

## MATERNAL AND NEONATAL FACTORS INFLUENCING KANGAROO BABY CARE AT AN URBAN MATERNITY HOSPITAL IN KENYA

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### Abstract

**Introduction:** Kangaroo Baby Care (KBC) is the consistent skin to skin contact between low birth weight newborn baby and mom or a substituted care giver, so as to control the infant's temperature. The study was carried out in February 2020. The aim was to assess the influence of maternal and neonatal factors on KBC practice at Pumwani Maternity Hospital, Nairobi.

**Methods:** This was a descriptive cross-sectional quantitative study, involving 111 respondents who were selected through systematic random sampling method. Data was collected using a semi-structured researcher administered questionnaire and analyzed using SPSS version 24.

**Findings:** Majority of the respondents were aged between 25-34 years (52.3%, n=58) and most had secondary education (45.9%, n=51). Majority of the mothers were married (72.1%, n=80) and the source of income was majorly from business (34.2%, n=38). Majority (53.2%, n=59) earned more than Kshs.20 000 per month. Most of the respondents (46.8%, n=52) had a parity of 2-3, and the gestation of majority (53.2%, n=59) ranged between 29-35 weeks. Most babies (67.6%, n=75) weighed 1.5-2kg, and majority (61.3%, n=68) were of post-neonatal age at the time of the study. On KBC practice, majority (72%, n=80) had poor practice.

**Conclusions and recommendations:** The study concluded that the practice of KBC was poor. Level of education of the mother, gestational age of the baby, birth weight of the baby and age of the baby by the time of study were significantly affecting practice of KBC at  $p < .05$ . The study appreciates and recommends that midwives assist the mothers to initiate KBC immediately after delivery regardless of gestation at birth and birth weight.

**Key words:** *Kangaroo baby care practice, maternal factors, neonatal factors, preterm*

### Introduction

Kangaroo Baby Care (KBC) is defined as consistent skin to skin contact between low birth weight newborn baby and mom, or a substituted care giver for example the dad or

other relatives. It begins in health facility and proceeds at home, for whatever length of time that the newborn baby requires, so as to control the infant's temperature (Yusuf et al., 2018).



Globally, preterm births are a major health issue and are the most common cause of mortality among the newborns. Premature birth is evaluated as the immediate reason for 35% of neonatal deaths worldwide (Schindler, 2015). Preterm birth in a roundabout way, adds to a significantly more prominent level of mortality, since it expands the hazard that a newborn child will kick the bucket from disease. Preterm births are ascending comprehensively, both in high pay and low-pay settings (USAID, 2014).

Accordingly, doable interventions that are relevant in high-and low-income settings are needed. As indicated by various medicinal assessments and World Health Organization, KBC aids in decreasing the mortality in newborn children, underpins mental health and can prompt prior release from the clinic (Therese, 2017).

Cho and Kim(2016) conducted a study where, 96% of the respondents announced that they comprehended the technique of KBC, while 12% expressed that they required an extra instructional course. Smith et al., (2017) assessed the pleasantness of KBC to fathers and mother. The newborn babies with birth weight below1.8kg (n=89) were randomized to assess whether kangaroo baby care was given by the baby's mother, or was conventional, for example use of incubators. It was found that 86% of the mothers were content practicing KBC, whereas 14% believed customary system was superior to KBC. Moreover, 56% of the mothers approved of KBC, while 73% communicated their objective of continuing

practice of KBC at home. In this study, 64% of the fathers who participated agreed with the method.

Roba and Naganuri (2017) conducted a study at Pumwani Maternity Hospital, to assess the knowledge of moms of preterm babies on kangaroo baby care. A sample of 35 mothers was chosen for examination whereby, 17.1% of the moms seemed to have insufficient information regarding kangaroo baby care, 17.1% had moderate learning, while (11.5%) displayed sufficient information.

