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Research Article

Effect of Supportive Education on Knowledge and Practice of Kangaroo-Mother-Care in Pre-term and Low-Birth-Weight Babies Management in Selected Communities in Enugu State, Southeastern Nigeria

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ABSTRACT

This study assessed the effect of supportive education on the knowledge and practice of kangaroo-mother-care (KMC) in the management of pre-mature and low-birth-weight babies in selected communities in Enugu State. A quasi-experimental pretest-posttest, non-randomized design was adopted. A sample size of 332 postnatal mothers from the two community health centers under study was determined using power analysis. A structured questionnaire was used as an instrument for data collection. Data were descriptively analyzed with SPSS version 22, while inferential statistical analysis was performed using the chi-square test, independent t test, and one-way analysis of variance. Results with a $p < 0.05$ were considered statistically significant. Results of major findings showed that mothers' knowledge of KMC improved after the intervention, from an average score of 34.8% to 85.6% and 31.9% to 69.2%, with mean and standard deviations of 6.8 ± 2.6 and 5.6 ± 2.9 in the experimental and control groups, respectively. The practice of KMC also improved after the intervention, from 30% to 76.6% and 36.4% to 73.5%, with mean and standard deviations of 7.7 ± 1.2 and 6.6 ± 1.5 in the experimental and control groups, respectively. There was a significant difference in mothers knowledge of KMC between the experimental and control groups before the intervention ($t = 2.6$ and $p = 0.010$) and after the supportive intervention ($t = 3.7$ and $p = 0.000$). There was no significant difference in the influence of socio-demographic characteristics of mothers and the practice of KMC after intervention in both groups: educational status ($F = 0.3$ and $p = 0.801$), marital age ($F = 0.3$ and $p = 0.889$), and parity ($F = 0.1$ and $p = 0.965$). In conclusion, participants with supportive education interventions (experimental group) performed better than those with normal health education (control group).

Keywords: *Kangaroo-mother-care, Low-birth-weight, Prematurity, Supportive education.*

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INTRODUCTION

Every child has a right to live and be protected. Given that newborns are completely dependent on the caregiver for protection and survival, the low-birth-weight and preterm babies need extra care because of problems associated with their disposition. According to the World Health Organization (WHO) (2018), preterm babies, also known as premature babies, are babies born before 37 full weeks of gestation, and low-birth-weight babies are babies weighing less than 5.5

pounds, 8 ounces (2,500 grams or 2.5 kg). Evidence from research showed that for every 10 children born globally at least there is 1 premature baby and thirteen million life births are said to be premature babies with over 1 million annual deaths of these infants. (WHO, 2018; CDC, 2015).

Reports from CDC in 2013 showed that globally 35% of infant deaths were related to prematurity, while WHO reported that 35% of neonatal deaths each year arise from direct or indirect complications of premature birth (CDC,

2015; WHO,2022). Preterm and low-birth-weight newborns can have a variety of worries, such as breathing and eating issues, issues with vision and hearing, developmental delays, and more. These complications are more prevalent in undeveloped and impoverished countries since there is a lack of access to technology and skilled medical personnel. These problems were the leading cause of child death as of 2018, accounting for 60–80% of newborn deaths globally (Grayson, 2018; WHO, 2018). CDC (2022) report shows that preterm rate as at March 2022 is 10.38%.

A report from the United Nations Children Emergency Fund (UNICEF) states that prematurity and low-birth weights have a high correlation with neonatal morbidities and mortality. Since their 2016 findings indicated that neonatal death due to low birth weight and prematurity is rising, this report has not changed substantially. It also revealed that Nigeria accounted for over 10% of all newborn fatalities worldwide in 2016 (UNICEF, 2017). Mfuh *et al.* (2019) reported that 15,000 children worldwide passed away before turning five in 2016, with 46% of those deaths happening in the first 28 days of life. Around the world, neonatal conditions account for 44% of fatalities in children under five, and the percentage of these deaths increasing is attributed to neonatal factors (Bhutta *et al.*, 2014; Liu *et al.*, 2015; UNICEF, 2017).

