Original

Supportive factors and barriers to Kangaroo Mother care for Preemies: Insights from Bono Region, Ghana

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Abstract

Background: The World Health Organization advocates for Kangaroo Mother Care (KMC) to improve preterm infants' survival. However, Ghana faces challenges in KMC uptake, hindering progress towards Sustainable Development Goal 3. The study assessed the supportive factors and perceived barriers to KMC for preterm babies among mothers of neonates at selected hospitals in the Bono Region, Ghana

Methods: A descriptive cross-sectional study design utilizing a quantitative approach. The study employed a simple random sampling technique to select the respondents. Data were gathered through a structured questionnaire administered to 94 mothers of preterm infants admitted for kangaroo mother care. The analysis employed descriptive statistics with the help of Statistical Package for the Social Sciences version 26.

Results: Respondents' mean age was 27.88±5.57 years, and mean gestational age was 32.57±2.56 weeks. There was a generally positive perception of supportive factors for kangaroo mother care (KMC), with an overall mean score of 4.37, falling within the "Agree" range (3.5–4.49) on the decision rule scale. Sixty-three(66.7%) of the respondents agreed with all the supportive factors such as; family support, privacy, providing necessary supplies and free KMC admission. Perceived barriers to KMC were also significant, with a mean score "Agree" of 3.84. Eighty-six (90.9%) of the respondents agreed that barriers such as lack of family support, inadequate facilities and limited time, constraints KMC patronage.

Conclusion: The study highlights a consensus among respondents on supportive factors and barriers to KMC. Tailored interventions are needed to address these challenges, to help promote kangaroo care in Ghana.

Keywords: Kangaroo care, Supportive factors, Barriers, Preterm infants.

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Introduction

Each year, the fragile cries of preterm babies echo across delivery rooms worldwide, signaling not just new life but also a race against infant mortality. For many of these babies born before 37 gestational weeks, the path to survival is fraught with complications that stretch the capacity of families and healthcare systems, particularly in low and middle-income countries (LMICs) like Ghana.[1] Preterm infants are at heightened risk of hypothermia, respiratory distress, infections, and poor feeding tolerance due to the immaturity of their body systems, which, if not adequately managed, often results in death.[2,3]

Globally, preterm births represent one in ten live births, with the burden disproportionately concentrated in

LMICs.[4] The World Health Organization (WHO) estimates that of the 15 million preterm births annually, over 85% occur in LMICs, where healthcare infrastructure and resources are often limited.[5] In contrast, high-income countries such as the United States report lower preterm birth rates (12%), with fewer deaths due to access to advanced medical care.[6] Alarmingly, sub-Saharan Africa alone accounts for more than 15% of the global preterm birth burden, with neonatal mortality rates as high as 28 deaths per 1,000 live births compared to 18 per 1,000 in Asia.[7]

Ghana exemplifies this regional challenge, with preterm birth being a significant contributor to neonatal mortality.[8] Despite advancements in antenatal care, the neonatal mortality rate remains high at 28 per 1,000 live births.[9] A study conducted at the Korle-Bu Teaching Hospital in Accra revealed that 18.9% of deliveries in 2018 were preterm, reflecting a widespread issue across the country.[10] These statistics shows the urgent need for interventions to mitigate the complications associated with prematurity, such as hypoglycemia, respiratory distress, prolonged hospitalization, and long-term developmental delays.[11]

In the Bono Region of Ghana, the situation mirrors national trends, with high rates of preterm deliveries despite commendable antenatal care patronage of 98.9%.[9] Institutional neonatal mortality has declined only marginally, from 16 to 14 per 1,000 live births, highlighting persistent gaps in care for preterm infants.[8] The socio-economic and infrastructural constraints within the region demand targeted strategies to improve neonatal outcomes.[12] One of such evidence-based intervention is kangaroo mother care (KMC).[11]