KBC gives an option of not isolating the newborn baby from the mother or guardians, in contrast to hatchery care (Chan et al., 2017). KBC also includes the guardians in the baby's care, and empowers them to assume control over the newborn's management (Bergh, 2016). Kangaroo baby care therefore, is a technique for consideration of premature infants, of weight under 2.5 kg. It incorporates selective and continuous breastfeeding, withstanding skin-to-skin contact, and backing for the mother- neonate dyad. It has appeared to decrease neonatal mortality in low and medium income countries (Ramanathan et al., 2011).

At Pumwani Maternity hospital, KBC has been very crucial for care of the preterm babies. Ongoing investigations have demonstrated that KBC is critical for the newborn recuperation and improvement. Due to these major valuable impacts, at Pumwani Maternity Hospital, KBC has been increasingly more supported to use in the



newborn child care and particularly untimely infant care (USAID, 2014). The objectives of this study were to assess the maternal and neonatal factors influencing KBC practice and to assess the level of KBC practice at Pumwani Maternity Hospital.

## Methods

This was a descriptive cross-sectional study, which adopted quantitative methods of data collection and processing. The study area was Pumwani Maternity Hospital in Nairobi, Kenya. The hospital is primarily an obstetric referral hospital, which handles approximately 1,500 deliveries per month, of which 29.9% are preterm. The study population constituted all caregivers with preterm babies, who were attending maternal child health clinic, and were practising KBC during the study period. The study excluded mothers of preterm neonates, who suffered from severe medical or surgical conditions, those with multiple deliveries at the time of study, and those who did not give consent.

The desired sample size i.e. 133, was determined using Taro Yamane's Formula:  $n = N / [1 + N(e)^2]$ . Preterm babies register was used as the sampling frame and the study used systematic random sampling methods to attain the obligatory least possible sample size. Simple random sampling was used to pick the first respondent and the other respondents were picked by systematic random sampling at intervals of 2. The simple random sampling picked the second patient.

Data collection tool used was a researcher-administered questionnaire, which was prepared by the researcher. Before actual data collection, a pre-testing was carried out at Pumwani Maternity Hospital on 10% of the sample size, which facilitated improvement of the tool. Three research collaborators were trained, and they participated in data collection. Clinical records were likewise surveyed to confirm data on the individual babies, and other clinical data given by the moms. Completed questionnaires were checked daily by the principal investigator for completeness and relevance. Before carrying out the real process and analysis, the research team received appropriate feedback every day in the morning.

Each administered questionnaire was keenly checked to ascertain its completeness, consistency, and accuracy. Data captured in the questionnaires was keyed into a computer using SPSS version 24 software for analysis. Bivariate analysis was used to assess the strength of association between dependent variable (KBC practice) and the maternal/neonatal factors. P-value of less than 0.05 was considered as statistically significant.

Ethical standards observed in this study included a letter from Mount Kenya University Postgraduate School, a research permit from NACOSTI, Government's ministry approval, Nairobi City County Government approval and authorization letter from Pumwani Maternity Hospital Administration. Informed consent was also acquired from the respondents



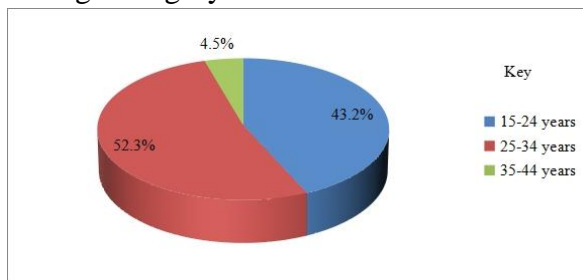
whereby, the privilege to take an interest in the investigation or not, remained with them.

## Findings

### Maternal Factors

#### *Age of the respondents*

Majority (52.3%, n=58) had an age bracket of 25-34 years, 43.2% (n=48) had an age between 15-24 years, and 4.5% (n=5) had an age between 35-44 years. There was no available information or reason for this big gap in terms of number of respondents in this age category.