According to Mfuh *et al.* (2019), the rate of preterm births is increasing globally. It is evident that tackling the issues of preterm and low-birth weight calls for a more proactive and comprehensive strategy. Preterm birth rates are increasing in both high and low socio-economic environments, high socio-income nations with high preterm prevalence include Brazil, China, India, the Philippines, Indonesia, and the Democratic Republic of the Congo, while low-income countries include Bangladesh, Pakistan, Nigeria, and the Democratic Republic of the Congo (Saifon *et al.*, 2018).

A significant portion of the fatalities of preterm and low-birth-weight infants may have been prevented. Studies reveal that, as compared to alternative forms of traditional newborn care, kangaroo mother care (KMC) considerably reduces mortality and morbidities associated with low birth weight and preterm infants (Claire, 2023). In resolving cases and concerns stemming from premature and low-birth-weight newborns KMC is advocated, likely because of its many palpable advantages. (Campbell-Yeo *et al.*, 2015; Cleveland Clinic, 2023), KMC shortens hospital stays, reduces the risk of hypothermia, severe illness, and nosocomial infection, and improves breastfeeding and mother-infant bonding in addition to these benefits (Lawan *et al.*, 2010; Conde and Diaz, 2014; Delia *et al.*, 2022).

Supportive health education involves the use of instructional materials and practical approaches to facilitate learning and personal development, focusing on knowledge, skills, values, beliefs, habits, and personal growth (Cambon *et al.*, 2012). It seeks to provide individuals with the information and abilities necessary for them to embrace and sustain healthy behaviors. It integrates individual and group intervention techniques to build the skills and information needed to make better health-related decisions. This procedure is typically a component of a larger health promotion strategy that also consists of other tactics for changing the environment and shifting the focus of health care toward prevention.

According to WHO (2018), health education gives people control over the fundamental factors that affect their health, enabling them to take charge of their own well-being.

Despite the knowledge explosion in this 21st century which has led to the manufacture and use of more encompassing and efficient assistive devices for the care of the preterm and low-birth-weight babies, there is still strong need for a better way of care for this category of children especially in resource-limited areas and rural communities where access to adequate medical services is elusive. Traditionally, low birth weight and premature newborns are managed using incubators, but most infants in developing countries lack access to these effective treatments. This is especially the case for populations living in rural areas and communities, where access to these services is limited. Other contributing factors include low income, high costs of technology, and a shortage of skilled healthcare providers. (Grayson, 2018). Furthermore, even in high-resource environments, there is little evidence to support LBW and preterm birth prevention. Several studies revealed that Kangaroo Mother Care significantly improved the survival rates of preterm or LBW babies in low- and middle-income countries (WHO, 2018; Claire, 2023).

Parents of LBW babies bear a significant financial burden while using incubators and other assistance technologies to manage their babies in underdeveloped nations like Nigeria and India. These exorbitant expenses imply that LBW babies' relatives cannot afford them (Sonam *et al.*, 2018). According to a 2017 UNICEF report, Nigeria accounted for over 10% of all newborn deaths worldwide in 2016. The World Health Organization endorses KMC, which has been proven to reduce mortality and morbidity in low- and middle-income countries, but its adoption and implementation have been limited (Dickson *et al.*, 2014). A study by Sonam, *et al.* (2018) showed that knowledge of KMC was low before the study, also a study done in Aminu Kanu Teaching Hospital by Mfuh *et al.*, in 2019 showed the need for wider public health campaign to sensitize the public and increase their knowledge about KMC. This attracts concern and further exposé the need for more educational intervention on the use of KMC model of care in Nigeria and globally

There is paucity of empirical studies on community KMC in Nigeria that assessed premature and LBW babies' management. Many KMC studies reviewed were done in the urban areas and tertiary facilities and none was done in the rural communities where KMC is obviously needed. This study therefore, assessed the impact of supportive education intervention on knowledge and practice of the KMC model in managing premature and LBW babies in rural communities in Enugu state, Nigeria.

MATERIALS AND METHODS

Study design: The study adopted a quasi-experimental pretest-posttest non-randomized design. This design was considered appropriate for this study because it helps to observe a change resulting from an intervention or treatment (Polit & Beck, 2020). Experimental and control groups were recruited. Supportive health education interventions were used on the experimental group, while normal health talk was

used on the control group. The outcome from the two groups were observed and analyzed.

