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Acceptability of Kangaroo Mother Care (KMC) by Mothers with Low-Birth-Weight Babies at Arthur Davison Children's Hospital, in Ndola, Zambia

Julia D. Kalito, Maureen M. Masumo, Chapima Fabian

Department of Midwifery, Women's and Child Health, University of Zambia, Lusaka, Zambia
Email: jdkalito@yahoo.com

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Abstract

Background: Kangaroo Mother Care is a simple safe method used to care for low-birth-weight babies. Low-birth-weight is a global public health issue that pose significant challenge to perinatal care systems. Globally, complications due to low-birth-weight are the leading cause of neonatal mortality, resulting in an estimated 1 million deaths annually. Kangaroo Mother Care (KMC) is a low-cost method of care for low-birth-weight infants in areas with inadequate incubators and power outages with positive outcomes. **Objectives:** To assess factors influencing acceptability of Kangaroo Mother Care (KMC) in NICU at Arthur Davison Children's Hospital in Ndola, Zambia. **Methodology:** A cross sectional quantitative analytical study design was used. The study was conducted at Arthur Davison Children's Hospital (ADCH) in Ndola, Zambia. The purposive sampling method was used to select the study participants and a total of 129 mothers with Low Weight Babies A were selected to participate structured closed ended questionnaire was used to collect data from the participants using an interview. Data was analyzed using a Statistical Package for Social Scientists (SPSS) software version 26. Cross tabulations were done to determine association of variables using a Chi square (x^2) test at 95% confidence interval and were assumptions where not met, fishers exact test was used. Multivariate binary logistic regression analysis was used to quantify the relationship between the dependent and independent variables. **Results:** Most of the respondents had male babies 77%, 69% of the babies weighed 1000 g - 1400 g, majority 79% had normal delivery, 71% of the respondents were multigravida and most of the respondents 79% were married. The study reviewed that 85% of those who attained secondary education accepted KMC, 74% of the respondents without monthly income accepted KMC, 80% of the respon-

dents had positive attitude and accepted KMC. 82% of the respondents who had positive perception accepted KMC. **Conclusion:** Acceptance of Kangaroo Mother Care (KMC) among 75% of the mothers underscores its widespread favourability as a beneficial method for infant care.

Keywords

Acceptability, Kangaroo Mother Care, Low Birth Weight Babies

1. Introduction

Chapter one begins with the background, problem statement, general objective, specific objectives, research questions and significance. Key concepts in the study were defined to provide the reader with some insight on acceptability of Kangaroo Mother Care (KMC). Furthermore, the chapter presents other components of the study which includes theoretical framework, conceptual and operational definition of terms used in this study and factors influencing acceptability of KMC. Lastly, the chapter outlines the dependent and independent variables and provides an illustration of these variables.

1.1. Background of the Study

Kangaroo Mother Care is a low-cost method of care for premature/low birth weight infants' in areas with inadequate incubators and power outages [1]. It was first initiated in Colombia due to shortages of incubators [2]. Kangaroo Mother care (KMC) involves low-birth weight babies being placed in an upright position against the caregiver's chest, with early skin-to-skin contact between the caregiver and infant [3] [4]. The infant is secured with a wrap that goes around the mother's naked torso, providing the infant with proper support and positioning, stable restraint without pressure points, and warmth. The mother may wear a front open shirt or hospital gown and place a blanket over the wrap of the newborn for covering [4]. This type of care is a low-cost method of care for low-birth-weight infants in areas with inadequate incubators and power outages [5] [6].

Kangaroo Mother Care (KMC) was endorsed by the World Health Organisation as a low cost, safe, and effective intervention in reducing morbidity and mortality among low-birth-weight infants [7]. Evidence-based studies showed that the efficacy of KMC reduces mortality and morbidity in preterm neonates, prevent hypothermia and infection, improve maternal-infant attachment and increase the duration of exclusive breastfeeding. The government of Zambia through Ministry of Health (MoH) conducted a study in 2016 on factors leading to increased neonatal mortalities and the results showed that hypothermia was the leading cause of death in low-birth-weight babies in hospitals with inadequate incubators following investigations from the various Neonatal/Paediatrics departments in the country. According to Zambia Demographic Health Survey

(ZDHS), neonatal mortality rate was very high in Zambia at a rate of 24/1000 live birth [8]. Despite the benefits of KMC, some mothers are not comfortable to practice it [9]. A study conducted in Ghana showed that in some areas it is common to carry babies on the back, therefore, it seemed strange to place a baby in front [10]. A study conducted in South Africa on Knowledge and attitudes of nursing staff and mothers towards Kangaroo Mother Care in the eastern sub-district of Cape Town, showed that the main identified obstacles to acceptability of KMC were; the mothers' lack of KMC knowledge, and a lack of KMC training of all nursing staff (antenatal clinic and hospital), and the mother's feelings of being isolated from their spouses and families [11]. WHO published new recommendations on the care of the low-birth-weight babies. This reflected new evidence that simple interventions such as Kangaroo Mother Care (KMC) immediately after birth, early initiation of breastfeeding, use of continuous positive airway pressure (CPAP) and medicines such as caffeine for breathing problems substantially reduced mortality in preterm and low birthweight babies. This guidance stressed on the need to ensure the mother and family take the pivotal role in caring for the baby. Mothers and newborns were encouraged to remain together from birth and not be separated unless the baby was critically ill. Acceptance of the KMC method is increasingly widespread and it is considered to be equivalent to conventional neonatal care [12]. A study conducted on skin-to-skin care for term and LBW infants in the neonatal ICU also reported that Kangaroo Mother Care increases milk production and mothers breastfeed for longer periods [13].

A study done on the perception and practice of KMC after discharge from women and newborn hospitals, revealed that the majority of mothers perceived KMC to be good, because it provided warmth to preterm babies [14]. In a study conducted in Malawi at Zomba and Bwaila hospitals to assess the knowledge of mothers on KMC, the results revealed that mothers had a positive attitude towards practicing KMC and had high knowledge of the importance and benefits of KMC [15].

Furthermore, mothers who practice Kangaroo Mother Care were more likely to breastfeed exclusively and, on average, they breastfed three months longer than those who didn't practice skin-to-skin care [16]. Similarly, in the study done in Kenya on motivation and barriers to Kangaroo Mother Care amongst health care providers, 98% agreed that the practice provides warmth to the baby, 93% believed KMC promotes exclusive breastfeeding, and 99% affirmed that KMC promotes safety and bonding [14]. The longer the care duration is, the greater the benefits obtained from it and the better consequences of physical, mental and emotional development are for the low-birth-weight infant (ibid). Therefore, it was critical to understand whether this type of care has been accepted by mothers of low-birth-weight infant as a method of care. Furthermore, it was cardinal to establish if there are any factors that influence KMC acceptability. This study is aimed at assessing acceptability of the KMC among mothers with low-birth weight babies at ADCH.

1.2. Statement of the Problem

Despite overwhelming evidence on the benefits of KMC on low-birth-weight-babies, hypothermic related conditions were the leading cause of neonatal mortalities among others factors [17]. NICU ward have inadequate incubators to accommodate low-birth-weight babies. There are 7 incubators in NICU and among them only two are functioning [17]. The number of low-birth-weight-babies admitted daily in NICU at ADCH was 5 - 7 babies. The number of incubators compared to the number of admissions were insufficient. To combat this, KMC was introduced in 2017 at ADCH. KMC provides warmth, contributes to weight gain in low-birth-weight babies and improves emotional attachment in mothers [18]. KMC has shown benefits for homeostasis and low birth weight infants who receive this care are more likely to maintain a healthy body temperature, and show increased cardio respiratory stability.

