Brief Report

Developing and Scaling Up Interactive Kangaroo Mother Care Training in Malaysia: Insights from the Kirkpatrick Training Evaluation Model

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ABSTRACT

Kangaroo Mother Care (KMC) is an evidence-based intervention recommended by the World Health Organization to improve outcomes for preterm and low birth weight infants. However, implementation in Malaysia has been variable, with insufficient training identified as a key barrier. This brief report describes the development and evolution of KMC training workshops conducted across Malaysia. Initial training was delivered using the SCORPIO method, a structured, station-based, small-group learning approach integrating clinical demonstration, supervised practice, and individualised post-workshop skills assessment. As demand increased, the training format was adapted to allow scale-up while preserving interaction and hands-on practice. The revised model utilised centrally facilitated demonstrations, small-group case discussions, and hands-on simulation using low-cost materials. This increased workshop capacity without extending workshop duration. Content was continuously updated to reflect evolving evidence and to address common misconceptions identified during training. The workshops are examined using the Kirkpatrick Model, a four-level framework for evaluating training programs. Participants reported high engagement and positive learning experiences (Level 1), assessments indicated improvement (Level 2) but differing assessment methods prevented direct comparison of learning outcomes between the original and redesigned formats. At Levels 3 and 4, workplace application and broader organisational impact were limited by the predominantly junior participants' authority to influence practice and by variable institutional support. This experience suggests that interactive KMC training can be effectively scaled through adaptive redesign using low-cost approaches. However, sustained practice change depends on supportive institutional environments and engagement of clinical decision-makers beyond the training itself.

Keywords: kangaroo mother care, workshop, premature infants, training, Kirkpatrick Model, SCORPIO

INTRODUCTION

Kangaroo Mother Care (KMC) is recommended by the World Health Organization as an evidence-based intervention that improves outcomes and survival for preterm and low birth weight infants 1. However, translating KMC from evidence and policy into routine practice remains challenging. In Malaysia, KMC has been promoted for more than a decade, but implementation remains variable. A national survey of hospitals providing Level II–III neonatal care found that, among 69 responding hospitals, 60 reported some KMC practice, but only

approximately half had integrated KMC into routine care. Reported barriers included inconsistent training, variable leadership support, structural limitations and limited integration of KMC into routine systems 2.

Training is therefore an important component of KMC implementation. Under the SEA-URCHIN (South East Asia – Using Research for Change in Hospital acquired Infection in Neonates) Project (2011-2015) 3, a multi-country initiative to reduce neonatal hospital-acquired infections through evidence-based practices, six healthcare professionals from three Malaysian hospitals were trained as KMC trainers using the SCORPIO (Structured, Clinical, Objective Referenced, Problem-based, Integrated and Organized) method 4. After returning to their institutions, they introduced KMC training in their own hospitals and subsequently helped expand training to other hospitals across Malaysia. The workshops subsequently evolved in response to practical limitations, participant feedback, emerging evidence and the need to reach more healthcare workers. This report describes this evolution and uses the Kirkpatrick Model as a framework to reflect on what the workshops achieved, and where training alone was insufficient to influence KMC implementation.

Evolution of the KMC workshops

The initial workshops used the SCORPIO method, integrating clinical skills with theoretical knowledge. Participants were organized into small groups of four to seven and rotated through different stations followed by individualized skills assessments and feedback, covering the science behind KMC, supporting a parent with KMC, breastfeeding in the context of KMC, and infant monitoring during KMC. Each station had written, objective-referenced learning goals, following a structured 'Tell-Show-Do-Feedback' approach. They were conducted over half a day, but participants reported that the programme was too rushed. Therefore, workshops were extended to a full day, allowing more time for role play, supervised practice and feedback. However, this format was labour-intensive, requiring approximately four trainers for 28 participants. Repeating the same intensive station as groups rotated stations was also tiring for trainers.

As demand increased, the workshops were redesigned to accommodate more participants within the same time frame while retaining their interactive and practical elements. Rather than rotating through stations, participants remained in small groups while trainers delivered core interactive teaching centrally using videos and demonstrations. Participants practised skills within their groups, while facilitators moved between groups to provide guidance and feedback.

To support hands-on practice without requiring additional specialised equipment, low-cost materials were used to simulate clinical environments. Examples included small dolls purchased from toy stores, with hips and knees that could be flexed and positioned in hip abduction (Fig. 1); improvised 'incubators' made from cardboard boxes (Fig. 2); 'mother's chests' made from pillows (Fig. 3); and breast models made from cotton-stuffed stocking-nets. Participants used these models to practise transferring an infant with multiple intravenous lines, oxygen tubing, and monitoring devices from an incubator to the KMC position with a seated mother; supporting mothers to transfer their infants independently from the incubator to the KMC position while standing; and assisting

mothers with diaper changes and milk expression while maintaining the KMC position. Role-play and simulated scenarios were also incorporated into the sessions.

Figure 1. Preparing dolls with tubes and lines.



Figure 2. 'Premature infants' in 'incubators'



Figure 3. 'Mother's chest' made from a pillow



This redesigned approach increased the usual workshop capacity from 28 to as many as 80 participants without extending the workshop duration. It also reduced trainer numbers, with extra facilitators brought in only for practical sessions. Importantly, it reduced repetitive delivery of intensive training to successive small groups. The redesign therefore improved the scalability and sustainability of the training model while retaining opportunities for hands-on practice.