Study Area: In the rural communities of Enugu State, Nigeria, two purposefully chosen primary health facilities—Awgu and Udi—were the focus of the study. Bound by the states of Kogi and Benue to the north, Ebonyi to the east, Abia and Imo to the south, and Anambra to the west, Enugu State is one of the states in the eastern region of Nigeria, situated at the base of the Udi plateau, which rises more than 1,000 feet (300 meters). Enugu was created on August 27, 1991, from part of the old Anambra State. The Enugu State Government statistics department (2019) estimates that its area is around 7,161 460/km² (2,765 sq m), with a density of 460/km³ (1,200/sq m). Enugu State is home to seven district hospitals, or rural community health districts, each of which serves a number of communities. These health districts include Enugu-Ezike, Agbani, Nsukka, Agbani, Isi-Uzo, and Awgu. A variety of primary health centers and public health institutions serve the surrounding communities in each health district, which is composed of two or three local government areas at minimum. In this way all the communities in the state were represented. Awgu and Udi communities were selected based on the assessment of functional facility-based services in their community health centers. According to Somashekhar and Nitesh (2019), for a successful introduction and implementation of KMC in the rural communities KMC must be linked to a functional facility-based health service. These district hospitals linked the study health centers, hence provided the necessary inclusion needed for this study.

Study Population: Based on WHO recommendation that all newborn babies should be introduced to KMC within 24 hours of birth due to its outstanding benefits on both mother and baby, the population chosen for this study are women of child bearing age, while the targets consisted of postnatal mothers who gave birth to babies and attended infant welfare clinic with their babies at the designated rural community health centers. The estimated population of women who put to bed in these centers annually as established by the 2022 attendant register was 1,413. All mothers with newborn babies under 3 months were included. Using postnatal mothers enabled the participants to use their live babies in practicing KMC, this gave the researcher and research assistants the opportunity to observe concurrently the participants during the practice session as well as aiding internalization of the concepts being learnt.

Inclusion Criteria: The following constitute the inclusion criteria for the study, postnatal mothers (1) who are healthy and strong enough to practice KMC. (do not have any underlying illness, and are mentally stable) (2) who have live babies to enable them practice what was taught immediately with their babies (3) whose babies are healthy and do not have any underlying health conditions, for instance babies who are extremely preterm (born before 25 weeks of pregnancy) who have not established independent respiration, and those critically ill are not qualified for KMC until they are stabilized (WHO,2003). (4) who wish to participate in the study willingly

Sample and Sampling Procedure: A sample size of 332 consenting postnatal mothers who visited postnatal/infant welfare clinics from the two community health centers under study during the six weeks period of this study (166 from each health center) was used for the study. This sample was determined statistically using power analysis with 10% attrition rate. Power analysis calculation was done using the formula

$$n = \frac{Z^2 pq}{d^2}$$

where, Population size (N) =1413, n= sample size, Z score (Confidence level at 95%) = 1.96, Margin of error 5% =0.05, Proportion of the population $p = 0.5$, $qvalue = 1 - p = 0.5$ $sample\ size\ (n) = 302$.

Four (4) participants dropped making the sample size 332. Multistage sampling technique was used to select the sample size for this study. Firstly, purposive sampling was used to select both the district community health facility linked to the study and rural community health centres used for the study in Enugu west geo-political zone. This selection was based on the assessment of functional facility-based services as suggested by Somashekhar and Nitesh,(2019). Secondly, convenient sampling was used to draw the 166 participants each from the two community health centres used for the study. This was based on willingness to participate, availability and health disposition of the respondents.

