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**Original article**

# KNOWLEDGE AND PRACTICES OF NURSING STUDENTS TOWARDS KANGAROO MOTHER CARE (KMC) AMONG TWO SELECTED NURSING INSTITUTIONS IN MBARARA MUNICIPALITY. A CROSS-SECTIONAL DESCRIPTIVE STUDY.

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## Abstract

**Background**:

Globally 25 million infants (17%) are born with a low birth weight (LBW) and most of these occur in low-income countries. LBW infants suffer from high rates of morbidity and mortality. Therefore, low-income countries have recognized kangaroo mother care (KMC) as a necessity to promote positive neonatal health under adverse conditions.

**Methods:**

A cross-sectional study was conducted using a quantitative approach. A total of three hundred twenty-six (326) nursing students participated in the study and they were selected by simple random sampling method. Data were collected through self-administered questionnaires. Data were checked for completeness, cleaned, and entered in SPSS for further analysis. Data analysis was conducted by using descriptive statistics and a chi-square test to show the association between variables.

**Results:**

Three hundred nineteen (319) fully completed the study, yielding a response rate of 97.8%. The majority of subjects were aged between 24 to 29 years (34.8%), belonged to the protestant religion (40.8%) and there were more females (56.4%). The majority of the nursing students were pursuing a certificate level of Ugandan education (29.5%) and most of them had two years of studying (52.6%). students in the second year (49.2%) had the highest percentage of nursing students with good to excellent knowledge as compared to the rest. Characters of age (P value=0.001), religion (P value=0.000) course of study (P value=0.000), and year of study (P value=0.007) were found significant with knowledge of nursing students on KMC.

**Recommendations:**

It is crucial to establish suitable guidelines and a specialized Kangaroo Mother Care unit in all health facilities in Uganda.

**Conclusion:**

The general level of knowledge and behavior toward KMC was deemed adequate.

*Keywords:* Kangaroo mother care, postnatal care, premature., Submitted: 2023-04-29 Accepted: 2023-05-01

## 1. Background

Globally 25 million infants (17%) are born with a low birth weight (LBW) and most of these occur in low-income countries (Ajanwaenyi et al., 2021). These low birth-weight infants suffer from (Adisasmita et al., 2021) high rates of morbidity and mortality and often remain underweight, stunted, or wasted from the neonatal period through childhood (Conde-Agudelo et al., 2012). Therefore low-income countries have recognized (Conde-Agudelo et al., 2012) kangaroo mother care (KMC) as a necessity to promote positive neonatal health under adverse conditions.

KMC is a cost-effective complementary method of caring for stable low birth weight (LBW) and preterm neonates (Akbari et al., 2018) that can contribute to improving the quality of care, as it ensures constant temperature regulation and improved survival of these infants. The benefit of KMC includes empowering the mother to care for her LBW infant, decreasing infant mortality, encouraging breastfeeding, and reducing the frequency of low-birth-weight babies visiting clinics after discharge from the hospital (Al-Shehri & Binmanee, 2021). In recognition of these positive attributes, nursing students play an essential role in the newborn assessment and implementation of KMC (Ali et al., 2021).

Complications of LBW account for 45% of all neonatal deaths ( Almutairi, 2022). An important responsibility of healthcare professionals is to reduce neonatal mortality. As part of the healthcare team, nursing students play a major role in KMC implementation. It has been stated that nursing students must be sensitive to KMC and have adequate knowledge of it (Salim et al., 2021). Studies have shown that nursing students' knowledge of KMC, and newborn assessment and that their knowledge generally derives from their university and other institutional education (Martha et al., 2021). It has been shown that nursing students' knowledge of KMC is at a medium or inadequate level.

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Clinical students play a very important role in the process of childbirth, as well as the practice and implementation of KMC. Aradhya et al., 2021 reported that 54.45% of deliveries (48.6% in urban areas, 64.32% in rural areas) are carried out by nursing and midwifery students, and these healthcare professionals are the first ones to make contact with infants after birth. Therefore, their knowledge and beliefs influence their encouragement and discouragement of KMC (Salim et al., 2021).

