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The impact of kangaroo Mother care on the Newborn Health Outcome of A preterm Infant at Al-Zahraa Teaching Hospital in Al-Najaf AL-Ashraf City 2024

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ABSTRACT

Background *Preterm neonates are the most critical cause of death in infants, Kangaroo Mother Care is an important early distinctive care with the least expensive piece of equipment to permit the health and well-being of infants born, by holding neonates on the mother's naked chest with skin-skin contact and exclusive breastfeeding involved with early home discharge. WHO recommended KMC for all neonates, especially preterm.* ***Methods:*** *A prospective cohort, observational design study of preterm infants, the study included a sample of 100 neonates (50 of them subjected to kangaroo groups, the remaining 50 were control group) delivered in AL-Zahraa teaching hospital with birth weight of less than 2000gm and gestational age of 28–35 weeks of both group, Consecutive sample was used to collect the data, all mothers of preterm babies were involved and interviewed with a predesigned questionnaire to take information about her and the neonates, after discharge home each preterm neonates were followed-up for six months age, comparison have been occurred between preterm admitted to kangaroo mother care unit and preterm neonates who didn't admit.* ***Result:*** *KMC infants as opposed to control group demonstrated Weight gain by (90%) RR 1.55(95%CI 1.2-1.99). and (90%) length increment RR 2.50(95%CI 1.7-3.5), (100%) exclusively breast fed, infant's developmental activities revealed (100%) RR 2.77(95%CI 1.9-4.0), the mean duration of hospital admission of Kangaroo group was (7.47±1.05) while, the case group (11.28±5.05), a P-value of all these follow up variations are statistically significant (<0.001).* ***Conclusion:*** *Results yield that KMC is one of the essential, inexpensive methods; it has the potential effects that significantly improve the newborns' physiological outcomes, increase neonatal survival, improve maternal-infant attachment, and encourage early hospital discharge.*

Keywards: Kangaroo Mother Care, Newborns, and Skin-skin Contact.

Article Information

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INTRUDUCTION

Kangaroo mother care which resembles a kangaroo's pocket, is an intersession of keeping a child with early skin-to-skin contact throughout the first 24 hours of life with the swaddled infant on the mother's naked chest with exclusive breastfeeding, (Campbell-Yeo *et al.*, 2015), This is better described as a loving body hug or a womb-like environment.

Newborn Care

kangaroo mother care is considered an early, essential primary response with the most economical form of equipment—for all preterm babies soon after birth in the labor room, skin-to-skin contact is advised independent of sex, birth weight, except those who necessitate immediate resuscitation.

Mother Care and Traditional Care:

An incubator is a transparent, box-shaped structure in which oxygen, humidity, and temperature can all be adjusted for promoting external thermoregulation of premature infants because they can't regulate their internal temperature, infant have little contact with the outside world; kept separated from the mother who is occasionally allowed to see, touch, and fed the child thus showed increase maternal stress anxiety and depression may persist after discharge (Kraft *et al.*, 2021).

Kangaroo Mother Care components include:

- **Skin-to-skin contact (kangaroo position)** between the mother and the child, which can occur sooner in the neonatal period and provides appropriate thermal regulation, among other benefits;

- **Exclusive breastfeeding (kangaroo nutrition)** whenever probable or expressing breastmilk if the mother is not attained;

Early discharge, beginning in the Hospital and continuing at home, and then follow-up if possible.(Charpak *et al.*, 2005) Kangaroo baby follow-up is an effective method to evaluate KMC performance of clinical outcomes until 6 months to ensure survival quality. Ensure the mother fully understands every step of the instructions for providing additional micronutrients, such as vitamins, calcium, phosphorus, iron, and calcium. Indeed, since KF's initial randomized control trial (RCT) in 1994, this ongoing observation has made it possible to examine both the short- and long-term benefits of initial identification and treatment of any prematurity or low birth weight related difficulties happen in the first year . (Charpak and Montealegre-Pomar, 2023).

METHODS

Study Design: A prospective cohort, observational design study of preterm infants performed on preterm infants at AL-Zahraa Teaching Hospital with a gestational age of 28–35 weeks in Al Najaf Al Ashraf City between October 2023 and July 2024.

Inclusion criteria: Infants assigned to the cases group were stable preterm infants born at 28–35 weeks gestational age who were admitted to the KMC unit, the control group have the same as case gestational age, birth weight, but not received Kangaroo care.

