THE EFFECT OF QUALITY IMPROVEMENT PROJECTS IN THE IMPLEMENTATION OF KANGAROO MOTHER CARE, A SYSTEMATIC REVIEW

M. Gutierrez Popoca[1], T. Tancred[2]
MSF OCG[1], Liverpool School of Tropical Medicine[2]

BACKGROUND AND OBJECTIVES

Neonatal mortality disproportionately affects premature and low birth weight (LBW) infants[1]. Kangaroo Mother Care (KMC) is an approach involving skin-to-skin contact (SSC) and exclusive breastfeeding (BF) to improve outcomes for these vulnerable babies[2]. Despite its cost-effectiveness, KMC implementation is constrained by poor quality and coverage[3]. Quality Improvement (QI) involves problem-solving cycles to identify and redress context-specific barriers to implementation. It is a promising strategy to support KMC implementation[4].

The objective of this review was to evaluate the effectiveness of QI initiatives targeting KMC implementation, identifying the most effective interventions that can be used in different contexts to implement KMC.

METHODOLOGY

A systematic review was carried out. Searches were conducted across multiple databases: CINAHL, Global Health, Cochrane Library, PubMed/MEDLINE, Global Index Medicus, and Web of Science. Additionally, a grey literature search was done on relevant health, paediatrics, prematurity, BF, or KMC-focused organisation websites. Our search focused on three main concepts: QI, KMC, and implementation. We included papers aiming to improve SSC duration, KMC coverage, or exclusive BF through QI activities in preterm or LBW newborns, carried out in low or middle-income countries (LMICs), and providing sufficient detail about the QI activities for analysis.

A single reviewer did a two-step screening process to select the studies that fulfilled the inclusion criteria. Study quality was assessed using the Quality Improvement Minimum Quality Criteria Set (QI-MQCS). The impact of the interventions was assessed with the score represented in Figure 1.
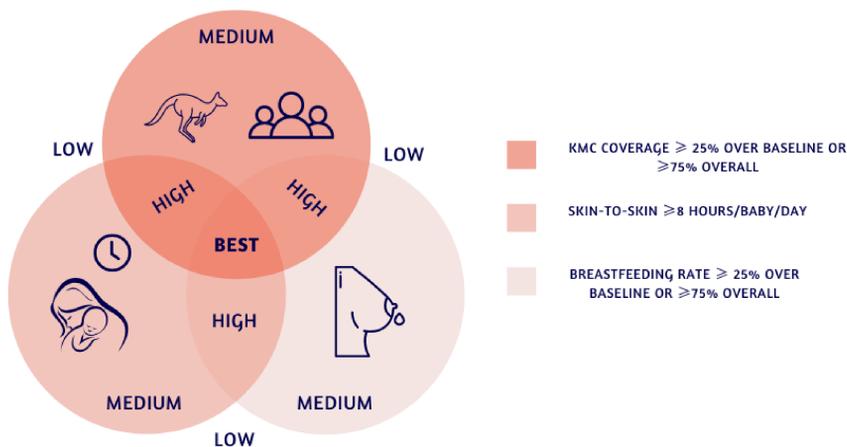

Figure 1. Venn diagram representing the intervention impact score system

A narrative synthesis of the results was conducted, focusing on the most successful QI-generated interventions, which were categorized using the Behaviour Change Wheel (Figure 2).
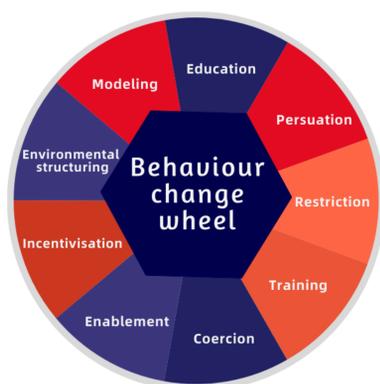

Figure 2. Components of the Behaviour Change Wheel used to categorize the interventions

ETHICS STATEMENT

No ethics approvals were required as this review exclusively included secondary data in the public domain.

References:
1. United Nations Inter-agency group, *Levels & Trends in Child Mortality United Nations Inter-Agency Group for Child Mortality Estimation (UN IGME)*, 2023
2. World Health Organization, *WHO recommendations for care of the preterm or low-birthweight infant.* 2022
3. Bergh, Gupta and Rao, Programmatic implementation of kangaroo mother care: a systematic synthesis of grey literature, 2023; Bergman et al., Health system intervention packages on improving coverage of kangaroo mother care for preterm or LBW infants: a mixedmethods systematic review, 2023; World Health Organization, *Kangaroo mother care: a transformative innovation in health care. Global position paper*, 2023
4. World Health Organization, *Improving the quality of care for mothers, newborns and children in health facilities: facilitator manual 2020, WHO Improving the quality of care for maternal, newborn and child health: Implementation guide for national, district and facility levels 2022*