KMC, also referred to as skin-to-skin care.[13] KMC is a low-cost, high-impact method of caring for preterm and low-birth-weight infants. This intervention involves placing the infant in direct skin-to-skin contact with the mother or caregiver to stabilize body temperature, enhance vital functions, and encourage breastfeeding.[7] Beyond its physical benefits, KMC promotes emotional bonding, maternal confidence, and psychological well-being.[13] Recognizing its potential to save lives, the WHO has included KMC as a key strategy under Every Newborn Action Plan to reduce neonatal mortality.[5]

However, despite its numerous benefits, the adoption of KMC remains limited in LMICs like Ghana.[10] Supportive factors such as awareness of KMC benefits, trained healthcare providers, and socio-cultural acceptance play a pivotal role in promoting its uptake. Conversely, barriers such as stigma surrounding preterm births, lack of privacy, limited family support, and logistical challenges impede the implementation of KMC.[5,9] For example, studies in sub-Saharan Africa have highlighted the absence of spousal and familial support, cultural misconceptions about preterm babies, and maternal fatigue, particularly among mothers recovering from cesarean sections, as significant obstacles to KMC.[15,16]

Although global research on KMC has grown, there is a notable gap in literature specific to Ghana, especially in the Bono Region. Understanding the supportive factors and perceived barriers to KMC in this region is crucial for tailoring interventions that align with its unique socio-cultural and economic contexts. This study addressed this gap by assessing the supportive factors and barriers influencing the adoption of kangaroo mother care among mothers of preterm infants in the Bono Region of Ghana. The findings provided critical insights to guide healthcare providers and policymakers in scaling up KMC practices, ultimately improving neonatal survival rates and contributing to global efforts to address preterm birth-related mortality.

Method

Study Design

The study adopted a quantitative research approach and descriptive cross-sectional study design.

Study Setting

The study was conducted within four referral hospitals in the Bono Region of Ghana. First, the Sunyani Teaching Hospital which serves as the highest referral hospital in the Bono Region of Ghana. The hospital kangaroo mother care ward is a newly established ward under the pediatric ward and the Neonatal Intensive Care Unit. Second, Drobo St. Mary's Hospital which is a mission hospital for the Catholic Church and falls under the Christian Health Association of Ghana (CHAG). It serves as a referral hospital for the people of Drobo and the surrounding communities in the Jaman South District. Third, Berekum Holy Family Hospital, which is also a Catholic Diocesan (CHAG) Hospital and serves as Municipal and referral hospital for the people of Berekum and its surrounding communities. The four hospital is the Dormaa Presbyterian hospital situated in Dormaa Ahenkro in the Bono Region of Ghana, and it is under the guardianship of the Presbyterian Church of Ghana and the CHAG.

Study Population

All mothers of preterm babies (<37weeks) on KMC admission in the four selected referral hospitals within the Bono Region of Ghana, formed the study

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population. It also included only mothers that agreed to take part in the study.

Sample Size

The total sample size for the study was 94 with 10% non-response rate inclusive. This was determined using the Cochran formular, with 95% confidence interval, 5% margin of error and 6% estimated proportion of kangaroo mothers in the Bono Region.

Sampling Method

Simple random sampling method was used in this study to ensure that each eligible respondent had an equal chance of being selected. This approach minimized selection bias and enhanced the representativeness of the sample. All eligible mothers of preterm babies admitted to the kangaroo mother care wards at the four selected hospitals in the Bono Region were identified. Each mother was assigned a unique number and using a random number generator, all the 94 mothers were selected without any pattern or subjective influence.

Study Instrument

The study utilized a structured questionnaire developed specifically to assess supportive factors and perceived barriers to kangaroo mother care among mothers of preterm infants. The questionnaire was developed based on a comprehensive review of existing literature on kangaroo mother care, drawing on validated questions from previous studies and relevant theoretical frameworks to ensure it covered key information relevant to the research objectives.