1.3. Significance of the Study

There was little or no evidence on acceptability of Kangaroo Mother Care among mothers with low-birth-weight babies at ADCH. Key findings from this study will provide the Ministry of Health in Zambia, donors, policy makers and other stakeholders with valuable information to design ways of improving acceptability of Kangaroo Mother Care (KMC). The results will also serve as a starting point for researchers and program implementers looking to improve KMC programs in the country.

1.4. Conceptual Framework

In this study, theory of acceptability has been used to help understand human behavior in acceptance of Kangaroo Mother Care among mothers of low-birth-weight babies. The conceptual framework of acceptability is innovative and provides conceptually distinct constructs that are proposed to capture key dimensions of acceptability among the mothers.

Conceptual Framework of Acceptability

Table 1 shows an increase in the numbers of deaths of low-birth-weight infants who had hypothermic related complications over the period of four years at ADCH.

The conceptual framework of acceptability (CFA) was developed in response

Table 1. Number of babies admitted and died with hypothermic related complications

Year	Total number of Admissions	No. of Deaths related to hypothermia	Percentage
2016	184	104	57%
2018	218	128	59%
2020	262	159	61%
2022	208	141	67%

to recommendations that acceptability of health care interventions should be assessed in the design, evaluation and implementation phases of healthcare interventions [19]. ADCH is at the implementation stage. A multi-faceted construct that reflects the extent to which people delivering or receiving a healthcare intervention consider it to be appropriate, based on anticipated or experienced cognitive and emotional responses to the intervention (ibid). The CFA consists of seven component constructs (affective attitude, burden, ethicality, intervention coherence, opportunity costs, perceived effectiveness, and self-efficacy) however; only three components have been adapted in this study. These components (attitude, knowledge and perceived effectiveness) can help to identify characteristics of interventions that may be assessed. The Conceptual Framework of Acceptability (CFA) can guide assessments of intervention acceptability across three temporal perspectives (before, during and after participation in an intervention) and from the perspectives of intervention deliverers and recipients [20] (**Figure 1**).

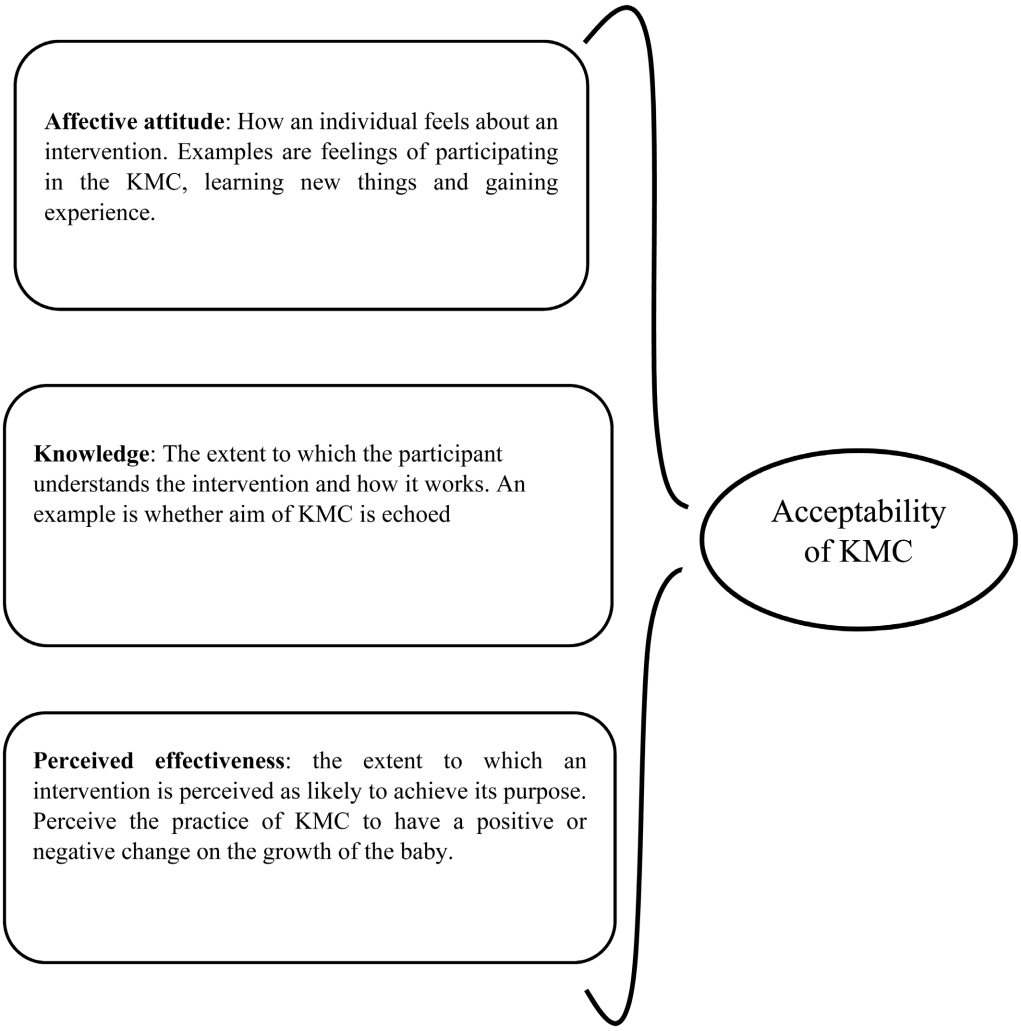

Figure 1. Diagram showing constructs of KMC acceptability by mothers caring for their low-birth-weight infants adapted from Sekhon *et al.*, 2017.

Application of the CFA to acceptability of KMC

Attitude: How an individual feel about an intervention. This construct is related and put to the mother's feelings about practicing KMC. Mothers with a positive attitude are more likely to practice KMC. An example is a mother feeling to be in the position where they can play a meaningful role in the care of their infant through KMC than when they are in the incubator, gaining experience and learning new things like care of the LBW infant, the socialization and experience sharing with other mothers, the strengthening of the bond between mother and baby; the positive effect on breastfeeding, the less stress felt and the immeasurable support to low-income families [20].

Knowledge: The extent to which the participant understands the intervention and how it works. Knowledge is understood as the extent to which participants recognize the benefits of KMC. Mothers who have adequate knowledge on KMC are expected to practice KMC as indicated. An example is a mother who echoes that "*it keeps the baby warm like in an incubator thanks to the skin-to-skin contact. It allows the baby to develop well and to be exclusively breastfed when possible*" [21].

Maternal perception: This construct is understood as the extent to which the intervention is perceived as likely to achieve its purpose. An example is a mother who perceives KMC to be an effective method for *baby* survival is likely to practice KMC [20].

1.5. General Objective of the Study

To assess factors influencing acceptability of Kangaroo Mother Care (KMC) in NICU ward at Arthur Davison Children's Hospital in Ndola, Zambia.

1.6. Specific Objectives

The specific objectives of the study will be:

1) To determine acceptability of KMC among mothers admitted with low-birth-weight babies.

2) To establish the effect of knowledge levels on acceptability of KMC among mothers of low-birth-weight babies.

3) To assess how attitude towards KMC influence acceptability among mothers of low-birth-weight babies.

4) To identify maternal perception on KMC and how it influences acceptability of KMC among mothers admitted with low-birth-weight babies.

1.7. Research Questions

1) What is the level of acceptability of KMC among mothers with low-birth weight babies?

2) What are the knowledge levels of acceptability of KMC among mothers with low-birth weight babies?

3) What is the attitude acceptability of KMC among mothers with low-birth

weight babies?

4) How is the maternal perception on acceptability among mothers with low-birth-weight babies?

1.8. Conceptual Definitions

1) Acceptability: It is the degree to which an intervention is agreed or approved by most people in the community [22].

2) Low-birth-weight baby: This is when the baby is born with less than 2500 g birth weight in regardless of the gestational age [2].

3) Mother: A woman who undertakes the responsibilities of a parent towards a child or a woman in relation to a child or children to whom she has given birth [23].