Instrument for Data collection: Data were collected with the aid of structured questionnaires in form of pre and post intervention questions, developed by the researcher, guided by WHO 2003 KMC manual and other extracts from works done by some renowned experts. The questionnaire assessed the knowledge and the practice of KMC components in the management of premature and low-birth-weight babies. The test items were translated from English to Igbo language by an expert in Igbo language and then further explained to the respondents (using the respondent's local dialect) through the help of research assistants who are natives of the community as well as work in the community health centres used for the study. The questionnaire consisted of 3 sections. Section A comprises socio-demographic data of the respondents which has 4 items. Section B consists of 13 questionnaire items on knowledge of KMC, while Section C consists of 10 items on the practice of KMC. Knowledge and practice Questions were measured as good, moderate or poor. Good is rated when a participant scores 70% or more of the questions posed. Moderate is 50-60% and poor below 50%. The Questionnaire was pre-tested among thirty-four (34) post-natal women in Agbani community health center who were not part of the study group.

Ethical Considerations: The head nurses of the community health centers and the administrators of each district health facility connected to the study received an introduction letter from the Department of Nursing Sciences at the University of Nigeria, Enugu Campus. This made it possible for the researcher to obtain written consent and clearance to conduct the study. The Ethical Committee at ESUT Teaching Hospital, Park Lane, Enugu, Nigeria, was consulted in order to get ethical clearance. (ESUTHP/C-MAC/RA/034/vol.2/146). The study involved obtaining oral consent from a range of

community leaders and healthcare facilities. After outlining the goal of the study, participants were asked for and given their informed oral consent prior to data collection. Throughout the study, the following principles were upheld: respondents' right to decline or withdraw, confidentiality, and anonymity. All expectations regarding the procedures and their explanations were made clear. They were informed of the advantages of the study results.

Intervention: (Pre-intervention) A total of 10 research assistants were recruited, trained and instructed on the purpose of the study. These comprise of 2 public health educators, 4 final year nursing students, a Nursing staff and a community health worker each from the two study centers. These staff were members of the study communities who understood and spoke the language fluently. This enabled them to explain the questionnaire items in their local dialects for the participants' proper understanding. Copies of the questionnaire were given to the research assistants to understudy before data collection. Prior notice of the days for the educational intervention were made known to the participants through the researcher, community health workers, community leaders and Nurses in the community health centers used for the study. Days that did not clash with major community social events and market days were chosen. **Pretest was first given to** the 332 participants (166 from experimental and control groups respectively) recruited for the study from the two community health centers, which lasted for about 45 minutes to 1 hour. It consisted of items on socio-demographic data of the respondents, and items covering aspects of knowledge and practice of KMC model in the management of pre-term and low-birth-weight-babies.

Intervention Activities: Participants in the control group received normal health talk without the supportive intervention, whereas those in the treatment group received the supportive education intervention from the researcher and assistants. The supportive education intervention was done for a duration of 2 hours. It included lectures, practical demonstration sessions (using inanimate model of a baby, pictorials and video clips showing how KMC is done) and practical learning sessions (with mothers using their live life babies). While normal health talk only was given to the control group. This procedure was repeated on two occasions at one week interval to encourage internalization of the concepts being taught, then 1hour post-test was administered to all the participants. These activities lasted for 3 weeks in each of the study centres making a total of 6 weeks. The results of the pre-test (before intervention) and the post-test (after intervention) were compared between the experimental and control groups. The difference in the results established the effectiveness of the supportive education intervention. Participants were given light entertainment after each session.

Method of Data Analysis: Descriptive statistical analysis was carried out using the statistical software SPSS version 22. To determine the differences in knowledge and use of KMC, inferential statistical analysis was carried out using the chi-square test, independent t test, paired t test, one-way analysis of variance, and multiple stepwise regression of data analysis. Initial statistical analysis was carried out using percentage,

mean, and standard deviation calculations of the data. Results with $p < .05$ were considered statistically significant.

RESULTS

Table 1 shows that age range 18-25 constitutes the highest number in both the experimental and the control groups, with 47% and 30.1% respectively. Age group 46-49 in both groups had the lowest frequency. The mean and standard deviation age for the experimental group was 28.4 ± 7.3 while the control group was 29.8 ± 6.8 . The highest level of education in both groups was secondary schools 68.7% and 66.3% respectively. In experimental group the participant with one child constitutes the highest frequency (39.8%) while in control group those with three children were more (26.5%). Considering the participants marital status, those that are married occurred more frequently in both experimental and control groups (96.4% and 94%) respectively.

