Barriers to Kangaroo Mother Care Practice: A Questionnaire-Based Study among Healthcare Providers in Special Baby Care Units in Yemen

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Abstract

Background: Preterm birth (PTB) is a major public health concern and the leading cause of neonatal morbidity and mortality. Simple and feasible interventions can improve neonatal outcomes. Kangaroo Mother Care (KMC), which involves skin-to-skin contact, has been shown to be an effective and practical method to reduce mortality rates among preterm infants in both low- and high-income countries.

Objective: To identify barriers in implementing Kangaroo Mother Care (KMC) among medical and nursing staff in special baby care units.

Methods: A cross-sectional descriptive study was conducted among hospital staff in Mukalla city, Yemen. Data were collected using a self-administered questionnaire that included socio-demographic characteristics, and barriers to implementing Kangaroo Mother Care (KMC). The data were entered into SPSS (version 22). Categorical variables were reported as frequencies and percentage and presented using bar charts.

Results: A total of 176 doctors and nurses participated in the study, with a response rate of 98.9%. The majority (70.7%) were female. Participants over 30 years of age comprised 105 (60.3%) of the sample, and 88.5% had not received any training on Kangaroo Mother Care (KMC). The most commonly reported barriers to KMC implementation were resistance to mindset change, inadequate training, limited experience, and challenges related to the facility environment and available resources.

Conclusion: Healthcare providers are key to successful KMC implementation. Overcoming barriers requires proper training, clear guidelines, staffing optimization, and financial support. In Yemen, integrating KMC necessitates structured education and system-wide adoption strategies.

Keywords: Preterm birth, Kangaroo Mother Care, Barriers, Yemen

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العوائق التي تواجه مقدمي رعاية الأم الكنغر: دراسة قائمة على الإستبيان بين مقدني الرعاية الصحية في وحدات العناية الخاصة بالرضع في اليمن

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الملخص:

الخلفية: تمثل الولادة المبكرة مشكلة صحية عامة رئيسية وهي السبب الرئيسي للمراضة والوفيات بين حديثي الولادة. يمكن أن تؤدي التدخلات البسيطة والقابلة للتنفيذ إلى تحسين نتائج حديثي الولادة. وقد ثبت أن رعاية الام الكنغر، التي تتضمن ملامسة الجلد للجلد، تُعد طريقة فعالة وعملية لتقليل معدلات الوفيات بين الرضع الخدج في كل من البلدان منخفضة وعالية الدخل.

الهدف: تحديد العوائق التي تواجه تنفيذ رعاية الكنغر الأمومية بين الأطباء وطواقم التمريض في وحدات العناية الخاصة بالرضع.

المنهجية: تم إجراء دراسة وصفية مقطعية بين الطواقم الطبيه و التمريضية في مستشفى في مدينة المكلا، اليمن. تم جمع البيانات باستخدام استبيان ذاتي الإدارة شمل الخصائص الاجتماعية والديموغرافية، بالإضافة إلى العوائق التي تحول دون تنفيذ رعاية الام الكنغر. تم إدخال البيانات في برنامج SPSS (الإصدار 22). تم عرض المتغيرات الفئوية على شكل تكرارات ونسب وعرضها باستخدام المخططات الشريطية.

النتائج: شارك ما مجموعه 176 طبيبًا وممرضًا في الدراسة، بمعدل استجابة بلغ 98.9%. كانت الأغلبية (70.7%) من الإناث. وشكل المشاركون الذين تزيد أعمارهم عن 30 عامًا 105 (60.3%) من العينة، في حين أن 88.5% منهم لم يتلقوا أي تدريب على رعاية الام الكنغر. كانت العوائق الأكثر شيوعًا لتنفيذ رعاية الام الكنغر هي مقاومة تغيير العقلية، وعدم كفاية التدريب، وقلة الخبرة، بالإضافة إلى التحديات المتعلقة ببيئة المنشأة والموارد المتاحة.

الإستنتاج: يُعد مقدمو الرعاية الصحية المفتاح لنجاح تنفيذ رعاية الام الكنغر. يتطلب التغلب على العقبات تدريبًا مناسبًا، وإرشادات واضحة، وتحسين تنظيم القوى العاملة، ودعمًا ماليًا. في اليمن، يستلزم دمج رعاية الام الكنغر توفير تعليم منظم واستراتيجيات تبني شاملة على مستوى النظام.