4) Premature baby: This is a baby that is born too early before 37 weeks of gestation [6].

5) Health care professionals: A health care professional is a person who is qualified and allowed by regulatory bodies to provide health care service to a patient.

6) Practices: To practice is to perform or work repeatedly to become proficient

7) Kangaroo mother care: Kangaroo Mother Care A universally available and biologically sound method of care for all newborn babies, but in particularly for premature babies with weight less than 2500 g. It has 3 components, skin to skin contact, exclusive breast feeding and support to the mother/infant.

8) Low-birth-weight: Low birth weight (LBW) is when a baby weighs less than 2500 g at birth.

1.9. Operational Definitions of Concepts

To avoid misunderstanding, it is critical to know various concepts that are being used on the research topic under study. Therefore, the following key terms should be understood in the context of this study (**Table 2**):

1) Acceptability: Mothers of preterm/low-birth-weight babies who will agree to sleep with the baby and place the baby in an upright position skin to skin between their breast continuously or at least not less than 20 hours a day. Acceptability will also be measured using a score sheet from 1 to 10 on a score sheet.

2) Attitude: An attitude is defined as a mental position about a fact or state, or a feeling or emotion towards something.

3) Knowledge: The condition of knowing something with familiarity gained through experience or association.

4) Perception: The way in which the mothers with LBWB will interpret KMC

1.10. Study Variables

1) Dependent Variable

Acceptability of Kangaroo Mother Care (KMC).

2) Independent Variables

a) Knowledge on KMC;

Table 2. Variables, cutoff points and indicators.

TYPE OF VARIABLE	CUT-OFF POINTS	INDICATOR
DEPENDENT VARIABLE		
Acceptability of Kangaroo Mother Care (KMC)	Accepted	Mothers who will accept to practice KMC continuously or for at least not less than 15 - 20 hours a day. A score of 10 - 14 indicates the mother has accepted to practice KMC.
	Not accepted	Mothers who will not accept to practice KMC continuously or stay with the baby for at least less than 15 hours a day. A score of 9 and below indicates the mother refused to accepted to practice KMC.
INDEPENDENT VARIABLES		
Knowledge on KMC	High	Mothers who will score 28 - 32 on knowledge about KMC.
	Low	Mothers who will score 27 and below on knowledge about KMC.
Attitude	Positive	When respondent gets 5 or more on the Likert scale.
	Negative	When respondent gets less than 4 on the Likert scale.
Maternal Perception	Positive	Respondent scores 5 and more if her perception is positive.
	Negative	Respondent scores 4 and below if her perception is negative.

b) Attitudes towards acceptability of KMC;

c) Maternal perception.

2. Literature Review

2.1. Introduction

This chapter presents a review of literature on acceptability of Kangaroo Mother Care (KMC) by mothers of low-birth-weight babies as a method of care at ADCH. The chapter extensively illustrates the research studies already conducted relating to acceptability of Kangaroo Mother Care at ADCH. Information discussed in this literature review was sourced from the journals, research text books and previously published research work from google scholar, CINAHL, PubMED and the Cochraine Library. The literature has been discussed under the study variables acceptability, knowledge, attitude, maternal confidence and maternal perception on KMC. This review will assist in establishing what has been done or is known about the topic and to identify gaps in the existing literature.

2.2. Acceptability of Kangaroo Mother Care

A study conducted by Tessier *et al.* [24] in France found that KMC was well-accepted by parents, and was associated with a significant reduction in hospital length of stay for premature infants. Similarly, a study conducted by Blomqvist *et al.* [25] in Sweden found that parents and healthcare professionals perceived KMC as a positive experience that helped to promote bonding between the mother and infant. Similarly, a study conducted by Beiranvand *et al.* [26] in Iran found that while KMC was generally well-accepted by parents, cultural barriers and lack of support from family members could limit its adoption. Despite the existing evidence on the acceptability of KMC, several gaps remain in these studies. The studies focused on specific countries or regions, and there is a need for more comprehensive studies that investigate the acceptability of KMC.

Many of the existing studies have relied on qualitative methods, and there is a need for more quantitative studies that can provide more robust evidence on the acceptability of KMC [26]. While there is some evidence on the acceptability of KMC in Europe, there is still a need for more comprehensive and quantitative studies that investigate the perspectives of care takers. This study will provide more robust evidence on the acceptability of KMC in this context and help to inform policies and practices that promote its adoption and implementation.

2.3. Knowledge Levels on KMC among Mothers of Low-Birth-Weight Babies

A study in India reported that only 29.6% of mothers had heard of KMC, and only 18.4% knew how to practice it [27]. Another study in Nigeria found that 67.5% of mothers had heard of KMC, but only 20.5% had adequate knowledge of the intervention [28]. A study in Ethiopia reported that 46.5% of mothers had heard of KMC, and 35.7% had a good level of knowledge about the intervention [29]. The studies also identified factors associated with low knowledge levels of KMC among mothers of LBW babies. These factors include low education levels, lack of awareness, and inadequate counseling by healthcare providers [27] [28] [29].

The findings of the studies reviewed suggest that knowledge levels on KMC among mothers of LBW babies are generally low. This may contribute to the underutilization of KMC in many settings. The identified factors associated with low knowledge levels suggest that education and awareness-raising interventions targeting mothers and healthcare providers could improve knowledge levels on KMC. However, the reviewed studies had some limitations. Firstly, they were conducted in different regions and used different methods to assess knowledge levels, which makes it difficult to compare the findings. Secondly, the studies were conducted among different populations, which may limit the generalizability of the findings.

A study in Zimbabwe found that mothers had limited knowledge of KMC and did not fully understand the benefits of skin-to-skin contact [30]. Similarly, a

study in South Africa found that mothers and healthcare providers had limited knowledge of KMC and the benefits of skin-to-skin contact [31]. Despite these findings, there is a need for further research in this area. One possible reason is that these studies have focused on specific regions or countries, and the findings may not be generalizable to other settings. Another reason is that the existing studies have used different methods to assess knowledge, which may affect the validity and reliability of the results. The literature on the knowledge of KMC among mothers with LBW infants suggests that mothers had limited knowledge and understanding of the intervention. Despite this, there is a need for further research in this area, using consistent and reliable methods to assess knowledge. The study by Asresie *et al.* [29] aimed to assess the practice of KMC and associated factors among mothers of low-birth-weight infants in public hospitals of Sidama zone, Southern Ethiopia. In the study, 509 mothers were interviewed, and the findings indicated that 59.5% of the mothers had heard about KMC. However, only 31.4% of the mothers had adequate knowledge of KMC, while the majority (68.6%) had inadequate knowledge.

The study also identified factors associated with inadequate knowledge, including lower educational status of mothers, being employed in a job other than farming, and having no prior experience of KMC. The authors concluded that there is a need to improve awareness and education on KMC among mothers of low-birth-weight infants in the study area. A study by Preece *et al.* [32] conducted in a tertiary hospital in South Africa found that while 89.7% of mothers had heard of KMC, only 57.8% knew what it entailed. A study by Ndirangu *et al.* [33] conducted in a hospital in Kenya found that only 18% of mothers had ever heard of KMC before delivery. These findings suggest that knowledge of KMC among mothers of low-birth-weight infants in Southern Africa is low, with some studies reporting knowledge levels as low as 18%.

In a study by Muzeya *et al.* [21] conducted in Lusaka, Zambia, only 29.1% of mothers had heard about KMC before delivery, and 37.8% had heard about it after delivery. Only 27.5% of mothers had good knowledge of KMC. Another study by Phiri *et al.* [34] conducted in two hospitals in Lusaka, Zambia found that 45.4% of mothers had heard about KMC before delivery, while 52.2% had heard about it after delivery. Only 34.3% of mothers had good knowledge of KMC. These findings suggest that there is low knowledge of KMC among mothers of low-birth-weight infants in Zambia as well. Education and awareness-raising interventions targeted at mothers and their families may help improve knowledge levels and increase uptake of KMC.