Table 1:
Socio-demographic characteristics of the participants, $n=166$

	Age group	Experimental group		Control group	
		F	%	F	%
Socio-demographic characteristics	18-25	78	47.0	50	30.1
	26-30	32	19.3	48	28.9
	31-35	28	16.9	34	20.5
	36-40	16	9.6	22	13.3
	41-45	8	4.8	8	4.8
	46-49	4	2.4	4	2.4
	Total	166	100	166	100
	Mean±SD		28.4±7.3		29.8±6.8
Level of education	No formal education	4	2.4		
	Primary	14	8.4	20	12.0
	Secondary	114	68.7	110	66.3
	Tertiary	34	20.5	36	21.7
	Total	166	100.0	166	100.0
Parity	One	66	39.8	36	21.7
	Two	38	22.9	32	19.3
	Three	18	10.8	44	26.5
	Four	26	15.7	32	19.3
	Five	18	10.8	22	13.3
	Total	166	100.0	166	100.0
Marital status	Single	6	3.6	8	4.8
	Married	160	96.4	156	94.0
	Separated	.	.	2	1.2
	Widow
Total	166	100.0	166	100.0	

From table 3, in the experimental group pretest, out of the 11 knowledge questions in this section, only questions on breast feeding habits and the reason why mothers are the best providers of KMC scored up to 56.6% and 50.6% respectively, while in the control group they scored 53.0% and 53.1% respectively to the same questions. The average percentage of respondents' knowledge in both groups before the intervention were 34.8% and 31.9% respectively. The mean and standard deviation of the scores for experimental group were 3.2 ± 2.9 , while that of the control group were 3.3 ± 3.1 . The result shows that both the experimental and the control groups had mean scores less than 3.4 and average percentage knowledge of less

than 50%, therefore, both groups were not knowledgeable about KMC before the intervention.

Table 2:

Mothers Knowledge of KMC in the management of preterm and LWB babies before the intervention

S/N	Items	pre-test experimental				pre-test control			
		Correct		Wrong		Correct		Wrong	
		F	%	F	%	F	%	F	%
1.	KMC is skin-to-skin, breast feeding, early discharge and follow up	70	42.2	96	57.8	50	30.1	116	69.9
2.	Skin-to-skin contact stability is met when baby is respiratory and haemodynamically stable	54	32.5	112	67.5	22	13.3	144	86.7
3.	Skin-to-skin contact is expected to end when baby no longer accept it	38	22.9	128	77.1	46	27.7	120	72.3
4.	Breastfeeding habits in KMC is exclusive	94	56.6	72	43.4	88	53.0	78	47.0
5.	KMC discharge is when baby maintain a stable temperature, gain weight and feed well	54	32.5	112	67.5	54	32.5	112	67.5
6.	Discharge criteria in the entire KMC process is achieved around 12 weeks	10	6.0	156	94.0	36	21.7	130	78.3
7.	Follow-up location is patient's home	56	33.7	110	66.3	62	37.3	104	62.7
8.	Follow up time usually lasts till 3 months	52	31.3	114	68.7	52	31.3	114	68.7
9.	Babies that gain most in Kangaroo care are preterm and LBW babies	44	26.5	122	73.5	36	21.7	130	78.3
10.	Mothers are the best provider of KMC because of breastfeeding	84	50.6	82	49.4	88	53.1	78	47.0
11.	KMC cannot be called baby wearing	80	48.2	86	51.8	48	28.9	118	71.1
Mean±SD		3.2±2.9				3.3±3.1			

Table 3:

Mother's knowledge of KMC in the management of preterm and LBW babies after intervention