The questionnaire was divided into three main sections to capture comprehensive information. The socio-demographic characteristics collected information on name of hospital, education level, mothers' job, religion, age, marital status, gestational age, and type of family. Supportive factors focused on potential sources and type of support that mothers received during kangaroo care. Questions included aspects such as partner support, family involvement, healthcare provider support, etc. Perceived barriers addressed obstacles that respondents faced in engaging in kangaroo mother care. It included questions on personal, family and hospital-related factors.

The questionnaire validity and reliability were ensured through two step validation process. First, the content validity was assessed by the research supervisors, and they reviewed the questions to ensure relevance, clarity and comprehensiveness. Feedback from these experts was incorporated to refine the items and improve alignment with the study's objectives. Second, a pilot test was conducted with a small sample of mothers who had undergone kangaroo mother care at different hospital aside the study area. The pilot test helped assess the instrument's clarity, understandability and reliability. After the pilot test, minor adjustment was also made to the wording and structure to enhance the questionnaire usability and accuracy. The final questionnaire was thus deemed suitable for capturing valid and reliable data for the study.

Data collection procedures

The data for this study was collected through the administration of questionnaires, facilitated by briefed field assistants. The field assistants were briefed on the objectives of the study, the nature of the questionnaire and the appropriate procedures for interacting with the respondents to ensure consistency and reliability in the data collection.

Respondents were approached at the mother and baby' ward within all the four selected hospitals. Before starting the data collection, all mothers were given a brief overview of the study and asked to provide informed consent to participate in the study voluntarily. For respondents with higher education, the questionnaires were hand over to them to complete it independently using eighter English or Twi, based on their preference. Respondents with lower education level were guided to select the responses options that best reflected their opinions, but field assistance ensured they did not influence the answers. Each questionnaire administration lasted for 10-15 minutes.

Data Analysis

The study's data analysis was guided by the research objectives, with specific objectives serving as dependent variables and socio-demographic variables of respondents serving as independent variables. SPSS Version 26 was used to perform all analyses.

Descriptive statistics were used to summarize and describe the characteristics of the independent variables. Frequencies and percentages were calculated for categorical socio-demographic variables such as marital status, education level, and employment status. Continuous variables among the socio-demographic characteristics such as maternal age and gestational age of preterm infants, descriptive measures, including mean, mode, median, and standard deviation, were calculated to understand central tendencies and variability. Dependent variables (supportive factors for kangaroo mother care and perceived barriers), frequencies and means were calculated. The supportive factors and perceived barriers were assessed on a Likert scale, and each factor or barrier was analyzed based on its percentage distribution across the scale.

Decision rule for Likert Scale Analysis

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A five-point Likert scale was used to measure responses for supportive factors and perceived barriers, with values assigned as follows: Strongly agree = 5, Agree = 4, Neutral = 3, Disagree = 2 and Strongly disagree = 1.
The decision rule for interpreting the mean values was as follows: Mean ≥ 4.5 = Strongly agree, Mean 3.5-4.49 = Agree, Mean 2.5-3.49 = Neutral, Mean 1.5-2.49 = Disagree and Mean ≤ 1.49 = Strongly disagree.
All results were presented in tables, with descriptive statistics detailing the socio-demographic characteristics and response distributions for each supportive factor and perceived barrier.

Assumptions of Statistical Tests

- ***Normality:*** Before proceeding with parametric or non-parametric tests, the data was tested for normality using the Shapiro-Wilk test. This test is appropriate for small sample sizes (less than 100) and evaluates whether the distribution of the data significantly deviates from normality. Since the data did not follow a normal distribution, non-parametric tests were chosen for further analysis.
- ***Independence:*** Another assumption for both descriptive and inferential analysis is that each respondent's data was independent of others. This was ensured by using a simple random sampling approach.
- ***Level of Significance:*** For the inferential statistics, a p-value ≤ 0.05 was set as the threshold for statistical significance, indicating that any observed association was unlikely to have occurred by chance.

All results were presented in tables, with descriptive statistics detailing the socio-demographic characteristics and response distributions for each supportive factor and perceived barrier. Tables also included inferential statistics results, displaying the p-values and test statistics for associations examined.