The studies reviewed in this literature review suggest that knowledge about KMC among mothers of low-birth-weight babies in Africa is generally low. However, there is a significant variation in knowledge levels across countries and regions, with some studies reporting higher levels of knowledge.

Furthermore, the gaps in the existing literature suggest that there is a need for more research on knowledge influence on KMC among mothers of low-birth-weight babies, particularly in specific cultural and social contexts. This research

could help to develop targeted and culturally sensitive interventions to increase knowledge and promote the adoption of KMC in different settings. There is a clear need for further research on knowledge about KMC among mothers of low-birth-weight babies in Africa and globally. Such research could help to inform the development of effective interventions to promote KMC and ultimately improve the health outcomes of low-birth-weight infants.

2.4. Attitudes towards KMC

A study by Kadam *et al.* [35] conducted in a tertiary care hospital in Maharashtra, India, found that mothers had a positive attitude towards KMC. The study reported that 86% of the mothers were willing to practice KMC and considered it a safe and effective intervention. The study also found that mothers who had received information about KMC from healthcare providers were more likely to have a positive attitude towards the intervention. Another study by Kansal *et al.* [36] conducted in a neonatal intensive care unit (NICU) in New Delhi, India, reported a positive attitude towards KMC among healthcare providers. The study found that nurses and doctors had a good knowledge of KMC and considered it a safe and effective intervention for the care of low-birth-weight infants.

However, the study also identified some barriers to the implementation of KMC, such as lack of training and support from hospital administration. A study by Kumar *et al.* [27] conducted in a government hospital in Punjab, India, reported mixed attitudes towards KMC among healthcare providers. The study found that while some healthcare providers had a positive attitude towards KMC, others were reluctant to adopt this intervention due to concerns about infection control and lack of training. Overall, the findings on attitude towards KMC in India suggest a generally positive attitude towards this intervention among both mothers and healthcare providers.

A study by Bauer *et al.* [37] conducted in a neonatal intensive care unit (NICU) in Ohio, USA, reported a positive attitude towards KMC among healthcare providers. The study found that nurses and physicians had a favorable attitude towards KMC and perceived it as a safe and effective intervention for low-birth-weight infants. However, the study also identified some barriers to the implementation of KMC, such as lack of support from hospital administration and concerns about infection control.

2.5. Perception of KMC by Mothers

Kangaroo Mother Care (KMC) is a low-cost, evidence-based intervention that involves continuous skin-to-skin contact between the mother and her preterm or low birth weight baby. While numerous studies have highlighted the benefits of KMC for both infants and mothers, little is known about mothers' perceptions of this practice. Studies have shown that the perception of KMC by mothers in Europe is positive. In a study conducted in Italy, mothers reported feeling closer to their infants and experiencing a deeper emotional connection through KMC

[38]. Similarly, a study conducted in Sweden found that mothers perceived KMC as a positive experience and reported a deeper understanding of their infants' needs [39].

Furthermore, a study conducted in Spain found that mothers reported feeling empowered by the opportunity to provide KMC for their infants and described it as a positive experience [40]. Similarly, a study conducted in the United Kingdom found that mothers reported feeling more confident in caring for their infants through KMC [41]. The findings of this literature review suggest that the perception of KMC by mothers in Europe is positive, with mothers reporting feeling closer to their infants and experiencing a deeper emotional connection through KMC. Mothers also reported feeling empowered by the opportunity to provide KMC for their infants and described it as a positive experience. The positive perception of KMC by mothers in Europe highlights the potential for successful implementation of KMC programs in the region.

Overall, the available evidence suggests that mothers in Southern Africa generally have a positive perception of KMC and report numerous benefits. However, further research is needed to explore the perceptions of mothers from diverse cultural backgrounds and to identify strategies to promote the wider adoption and sustained practice of KMC in Southern Africa. A study by Chibwe *et al.* [42] explored the experiences of mothers and healthcare providers with KMC at the University Teaching Hospital in Lusaka, Zambia. The study found that mothers who practiced KMC had positive perceptions of the intervention, with many expressing satisfactions with the care they received. Mothers felt that KMC was a natural way of caring for their babies, and they appreciated the bonding that occurred during skin-to-skin contact. However, some mothers also expressed concerns about the duration of the KMC intervention, as well as the lack of privacy and support from family members. Another study by Phiri and Kaisi [34] conducted a narrative review of literature on the association of KMC with infant morbidity and mortality in Zambia. The study found that mothers who practiced KMC had positive perceptions of the intervention, with many reporting increased confidence in caring for their babies. However, the study also identified barriers to KMC implementation in Zambia, including lack of knowledge and skills among healthcare providers, lack of equipment and supplies. A study by Zgambo *et al.* [43] explored the factors influencing the uptake of KMC in rural Zambia. The study found that mothers had positive perceptions of KMC, with many perceiving it as a natural and effective way of caring for their babies.

However, the study also identified barriers to KMC uptake, including lack of knowledge and awareness of the intervention, lack of support from family members and healthcare providers, and cultural beliefs and practices.

2.6. Conclusion

In conclusion, the literature on the acceptability of KMC among parents in Zambia suggests that the practice is generally well-received by parents. However,

there are still barriers to its widespread adoption, such as lack of knowledge, awareness, and confidence in the practice. This study is needed to better understand these variables among the cultural diversity and confidence in KMC among parents in Zambia. Additionally, this research could explore the attitudes of parents towards KMC and how these attitudes influence their willingness to practice it. Ultimately, this research could inform the development of targeted interventions aimed at increasing knowledge, awareness, confidence, and positive attitudes towards KMC among parents in Zambia, ultimately improving the health outcomes of infants and promoting maternal-infant bonding and attachment.

3. Methodology

3.1. Introduction

This chapter describes the methodology that was used to conduct the research. The research approach, research design, study population, sample size and data collection techniques were all discussed in detail in this chapter. Explanation on how the researcher would ensure validity and reliability, the ethical considerations that were considered, how the pilot study was conducted, the plan for data analysis and plans for dissemination of research findings.

3.2. Study Design

A cross sectional quantitative analytical study design was used. This design aimed to gather data at a specific point in time to describe acceptability of KMC by mothers with LBWB. This design involved collecting data from a sample of participants without any manipulation or intervention by the researcher. A quantitative analytical cross section study design was chosen because it did not require a lot of time to complete the survey and the results were known immediately. Further, the study design allowed the researcher to collect a large amount of data from a large sample size on a variety of subjects. It used visual aids such as graphs and charts thus, interpretation and presentation of data is simplified.

3.3. Study Setting

The study was conducted at Arthur Davison Children's Hospital (ADCH) in Ndola. The study setting was selected selected because it receives a large number of referrals from within Ndola district as well as other health facilities outside Copperbelt. ADCH has a dedicated area where mothers of low-birth-weight babies are accommodated. This ward provided a supportive environment for mothers to stay in close proximity to their infants and practice KMC. The hospital has dedicated counseling rooms where healthcare professionals conduct educational sessions and provide information to mothers about KMC.

3.4. Study Population

The target population in the study were all mothers with LBWB admitted to

ADCH NICU and were available at the time of the study and consented to participate.

3.5. Sampling Method

The study setting was purposively selected after annual reports at the hospital indicated challenges with acceptance of KMC by mothers with LBWB. Respondents who were selected were included in the study because they happened to be in the right place at the right time and were simply entered into the study. The participants were found in NICU as they waited to take care of their LBWB.

3.5.1. Inclusion Criteria

All mothers with LBWB who were admitted in NICU ward KMC unit at ADCH and consented to participate in the study were included in the study. Only mothers who were admitted for more than 5 days at the hospital were considered in the study.