Workshop content was continuously refined in response to emerging evidence and participant feedback. KMC recommendations evolved from 'initiation after stabilization' to 'initiation as soon as possible after birth'. Common misconceptions identified during workshops (e.g., that infants must wait 30 minutes after tube feeding before KMC can be initiated) were addressed and subsequently incorporated into future training sessions. Group discussions enabled participants to identify barriers and develop strategies to support KMC implementation in their own settings.

Participant feedback and post workshop assessment

Participant evaluations were consistently positive. Early feedback supported the interactive approach but identified the half-day format as too rushed, prompting extension to a full day. Later participants requested more case scenarios and opportunities to work through real-life clinical situations; these were subsequently incorporated through case-based scenarios and locally relevant discussions. Participants were also asked to identify actions they intended to take on returning to their neonatal units, providing an opportunity to link training with anticipated workplace application.

In the adapted workshops, pre- and post-training written assessments replaced the individualised skills assessments used in the original SCORPIO model. In both forms of post-workshop assessment, participants demonstrated improvement in knowledge and practical skills following the workshop. However, findings from the two assessment approaches cannot be directly compared because they used different assessment methods.

Insights from the Kirkpatrick Model

To reflect on the strengths, limitations, and lessons learned from the KMC workshops, the Kirkpatrick Model was used. The is a widely used framework for evaluating training program that considers four levels of impact from workshops: participants' reactions to the training (Level 1), learning gained (Level 2), changes in workplace behaviour (Level 3), and broader organisational or patient outcomes (Level 4) [5].

Level 1 & 2: Reaction and Learning

Workshops were consistently well received, with participants reporting high levels of engagement and enthusiasm (Level 1). This supports the value of the adult learning approach, which emphasise active participation, experiential learning and opportunities to apply skills in realistic contexts. Workshops also identified misconceptions and practical concerns among healthcare providers, informing iterative refinement of content.

Pre- and post-workshop assessments indicated improved knowledge and, for workshops using the original SCORPIO method, improved performance on the skills assessment (Level 2). However, different assessment methods were used across the original and redesigned formats, preventing direct comparison. We therefore cannot conclude that the redesigned format was equivalent or superior to the original in terms of knowledge or skills.

Table 1. Evolution of the KMC workshop model

Workshop phase	Delivery model	Scale and practical implications
Initial SCORPIO model	Introductory session followed by four rotating stations using the Tell–Show–Do–Feedback sequence (30 minutes per station), then individual assessment and feedback.	Staffing: ~4 trainers Participants: 28–30 Duration: 4 hours Provided structured, intensive hands-on training with individualised assessment and feedback, but limited participant capacity and required substantial trainer input.
Expanded SCORPIO model	Introductory session followed by four rotating stations using the Tell–Show–Do–Feedback sequence (60 minutes per station), then individual feedback.	Staffing: ~4 trainers Participants: 28–30 Duration: 7 hours Allowed more time for practice, role-play and feedback, but remained labour-intensive and limited in scale.
Redesigned model	Central interactive teaching with simultaneous small-group practice, evidence updates, case simulations, role-play, locally relevant scenarios, and facilitator feedback.	Staffing: ~2 trainers, with additional facilitators as needed Participants: 75–80 Duration: Unchanged Increased capacity without extending workshop duration while retaining interactive, hands-on learning.

Level 3 & 4: Behaviour and Results

The transition from learning to workplace behaviour and broader outcomes was more complex. Most hospitals chose to send junior staff to the workshops. During group discussions, participants generally expressed strong motivation to apply what they had learned, but many recognised that they might have limited ability to change practice on returning to their wards. As junior staff, they often lacked the clinical and administrative authority to influence KMC practices, institutional policies, staffing arrangements or workflows. This was consistent with findings from a recent national KMC survey and key-informant interviews in Malaysia, which also highlighted the importance of leadership, decision-making authority and organisational support for KMC implementation [2, 6, 7]. These findings suggest that hospitals should ensure KMC training reaches not only frontline

staff but also senior clinicians, nurse leaders and other personnel with the authority to influence institutional policies, workflows and resource allocation.

However, training alone does not translate into sustained KMC implementation. Local and international studies identify broader barriers, including staffing constraints, high workload, inadequate resources, limited provider engagement and insufficient organisational support. Therefore, improvements in KMC implementation, including increased duration of KMC following training, may not be sustainable without ongoing leadership support, routine monitoring, continuous quality improvement, adaptation of the ward environment, engagement of parents and caregivers, and peer support [8, 10].

Together, these findings highlight that KMC training cannot be considered in isolation from the organisational context in which participants work. Training should therefore engage relevant clinical decision-makers and address the broader organisational strategies needed to support KMC implementation, such as appropriate policies, organisational support and monitoring systems [11].

The family perspective is also important. Our previous study identified factors influencing KMC uptake from the family perspective [6]. Although these parents did not evaluate the workshops described here, their experiences highlight that successful KMC implementation also depends on whether parents feel informed, supported and welcomed as participants in their infant's care. Parent involvement should therefore be considered when designing future training.

Recommendations for future KMC workshops

1. Engage senior staff and embed training within existing programmes, such as the 20-hour breastfeeding course, rather than relying solely on stand-alone activities.
2. Link training to KMC indicators and audit-feedback mechanisms to monitor implementation and identify gaps.
3. Include parents' perspectives and address practical barriers to KMC, including privacy, space, staffing and continuity of care.
4. Continue to adapt training to emerging evidence and local needs, recognising that different hospitals may face different implementation challenges and require tailored approaches [12-14].

Conclusion

KMC workshops can be adapted and scaled using interactive, low-cost approaches, but scaling training alone does not ensure implementation. Sustained KMC practice requires institutional support, monitoring and a broader implementation strategy responsive to local needs.

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