Ethical Approval

The study proposal was presented to the University of Port Harcourt ethical committee board for ethical clearance. Upon granted approval, the ethical clearance for the study and introductory letter was presented to the administration/authorities of the four selected hospitals in the Bono Region, Ghana that served as the study areas. Respondents consent for participation was obtained before enrolled into the study. The content and the intention of the research was clearly explained to all the respondents in English and in the local dialect (Twi). Respondents were made to tick the agreement section on the questionnaire to prove their acceptance to participate in the study before enrolled into the study. The research was conducted in a confidential and anonymous manner. Respondent were assured of confidentiality with regards to the information given. Number was assigned to each questionnaire instead of names to protect respondents' identity. Also, address of respondents was not captured on the questionnaire. There was no risk to any of the respondents. Also, the research method did not involve experiments or inflicted any form of pain on the respondent. Respondents had the right to withdrawn from the study at any point in time without any implications.

Results

Socio-demographic characteristics of respondents

Majority 38(40.4%) of the respondents were recruited from the Bono Teaching hospital. Quite a number of respondents 25(26.6%) had tertiary education. This reflected in the respondents' job as a lot of them 28(29.8%) engages in government work. More than half of the respondents 69(73.4%) were Christians. Most respondents were married 68(72.3%) and stay with their nuclear family 73(77.7%). The minimum and maximum gestational ages of the respondents were 28 and 36 weeks respectively.

Table 1: Socio-demographic characteristics of respondents (n = 94)

Respondent's Socio-Demographic Characters	Categories	Frequency (94)	Percentage (100%)
Number of respondents interviewed in each of the hospitals	Bono Teaching Hospital	38	40.4
	Berekum Holy Family Hospital	28	29.8
	Dormaa Presbyterian Hospital	22	23.4
	Drobo St. Mary's Hospital	6	6.4
Education level	Illiterate	16	17
	Basic school	12	12.8
	Junior High School	18	19.1
	Senior High School	23	24.5
	Tertiary (Diploma, Degree, Masters, PHD)	25	26.6

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Job	Government employee	28	29.8
	Trader	27	28.7
	Farmer	20	21.3
	No job	19	20.2
Religion	Christianity	69	73.4
	Muslim	19	20.2
	No Religion	6	6.4
Marital status	Married	68	72.3
	Not married	26	27.7
Type of family	Nuclear family	73	77.7
	Extended family	21	22.3
Mother's Age	16-23 years	23	24.5
	24-31 years	44	46.8
	32-39 years	20	21.3
	40-47 years	7	7.4
Gestational age at birth	28-30 weeks	25	26.6
	31-33 weeks	30	31.9
	34-36 weeks	39	41.5

Table 2: Descriptive statistics of respondents' age and gestational age (n= 94)

	Mean	Mode	Std. Deviation	Minimum	Maximum
Gestational age at birth (weeks)	32.57	32[a]	2.596	28	36
Respondent age (years)	27.88	25	5.572	16	38

Supportive factors for kangaroo mother care

The supportive factors for kangaroo mother care (KMC) were analyzed descriptively using frequency, percentage, and mean scores. The overall mean score for supportive factors was 4.37, which felled within the range of 3.5 – 4.49 on the decision rule, corresponding to "Agree." Specifically, this mean score indicated a generally positive perception among mothers regarding the availability of supportive factors, such as family involvement, partner support, and healthcare provider assistance. While the score does not reach the "Strongly Agree" threshold (≥4.5), it reflects a favorable level of support that could contribute positively to the mothers' experiences and adherence to KMC.