3.5.2. Exclusion Criteria

The study excluded mothers who gave birth to multiple low-birth-weight babies (e.g., twins, triplets) due to potential confounding factors or logistical challenges associated with practicing KMC for multiple infants simultaneously.

3.5.3. Sample Size

The study used adjusted Cochran's sample size calculation formula for estimating a proportion. The assumptions of the formula are [44]: the formula assumed that the sample was selected randomly from the target population. Random sampling helped ensuring that the sample is representative of the population and reduces the potential for bias, the formula assumes that the observations within the sample were independent of each other. In other words, the responses or outcomes of one participant did not influence the responses or outcomes of other participants in the sample, the formula assumed that the proportion of interest (p) was fixed and did not vary within the population. This means that the estimated proportion obtained from the sample was accurately represented as the true proportion in the population, the formula assumed that the sampling distribution of the proportion be approximated by a normal distribution. This assumption was valid if the sample size was sufficiently large, typically when both np and nq are greater than 5, where n is the sample size and p and q are the estimated proportions.

- n is the required sample size;
- Z is the Z-score corresponding to the desired level of confidence (e.g., 1.96 for a 95% confidence level);
- p is the estimated proportion (prevalence);
- q is $1 - p$ (the estimated proportion of the population not meeting the criteria)
- E is the desired margin of error.

Sample size calculation:

$$n = \left(1.96^2 * 0.5 * (1-0.5)\right) / 0.05^2$$
$$= \left(3.8416 * 0.5 * 0.5\right) / 0.0025$$
$$= 0.9604 / 0.0025$$
$$384.16$$

Therefore

$$\text{Nf} = 385 / (1 + 385/285)$$
$$= 385 / (1 + 1.3509)$$
$$= 385 / 2.3509$$
$$= 163.95$$

The sample size was 164 mothers with LBWB.

3.6. Data Collection Plan

3.6.1. Data Collection Tools

In this study, a structured closed ended questionnaire was used to collect data from the participants using an interview. The structured questionnaire was developed based on the literature reviewed in the study.

3.6.2. Data Collection Technique

Data was collected by the researcher over a period of 90 days. The procedure for data collection was as follows; the investigator got permission from Copperbelt Provincial Health Office and ADCH respectively to carry out a pilot and the main study. Before carrying out the study, the researcher introduced herself to the respondents and explained the purpose of the study. Later on, she reassured the respondents of confidentiality and anonymity and feedback was given to the respondents. After obtaining the consent from the respondents to carry out the interview, the researcher read out the questions and recorded the responses. At the end of the interview, the researcher went through the questionnaire to check for consistence in the answers given and for completeness. Then the researcher asked the respondents for any questions, comments or contributions regarding the study and thereafter, thanked them for their participation. Each interview on average lasted for about 30 minutes per respondent.

3.6.3. Data Management and Storage

The researcher ensured that the data collected was well managed and stored. Collected data was stored in a lockable cupboard and the researcher was the custodian of the keys. Soft copies were saved on a Password protected computer, and the Password was only known by the researcher.

3.7. Ethical Considerations

Ethical clearance of the study was obtained from the University of Zambia Biomedical Research Ethics Committee (UNZABREC) with approval number 4450-2023, the National Health Research Authority reference number NHRA0003/26/10/2023, Ndola Teaching Hospital and ADCH.

Preterm infants and their mothers are vulnerable populations. Special consid-

eration was given to their well-being. The privacy and confidentiality of participants personal and medical information was honoured. Anonymized data when reporting results had been used to maintain confidentiality.

3.8. Validity and Reliability

Validity was maintained by reviewing literature extensively on the variables of interest. To ensure validity of the instrument, questions were specific, simple and brief. The study used the structured questionnaire. The questionnaire was also pretested. The study ensured reliability by standardizing the measurement. The research tool was tested before the main study was conducted using a pilot study in an environment with similar characteristics as the environment in which the main study was conducted. This was done to ensure stability of the data collection tool. The instrument brought out the accurate information whereby if the same instrument were to be used after some time, it would produce the same responses.

3.9. Pilot Study

The pilot study was conducted in SCBU at Ndola Teaching Hospital, Ndola, Copperbelt, Zambia. Respondents who participated in the pilot were not included in the main study. The pilot study was conducted in order to identify flaws in the data collecting tool and to establish whether the variables would be measurable. The study sample for the pilot constituted 10% of the main study sample and semi structured interview schedule was used to collect data from the respondents. The researcher made corrections on the questionnaire before the actual study was embarked upon.

3.10. Chapter Summary

The chapter described the research methodology that was used. The research design was a community based quantitative descriptive cross sectional in nature. The sample size, sampling techniques and a questionnaire as primary data collection instrument were described. The questionnaire developed was piloted and tested before a refined one was administered to the respondent.

4. Data Analysis and Presentation of Findings

4.1. Introduction

Chapter four focuses on data analysis and presentation of findings. Data was collected from NICU ward at Arthur Davison Children's Hospital, Kangaroo Mother Care Unit from one twenty-nine (129) postnatal mothers with low-birth-weight babies using a questionnaire. The researcher was able to gather data from 129 respondents instead of the initially targeted 164 respondents due to time limitation during data collection phase of the research.

4.2. Data Analysis and Presentation of Findings

Data was analyzed using a Statistical Package for Social Scientists (SPSS) soft-

ware version 26. Cross tabulations were done to determine association of variables using a Chi square (x^2) or test at 95% confidence interval and where assumptions where not met, fishers exact test was used. Binary logistic regression analysis was done using bivariate logistic regression analysis.

4.3. Presentations of Findings

The findings have been presented using the frequency tables which were presented for each of the independent variables to indicate proportions of categories within each respective variable.

4.3.1. Section A: Demographic Characteristics

This section presents the demographic characteristics of the study participants. A frequency table have been used to present the study findings.

Table 3 shows that most 77% (99) of the participants had male babies. Most 69% (89) of the babies weighed between 1000 - 1400 g. Most 79% (102) of the respondents had normal delivery. Most 71% (92) were multigravida. In addition, the majority 34% (44) of the mothers were above 31 years and most 79% (102) were married.

Table 3. Demographic characteristics of baby/mother for the sample (n = 129).

Characteristic	Frequency	Percentage
Sex		
Male	99	77%
Female	30	23%
Total	**129**	**100%**
Birth weight		
1000 - 1400 g	89	69%
1500 - 2000 g	40	31%
Total	**129**	**100%**
Type of delivery		
Normal Vagina Delivery	102	79%
Caesarian	27	21%
Total	**129**	**100%**
Gravida		
Primi	37	29%
Multigravida	92	71%
Total	**129**	**100%**
Mother's Age		
<19 years	36	28%
20 - 25 years	27	21%

Continued

26 - 30 years	22	17%
>31 years	44	34%
Total	**129**	**100%**
Marital status		
Single	27	21%
Married	102	79%
Total	**129**	**100%**

Table 4. Demographic characteristics of mother for the sample (n = 129).

Characteristic	Frequency	Percentage
Level of education		
No education	14	11%
Primary	35	27%
Secondary	67	52%
Tertiary	13	10%
Total	**129**	**100%**
Occupation		
Not employed	86	67%
Self employed	16	12%
Formal employment	27	21%
Total	129	100%
Monthly income		
No income	86	67%
K1000 - K5000	39	30%
K5001 - K10,000	4	3%
Total	**129**	**100%**
Religion		
Christian	121	94%
Muslim	4	3%
Hindu	**4**	**3%**
Total	**129**	**100**

Table 4 shows the majority 52% (67) of the respondents attained secondary education and in terms of occupation, 67% (86) of the respondents were unemployed. Most 67% (86) of the respondents reported having no monthly income, and concerning religion, most respondents 94% (121) were Christians.