S/N	Items	post-test experimental				post-test control			
		Correct		Wrong		Correct		Wrong	
		F	%	F	%	F	%	F	%
1.	KMC is skin-to-skin, breast feeding, early discharge and follow up	118	71.1	48	28.9	118	71.1	48	28.9
2.	Skin-to-skin contact stability is met when baby is respiratory and haemodynamically stable	124	74.7	42	25.3	98	59.0	68	41.0
3.	Skin-to-skin contact is expected to end when baby no longer accept it	116	69.9	50	30.1	104	62.7	62	37.3
4.	Breastfeeding habits in KMC is exclusive	162	97.6	4	2.4	156	94.0	10	6.0
5.	KMC discharged is when baby maintain a stable temperature, gain weight and feed well	136	81.9	30	18.1	88	53.0	78	47.0
6.	Discharge criteria in the entire KMC process is achieved around 12 weeks	140	84.3	26	15.7	128	77.1	38	22.9
7.	Follow-up location is patient's home	150	90.4	16	9.6	92	55.4	74	44.6
8.	Follow up time usually lasts till 3 months	146	88.0	20	12.0	128	77.1	38	22.9
9.	Babies that gain most in Kangaroo care are preterm and LBW babies	156	94.0	10	6.0	126	75.9	40	24.1
10.	Mothers are the best provider of KMC because they are the only caregiver that can breastfeed the baby	162	97.6	4	2.4	106	63.9	60	36.1
11.	Kangaroo-mother care cannot be called baby wearing	152	91.6	14	8.4	120	72.3	46	27.7
Mean±SD		6.8±2.6				5.6±2.9			

Table 4:

Practice of KMC in the management of preterm and LBW babies by the mothers before intervention

	Items	pre-test experimental				pre-test control			
		correct		Wrong		Correct		Wrong	
		F	%	F	%	F	%	F	%
1.	Initiated skin-to-skin after stability criteria is met	58	34.9	108	65.1	68	41.0	98	59.0
2.	Skin-to-skin contact done in continuous within session	44	26.5	122	73.5	56	33.7	110	66.3
3.	Skin-to-skin contact dosage done in not less than 90% of 24 hours	64	38.6	102	61.4	68	41.0	98	59.0
4.	Breastfeeding started immediately or within one hour of delivery	48	28.9	118	71.1	46	27.7	120	72.3
5.	Breastfeeding frequency done whenever possible, as often as the infant wants it	92	55.4	74	44.6	96	57.8	70	42.2
6.	Breastfeeding duration stopped when infant and mother were satisfied	56	33.7	110	66.3	66	39.8	100	60.2
7.	KMC baby care done with diaper, cap and socks	80	48.2	86	51.8	50	30.1	116	69.9
8.	KMC baby position placed vertically in-between the mothers breast in a flexed fetal position	48	28.9	118	71.1	50	30.1	116	69.9

9. KMC stopped when baby attained a weight of 2.5kg or gestational age of 37 weeks	58	34.9	108	65.1	52	31.3	114	68.7
Mean±SD	3.3±1.5				3.3±1.6			

Results in Table 3 shows that all the participants scored well above average in the experimental group after the intervention with the highest percentage of (97.6%) and lowest percentage of (69.9%). With a mean score and standard deviation of 6.8±2.6. The control group's highest score is (94%) and the lowest score is (53%), with a mean score and standard deviation of 5.6±2.9 in the control group. This result shows that there was improvement in knowledge after the intervention worked. However, the improvement is more remarkable in the experimental group

Table 5 shows that all the participants (100%) in both experimental and control groups have not practiced KMC

before the educational intervention. Majority of the respondents in both groups also did not get questions correctly on the practice of KMC apart from the question on breastfeeding frequency where both got 55.4% and 57.8% respectively. The average practice of KMC were 30% and 36% for experimental and control groups respectively. The mean and standard deviation of the scores for the experimental group were 3.3±1.5, while that of the control group were 3.3±1.6. The result shows that both groups had mean scores lower than 3.4, therefore both groups were poor in the practice of KMC before the intervention.

Table 5

Practice of KMC in the management of preterm and LBW babies by the mothers after intervention