الكلمات المفتاحية: الولادة المبكرة، رعاية الام الكنغر، العوائق، اليمن.

Introduction:

Preterm birth (PTB), defined as birth before 37 weeks of gestation, is a leading cause of neonatal morbidity and mortality worldwide, affecting both developed and developing countries (1,2). With an estimated 13.4 million preterm births annually—approximately one in ten live births—PTB poses a major public health concern, contributing to nearly one million neonatal deaths due to complications such as respiratory distress, hypothermia, and hypoglycaemia (3,4). Additionally, survivors may experience long-term developmental challenges (5,6).

In Yemen, neonatal mortality remains high, with 26 deaths per 1,000 live births reported between 2009 and 2013, accounting for nearly half of under-five deaths (7). Hospital records from Al-Mukalla Maternity and Child Hospital (MMCH) highlight the burden of preterm births, with preterm-related mortality rates ranging from 22% to 34% between 2020 and 2023 (8).

Prematurity remains a major global health concern, prompting the World Health Organization (WHO) to observe World Prematurity Day annually to raise awareness (9,10). While traditional neonatal care depends heavily on advanced technologies such as incubators and ventilators, cost-effective interventions like Kangaroo Mother Care (KMC) have demonstrated substantial benefits in enhancing preterm infant survival rates. In its guidelines, the WHO outlines specific inclusion and exclusion criteria for KMC: mothers must be willing to provide care following appropriate counselling, and eligible infants must exhibit stable cardiac function, oxygen saturation levels exceeding 40%, and no major congenital anomalies (11). KMC is characterized by continuous skin-to-skin contact between the mother and her infant, preferably in a vertical position between the mother's breasts (12).

This method promotes thermoregulation, reduces reliance on incubators, and significantly improves neonatal health outcomes (5,13,14). Notably, the implementation of comprehensive thermal care through KMC, combined with breastfeeding support and effective sepsis management, has been associated with saving approximately 94,400 neonatal lives in sub-Saharan Africa (6).

Successful KMC implementation requires healthcare providers to be knowledgeable about its components, criteria, and proper monitoring (1,14,15). Studies from the U.S. and Europe report widespread adoption in neonatal intensive care units (NICUs) (1,5)., yet barriers such as concerns about infant safety, increased workload, lack of training, and unclear protocols hinder implementation in some regions (16,17).

The successful adoption of KMC largely depends on healthcare providers' knowledge, and perceived barriers. Therefore, assessing the obstacles that hinder KMC implementation from the perspective of healthcare professionals is crucial.

This cross-sectional study was conducted in Mukalla, Yemen, from September 2023 to May 2024, involving doctors and nurses from special baby care units in major governmental and private hospitals. A semi-structured, bilingual questionnaire (English and Arabic) was used to collect data, with a pilot study conducted to refine wording for clarity and cultural appropriateness.

This study aims to identify the barriers to the adoption of KMC among healthcare providers in Yemen. A review of the literature on PubMed and Google suggests that this is the first study in Yemen to assess challenges in implementing Kangaroo Mother Care.

Subjects and Methods:

This cross-sectional study was conducted in Mukalla, Yemen, from September 2023 to May 2024, involving doctors and nurses from special baby care units in major governmental and private hospitals. A semi-structured, bilingual questionnaire (English and Arabic) was used to collect data, with a pilot study conducted to refine wording for clarity and cultural appropriateness.

A total of 174 participants completed the questionnaire individually. To avoid duplication, those working in both government and private sectors were counted based on their primary workplace. The questionnaire encompassed socio-demographic details, professional background, and barriers to Kangaroo Mother Care (KMC), with responses measured on a Likert scale. Initially, barriers were assessed using a five-point Likert scale: strongly agree, agree, neutral, disagree, and strongly disagree. For analysis, responses were consolidated into broader categories: "agreement" (strongly agree and agree), neutral, and "disagreement" (disagree and strongly disagree). Data analysis was performed using SPSS (version 22), applying descriptive statistics, bar charts.

Results:

The study involved a total of 176 doctors and nurses working at special baby care units in both governmental and private hospitals in Mukalla, Hadhramout, Yemen. Two doctors refused to participate, then study group was 174. Table 1 shows the socio-demographic characteristics. The majority of staff were females (70.7%) with male to female ratio of 1:3 (Figure 1). Most of the staff age was > 30 years (60.3%), while younger aged group (< 25 years) was only 6.9%.