**Figure 1: Age of respondents**

On assessing the relationship between age and practice of KBC, increase in age was associated with increase of the chances of practicing KBC with Cramer's V of 0.156. However, these results were found not to be significant at  $\chi^2 (2, N=111) = 2.695$ ,  $p=0.260$ , Fisher's exact test  $p$  value=0.255.

**Table 1: Age and Practice of KBC**

Variable	Category	Practice of Total KBC		Total
		Poor	Good	
Age	15-24 yrs	35	13	48
	25-34	43	15	58

	35-44	2	3	5
<b>Total</b>		80	31	111

$\chi^2 (2, N=111) = 2.695$ , Fisher exact  $p=0.255$

#### *Marital status of the respondents*

Most of the respondents (71.2%) were married, 23.4% were single while 4.5% were separated. There was a moderate association between marital status of the mother and practice of KBC at Spearman's rho of 0.176 and Cramer's V of 0.177. These results however, were not statistically significant at  $\chi^2 (2, N=111) = 3.483$ ,  $p=0.175$ , Fisher's exact test  $p$  value=0.169.

**Table 2: Marital Status and Practice**

Variable	Category	Practice of Total KBC		Total
		Poor	Good	
<b>Marital status</b>	Single	16	10	48
	Married	59	21	58
	Separated	5	0	5
<b>Total</b>		80	31	111

$\chi^2 (2, N=111) = 3.483$ , Fisher exact test  $p=0.169$

#### *Level of education of the respondents*

Level of education was varied from no formal education to university level. The study findings showed that, majority of the respondents (45.9% n=51) had secondary level of education, followed by primary level of education (29.7%, n=33) and no formal education had the least proportion (0.9%, n=1).

**Table 3: Education Level of Respondents**

Level of education	Frequency	Percentage
No formal	1	0.9
Primary	33	29.7
Secondary	51	45.9



College	20	18
University	6	5.4

The findings revealed that, as the level of education increased, the good practice of KBC also increased. There was a strong association between level of education of the respondent and practice of KBC, at Phi value of 0.318 and Spearman's (r) of 0.231. These results were significantly affecting practice of KBC among the mothers with preterm babies in Pumwani, at  $\chi^2(4, N=111) = 11.236$ , Fisher exact test  $p=0.015$ . These results were in line with the findings of Rahman *et al.*, (2017), which found mothers' level of education to significantly affect KBC practice.

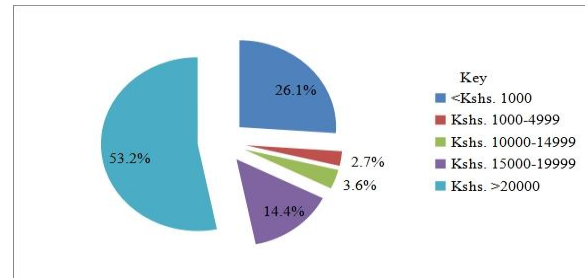
**Table 4: Level of Education and Practice**

Variable	Category	Practice of KBC		Total
		Poor	Good	
<b>Level of education of respondent</b>	No formal	1	0	1
	Primary	27	6	33
	Secondary	36	15	51
	College	15	5	20
	University	1	5	6
<b>Total</b>		80	31	111

$\chi^2(4, N=111) = 11.236$ , Fisher exact test  $p=0.015$

#### *Gross monthly household income for the respondents*

Since economic status is a sensitive issue, the income was categorized and the respondents were asked to tick the range in which their monthly income fell in. Majority reported to be earning above Kshs. 20,000 with the least proportion earning between Kshs. 1000 and kshs. 4999.