4.3.2. Section B: Acceptability to Practice Kangaroo m = Mother Care

In this section respondents were asked to elicit information on acceptability to practice Kangaroo Mother Care. Responses were assigned scores to determine acceptability of mothers with low-birth-weight babies to practice Kangaroo Mother Care (KMC). The variables addressed were: comfort, continuation of KMC at home, hours of practice and preference for either incubator care or KMC.

Table 5 shows that most 65% (84) mothers were comfortable to practice KMC and the majority 86% (111) of the respondents agreed to continue with the KMC at home. Most 62% (80) of the mothers placed the baby in KMC position for more than 20hours and all the mothers 100% (129) felt that their babies should not be kept in the incubators. Most 75% (97) of the mothers accepted KMC.

4.3.3. Section C: Knowledge Levels on KMC

In this section knowledge levels on Kangaroo Mother Care were assessed. The table below shows the knowledge levels of respondents on Kangaroo Mother Care.

Table 6 illustrates that most 91% (118) had no knowledge before admission to

Table 5. Acceptability to practice Kangaroo m = Mother Care (n = 129).

Characteristic	Frequency	Percentage
Felt comfortable practicing KMC		
Comfortable	106	82%
Not comfortable	23	18%
Total	**129**	**100%**
Mothers who agreed to continue providing KMC at home after discharge		
Yes	111	86%
No	18	14%
Total	**129**	**100%**
Number of hours mothers took to place baby skin to skin		
<15 hours	22	17%
15 - 20 hours	27	21%
>20 hours	80	62%
Total	**129**	**100%**
Incubator care		
No	129	100%
TOTAL	**129**	**100%**
Acceptability		
Accepted	97	75.2%
Not Accepted	32	24.8%
Total	**129**	**100%**

Table 6. Knowledge levels on KMC (n = 129).

Characteristic	Frequency	Percentage
How would you define KMC in your own words?		
Placing baby on mother's chest skin to skin so as to keep baby warm.	**129**	**100%**
Information on KMC before admission		
Yes	11	9%
No	118	91%
Total	**129**	**100%**
Information on KMC while in hospital		
Yes	109	85%
No	20	15%
Total	**129**	**100%**
Source of information		
Doctor	23	18%
Nurse	95	73%
Friend	9	7%
Relative	2	2%
Total	**129**	**100%**

KMC. During hospitalization 85% (109) mothers were equipped with knowledge on KMC.

Table 7 shows that most mothers 85% (109) indicated that the information they received on KMC was adequate. More than half 59% (76) reported that KMC kept the baby warm, as a result, most 85% (109) respondents practiced continuous KMC. Most 82% (106) of the mothers had high knowledge towards KMC.

4.3.4. Section D: This Section Shows Attitude of Mothers on KMC

Table 8 shows that the majority 86% (111) of the mothers strongly agreed that KMC has a positive impact towards mother's emotional wellbeing. About 49% (63) respondents also strongly agreed that KMC is easy to practice and the most 79% (101) strongly agreed that KMC has a positive impact on bonding with the baby. Most 68% (88) of the participants had positive attitude towards KMC.

4.3.5. Section F: Perception of KMC (n = 129)

This section shows how mothers perceived the Kangaroo Mother Care.

Table 9 shows that most 68% 87 mothers reported KMC to be very effective and all mothers considered KMC to be beneficial to LBW babies. Concerning confidence, most 61% (79) of the mothers were very confident in practicing KMC, 32% and all respondents agreed that they would recommend other mothers

Table 7. Knowledge levels on KMC (n = 129).

Characteristic	Frequency	Percentage
Have you heard about KMC before?		
Yes	109	85%
No	20	15%
Total	**129**	**100%**
What is the primary goal of KMC?		
Keeps the baby warm	76	59%
Improves breastfeeding	5	4%
Baby gains weight	48	37%
Total	**129**	**100%**
How should KMC be practiced or what is involved in KMC?		
Intermittent	20	15%
Continuous	109	85%
Total	**129**	**100%**
Knowledge		
High	106	82%
Low	23	18%
Total	**129**	**100%**

Table 8. Attitude towards KMC (n = 129).

Characteristic	Frequency	Percentage
Impact on emotional wellbeing		
Neutral	8	6%
Agree	10	8%
Strongly agree	111	86%
Total	**129**	**100%**
Should KMC be promoted/encouraged		
Yes	129	100%
Total	**129**	**100%**
Do you believe that KMC is easy to practice		
Neutral	15	11%
Agree	51	40%
Strongly agree	63	49%
Total	**129**	**100%**
Impact of KMC on your bond with the baby		
Agree	28	21%
Strongly agree	101	79%

Continued

Total	**129**	**100%**
Attitude		
Positive	88	68.2%
Negative	41	31.8%
Total	**129**	**100%**

Table 9. Perception of KMC (n = 129).

Characteristic	Frequency	Percentage
Effectiveness		
Moderately effective	26	20%
Effective	16	12%
Very effective	87	68%
Total	**129**	**100%**
Benefits of KMC to LBW babies		
Yes	129	100%
Total	**129**	**100%**
Confidence in explaining KMC		
Slightly confident	8	6%
Moderately confident	1	1%
Confident	41	32%
Very confident	79	61%
Total	**129**	**100%**
Recommended KMC to other mothers		
Yes	129	100%
Total	**129**	**100%**
Perception		
Positive	68	53%
Negative	61	47.3%
Total	**129**	**100%**

to practice KMC. About 53% (68) had a positive perception towards KMC.

4.3.6. Section F: Cross Tabulations Illustrating Relationships between Independent and Dependent Variables

Cross tabulations were done to determine association of variables using fisher exact test at 5% level of significance.

Of the 67 (100%) who attained secondary education, 57(85%) accepted KMC while 10 (15%) did not, of the 86 (100%) without monthly income, 64 (74%) ac-

cepted KMC while 22 (26%) did not accept KMC. Of the 106 (100%) of those who were knowledgeable, 84 (79%) accepted KMC while 16(21%) did not. Of the 88 (100%) positive attitude, 70 (80%) accepted KMC while 18(20%) did not. Of the 68 (100%) respondents who had a positive perception, 56(82%) accepted KMC while 12(18%) did not (Table 10).

4.3.7. Binary Logistic Regression Analysis

Results in this section focus on regression analysis estimates using both univariate and multivariate regression analysis (Table 11).

Results for univariate logistics regression analysis

The higher the odds ratio of the independent variable the higher the influence on the dependent variable. The odds ratio of accepting KMC for mothers that

Table 10. Relationship between independent variables and dependent variables.

Characteristics	Acceptability		Total	P-Value
	Acceptable	Not acceptable		
Level of education				
No education	7 (50%)	7 (50%)	14 (100%)	0.025
Primary	24 (69%)	11 (31%)	35 (100%)	
Secondary	57 (85%)	10 (15%)	67 (100%)	
Tertiary	9 (69%)	4 (31%)	13 (100%)	
Total	**97 (75%)**	**32 (25%)**	**129 (100%)**	
Monthly income				
no income	64 (74%)	22 (26%)	86 (100%)	0.040
K1000 - k5000	32 (82%)	7 (18%)	39 (100%)	
K5001 - k10,000	1 (25%)	3 (75%)	4 (100%)	
Total	**97 (75%)**	**32 (25%)**	**129 (100%)**	
Knowledge				
High	84 (79%)	22 (21%)	106 (100%)	0.022
Low	13 (56%)	10 (44%)	23 (100%)	
Total	**97 (75%)**	**32 (25%)**	**129 (100%)**	
Attitude				
Positive	70 (80%)	18 (20%)	88 (100%)	0.94
Negative	27 (66%)	14 (34%)	41 (100%)	
Total	**97 (75%)**	**32 (25%)**	**129 (100%)**	
Perception				
Positive	56 (82%)	12 (18%)	68 (100%)	0.047
Negative	41 (67%)	20 (33%)	61 (100%)	
Total	**97 (75%)**	**32 (25%)**	**129 (100%)**	

Table 11. Univariate regression analysis.

