean difference of frequency of breast feeding of Experimental group and Control group

Mean difference of frequency of breast-feeding	Experimental group	Control group
Day 1	12	12
Day 2	13	10
Day 3	14	10
Day 4	17	10

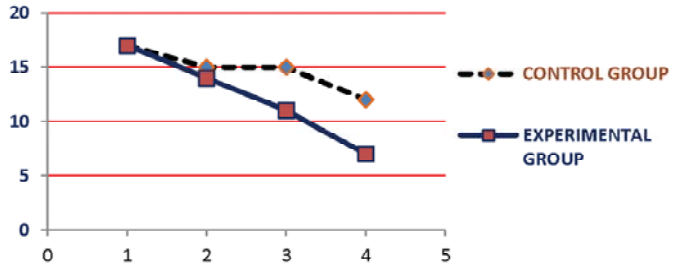

Fig 1: Mean difference of frequency of babies crying states of experimental group and control group.

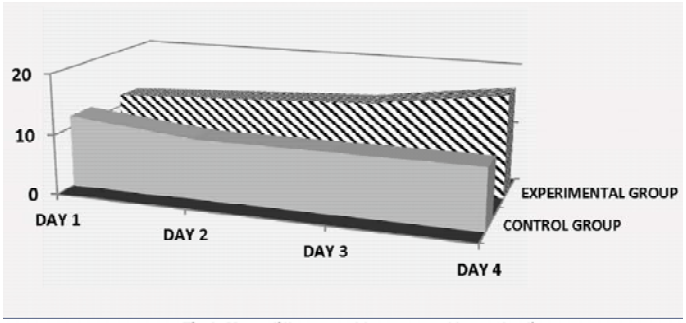

Fig 2: Mean difference of frequency of breastfeeding.

temperature readings of the newborn.

A similar study on the effect of KMC on neonatal weight and temperature by MD Shanti showed an increase of 1°C in neonatal temperature after KMC in the experimental group newborns as observed in 4 consecutive days.

Table 4 shows that the paired 't' value for newborn temperature readings is 1.725 after implementation of KMC for 4 consecutive days in the experimental group. So, it is statistically shown that the tabulated 't' value of temperature, which is 2.02 with p>0.05, is greater than the calculated 't' value. Thus the hypothesis (H1) of this study i.e. "There will be significant difference in the temperature readings of the newborns before and after the KMC" is accepted.

Table 3: Comparison of mean, standard deviation of neonatal temperature after implementation of kangaroo mother care

Neonatal temperature observation	Experimental group			Control group		
	Mean	SD	't' value	Mean	SD	't' value
DAY 1						
Pre-observation	35.675	0.48	1.686	35.2	0.529	1.24
Post-observation	35.915	1.837		35.695	0.623	
DAY 2						
Pre-observation	36.07	0.538	1.677	35.9	0.326	0.528
Post-observation	36.267	0.538		36	0.327	
DAY 3						
Pre-observation	36.19	0.516	1.452	36	0.351	0.533
Post-observation	36.305	0.538		36.09	0.356	
DAY 4						
Pre-observation	36.15	0.525	0.609	36.11	0.195	0.102
Post-observation	36.255	0.525		36.21	0.2	

Table 4: Comparison of neonatal temperature after implementation of kangaroo mother care for experimental group

Experimental group	Mean temperature	Paired 't' test
Day - 1	35.675	1.725
Day - 2	36.267	
Day - 3	36.305	
Day - 4	36.255	

Related to the effectiveness of KMC on the newborn's weight gain: The highest mean and standard deviation of neonatal weight for experimental group newborns were observed in 4 consecutive days. The mean and standard deviation for day 1 pre-observation was 2365±460.558 while in post assessment it was 2673±481.137 (Table 5). On day 1, the mean difference showed 308.95 gm increase in the weight gain after implementation of KMC. On day 4 the mean and standard deviation of pre-observation was 2352±478.507 and in post-assessment it climbed to 2472.7±479.492. Therefore the mean difference was 120 gm. The finding showed that KMC is quite effective in achieving optimal weight gain.