S/N	Items	post-test experimental				post-test control			
		correct		Wrong		Correct		Wrong	
		F	%	F	%	F	%	F	%
1.	Initiated skin-to-skin after stability criteria is met	128	77.1	38	22.9	116	69.9	50	30.1
2.	Skin-to-skin contact was done continuous within session	124	74.7	42	25.3	114	68.7	52	31.3
3.	Skin-to-skin contact dosage was not less than 90% of 24 hours	140	84.3	26	15.7	132	79.5	34	20.5
4.	Started breastfeeding immediately and within one hour of delivery	158	95.2	8	4.8	124	74.7	42	25.3
5.	Breastfeeding frequency was as often as the infant wanted	158	95.2	8	4.8	150	90.4	16	9.6
6.	Breastfeeding duration was when infant and mother were satisfied	122	73.5	44	26.5	98	59.0	68	41.0
7.	Baby was dressed with diaper, cap and socks	164	98.8	2	1.2	144	86.7	22	13.3
8.	Baby was positioned vertically in-between the mothers breast in a flexed fetal position	142	85.5	24	14.5	120	72.3	46	27.7
9.	KMC was stopped when baby attained a weight of 2.5kg or gestational age of 37 weeks	142	85.5	24	14.5	100	60.2	66	39.8
Mean±SD		7.7±1.2				6.6±1.5			

Table 6:

Difference in mother's knowledge of KMC before intervention between the experimental and control groups

Group	N	Mean	Std. Dev.	T	p value	HO Accept/Reject
pre-test experimental	166	5.6	2.9	2.6	0.010	Rejected
pre-test control	166	6.4	3.1			

Level of significance 0.05%

Table 7:

HO on Difference in mother's knowledge of KMC between experimental and control groups after intervention

Group	N	Mean	Std. Dev.	T	p value	HO Accept/Reject
post-test experimental	166	6.783133	2.976873	3.7	0.000	Rejected
post-test control	166	5.584337	2.850114			

Level of significance 0.05%

DISCUSSION

Findings from this study showed that participants were not knowledgeable about KMC before the educational intervention. The average knowledge of the experimental and control groups were 34.8% and 31.9% respectively. There was not much observed difference in both groups about their knowledge before the intervention. It was obvious that this percentage they got from the pretest was purely by chance because many participants from both groups said they hadn't

heard about KMC before the intervention (57% and 97% from experimental and control groups respectively).

This result is in line with a study conducted in 2019 by Paras *et al.* in which post-natal mothers in a tertiary care facility in Mangalore, Karnataka, India was assessed on their knowledge, attitude, and practice of Kangaroo mother care. 95.5% of the mothers were unaware of KMC at the time of recruitment, according to the study. In addition, the majority of mothers (83.3%) in a study by Solomon and Rosant (2011) that looked at the knowledge and attitude of nursing staff and mothers towards kangaroo mother care (KMC) in the eastern

sub-district of Cape Town were unaware of KMC before the study. Urmila and Karunakaran (2015) assessed the knowledge, attitude, and practice of kangaroo-mother-care among post-natal mothers in a tertiary care center in North Kerala, India. The hospital is located in Kerala, India. 95.4 percent of mothers were found to be ignorant of KMC at the time of recruitment, according to the data. This, however, is in contrast with a 2019 study by Mfuh *et al.* on the knowledge and practice of kangaroo mother care among post-natal mothers in a tertiary hospital in northwestern Nigeria, Aminu Kano Teaching Hospital Kano. According to the findings, 61% of the respondents were aware of kangaroo mother care, and 57% actually practiced it. In a study conducted by Sonam *et al.* (2018), the researchers examined knowledge regarding kangaroo-mother-care among antenatal mothers. Of the 60 samples, 40 (66.67%) of the respondents had sufficient knowledge, and 20 (33.33%) had inadequate knowledge. The study's environment may be to blame for these knowledge disparities. Although the reference studies were conducted in tertiary hospitals, where it was evident that KMC had been thoroughly taught and applied, the current investigation was conducted in rural community settings.

Finding from this study showed that before the intervention, all the participants (100%) in the two groups never practiced KMC. The two groups showed poor practice of KMC (average of 30% and 36%) respectively. The researcher assumes that these percentages were obtained by chance since 100% of the participants had never practiced KMC before the intervention. This study's outcome is consistent with that of Arif's (2020) investigation, which evaluated knowledge, attitude, and practice of Kangaroo mother-care among postnatal mothers in a tertiary care center in the Harari region of Ethiopia. This finding indicates that 32.12% of participants correctly practiced KMC. In a study conducted by Kassahun (2018) on the knowledge, attitude, practice, and associated factors of Kangaroo mothers care for neonatal survival among caretakers of preterm and low-birth-weight infants in health care settings in Hawassa, Southern Ethiopia, it was revealed that overall, caregivers' practices regarding KMC were found to be inadequate. This result, however, differs from that of a study conducted by Abrham *et al.* (2017) on Knowledge, Attitude, and Practice of Kangaroo Mother Care by Postnatal Mothers who gave birth to preterm and low birth weight babies in public hospitals in Eastern Ethiopia, which revealed that 189 (54.15%) mothers had previously engaged in Kangaroo Mother Care.