**Figure 2: Monthly household income for the respondents**

There was a weak association between monthly household income and practice of KBC at Phi of 0.193. On correlation, the Spearman's (r) was 0.061. These results were not significantly affecting the practice of KBC at  $\chi^2(4, N=111) = 4.118$ , Fisher exact test  $p=0.399$

**Table 5: Monthly household income and practice of KBC**

Variable	Category	Practice of KBC		Total
		Poor	Good	
<b>Monthly household income of the respondent in Kshs.</b>	<1000	21	8	29
	1000-4999	3	0	3
	10000-14999	3	1	4
	15000-19999	14	2	16
	>20000	39	20	59
<b>Total</b>		80	31	111

$\chi^2(4, N=111) = 4.118$ , Fisher exact test  $p=0.399$

#### *Parity of the mother*

Majority of the respondents (46.8%,  $n=52$ ) had a parity of 2-3, closely followed by parity of 1 (45.9%,  $n=51$ ) and parity of above six had the least proportion (1.8%,  $n=2$ ). There was a weak association between the parity of the mother and practice of KBC at Phi of 0.112 and negative correlation of Spearman's (r) 0.046. These results were not significantly affecting practice of KBC at  $\chi^2$



(3, N=111) = 1.384, Fisher exact test  $p=0.626$ . Evidently, there is no association between parity if the mother and practice of KBC.

**Table 6: Parity and Practice of KBC**

Variable	Category	Practice of KBC		Total
		Poor	Good	
Parity of the respondent.	1	35	16	51
	2-3	39	13	52
	4-5	5	1	6
	>6	1	1	2
<b>Total</b>		80	31	111

$\chi^2$  (3, N=111) = 1.384, Fisher exact test  $p=0.626$

### Neonatal factors influencing KBC

#### *Gestational age of the baby at birth*

The gestation of the babies ranged from 20 weeks to 35 weeks. Majority (53.2%, n=59) had their gestations ranging between 29-35 weeks.

The results indicated that, the mothers whose preterm babies were born after 28 weeks of gestation were taking more time with their babies on KBC. It was not studied on the reason why the mothers whose babies were born below 28 weeks of gestation were not practicing good KBC, yet these are the ones expected to be doing it, so that the babies can benefit from skin to skin contact, improve their respirations and gain weight.

Further analysis revealed that, there was a strong association between gestational age of the baby and good practice of KBC, at Phi of 0.464 and positive correlation of Spearman's (r) 0.464. The mothers who had their babies born after 28 weeks of gestation,

were 14.753 times more likely to practice good KBC, than those mothers whose babies were born before 28 weeks of gestation (OR=14.753, CI [4.131-52.679]) These results were statistically significant in determining the practice of KBC among mothers with preterm babies in Pumwani hospital, at  $\chi^2$  (1, N=111) = 23.865, Fisher exact test  $p<0.01$ . The results replicated the findings of Rahman *et al.*, (2017), which indicated gestational age as a factor in determining KBC practice.

**Table 7: Gestational age and Practice**

Variable	Category	Practice of KBC		Total
		Poor	Good	
Gestational in weeks.	20-28	49	3	52
	29-35	31	28	59
<b>Total</b>		80	31	111

$\chi^2$  (1, N=111) = 23.865, Fisher exact test  $p<0.01$

#### *Birth weight of the baby*

The weight of the babies nursed at the time of the study ranged from below 1.5 kg to above 2.5 kg.

**Table 8: Birth weight of the baby**

Birth weight	Frequency	Percentage
Below 1.5 kg	30	27
1.5-2 kg	75	67.6
Above 2 kg	6	5.4

There were 30 mothers with babies born with birth weight of below 1.5 kgs, and among them, one was found to practice good KBC. Among the 75 mothers whose babies had birth weight of between 1.5 and 2kgs, 28 of them were practicing good KBC and out of six mothers whose babies were born



with birth weight of above 2kg, only two of them were practicing good KBC.

Mothers who had their babies with birth weight of between 1.5kg to 2 kg were more likely to practice good KBC, compared to those whose babies had a birth weight of above 2 kg. There was a moderate association between birth weight of the baby and practice of KBC at Cramer's V of 0.334, and a positive correlation of Spearman's (r) 0.294.

These results were statistically significant at  $\chi^2$  (2, N=111) = 12.399, Fisher exact test p=0.002. Yusuf *et al.*, (2018) also found out that the birth weight of the baby was a significant determinant in KBC practice.