Table 1: Socio-demographic characteristics of participants (No = 174)

Socio-demographic characteristics		Frequency	Percentage
Sex	Male	51	29.3
	Female	123	70.7
Total		**174**	**100**
Age [Years]	<25	12	6.9
	25 - <30	57	32.8
	≥30	105	60.3
Total		**174**	**100**
Marital Status	Single	89	51.1
	Married	77	44.3
	Widow/Widower	1	0.6
	Divorced	7	4
Total		**174**	**100**
Having Children	Yes	72	41.4
	No	102	58.6
Total		174	100
Having a Preterm Child	Yes	3	1.7
	No	171	98.3
Total		**174**	**100**

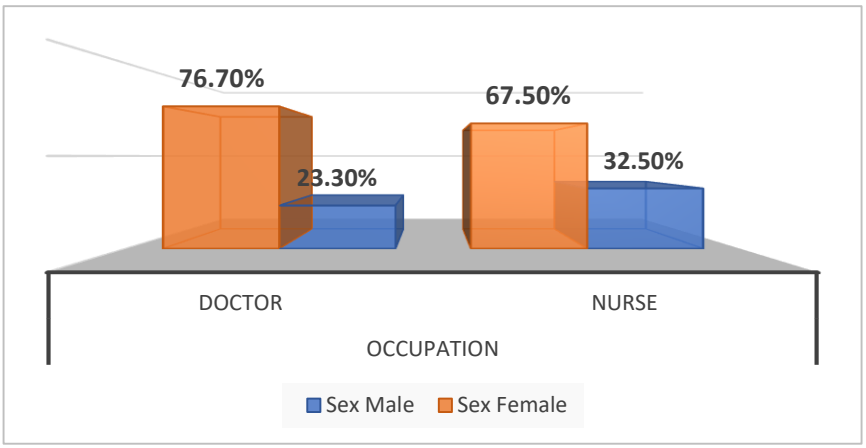


Figure 1: Sex characteristics of participants (No = 174)

Regarding educational attainment, approximately 50.6% of participants held a bachelor's degree, while 32.2% had a diploma (Figure 2). Among the doctors, only 3 held doctoral degrees and 7 had board certifications; no nurses attained these qualifications. Additionally, the majority of participants (88.5%) had not received any training on KMC (Table 2)

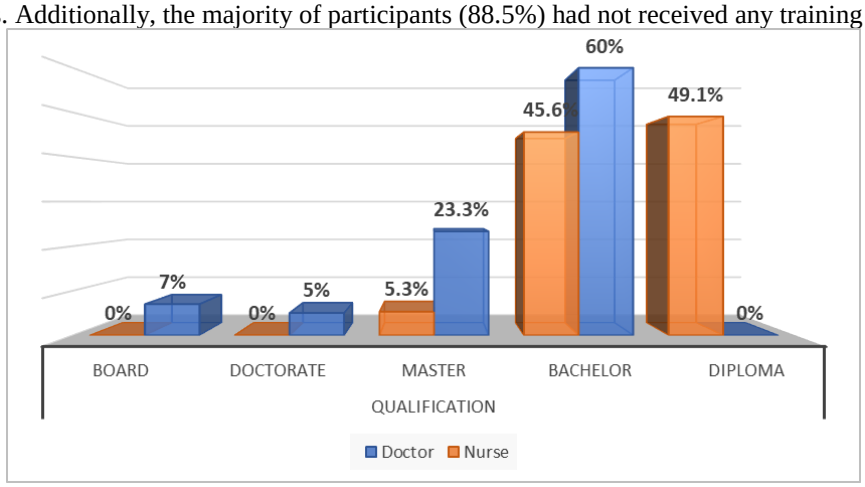


Figure 2: Educational attainment of participants (No = 174)

Table 2: Career professional characteristics of participants (No = 174)