A similar study on the effect of KMC on neonatal weight and temperature by MD Shanti showed an increase of 120.7 gm in neonatal weight after administering the KMC.

Table 6 shows that the paired 't' value for weight is 0.724 after implementation of KMC. Since statistically it is shown that tabulated 't' value is greater than calculated 't' value, the next hypothesis of the study i.e. H2 "There will be significant difference in the weight measurements of the newborns before and after the KMC is accepted.

Related to the comparison of the effect of KMC and conventional methods of care on newborn's weight gain & temperature regulation: The unpaired 't' value for temperature is 1.677 and the unpaired 't' value for weight is 1.821 while the tabulated 't' value is 2.02 with p>0.05. Therefore the tabulated 't' value of both the temperature and weight is greater than the calculated 't' value (Table 7). Thus the hypothesis of this study (H3) i.e. "There will be significant difference in the newborns temperature readings and weight gain between the experimental and control group" has been accepted.

Implications

Nursing practice: The health personnel especially the nurses dealing with post-natal mothers in the clinical and community setting can educate the mothers regarding effects of KMC on the neonatal temperature and weight among newborns and also utilise this improved knowledge to provide quality care to people around.

Table 5: Comparison of mean, standard deviation of neonatal weight after implementation of kangaroo mother care

Neonatal weight observation	Experimental group			Control group		
	Mean	S.D	't' value	Mean	SD	't' value
Day 1 Pre-observation Post-observation	2365 2512.2	460.558 481.137	1.898	2371.25 2372.25	460.2 471.13	0.02
Day 2 Pre-observation Post-observation	2374.3 2563.6	457.385 478.046	0.02	22374 2377.15	450.216 452.172	0.018
Day 3 Pre-observation Post-observation	2381.3 2482.6	450.796 478.548	0.008	2375.3 2376.3	449.213 459.16	0.005
Day 4 Pre-observation Post-observation	2352 2472.7	478.507 479.492	0.204	2377.3 2378.3	472.501 475.322	0.19

Nursing education: The nursing students must be equipped with sufficient knowledge regarding the techniques of KMC so they can help post-natal mothers benefit from this during their clinical experience and thus help in preventing neonatal morbidity and mortality.

Nursing administration: The Nurse Administrator should induce the practice of KMC in hospitals effectively utilising the mass media & other communications.

Nursing research: Further research can be conducted assessing the effect of KMC.

L**imitations of the study:** The sample size was limited to 40 and the data collection period was 1 week.

Recommendations

- ❒ The study can be replicated on large scale sample to generalise the findings of the present study.
- ❒ A similar study can be conducted for low birth weight babies.
- ❒ An experimental study can be conducted on effectiveness of KMC on temperature, weight, demand feeding, and easy caring of neonates.

Table 6: Comparison of neonatal temperature after implementation of kangaroo mother care for experimental group

Experimental group	Mean weight	Paired 't' test
Day 1 Day 2 Day 3 Day 4	2365 2563.6 2482.6 2472.7	0.724

Table 7: Comparison of neonatal temperature and weight after implementation of kangaroo mother care for experimental and control group

No. of days of data collection	Experimental and Control group	
	Unpaired 't' test value for Neonatal temperature	Unpaired 't' test value for neonatal weight
Day 1	1.387	0.019
Day 2	0.101	0.041
Day 3	1.452	0.034
Day 4	1.677	1.821

Conclusion

Retention of body warmth is seen to be higher among KMC neonates as compared to the conventional cared newborns. After 20 minutes of post-exposure, control group gained 10 gm of weight whereas experimental group gained 24 gm of weight on 4th day of post-observation increased weight gain also leads to shorter hospital stays. Thus, KMC is definitely effective in promoting temperature control and weight maintenance of newborns.

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