**Table 9: Birth Weight and Practice**

Variable	Category	Practice of KBC		Total
		Poor	Good	
Birth weight of the baby of the respondent.	Below 1.5kg	29	1	30
	1.5-2.0kg	47	28	75
	Above 2kg	4	2	6
<b>Total</b>		80	31	111

$\chi^2$  (2, N=111) = 12.399, Fisher exact test p=0.002

#### *Age of the baby at the time of study*

The age was categorized into two; neonatal age (0-28 days) and post neonatal age (above 28 days after delivery). Majority of the babies (61.3%, n=68) were found to be post neonatal age.

At the time of the study, the babies were categorized into two groups: below 28 days

of life and above 28 days of life after delivery. The results showed that, the mothers whose babies were below 28 days of life were 0.222 times more likely to practice good KBC, than those mothers whose babies were above 28 days of life (OR=0.222, CI [0.092-0.535]).

There was a strong association between age of the baby post-delivery, and practice of good KBC at Cramer's V of 0.638, and negative correlation of Spearman's (r) 0.329. These results were statistically significant at  $\chi^2$  (1, N=111) = 12.043, p=0.001. These results were in agreement with the findings of Rahman *et al* (2017), which showed age and baby birth weight to be determining KBC practice. Another study by Yusuf *et al.* (2018) showed that, KBC practice was significantly associated with baby birth weight and not the age of the baby.

**Table 10: Age of the baby and Practice**

Variable	Category	Practice of KBC		Total
		Poor	Good	
Age in days.	Below 28	23	20	43
	Above 28	57	11	68
<b>Total</b>		80	31	111

$\chi^2$  (1, N=111) = 12.043, p=0.001

#### *Kangaroo baby care practice*

All those who practiced KBC for more than 15 hours a day were considered to have good practice of KBC, since World Health Organization (WHO) guidelines for KBC recommends at least 3 hourly KBC practice. The other three items that were considered to measure level of practice of KBC



included: starting KBC soon after delivery, starting KBC immediately after delivery and practicing KBC at night. All these four factors were computed into a single variable: level of KBC Practice. In the computed variable, individual respondents had a range of score from 1 to 4. This practice was further categorized as good KBC practice and poor KBC practice. Those who scored 4 in the four items were considered to have good practice of KBC, while those who scored 3 and below were considered to have poor practice. Therefore, the prevalence of good practice of KBC was found to be at 28%.

**Table 11: Level of practice of KBC**

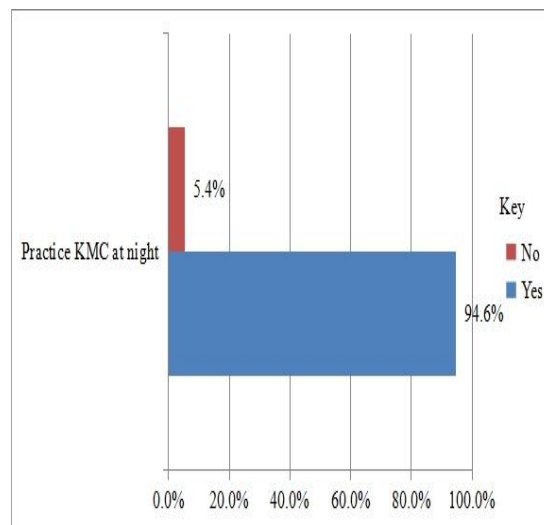
Level of KBC practice	Frequency	Percentage
Good practice	31	28
Poor practice	80	72

#### *Initiation of KBC*

Majority (94.6%, n=105) reported to have started KBC soon after delivery, with a few (5.4%, n=6) reporting to initiate it later on. The researcher probed more on how soon the mothers had started KBC, in terms of how many hours post-delivery. The study found that majority (48.6%, n=54) initiated it after more than 2 hours.

#### *Practice of KBC at night*

Majority of the respondents (94.6%, n=105) reported to be practicing KBC at night.