According to the WHO (2015), there has been evidence of improvement in the health outcomes of LBW babies who received kangaroo care, therefore, this practice should be routine care for babies weighing less than 2000g. However, few countries have made the intervention accessible and available to families with low birth weight babies despite its recognition and benefits (WHO, 2015).

In a study by Manzoor et al., 2020 about Knowledge, Attitude, and Practice of Kangaroo Mother Care among nursing students in neonatal units, only 32% of participants knew about the KMC method of care for neonates, 12% of nurses are sure about the components and verbalized correctly about skin to skin contact of an infant and the mother, early discharge, and supportive follow-up, 38% of nurses answered that KMC is beneficial for low birth weight infants. In addition, it was observed in a study by (Arora et al., 2021) that 12 (32%) nurses guided and counseled mothers about practicing KMC and its benefits and how to do KMC at home; only 28% guided the father about this technique; 38% re-examined the infants and their mothers; 42% explained the method through play cards, posters, and videos.

A study conducted by (Artese et al., 2021) discovered that 33.1% of the nurse had clear knowledge about KMC; 29.7% knew eligible infants (Dalal, Bala, & Chauhan, 2014). These are the ones who play supervision the nursing students when they are in clinical placements as their mentors, having low knowledge about KMC means that they are not able to give the necessary knowledge to the junior nurses. Another study conducted in Kenya elaborated that 87.5% of healthcare professionals knew the need for KMC for

LBW infants; 94.3% knew that KMC practice is through the skin to skin contact (Charpak et al., 2020). A study conducted in Africa on a staff of nurses affirmed that a majority of nurses had knowledge of KMC (Bedford, Piccinini-Vallis, & Woolcott, 2022), thus this study aimed at assessing the knowledge and practices of nursing students towards KMC among two Selected Nursing Institutions in Mbarara Municipality

## 2. Methodology:

### *2.1. Study Design:*

A cross-sectional descriptive study and a quantitative method were utilized. This is because there were no interventions to be done and a short period was required for the study (Polit & Beck, 2014).

### *2.2. Study Setting:*

The study was carried out at Bishop Stuart University, Ruharo Nursing Campus, and Mayanja Memorial Training Institute. Bishop Stuart University, Ruharo Nursing Campus located in Ruharo Ward, Kamukuzi Division, Mbarara Municipality, Mbarara District along MbararaBushenyi Road. It has a population of approximately 300 students. It admits students to the following courses in nursing: - Bachelor in Nursing Science, Diploma in Nursing (Directs) Bachelor in nursing completion (BNC), and Diploma in Nursing (Extensors). Mayanja Memorial Training Institute is located two miles from Mbarara town in MakenkeKakoba Division, Mbarara Municipality, and Mbarara District along Mbarara-Masaka road. It admits students to the following courses in nursing namely: Diploma in Nursing (direct), Diploma in Nursing (Extensors), and Certificate in Enrolled Nursing. The choice of these study areas was the best because they are easily accessible. Data collection was done from 6th June 2022 to 27th July 2022.

### *2.3. Study Population:*

The study population included nursing students at Bishop Stuart University (Ruharo Nursing Campus) and Mayanja Memorial Training Institute**.** The choice of this group was because they are taught theory and skills concurrently at their training institutions and were easily accessible.

### *2.4. Selection Criteria:*

#### *2.4.1. Inclusion Criteria*

The study included only nursing students who had ever practiced on the ward at the time of data collection and who were willing to participate in the study.

#### *2.4.2. Exclusion Criteria*

All nursing students that had ever practiced on the ward but were not available at the time of data collection were excluded from the study.

### *2.5. Sample Size Determination:*

The sample size was estimated by Kish and Leslie's standard formula (1965), N= Z2PQ/E2. Where N is the sample size, Z is the score responding 95% of the confidence interval which is 1.96, and P is the percentage of students who had ever practiced on neonatal wards in a study that was done by (Nuuyoma, Swart, & Ashipala, 2017) was estimated to be 0.694. Q=1-P=1-0.694=0.306. The level of error expected is 0.05 N= (1.96)2 x 0.05 (0.5)/0.052, N=326. Thus 326 nursing students were considered in this study.