Findings from this study showed that the intervention had effect on the knowledge of the participants in using KMC in the management of preterm and LBW babies in the studied communities. Average of 85.6% and 69.2% respectively from experimental and control groups answered correctly to knowledge-based questions posed to them. Both groups showed their willingness to know more about KMC by engaging the researcher and her research team with several question-and-answer sections. They were equally able to answer questions posed to them outside the posttest correctly. They further were enthusiastic and equally promised to extend the knowledge to other community members. This finding is in agreement with a study done by Aruna *et al.* (2019) who assessed the use of KMC in determining knowledge and

practices of postnatal mothers of low-birth-weight babies in selected hospital of Haryana using Quasi experimental approach which showed that a greater percentage of the participants answered knowledge-based questions correctly after intervention. This finding is also in agreement with the studies done by Paras *et al.* (2019) and Urmila and Karunakaran (2015), respectively who discovered that knowledge of the participants improved after intervention.

From the findings, participants from the experimental group demonstrated an average score of 76.6% practice. This indicated an improvement in their practice as a result of the supportive education intervention, their practice improved. After accepting the care model, the researcher discovered that the majority of participants were eager to learn how to conduct KMC correctly. According to Pontius *et al.*'s (2019) findings, 71.8% of mothers in sub-Saharan Africa were willing to undertake kangaroo mother care for preterm infants, which made learning easier. A willingness to continue KMC at home was also demonstrated by the participants. In a tertiary care center in Mangalore, Karnataka, India, postnatal mothers were assessed for knowledge, attitude, and practice of Kangaroo Mother Care (KMC). The study's findings were corroborated by this research as well. The mothers' prior knowledge of KMC was low, but it improved after the study, and they are now happily practicing KMC at home and in the hospital. This is in line with the findings of Aruna *et al.* (2019), who assessed the use of KMC in determining the knowledge and practices of postnatal mothers of low-birth-weight babies in a selected hospital in Haryana using a quasi-experimental approach. The primary findings showed that the mean knowledge score on the posttest (23.6 ± 2.23) and practice score (22.4 ± 2.34) were higher in the experimental group than in the pretest (15.17 ± 2.60) and practice (13.1 ± 2.82).

The findings demonstrated that, prior to the intervention, mothers in the experimental and control groups knew significantly different things about KMC ($t = 2.6, p = 0.010$). The experimental group had a mean score of 34.8% prior to the supportive education intervention, while the control group's score was 31.9%. This difference obviously happened by chance due to the fact that neither the experimental nor the control group knew much about KMC before the intervention. The researcher also made this assertion based on the premise that both groups resisted pretests on the reason that they neither heard nor knew anything about KMC. When asked whether they have heard about KMC, an average of 77.3 % said they have not heard. This finding is in agreement with the findings by Aruna *et al.* (2019) whose findings showed no significant difference in mothers' knowledge of KMC between experimental and control groups and the selected variables such as age parity, type of family and habitat before intervention.

The result showed there was significant difference in mothers' knowledge of KMC between the experimental and control group after the supportive intervention with $t=3.7$ and p value= 0.000. After supportive education intervention the experimental group has a mean score 85.6% while the control group has 69.2%. This result obviously showed that the supportive intervention improved their knowledge. The participants equally showed high satisfaction with the supportive materials used, this was why they requested that

such teaching should be integrated in all antenatal and infant welfare health education given to them each time they come for health visits for a clearer understanding and internalization. Nevertheless, this result contradicts a study by Aruna *et al.* (2019), who assessed the use of KMC in determining the knowledge and practices of postnatal mothers of low-birth-weight babies in a selected hospital in Haryana using a quasi-experimental approach. The study found no significant difference between the two groups' pre- and post-intervention levels of interaction.

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