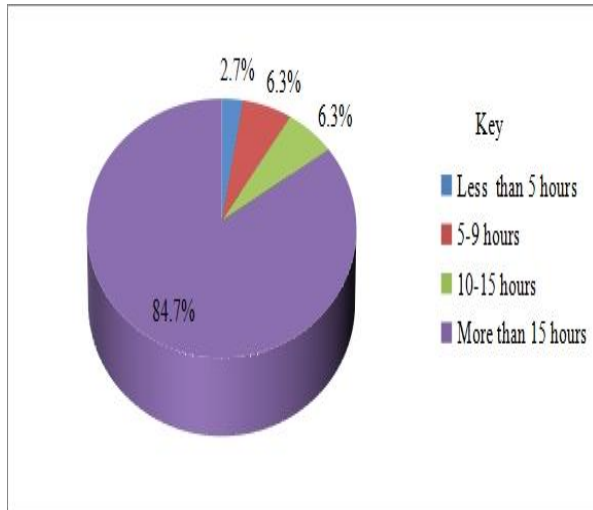


**Figure 3: Practice of KBC at night**

#### *Hours of KBC practice per day*

The respondents were asked to indicate for how many hours a day they practiced KBC with their babies. Majority (84.7%, n=94) reported to be practicing KBC for more than 15 hours a day, 6.3% (n=7) reported to be practicing KBC for 10-15 hours, a similar proportion also reported to practice KBC for 5-9 hours a day, and 2.7% (n=2) reported to only practice KBC for less than 5 hours a day.

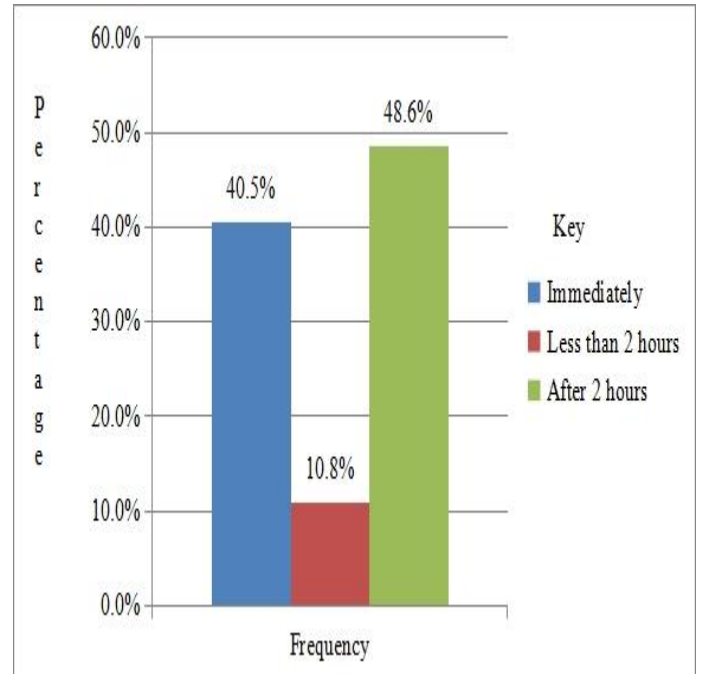




**Figure 4: How many hours the mothers practiced KBC in a day**

#### *Time of KBC initiation*

In the same study, the respondents indicated after how long they had started KBC. It was found that 40.5% (n=45) had started KBC immediately, 10.8% (n=12) started KBC in less than 2 hour after delivery and 48.6% (n=54) had initiated KBC after 2 hours post delivery.



**Figure 5: Time frame when the mothers initiated KBC post delivery**

#### **Conclusions**

Significant maternal and neonatal factors affecting KBC practice were, educational level of the mother, the gestational age at birth, birth weight and age of baby at the time of study.

Kangaroo baby care practice was generally poor.

#### **Recommendation**

There is room for improvement in the practice of KBC. Midwives are well placed to support mothers to ensure that KBC is initiated immediately after birth where applicable and insisting on adherence to good practice regardless of the preterm baby's gestational age and birth weight.

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