### *2.6. Sampling Technique:*

The study used two sampling methods. In the beginning, the researcher used a representative stratified random sampling method, where the researcher after dividing the study population into appropriate strata according to the courses; BNS, BNC, DNS, DNE, and ENC calculated a representative sample from each stratum about the total. After that, the researcher used simple random sampling to select the study sample. This method was chosen because there was no need to divide the population into subpopulations or take any additional steps before selecting members of the population at random and it was considered (Polit & Beck, 2014).

### 2.7. Data Collection:

The study used a standardized structured questionnaire originally developed by MHLOPE (2019) which was modified by the researcher (Appendix 5) to collect data. This questionnaire contained questions on the knowledge and practices of KMC. The questions were close-ended questions that produced data that could be analyzed quantitatively for patterns and trends (Polit & Beck, 2014). Part "A" provided information about the demographics of the students' Parts "B" & "C" provided information about the respondents 'level of knowledge and practices. All questions were answered by either choosing "YES" or "NO", in other Questions the participants were given several alternatives and were asked to "Tick" (√) their choices.

### 2.8. Data Collection Method

The researcher conducted research using a modified questionnaire adapted from (MHLOPE, 2019) (Appendix 5) which was answered by putting a "Tick"(√) for the chosen answers. The questionnaire had 7 questions on knowledge and 6 questions on practice.

The questionnaire had been chosen because it offers the possibility of anonymity; the absence of an interviewer to ensure the independence of the interviewee and to produce data that could be analyzed quantitatively for patterns and trends(Polit & Beck, 2014).

### 2.9. Data Collection Procedures:

The researcher obtained an introductory letter from the Head of the Nursing Department Bishop Stuart University after being approved by the bishop Stuart University review board. This letter was presented to the Faculty Dean of Nursing and Health Sciences at Bishop Stuart University and the principal of the nursing department at Mayanja Memorial Medical Training Institute seeking permission to collect data. Before data collection, the researcher explained the purpose and objectives of the study to the study participants seeking consent. Those who were willing to participate in the study signed informed consent and then were given questionnaires that contain the study questions.

#### 2.9.1. Validity

Validity is a measure of how well a test measures what it is supposed to measure McClung (1978). Any validity errors in this research were eliminated by the supervisor reviewing the work before approving it. Furthermore, it was achieved by pre-testing the questionnaire with at least 10 subjects. The errors in phrases and sentences were corrected to make them precise before collecting data. Additionally, the questionnaire was maintained in English to avoid translation errors.

#### 2.9.2. Reliability

The reliability of any given measurement refers to the extent to which it is a consistent measure of a concept and Cronbach's alpha is one way of measuring the strength of that consistency. Cronbach's alpha of >75 from previous studies was used (Conde-Agudelo & Diaz-Rossello, 2016). Cronbach's alpha was used to assess the reliability or internal consistency, of a scale that was used to assess knowledge and practices.

### 2.10. Measurements of Variable:

#### 2.10.1. Independent Variables

Demographics: Age, gender, and year of study were the independent variables of the study .

#### 2.10.2. Dependent Variable:

Knowledge and practice level was the dependent variables of the study. Knowledge and practice were measured as a percentage (<50%) = Poor, (50%-75%) = Good and (>75%) = Excellent .

### 2.11. Data Management:

The data collected was carefully checked for completeness before safety storage, and attempts were made to ensure the complete filling of the questionnaires. The data collected from the respondents were directly entered into Microsoft Excel where it was cleaned and transferred into SPSS for analysis. Only the researcher and the assistants had access to them.

### 2.12. Data Analysis Technique:

Data were entered into Excel and then transferred to Statistical Program Statistical Package for Social Sciences version 20 (SPSS) for analysis.

#### 2.12.1. Univariate Level:

This involves an examination of one variable at a time. Categorical data were described and summarized using frequency, distribution, and percentages.