Table 3: Supportive factors for Kangaroo Mother Care

Supportive factors for KMC	SA	A	N	D	SD	Mean	Decision
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)		
Encouraging spouse and extended family support during kangaroo mother care	52(55.3)	26(27.7)	11(11.7)	5(5.3)	0	4.33	Agree
Providing supplies such as food, beds, and kangaroo vests during hospital stay	54(57.4)	29(30.9)	9(9.6)	2(2.1)	0	4.44	Agree
Ensuring privacy at the facility	44(46.8)	40(42.6)	8(8.5)	1(1.1)	1(1.1)	4.33	Agree
Educating mothers on kangaroo mother care importance and the skills in doing it, especially during antenatal care	45(47.9)	46(48.9)	2(2.1)		1(1.1)	4.42	Agree
Encouraging nurses and midwives support during kangaroo mother care admission	42(44.7)	47(50.0)	3(3.2)	2(2.1)	0	4.37	Agree

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Kangaroo mother care should not come with admission cost	50(53.2)	30(31.9)	8(8.5)	5(5.3)	1(1.1)	4.31	Agree

Strongly agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly disagree (SD)

Perceived barriers to Kangaroo Mother Care

The perceived barriers to kangaroo mother care (KMC) were analyzed descriptively using frequency, percentage, and mean scores. The overall mean score for barriers was 3.84, which felled within the range of 3.5–4.49 on the decision rule, corresponding to "Agree." This level point of agreement suggested a consensus that, the obstacles assessed exist and are noticeable but may vary in intensity or impact across individuals.

Table 4: Barriers to Kangaroo Mother Care

Barriers to KMC	SA	A	N	D	SD	Mean	Decision
	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)	Freq. (%)		
Lack of support from family members especially mother and spouse	41(43.6)	21(22.3)	13(13.8)	14(14.9)	5(5.3)	3.84	Agree
Lack of facilities such as bed, safe and secure place	33(35.1)	26(27.7)	16(17.0)	14(14.9)	5(5.3)	3.72	Agree
Lack of knowledge and skills in doing it	40(42.6)	25(26.6)	16(17.0)	6(6.4)	7(7.4)	3.90	Agree
Not having adequate time because of mother's job	32(34.0)	20(21.3)	12(12.8)	22(23.4)	8(8.5)	3.49	Neutral
Inadequate support from nurses and midwifes	29(30.9)	23(24.5)	12(12.8)	20(21.3)	10(10.6)	3.43	Neutral
Feeling shy/embarrassed because of uncover breast	27(28.7)	43(45.7)	4(4.3)	10(10.6)	10(10.6)	3.71	Agree
Difficulty in getting food to eat during the hospital stay	34(36.2)	33(35.1)	12(12.8)	10(10.6)	5(5.3)	3.86	Agree
High/extra cost during kangaroo mother care admission	33(35.1)	30(31.9)	10(10.6)	16(17.0)	5(5.3)	3.74	Agree
Mother's condition	40(42.6)	36(38.3)	10(10.6)	6(6.4)	2(2.1)	4.13	Agree
Baby's condition	43(45.7)	35(37.2)	11(11.7)	4(4.3)	1(1.1)	4.22	Agree
The belief that kangaroo mother care can be practiced at home and does not need hospital admission	45(47.9)	37(39.4)	2(2.1)	8(8.5)	2(2.1)	4.23	Agree

Strongly agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly disagree (SD)

Discussion

The study revealed a generally positive perception of supportive factors for kangaroo mother care (KMC), with an overall mean score of 4.37, falling within the "Agree" range (3.5–4.49). This score indicates that mothers recognize the importance of support systems, including family involvement, partner assistance, and healthcare provider support, in facilitating KMC. However, the findings did not reach the "Strongly Agree" threshold (≥4.5), suggesting potential gaps in the consistency or quality of the support provided. These results align with earlier studies emphasizing the crucial role of family involvement in the successful implementation of KMC.[2,17] However, the mean score indicates that not all mothers experience optimal support, mirroring findings that family support often falls short due to competing domestic responsibilities and limited awareness of KMC benefits.[8,19] This highlights the need for targeted family education programs to enhance mothers' engagement in KMC practices.