Data collection tools

A consecutive sample was used on preterm infants from the kangaroo mother care ward. Qualified mothers with their infants received instructions to enroll in the Kangaroo mother care program at AL-Zahraa Teaching Hospital

Statistical analysis

Statistical analysis of this study was carried out using the Statistical Package for Social Sciences (SPSS) version 22.00 and Microsoft Excel 16 to compute descriptive statistics. The chi-square test and Fisher exact test were used to associate between categorical variables. A p-value equal to or less than 0.001 was considered statistically significant.

RESULTS

Enrolled newborn infants of kangaroo and control groups in Table 1 demonstrated baseline characteristics, including sex, birth weight, and gestational age. In both groups, male made up the majority of the gender.

Kangaroo preterm neonates have a birth weight within 980-1700 (gm) Mean±SD (1180.6±334.9) and gestational age of 28-35 (wks.) Mean±SD (32.1±2.4), The control group's Mean±SD for birth weight and gestational age was almost similar to that of the case group.

No significant differences in sex, birth weight, gestational age, or P-value with no significant differences (0.224, 0.261 , 0.161) systematically.

kangaroo infants significantly increase their weight by 90% (45). conversely, control groups don't have weight gain by 42% due to recurrent illnesses and inadequate nutrition. P-values of weight gain are statistically significant (<0.001). A risk ratio of 1.55(1.2-1.99) interprets increased risk for developing the health outcomes in the exposed group. A further significant increment in the length of case infants by 90% (45), even though. Even though only 64% (32) of control groups don't have increment P-value of length increment are statistically significant (<0.001). risk ratio 2.50(1.7-3.5). Another notable improvement in kangaroo infant's activity levels revealed 100% merely just 64% of control groups have a P-value statistically significant (<0.001) risk ratio of 2.77 (1.9-4.0) shown in table .

Table 3: Neonate characteristics n=50.

Neonate characteristics	Subgroups	Groups		Total	P value
		Cases (n=50) No. (%)	Controls (n=50) No. (%)		
Sex	Female	24(48%)	18(36%)	42(42%)	0.224
	Male	26(52%)	32(64%)	58(58%)	
Birth weight (gm)		1180.6±334.9	1123.2±130.2		0.261
Gestational age (wks.) $$		32.1±2.4	32.7±1.8		0.161

$median (IQR) , $$Mean SD

Table2: follow up results for six months.

Neonatal Characteristics	Subgroups	Group		Total	P value	RR (95%CI)
		Cases (n=50) No. (%)	Controls (n =50) No. (%)			
Feeding method	Exclusive breastfeeding	50(100%)	10(20%)	50(50%)	<0.001	
	Mixed	0(0%)	40(80%)	50(50%)		
Weight gain	Yes	45(90%)	29(58%)	74(74%)	<0.001	1.55 (1.2-1.9)
	No	5(10%)	21(42%)	26(26%)		
Length increment	Yes	45(90%)	18(36%)	63(63%)	<0.001	2.50 (1.7-3.5)
	No	5(10%)	32(64%)	37(37%)		
Activity improvement	Yes	50(100%)	18(36%)	68(68%)	<0.001	2.77 (1.9-4.0)
	No	0(0%)	32(64%)	32(32%)		

As a comparison between the study groups revealed weight gain during the time of follow-up (at one, two, four, and six months).

Table 3: Evaluation of weight gain (gm) according to the time of follow-up between kangaroo groups and non-kangaroo group.

Weight (gm)	Cases Mean SD	Controls Mean SD	P Value
At birth	1357±1263.25	1123.2±130.22	0.196
At 1 month	1321.6±345.56	1197.4±144.47	0.021
At 2 months	1720±369.78	1455±315.62	<0.001
At 4 months	2184.6±529.17	1921.2±323.25	0.003
At 6 months	4102±1171.64	3234±1107.714	<0.001

The result showed in Figure1 the mean weight gain was highly significant in KMC infants, especially after two months (1720±369.78) till six months follow-up, compared to the control group P-value (<0.001).As an open-ended question on mothers` opinion of KMC was given at the end of the questionnaire, Figure 2 results showed that 92% of women believed KMC was beneficial. No discomfort was reported by mothers who held the infants while in the kangaroo position. The questionnaire and conversations with the parents revealed that Kangaroo Care was considered socially acceptable and had the highest possible levels of satisfaction.