Career professional Data		Frequency	Percentage
Specialization	**Physician**	60	34.5
	Nurse	114	65.5
Total		**174**	**100**
Health Sector	**Governmental**	128	73.6
	Private	34	19.5
	Governmental & Private	12	6.9
Total		**174**	**100**
Education Level	**Diploma**	56	32.2
	Bachelor	88	50.6
	Master	20	11.5.
	Doctoral	3	1.7
	Board	7	4
Total		**174**	**100**
Years of Experience	**<1**	22	12.6
	1 - <3	42	24.1
	3 - <6	58	33.3
	≥ 6	52	29.9
Total		**174**	**100**
Received Training about KMC	**Yes**	20	11.5
	No	154	88.5
Total		**174**	**100**

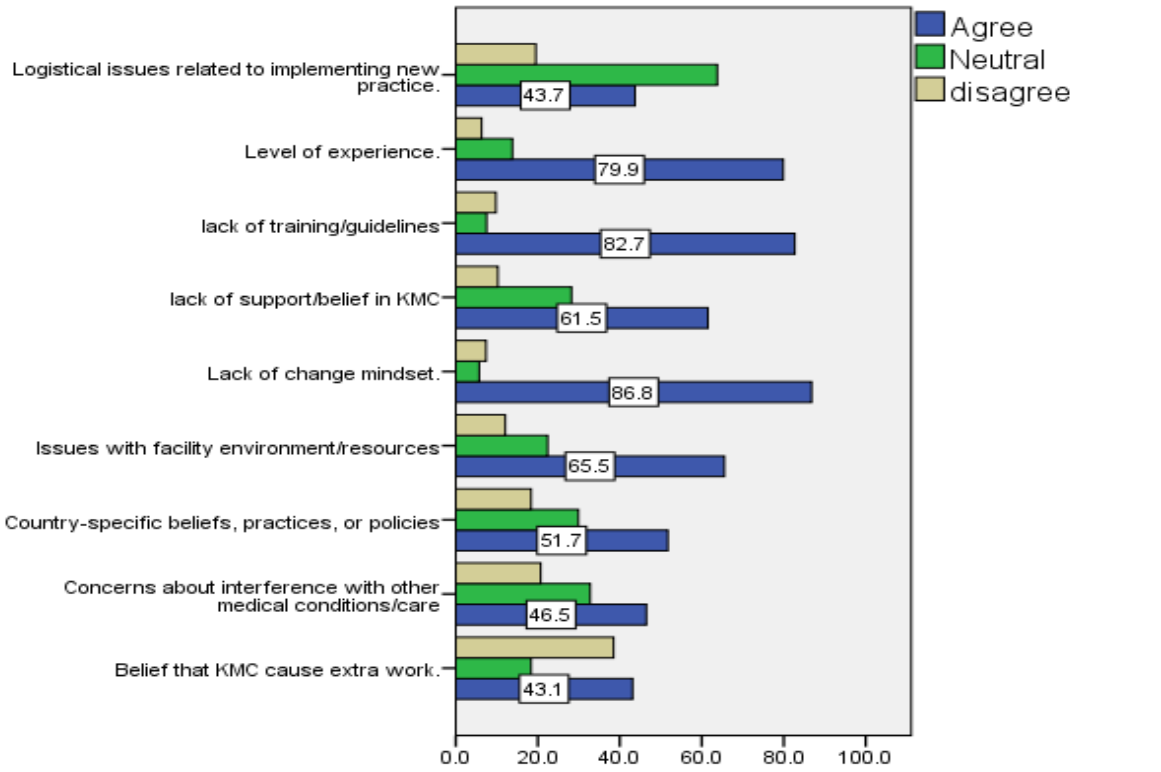
Barriers to KMC implementation

Table 3 summarizes the opinions of doctors and nurses on the challenges of implementing Kangaroo Mother Care (KMC) for preterm infants. The top three barriers identified were the need for an attitude change (86.8%), the lack of training and guidelines (82.7%), and varying levels of experience (79.9%) (see Fig. 3). Additionally, 43.1% of participants cited increased workload as a barrier, while 51.7% pointed to country-specific beliefs, practices, or policies—such as parental discomfort with exposing the chest—as potential obstacles.