#### 2.12.2. Bivariate Level:

This involves the examination of two variables simultaneously. Independent variables were cross-tabulated with the dependent variable. Data were analyzed mainly with Chi-square distribution.

### 2.13. Ethical Consideration:

The researcher obtained an introductory letter from the Head of the Nursing Department at Bishop Stuart University. Permission was obtained from Mayanja Memorial Medical training institute and Bishop Stuart University Ruharo Nursing campus. Informed consent was always sought from respondents and our questionnaire did not capture participants' initials. This assured confidentiality of the information. Data collected was kept in a locked box and only authorized persons were able to access it this assured privacy.

## 3. Study Findings

### 3.1. Participant Characteristics:

Three hundred twenty-six (326) nursing students were selected to participate in the study, and three hundred nineteen (319) fully completed the study, yielding a response rate of 97.8%. The majority of subjects were aged between 24 and 29 years (34.8%), belonged to the protestant religion (40.8%) and there were more females (56.4%). The majority of the nursing students were pursuing a certificate level of Ugandan education (29.5%) and most of them had two years of studying (52.6%) (Table 1).

### 3.2. Association between socio-demographic characters and level of knowledge on KMC

The overall findings from the study show that the majority of the nursing students had good to excellent knowledge (94.4%). Students in the age groups of 24-29 years (80.6%) had good to excellent knowledge as compared to others. In terms of gender, the proportion of female students with excellent knowledge (57.4%) was higher than those of male students. On courses of study, BNC (23.8%) had good- excellent knowledge as compared to the rest of the courses.

In addition, students in the second year (49.2%) had the highest percentage of nursing students with good to excellent knowledge as compared to the rest. When we compared the association between the two, Characters of age $X^2(df=6)=21.920$, P value=0.001, religion $X^2(df=8)=34.919$, P value=0.000 course of study $X^2(df=8)=36.435$, P value=0.000 and year of study $X^2(df=6)=17.595$, P value=0.007 were found significant as shown in table two below.

Study findings indicate that most of the participants always supported mothers to initiate KMC (77.7%), provide information to the parents/family members on kangaroo mother care (78.6%), Encouraged mothers to practice KMC (87.1%), assisted mothers to practice KMC (82.4%), the practice of kangaroo mother care effectively implemented in facility 74.6%) and mothers of low birth weight babies practice KMC continuously (80.8%)

### 3.3. Practices of nursing students towards KMC

## 4. Discussion:

### 4.1. Knowledge of nursing students towards KMC

Kangaroo mother care is an effective and low-cost technique that prevents neonates from hypothermia, a leading cause of preventable neonatal mortality. Knowledge and practice of Kangaroo mother care are of utmost importance in developing countries like Uganda where incubator or such advanced services is still out of reach

Table 1: Participant Characteristics

| Variable | Category | N(%) |
|---|---|---|
| Gender | Female | 180(56.4) |
| | Male | 139(43.6) |
| Age | 18-23 | 62(19.4) |
| | 24-29 | 111(34.8) |
| | 30-35 | 97(30.4) |
| | 36-49 | 49(15.4) |
| Religion | Catholic | 68(21.3) |
| | Protestant | 130(40.8) |
| | Moslem | 83(26.0) |
| | Adventist | 21(6.6) |
| | Born again | 17(5.3) |
| Course of study | BNS | 52(16.3) |
| | DNS | 40(12.5) |
| | BNSC | 73(22.9) |
| | DNE | 60(18.8) |
| | ECN | 94(29.5) |
| Year of Study | Year one | 48(15.0) |
| | Year two | 171(53.6) |
| | Year three | 74(23.2) |
| | Year four | 26(8.2) |

for the majority of the rural populations. Therefore, nursing students and entirely nurses need adequate knowledge of the pain of Kangaroo mother care. Knowledge deficits regarding Kangaroo mother care have been cited as one of the barriers to its applicability (Shah et al., 2018). It is, therefore, recommended that nursing students as future nurses engage in continuous professional development programs on Kangaroo mother care.