Univariate regression analysis					
Independent variable		**Odds ratio**	**95% confidence intervals**		**P-value**
Employment status	Not employed	1.134375	0.4812592	2.673833	0.773
	Employed	2.909091	1.792221	4.721996	0.000
Birth weight	1000 - 1400 g	0.4708249	0.2025092	1.082445	0.075
	1500 - 2000 g	0.3944444	2.351575	2.351575	0.000
Type of delivery	Normal	0.5822785	0.2308587	1.468639	0.252
	Caesarian	3.434783	2.1558852	5.464817	0.000
Mothers age at last birth	≤19 years	1.257143	0.3604974	4.383965	0.720
	20 - 25 years	1.285714	3372177	4.902059	0.713
	26 - 30 years	0.5523809	0.202608	1.5055986	0.246
	≥31 years	3.500	1.595248	7.679056	0.002
Marital status	Single	2.571429	1.01147	6.537263	0.047
	married	0.6666667	0.0372369	11.93558	0.783
Level of education	No education	2.181818	0.6141876	7.750614	0.228
	Primary	5.7	1.641873	19.78837	0.006
	Secondary	2.25	0.4651573	10.88342	0.313
	Tertiary	1	0.3507629	2.850929	1.00
Knowledge	High	0.3404762	0.1318506	0.8792077	0.026
	Low	3.818182	2.387787	6.10545	0.000
Attitude	Positive	0.4959184	0.2167596	1.134598	0.097
	Negative	3.888889	2.316724	6.52795	0.000
Perception	Positive	0.4392858	0.1932296	0.9986668	0.050
	Negative	4.666666	2.501703	8.70518	0.000

were in employment was 2.909091 times higher than the unemployed mothers. Changes in knowledge levels from low to high increases the odds ratio of accepting KMC to 3.818182 times while the odds ratio of those who delivered by caesarian section were 3.434783 times higher than mothers who delivered normally. The odds ratio was 3.500 times higher in mothers aged above 31years in comparison to mothers aged below 19 years. The odds of acceptability for mothers with babies weighing between 1500 g and 200 g reduced by 0.3944444 times as compared to mothers with babies weighing between 1000 g and 1400 g at birth (Table 12).

Results for multivariate logistics regression analysis

A change in some independent variables contributed significantly to the outcome of the dependent variable, while changes in other independent variables did not contribute significant change to the dependent variable. Low knowledge

Table 12. Multivariate regression analysis.

Multivariate regression analysis				
Independent variable	**Odds ratio**	**95% confidence intervals**		**P-value**
Knowledge (2)	0.3597071	0.1200507	1.077787	0.068
Attitude (2)	0.8949953	0.316484	2.530986	0.834
Perception (2)	0.5379539	0.2091558	1.383631	0.198
Employment status (2)	1.938471	0.6434944	5.839477	0.239
Birth weight of the baby (2)	0.5922722	0.2408143	1.456667	0.254
Mothers age at last birth	6.572306	2.391487	18.06207	0.0001

levels reduce the odds ratio of accepting KMC by 0.3597071 while the odds ratio of acceptance for mothers who were employed was 1.938471 times higher than those who were not employed. The odds ratio of mothers aged above 31 years increased to 6.572306 times higher in comparison to mothers aged below 31 years while the odds ratio of those who weighed 1500 - 2000 g reduced by 0.5922722.

4.4. Summary

The data was collected from 129 postnatal mothers with low-birth-weight babies who were selected because they happened to be admitted in NICU ward at Arthur Davison Children's Hospital. Data was analyzed using SPSS version 26 and chi-square was used to test associations.

The findings showed that 75.2% of the respondents accepted KMC, 82% had high knowledge levels on KMC, 68.2% had positive attitude towards KMC and 53% had positive perception on KMC. There was a significant association between mothers' knowledge about KMC and acceptance of KMC (P - 0.022). Binary logistics regression analysis showed that the higher the odds ratio of the independent variable the higher the influence on the dependent variable

Multivariate logistics regression analysis showed that change in some independent variables contributed significantly to the outcome of the dependent variable, while changes in other independent variables did not contribute significant change to the dependent variable.

Therefore, there is need to address the identified challenges to improve survival of the increasing numbers of preterm babies in Zambia.

5. Discussion of Study Findings

5.1. Introduction

Chapter five focuses on discussion of findings, Nursing implication of the study findings, recommendations, dissemination of findings, strengths and limitation of the study. The care of low-birth-weight (LBW) infants poses unique challenges within the realm of neonatal healthcare, demanding specialized ap-

proaches that prioritize their fragile health and development. Among these approaches, Kangaroo Mother Care (KMC) has emerged as a promising intervention, emphasizing skin-to-skin contact between mother and infant, thermal regulation, and emotional bonding. KMC not only serves as an alternative to conventional care methods but also fosters a nurturing environment that supports the growth and well-being of LBW infants [5]. The results of this study holds implications of the health education on KMC by mothers with low-birth-weight babies at ACDH in Ndola, Zambia.

5.2. Discussion of Study Findings

5.2.1. Demographic Characteristics of the Respondents

This variance in findings highlights the need for further research to understand demographic variations and their potential impact on the acceptability and implementation of Kangaroo Mother Care (KMC) among mothers with low-birth-weight babies. Contrary to the current study findings, Gupta *et al.*, [45] reported that the majority of respondents were primigravida and the majority of participants had female babies. This discrepancy in findings underscores the importance of considering demographic factors and context-specific variables when assessing the acceptability and feasibility of Kangaroo Mother Care (KMC) among mothers with low-birth-weight babies.

The current study findings imply that these mothers might have some experience in childbirth and infant care, which could potentially influence their approach and understanding of KMC. Experience with prior pregnancies might positively impact their adherence to KMC practices due to familiarity with maternal and infant care routines. This is in agreement with Smith *et al.*, [46] who reported that Mothers who had previous experiences with pregnancies appeared to have a better understanding and adherence to Kangaroo Mother Care practices, likely due to their familiarity with maternal and infant care routines.

Most of the mothers were married, this implies that a significant portion of the mothers undergoing KMC had spousal support or potentially a familial structure that could assist in caregiving. This finding suggests that a strong family unit or support system might positively impact the success and continuity of KMC for low-birth-weight infants. In agreement, Teklemariam, and Getinet [47] reported that family support influences the practice of KMC among LBWB, indicating that a strong family unit or support system could enhance the success and continuity of KMC.

Individuals with lower levels of education are more likely to have difficulty understanding health information and adhering to medical recommendations [48]. The majority of respondents had attained secondary education, suggesting a moderate level of educational attainment. This could imply a certain level of literacy and comprehension that might aid these mothers in understanding and following KMC guidelines effectively.

There was a significant association between levels of education and the acceptance of KMC. Individuals with higher education levels were more likely to ac-

cept KMC as a viable method of care for low-birth-weight babies. This association might be due to better understanding and awareness of healthcare practices among individuals with higher educational attainment, enabling them to appreciate the benefits and importance of KMC.

A significant majority of the respondents were unemployed, indicating potential financial constraints and economic challenges. This suggests that the implementation of KMC needs to consider economic barriers that might affect the ability of mothers to adhere to KMC practices consistently, possibly requiring additional support or resources. Most mothers were suggesting that cultural and religious beliefs may influence perceptions and practices related to child-rearing, including healthcare decisions. Incorporating cultural sensitivity and understanding into the KMC program might enhance its acceptability and implementation among diverse religious groups. Concerning religion, most respondents reported being Christians. This could be attributed to the fact that Zambia is a Christian nation.