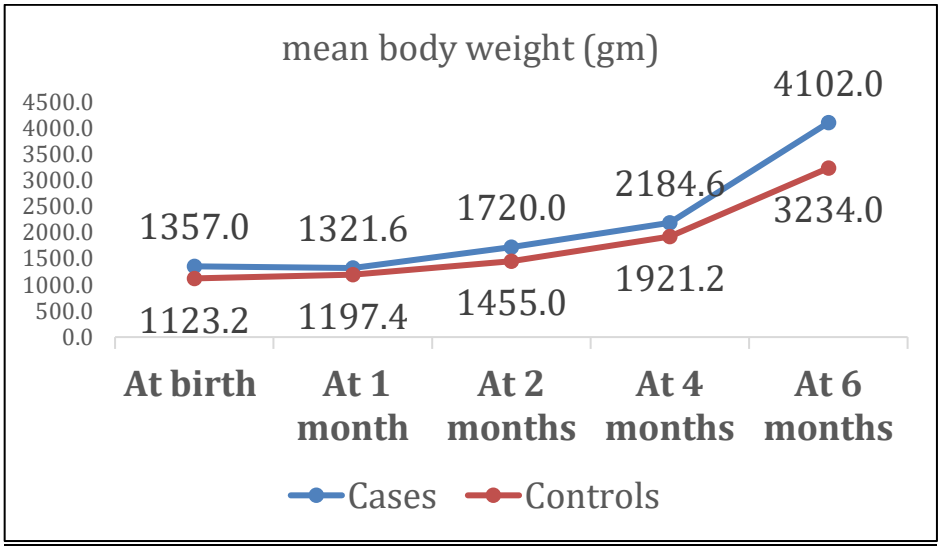

Figure 1: Weight gain during six months follow-up.

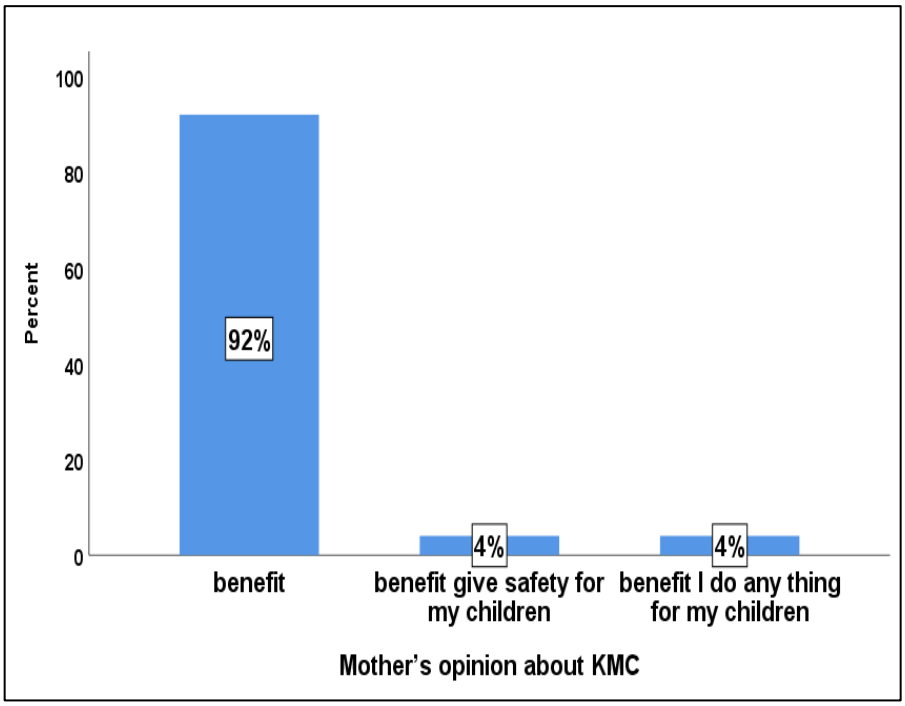

Figure2: Mother's opinion about KMC.