The overall findings from the study show that the majority of the nursing students had good to excellent knowledge (94.4%). Students in the age groups of 24-29 years (80.6%) had good to excellent knowledge as compared to others. In terms of gender, the proportion of female students with excellent knowledge (57.4%) was higher than those of male students. On courses of study, BNC (23.8%) had good- excellent knowledge as compared to the rest of the courses. In addition, students in the second year (49.2%) had the highest percentage of nursing students with good to excellent knowledge as compared to the rest. The present study results are in line with key findings from studies done by (Shah et al., 2018) and (Olawuyi, 2021) who revealed that participants have heard of KMC, and their knowledge and attitude toward KMC were found to be positive. More so, believed that KMC is helpful to babies. The reason for this is that most of the participants in this study were already attached to maternity wards and as well had already covered midwifery where KMC is covered.

On bivariate analysis, this study's results revealed a significant relationship among socio-demographic characters of age, religion, course of study, and year of study. These study's results are in line with results from studies by (Manzoor et al., 2020) and (Hendricks-munoz & Mayers, 2014) who indicated significant relationships between socio-demographic characters and knowledge of KMC.

In this study, a significant relationship was registered between the age and knowledge of nursing students on KMC. Being between the age of 24-

Table 2: Association between socio-demographic characters and level of knowledge on KMC

| Variable | Category | Level knowledge of KMC | | | X2 | df | P value |
|---|---|---|---|---|---|---|---|
| | | **Poor N(%)** | **Good N(%)** | **Excellent N(%)** | | | |
| Gender | Female | 9(50.0) | 31(54.4) | 140(57.4) | 0.489[a] | 2 | 0.783 |
| | Male | 9(50.0) | 26(45.6) | 104(42.6) | | | |
| Age | 18-23 | 9(50.0) | 12(21.1) | 41(16.8) | 21.920[a] | 6 | 0.001* |
| | 24-29 | 3(16.7) | 27(47.4) | 81(33.2) | | | |
| | 30-35 | 2(11.1) | 15(26.3) | 80(32.8) | | | |
| | 36-49 | 4(22.2) | 3(5.3) | 42(17.2) | | | |
| Religion | Catholic | 6(33.3) | 16(28.1) | 46(18.9) | 34.919[a] | 8 | 0.000* |
| | Protestant | 11(61.1) | 29(50.9) | 90(36.9) | | | |
| | Moslem | 0(0.0) | 1(1.8) | 82(33.6) | | | |
| | Adventist | 0(0.0) | 7(12.3) | 14(5.7) | | | |
| | Born again | 1(5.6) | 4(7.0) | 12(4.9) | | | |
| Course of study | BNS | 0(0.0) | 12(21.1) | 40(16.4) | 36.435[a] | 8 | 0.000* |
| | DNS | 1(5.6) | 0(0.0) | 39(16.0) | | | |
| | BNSC | 3(16.7) | 12(21.1) | 58(23.8) | | | |
| | DNE | 2(11.1) | 6(10.5) | 52(21.3) | | | |
| | ECN | 12(66.7) | 27(47.4) | 55(22.5) | | | |
| Year of Study | Year one | 0(0.0) | 4(7.0) | 44(18.0) | 17.595[a] | 6 | 0.007* |
| | Year two | 17(94.4) | 34(59.6) | 120(49.2) | | | |
| | Year three | 1(5.6) | 14(24.6) | 59(24.2) | | | |
| | Year four | 0(0.0) | 5(8.8) | 21(8.6) | | | |

Table 3: Practices of nursing students towards KMC

| Variable | Category | N(%) |
|---|---|---|
| Supported mothers to initiate KMC | Yes | 248(77.7) |
| | No | 71(22.3) |
| Provide information to the parents/family members on kangaroo mother care | Yes | 251(78.6) |
| | No | 68(21.3) |
| Encouraged mothers to practice KMC | Yes | 278(87.1) |
| | No | 41(12.8) |
| Assisted mothers to practice KMC | Yes | 263(82.4) |
| | No | 56(17.6) |
| The practice of kangaroo mother care effectively implemented in the facility | Yes | 238(74.6) |
| | No | 81(25.3) |
| Mothers of low birth weight babies practice KMC continuously | Yes | 258(80.8) |
| | No | 61(19.1) |

35 years had higher odds of knowledge of KMC. These study results are similar to the study results of (Al-Shehri & Binmanee, 2021) which revealed a significant association between adult ICU nurses compared to junior nurses. However, in this study results can be explained by the fact that the majority of our participants are between ages 24-35 years and usually are in their clinical areas where they are practicing KMC.