Table 3: Barriers to implementing KMC in preterm infants

Item	Agree		Neutral		disagree	
	No.	%	No.	%	No.	%
Lack /training/guidelines on KMC	144	82.7	13	7.5	17	9.8
Lack of support/belief in KMC efficacy.	107	61.5	49	28.2	18	10.3
Issues with facility environment/resources such as providing parents' privacy	114	65.5	39	22.4	21	12.1
Concerns about interference with other medical conditions/care	81	46.5	57	32.8	36	20.7
Belief that KMC causes extra work.	75	43.1	32	18.4	67	38.5
Country-specific beliefs, practices, or policies (e.g. parents' discomfort with exposing their chest)	90	51.7	52	29.9	32	18.4
Lack of change mindset.	151	86.8	10	5.7	13	7.4
Logistical issues related to implementing new practice.	76	43.7	64	36.8	34	19.5
Level of experience. (duration of working in special baby care unit)	139	79.9	24	13.8	11	6.3

Fig. 3 Percentage of particpants reporting Barriers to KMC implementation



Discussion:

Although Kangaroo Mother Care (KMC) is a simple and cost-effective practice, its acceptance and implementation by healthcare workers require significant effort. Several challenges can hinder its adoption, including knowledge gaps, reluctance to embrace the practice, and the need for adequate training. The present study explores the barriers that might face the staff in special care units regarding the implementation of KMC.

In this study, 60.3% of the participants were over 30 years old, a finding consistent with studies conducted in Syria (17) and Saudi Arabia (18), particularly among nurses. The literature highlights multiple obstacles to KMC implementation, including staffing shortages, inadequate infrastructure, and a lack of qualified healthcare professionals (19). Additionally, increased workload, concerns about interference with other medical conditions, lack of clear guidelines and training, and skepticism about the effectiveness of KMC have been reported as barriers (20,21).

In Saudi Arabia, Al-Shehri *et al.* (18) identified additional concerns, such as the difficulty in allocating sufficient time for mother-infant interaction, the risk of accidental extubation during KMC, and mothers' discomfort with chest exposure.

Furthermore, some studies indicate that training mothers to practice KMC is time-consuming and may reduce the time available for attending to other critically ill patients. To address these challenges, optimizing staff numbers and workload distribution is crucial to ensure effective KMC implementation and improve overall neonatal care (22).

The successful implementation of a new intervention requires the adoption of a theory of change that evolves and adapts in response to emerging challenges and the decisions made by partners and other stakeholders (23). In the present study, participants ranked the lack of a change mindset as the most significant barrier, followed by insufficient training and guidelines, varying levels of experience, environmental and facility-related factors, and the need for stronger support and belief in KMC. In contrast, workload concerns and interference with other medical conditions were ranked among the least significant barriers (Fig. 3).

These findings differ from those of Seidman *et al.* (24), who positioned change of mindset as the least significant barrier, which may be attributed to differences in the overall experience level of the participants in both studies. Regarding Country-specific beliefs, practices, the majority of participants (51.7%) think this would be a barrier in contrast to the report from Ghana which reported by Nguah *et al.* where KMC practice was not affected by perceived community attitudes (24).

The successful implementation of a new intervention requires the adoption of a theory of change that evolves and adapts in response to emerging challenges and the decisions made by partners and other stakeholders (25).

Given the potential challenges in implementing KMC, it is crucial to equip healthcare workers with adequate education and training to ensure they are confident and competent in its practice. Addressing these barriers through structured training programs, institutional support, and clear guidelines will enhance the successful integration of KMC into neonatal care practices.

Conclusion and Recommendations:

Kangaroo Mother Care (KMC) is crucial for premature infants, but barriers such as lack of training, insufficient infrastructure, staff shortages, and resistance to change hinder its implementation.

To improve KMC adoption in Yemen, structured training for healthcare providers, better staff allocation, and adequate funding for KMC facilities are essential. Developing standardized guidelines and engaging stakeholders will ensure consistency in practice. Additionally, raising public awareness through social media can help dispel misconceptions and encourage community support. Addressing these challenges will facilitate the successful integration of KMC into neonatal care in Yemen.

Limitations of the Study:

This study has several limitations that should be considered:

The number of barriers assessed in the questionnaire was limited, which may not fully capture all potential challenges in implementing KMC.

The study did not specify the number of healthcare professionals in each hospital, making it difficult to determine which facilities require more targeted interventions.

The study did not differentiate between doctors and nurses, which could have helped identify profession-specific barriers to KMC implementation.

Ethical clearance:

Ethical approval for this study was obtained from all relevant hospital authorities. Additionally, informed consent was secured from all study participants after explaining the study's objectives and ensuring data confidentiality.

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