DISCUSSION

Premature infants require extra care to ensure their survival, growth, and development. WHO recommended KMC as a routine care for all preterm or low birth weight infants around the world to ensure their preventive and promotive care can be applied without any special equipment, especially in developing countries, that's declared by the American Journal of Maternal/Child Nursing in 2024 by (Callister, 2024)

No significant differences in baseline neonatal characteristics: sex, birth weight, gestational age of enrolled newborn and control group, male made up the majority of the gender. (Annual Statistical Report total birth 2023)

The expected mortality rate is can be reduced to desirable levels by 2030 by this affordable and scalable kangaroo method according to the results of a research study in southern India (Thomas *et al.*, 2024), Thomas found the mortality rate was 6.4% among KMC-initiated babies, in line with the result of this study (mortality rate 2%).

kangaroo infants significantly increased their weight by (90%) meanwhile, weight gain in (58%) of control groups; this finding is compatible with other previous studies (Samra, El Taweel and Cadwell, 2013) who conclude that KMC was effective intervention and strategy for delated weight gain. Other studies in various countries are well-suited with this result, a study in Egypt institute that kangaroo care can improve the vital signs and weight gain of critically ill and premature newborns (Alhoot, Elbanna and Elgebaly, 2024)). Another study in Iran confirms that KMC improves neonatal weight gain and decreases hospitalization. This advantage in weight gain throughout the neonatal period was observed unrelated to the infant's sex, gestational age, or birth weight category (Karimi *et al.*, 2020).

Results Found significant increment in the length of kangaroo preterm infants, and that`s similar to a study in China which confirmed the association between KMC admission and length increment, promoting that KMC infants had significantly increased body weight and body length at hospital discharge and more body weight, body length, and head circumference increases in follow-ups (Wang *et al.*, 2021).

Another notable improvement in Kangaroo infant`s developmental activities, matching the results that obtained with a cohort study on 144 preterm infants conclude that early and prolonged KMC have better language and behavioral development (Bisanalli *et al.*, 2023).

Of all Eastern Mediterranean countries, Most KMC research has been carried out in Iran evaluates the benefit of KMC to the mother by improve bonding with their preterm infants showed that the benefit was significantly high, in line with many research (Karimi *et al.*, 2024) determined that kangaroo care resulted in higher maternal-preterm emotional attachment, another study (Mehrpisheh *et al.*, 2022) in SARI/Iran (Journal of Neonatal Nursing–Elsevier) believed that skin-to-skin contact causes the mother to feel closer to her neonate and be aware of their needs. Furthermore, (Erduran and Yaman Sözbir, 2023) in Ankara/Turkey, on the impaction of KMC maternal attachment, it was found that the intervention groups had greater scores of maternal-infant relationships.

CONCLUSIONS

Results yield that KMC is a safe, essential, inexpensive method of care; it has the potential effects that significantly improve the newborns' physiological outcomes, sufficient nutrition by exclusive lactation to increase neonatal survival, and better physical growth of the kangaroo group than the conventional control group.

In addition, Kangaroo admission encourages early hospital discharge and shortens the average length of hospital stays, which lowers the need for expensive devices; newborns can be discharged from the Hospital once they have successfully adapted to the kangaroo position.

RECOMMENDATIONS

1. Regular kangaroo mother care (KMC) is suggested for all preterm or underweight newborns. KMC viewed as a means of humanizing the delivery process, and should be strongly imposed as many hours as possible and started after neonates' stabilization in hospitals and upon early discharge.
2. Most babies who received Kangaroo Mother care exposed a notable improvement in key physiological markers without needing specific technology, proving that this method can give neonates superior care. This method should apply to all Iraqi hospitals.
3. Mothers should be trained by KMC in the postnatal periods to educate mothers about the benefits of Kangaroo care and encourage the value of it.
4. Other research needs to be done about starting KMC immediately with continuous kangaroo applications after birth, even non-stabilized newborns.

Limitations of study

1. Some families delayed follow-up appointments, especially control groups from rural areas, far distances, and poor cooperation as excuses for the difficult communication.
2. Because the study was only conducted in one city, the results can only be generalized to one city. As such, it is suggested that more research be done across many cities.
3. Since this study was a prospective chart review, need more time than 6 months to follow up for more than one year, especially since the preterm infant's development required more than six months.
4. After discharge home, some mothers don't commit to the exact duration of 9 hrs. S-SC, as much as they had done in the Hospital, is a home responsibility, so they need extra encouragement to adopt and fulfill prescriptions of daily duration.
5. The participating preterm neonates don't represent all other neonates.

Despite these limitations, this study provides important participation as it assesses the value of kangaroo mother care and its essential role in preterm infants' health outcomes, also benefits the mother, Hospital, and community, and highlights the advantages of kangaroo admission in contrast to the traditional care.

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