Study findings in this current study revealed a significant relationship between religion and knowledge of KMC. Being a Christian had higher odds of KMC.

### *4.2. The practice of nursing students towards KMC*

Effective KMC for LBW babies is initiated in the hospital after the condition of the baby is stabilized. Infants who are not stable and require medical attention can practice intermittent KMC (spending some hours in the KMC position, gradually increasing the time as the baby gets stronger). Early discharge after delivery is a hallmark of the KMC approach and occurs when the baby is suckling well and growing, and when the mother or family caregiver demonstrates competency in caring for the baby on her own. The pair is discharged to continue KMC at home with an agreed-upon schedule for follow-up visits at the hospital, outreach clinic, or at home to monitor the health of the baby.

Study findings indicate that most of the participants always supported mothers to initiate KMC (77.7%). This study's results in consistent with results from a study by(kdecamp, 2011), which indicated that in healthcare nurses play a bigger role and should be knowledgeable for effective practice. In this current study nursing students during practicum and always doing hands-on work to improve their psychomotor skills hence this accounts for the increased interactions with mothers on KMC indicated in this current study.

Furthermore, in this study, most of the nursing students provide information to the parents/family members on kangaroo mother care (78.6%) and encouraged mothers to practice KMC (87.1%). This is in line with results from a study by (Adisasmita et al., 2021) which indicated that most nurses communicated with the mothers showing them practically how to go through the exercise of KMC as well as explaining to them the benefits. In this current study nursing students take such opportunities since they help them to boost their experience in interacting with patients which is usually essential in their practicum exams.

More so, nursing students in this study assisted mothers to practice KMC (82.4%) and practice of kangaroo mother care effectively implemented in facilities 74.6% and continuously. These results in the current study are in line with what was earlier mentioned in a study by (Yang et al., 2022) where nurses and other healthcare workers ensured that mothers carried out KMC correctly by observing them during the procedure. In addition, the behavior of nurses during clinical training is used to witness return demonstrations to be sure if knowledge has been communicated or not.

## 5. Limitation

This study faced financial constraints that prevented us from involving more than two institutions due to a limited budget.

## 6. Conclusion

The general level of knowledge and practice towards KMC was deemed adequate. They wanted to find out more about KMC. It is crucial to establish suitable guidelines and a specialized Kangaroo Mother Care unit in health facilities in Uganda because practically all participants agreed that KMC is advantageous to newborns and that its usage should be promoted.

## 7. Recommendations:

### *7.1. To nursing practices:*

To inform nurses of the effectiveness and positive outcomes of kangaroo care for infants and parents, nursing education must be strengthened.

### *7.2. To mothers:*

All mothers attending prenatal and postnatal clinics should be made aware of the value of KMC during health education sessions by healthcare professionals, including student nurses, as well as by their partners.

### *7.3. To the community:*

By establishing a community-based program on kangaroo care, locals may be inspired to actively advance the practice of Kangaroo Mother Care.

## 8. Funding.

This study was self-funded to fulfill the academic requirement

## 9. Conflict of interest:

There was no conflict of interest from the start upto the end of this study

## 10. Acknowledgements

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## 11. Abbreviations and Acronyms

DHIS: District Health Information System
KMC: Kangaroo Mother Care
LBW: Low Birth Weight
NDHS: National Demographic Health Survey
RDS: Respiratory Distress Syndrome
SPSS: Statistical Package for Social Science
WCH: Windhoek Central Hospital
WHO: World Health Organization

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