Despite the presence of supportive factors, perceived barriers to KMC were also significant, with a mean score of 3.84, categorized as "Agree." Mothers identified challenges such as limited time, financial constraints, and the absence of dedicated KMC facilities as obstacles to effective implementation. These findings resonate with studies that documented cultural perceptions and inadequate knowledge as major barriers to KMC adoption in low- and middle-income countries.[20,21] The current study further shows systemic challenges, such as resource constraints and lack of privacy, which have also

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been highlighted in previous research.[22] Addressing these barriers is crucial, as they not only hinder the uptake of KMC but also perpetuate inequalities in neonatal care outcomes. A systems-level approach, including infrastructure improvements and policy reforms, is necessary to overcome these obstacles.

The persistent barriers, even in the presence of supportive factors, point to a gap in healthcare system readiness to promote KMC comprehensively. While this study showed that healthcare providers play a supportive role, the findings suggest that their involvement is not sufficient to eliminate challenges faced by mothers. Evidence shows the importance of healthcare provider training in creating an enabling environment for KMC.[5,23] However, findings from this study suggest that training must extend beyond clinical knowledge to encompass skills in family engagement and cultural sensitivity. This aligns with insights advocating for integrated care models that involve both families and communities in KMC education and practice.[24]

Additionally, the findings suggest that while awareness of KMC's benefits is increasing, practical implementation remains constrained by systemic issues. For instance, the lack of dedicated KMC wards in many facilities reflects broader infrastructural challenges within the healthcare system. Previous studies similarly found that logistical barriers, such as overcrowding and limited resources, undermine the effectiveness of KMC programs.[17,13] These systemic constraints call for stronger governmental and institutional support, including investments in healthcare infrastructure and the integration of KMC into national maternal and neonatal care strategies.

Finally, the findings highlight the need for a holistic approach to KMC promotion. While healthcare providers play a critical role, they must work collaboratively with families to ensure that mothers receive the necessary physical, emotional, and logistical support. This aligns with recommendations that KMC should be a family-centered intervention.[1,26] Studies further indicated advocating for interventions that actively involve fathers and extended family members in the caregiving process.[25] By fostering a supportive and inclusive environment, healthcare systems can improve KMC uptake and, ultimately, neonatal survival outcomes.

Implications of the findings of this study

The findings of this study have significant implications for healthcare providers and policymakers. The positive perception of supportive factors suggests that existing support systems can be leveraged to enhance KMC practices. Healthcare providers should actively engage families in the KMC process, fostering an environment where mothers feel supported and empowered. This is particularly critical, as the WHO advocates for family-centered care as a vital component of neonatal health.

Furthermore, the identification of perceived barriers necessitates targeted interventions to address these challenges. Strategies could include educational programs aimed at dispelling misconceptions about KMC, enhancing partner and family involvement, and ensuring adequate healthcare support.

Strengths and Limitations of the Study: This study provides a comprehensive exploration of supportive factors and perceived barriers to Kangaroo Mother Care (KMC) in the Bono Region of Ghana, offering valuable insights into maternal experiences and contributing to efforts toward achieving Sustainable Development Goal 3. The use of a quantitative approach with a structured questionnaire ensures consistency and reliability in data collection. Furthermore, the application of a simple random sampling technique enhances the representativeness of the respondents, while the robust analysis using SPSS version 26 ensures accuracy in interpreting the findings.

The study's cross-sectional design limits its ability to establish causal relationships between the identified factors and KMC uptake. Additionally, the relatively small sample size of 94 respondents may restrict the generalizability of the findings to other settings or regions.

Conclusion

In conclusion, this study highlighted the importance of both supportive factors and perceived barriers to kangaroo mother care among mothers in the Bono Region of Ghana. The generally positive perceptions regarding support indicate a strong foundation for KMC practices, yet the recognition of significant barriers indicate the need for continues improvement to better maternal and neonatal health outcomes.

Declarations

Ethical Consideration: Ethical approval for the study was sought from the UNIPORT Research ethics committee.

Authors' Contribution: Asomah Amanda (Conducted the primary research, including data collection, analysis, and interpretation; Drafted the manuscript, integrating feedback from other authors; Coordinated the revision process and finalized the article for submission), Anochie Ifeoma (Provided

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