RESULTS

The search results are illustrated in a PRISMA flow diagram shown in Figure 3. Of the 13 papers chosen for this review only 8 attained a satisfactory QI-MQCS score. These 8 studies included in total 1,118 newborns. Notably, all the studies were carried out in India and used Plan-Do-Study-Act (PDSA) cycles as the QI approach. A description of the included studies can be found in Table 1.
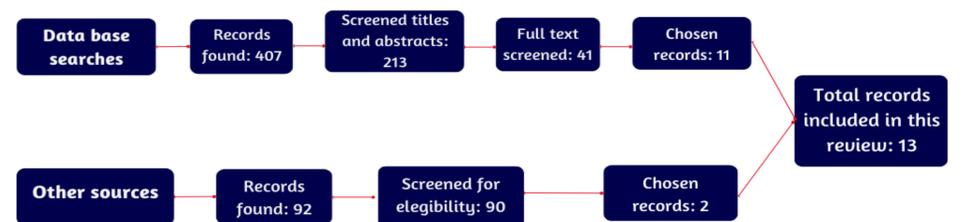

Figure 3. Simplified PRISMA flow diagram

Table 1. Brief description of the studies and their outcomes

	Author, country and year	Type of facility / Community	Type of QI and duration	Participants, type of data collected	Obtained outcomes	Behaviour change wheel interventions identified in the projects	QI-MQCS Score	Interventions impact score
1	Arora, 2021 India	Tertiary care centre, NICU level III	PDSA 8 m	169 twin pairs (338 babies) <2,500 g, prospective throughout	KMC coverage +29% (82%), SSC duration: 9/h/baby/day, BF: not reported.	Education, persuasion, environmental restructuring, enablement.	12	High
2	Jain, 2023 India	Tertiary care centre, NICU	PDSA 10 m	74 preterm or LBW babies, prospective throughout	KMC coverage: not reliable, SSC duration: 6 h/baby/day, BF not reported.	Education, persuasion, enablement.	10	Low
3	Jayashree, 2021 India	2 public health facilities: one 3rd level and one 2nd level	PDSA 20 m	276 VLBW, also included 5,343 term babies, prospective throughout	KMC coverage: +28% (71%), SSC duration: not reported, BF: +20% (80%)	Education, persuasion, incentivisation, training, restriction, environmental restructuring, modelling, enablement.	15	High
4	Jegannathan, 2022 India	Tertiary care centre, NICU Level III	PDSA 7.5 m	86 babies <2,000g, baseline based on 24 h recall of mothers, prospective afterwards	KMC coverage: not reported, SSC duration: 16 h/baby/day, BF: not reported	Persuasion, incentivisation, environmental restructuring, modelling.	10	Medium
5	A. Joshi, 2022 India	Public teaching hospital, NICU level II/III	PDSA 2 y 6 m	No number of patients specified. <2,500 g, cross-section baseline, prospective afterwards	KMC coverage: +80% (100%), SSC duration 6 h/baby/day	Education, persuasion, training, restriction, environmental restructuring, modelling.	13	Medium
6	M. Joshi, 2018 India	NICU level II and Level III	PDSA 16 m	30 preterm babies, prospective throughout	KMC coverage: not reported, SSC duration: 9 h/baby/day, BF: not reported	Education, persuasion, incentivisation, environmental restructuring, modelling, enablement.	10	Medium
7	Patawat, 2023 India	Urban / Rural community College Hospital	PDSA 3 m	180 babies <2,000 g, prospective throughout	KMC coverage: +34% (50%), SSC duration: 12 h/baby/day, BF: 78% (baseline?)	Education, persuasion, training, environmental restructuring, enablement.	10	Best
8	Ramachandrappa 2022 India	Private Tertiary care centre, NICU level III	PDSA 2 y 3 m	134 babies <2,000 g, prospective throughout	KMC coverage: not reported, SSC duration: 8 h/baby/day, BF: not reported	Education, persuasion, incentivisation, training, restriction, environmental restructuring, modelling, enablement.	11	Medium

QI-MQCS score colour code: 🟩 Excellent 🟨 Good 🟧 Moderate

DISCUSSION/ CONCLUSION

After classifying the interventions of each of the included studies according to the Behaviour Change Wheel, the most consistently impactful interventions were identified, leading to the following recommendations:

- **Training:** Provide continuous and structured training, reaching every member of staff involved in providing KMC.
- **Education:** Up to date protocols and guidelines; ensure everyone involved in newborn care is aware that KMC is routine care for any LBW baby, should be given for at least 8 h per day and should be started as soon as possible. Breast milk should be the preferred nutrition for any newborn.
- **Incentivisation:** make KMC a monitored indicator. Include monitoring tools in patient files; report at facility, regional or national level when possible.
- **Restriction:** Minimise interruptions of KMC and BF. Create clusters of clinical care. Provide mothers with necessary tools and encourage them to practice KMC while doing other activities.
- **Enablement:** KMC as a shared family responsibility; allow and promote other family members to provide SSC and support the mother.
- **Environmental structuring:** Keep mother and baby together; designate spaces for KMC, this helps the staff gain experience in supporting KMC and gives the mothers the opportunity for peer support. Ideally mothers should receive obstetric care in this space to avoid separation from their babies.

QI can be used in LMICs as an effective strategy to implement KMC.