5.2.2. Mother's Acceptability to KMC

The current study findings are also attributed to high agreement among respondents to continue KMC at home which is a positive sign for the sustainability of care. The findings are also similar to a study conducted by Mgawadere *et al.* [49] which explored on the barriers and facilitators to implementing KMC in Malawi, Tanzania, and Zimbabwe. This implies that a large majority are willing to extend KMC beyond the hospital setting, which is crucial for ensuring continuous care and reaping the benefits of KMC for the infants' growth and development. Longer durations of KMC have been associated with better outcomes for low-birth-weight infants [25]. Similar to the study findings, a study conducted by Tessier *et al.* [24] in France found that KMC was well-accepted by parents, and was associated with a significant reduction in hospital length of stay for LBWB. This implies that a significant portion of the mothers are receptive to and confident in applying KMC techniques.

The mothers unanimous agreed that their babies were not going to be kept in incubators. This finding suggests a collective understanding and acceptance of the benefits of KMC over traditional incubator care. This highlights the mothers' preference for the more intimate and nurturing care provided by KMC, which aligns with the principles of skin-to-skin contact and maternal bonding [50].

5.2.3. Mother's Knowledge Levels on KMC

The current study found that most of mothers had no prior knowledge about KMC before admission to the KMC unit. This suggests a lack of awareness or education regarding this care method. This indicates a potential gap in prenatal or antenatal education programs that should emphasize the importance and benefits of KMC, allowing mothers to be more prepared and receptive to this form of care. This was attributed to low education levels, lack of awareness, and inadequate counseling by healthcare providers. Similarly, Asresie *et al.*, [29] re-

ported that knowledge levels on KMC among mothers of LBWB were generally low. Another study in Zimbabwe found that mothers had limited knowledge of KMC and did not fully understand the benefits of skin-to-skin contact [30]. These findings were attributed to inadequate counseling by healthcare providers. In agreement to these findings, a study in South Africa found that mothers and healthcare providers had limited knowledge of KMC and the benefits of skin-to-skin contact [31].

Th high levels of knowledge in the current study are attributed to counselling by healthcare workers during their hospital stay. This shows the effectiveness of the hospital's educational interventions, implying the significance of providing comprehensive information and training to mothers during their time in healthcare facilities. The current findings are also consistent with those of Chisenga *et al.*, [51] who conducted a study on the review of mother's experiences at Bwaila hospital and Zomba Central hospital in Malawi and reported that results showed that most of the participants had high levels of knowledge which was acquired during the hospital stay.

Mothers with a higher level of knowledge about KMC were more likely to accept it compared to those with lower levels of knowledge. This association underscores the importance of education and information dissemination in influencing the acceptance and adoption of KMC. Higher knowledge levels likely contribute to a better understanding of the benefits and effectiveness of KMC, thus increasing its acceptability among individuals.

5.2.4. Mother's Attitude to KMC

Similar to the findings of the current study, most of the mothers had a positive attitude towards KMC, a study by Kadam *et al.* [35] conducted in a tertiary care hospital in Maharashtra, India, found that mothers had a positive attitude towards KMC. The findings were attributed to the confidence in their ability to care for their infants and satisfaction with their experience in the NICU. In agreement, a study conducted in 2019 in a rural hospital in Zambia found that mothers had a positive attitude towards KMC. They reported that KMC was a useful intervention for improving the health of their low-birth-weight infants, and they were willing to continue practicing it even after discharge from the hospital [52].

In the current study, the positive attitude is attributed to mothers strongly agreeing that KMC has a positive impact on their emotional wellbeing. This suggests that KMC might have a profound positive effect on mothers' emotional states, possibly contributing to reduced stress, increased confidence, and a sense of closeness with their infants.

This emotional support and connection can be vital for maternal mental health, especially in challenging circumstances with low-birth-weight infants. Majority of mothers strongly agreed that KMC is easy to practice. This implies that most mothers perceive KMC as a manageable and feasible care method. This perception of ease in practicing KMC could positively influence adherence and consistency in providing care, potentially contributing to better outcomes

for the infants.

Most mothers strongly agreed that KMC had a positive impact on bonding with the baby. This suggests the potential for KMC to facilitate and enhance mother-infant bonding. This closeness and bonding fostered by KMC can have long-term positive effects on the child's development and the mother's emotional connection with her baby.

5.2.5. Mother's Perception about KMC

Similar to the findings of the current study, Blomqvist *et al.* [25] in Sweden found that mothers perceived KMC as a positive experience that helped to promote bonding between the mother and infant. This current finding is attributed to the mother's report that KMC is very effective.

This overwhelming perception of effectiveness implies that mothers acknowledge and observe the positive impact of KMC on their babies' health and well-being. The findings are similar to a study conducted by Blomqvist *et al.* [25] in Sweden who found that parents and healthcare professionals perceived KMC as a positive experience that helped to promote bonding between the mother and infant. Such high ratings of effectiveness suggest that KMC is perceived as a valuable and successful intervention in improving LBW babies' outcomes.

The unanimous agreement among all mothers that KMC is beneficial to LBW babies emphasizes the collective recognition of its advantages. This shared perception reinforces the understanding that KMC is widely regarded as advantageous for the health and development of LBW infants. Majority of mothers expressed a high level of confidence in practicing KMC. This high level of confidence implies that most mothers feel assured and capable in implementing KMC techniques, which is essential for maintaining consistent care and achieving positive outcomes for LBW babies.

Mothers unanimously agreed among all respondents that they would recommend KMC to other mothers. This finding underscores their belief in the effectiveness and benefits of KMC and it suggests a high level of satisfaction and conviction among mothers regarding the importance of KMC such as bonding with the baby, making them advocates for its adoption and practice among other mothers with LBW babies. In agreement with this finding, Ng'ambi *et al.* [53] reported numerous benefits, including improved bonding with their baby, increased confidence in caring for their baby, and improved breastfeeding practices

Similarly to the current study findings, Ayebare *et al.*, [54] reported mothers who hold positive perceptions regarding KMC are more likely to accept it as an effective care method for low-birth-weight infants. This association highlights the influence of attitudes and beliefs in shaping the acceptance of healthcare interventions. A positive perception likely stems from understanding and believing in the efficacy and benefits of KMC, thereby fostering greater acceptance.

6. Conclusions

The study sought to determine the acceptability of Kangaroo Mother Care by

mothers with low-birth-weight babies. Findings of this study revealed that high knowledge levels contributed greatly to accepting KMC as 75.2% of respondents accepted Kangaroo Mother Care as a method of care for their low-birth-weight babies. Positive attitude of respondents (68.2%) and positive perception (53%) contributed greatly to acceptance of KMC.

Information, Education and Communication played a role in acceptance as results show that 82% of mothers felt comfortable to practice KMC even though 91% of respondents had not received information before admission. Therefore, mothers need to be made aware that they have a very important role in the care of their low-birth-weight babies by providing them with adequate information on KMC.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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List of Abbreviations

ADCH	Arthur Davison Children's Hospital
ADCPCHN	Arthur Davison College of Paediatrics and Child Health Nursing
CI	Confidence Interval
CDE	Classified Daily Employee
CSO	Central Statistics Office
ENAP	Every Newborn Action Plan
ENC	Essential Newborn Care
ICU	Intensive Care Unit
IEC	Information, Education and Communication
KMC	Kangaroo Mother Care
LBWB	Low Birth Weight Babies
MOH	Ministry of Health
NHRA	National Health Research Authority
NICU	Neonatal Intensive Care Unit
OR	Odds Ratio
PMNCH	Postnatal Maternal and Newborn Child Health
SCBU	Special Care Baby Unit
SD	Standard Deviation
SIDA	Swedish International Development Cooperation Agency
SPSS	Statistical Package for Social Sciences
STS	Skin to Skin
UNICEF	United Nations Children's Fund
UNZA	University of Zambia
UNZABREC	University of Zambia Biomedical Research Ethics committee
USA	United States of America
USAID	United States Agency for International Development
UTH	University Teaching Hospital
WHO	World Health Organisation
ZDHS	Zambia Demographic and Health Survey
ZSA	Zambia Statistics Agency