

PROGRESS WITH THE IMPLEMENTATION OF KANGAROO MOTHER CARE IN FOUR REGIONS IN GHANA

A-M. BERGH¹, R. MANU², K. DAVY¹, E. VAN ROOYEN³, G. QUANSAH ASARE⁴, J.K. AWOONOR-WILLIAMS⁵, M. DEDZO⁶, A. TWUMASI⁷ and A. NANG-BEIFUBAH⁸

¹MRC Unit for Maternal and Infant Health Care Strategies, University of Pretoria, South Africa, ²UNICEF Ghana, ³Department of Paediatrics, University of Pretoria, South Africa, ⁴Family Health, Ghana Health Service, Accra, Ghana, ⁵Ghana Health Service, Upper East Region, Bolgatanga, Ghana, ⁶Ghana Health Service, Central Region, Cape Coast, Ghana, ⁷Ghana Health Service, Northern Region, Tamale, Ghana, ⁸Ghana Health Service, Upper West Region, Wa, Ghana

Corresponding Author: Dr. Anne-Marie Bergh

E-mail: anne-marie.bergh@up.ac.za

Conflict of Interest: The project was funded by UNICEF but no author received additional remuneration for participating in the project

SUMMARY

Aim: To measure progress with the implementation of kangaroo mother care (KMC) for low birth-weight (LBW) infants at a health systems level.

Design: Action research design, with district and regional hospitals as the unit of analysis.

Setting: Four regions in Ghana, identified by the Ghana Health Service and UNICEF.

Participants: Health workers and officials, health care facilities and districts in the four regions.

Intervention: A one-year implementation programme with three phases: (1) introduction to KMC, skills development in KMC practice and the management of implementation; (2) advanced skills development for regional steering committee members; and (3) an assessment of progress at the end of the intervention.

Main outcome measures: Description of practices, services and facilities for KMC and the identification of strengths and challenges.

Results: Twenty-six of 38 hospitals (68%) demonstrated sufficient progress with KMC implementation. Half of the hospitals had designated a special ward for KMC. 66% of hospitals used a special record for infants receiving KMC. Two of the main challenges were lack of support for mothers who had to remain with their LBW infants in hospital and no follow-up review services for LBW infants in 39% of hospitals.

Conclusions: It was possible to roll out KMC in Ghana, but further support for the regions is needed to maintain the momentum. Lessons learned from this project could inform further scale-up of KMC and other projects in Ghana.

Keywords: kangaroo mother care, premature infant, implementation, evaluation, Ghana

BACKGROUND

Kangaroo mother care (KMC) is a safe and effective method of caring for low birth-weight (LBW) infants, especially in low-resourced settings.¹ It has also been described as a cost-effective,^{2,3} high-impact intervention^{4,5} for improving newborn survival. Beneficial physiological and behavioural effects of KMC for the infant are well documented.⁶⁻⁷ Physiological effects include better thermoregulation, improved cardio-respiratory stability, lower risk of infection and faster growth. Behavioural effects relate to better sleep cycles, less crying and an analgesic effect during painful procedures. Beneficial effects for the mothers include better breastfeeding (increased milk production, exclusivity, duration, early initiation) and psychosocial effects (reduced anxiety, more maternal satisfaction, improved maternal-infant attachment and bonding).⁶⁻⁷

KMC entails a 'total health-care strategy'⁸ applied within a supportive environment, with the skin-to-skin position of the infant against the mother's chest as one of the major components. Other components include exclusive breastfeeding wherever possible and early discharge from the health care facility (i.e. when breastfeeding has been established, the mother shows an appropriate level of infant-handling competency and the infant is gaining weight) with a proper follow-up system in place for regular review of the infant.⁹ Continuous KMC is practised when the mother and infant are in skin-to-skin contact day and night for at least 20 hours or more per day. If the infant is placed in the skin-to-skin position for shorter periods of time every day (preferably at least 70 minutes per session), intermittent KMC is said to be practised.¹⁰ The World Health Organization's kangaroo mother care guide provides a detailed description and illustration of the correct and safe positioning of the infant in KMC.¹¹

Although KMC has become widely accepted during the past decade, it remains, according to Lawn and colleagues, ‘unavailable at-scale in most low-income countries’.¹² Until 2007 no KMC was practised in Ghana.¹³ The *KMC Ghana* initiative was the first roll-out attempt in four regions, namely the Central, Northern, Upper East and Upper West Regions. The year-long intervention during 2008 and 2009 consisted of three phases. The first phase entailed the introduction of the KMC concept and the provision of the basic KMC information and skills needed to start practising KMC, as well as the development of management and leadership skills for the district representatives identified as part of the regional steering committees. Six months later the second phase followed, with an advanced workshop for steering committee members in each region. Each district was expected to provide feedback on progress made with their individual, contextually developed action plans, and emerging challenges and possible solutions were discussed. The advanced skills development covered KMC practice and the management of implementation. After a further six-month period the *KMC Ghana* intervention was concluded with a third phase which involved the assessment of progress with KMC implementation.¹⁴ This paper gives an overview of the evaluation process and a descriptive profile of KMC practices, services and facilities in the four regions.

METHODS

The purpose of the end-of-intervention assessment, which was called ‘progress monitoring’, was to review the status and level of KMC implementation and practice in health facilities in the four regions with a view to identifying strengths and challenges and, where necessary, making recommendations for improvement. This formed part of an action research design used for monitoring the process and outcomes of the interven-

tion. Action research often entails a developmental and participatory approach where a group of people are intensely involved in the change process and reflect on ways of improving what they are doing.¹⁵ In the case of *KMC Ghana* health workers participated in the implementation of KMC in their quest to reduce mortality and morbidity in LBW infants. The research design was therefore emerging as the process unfolded, to accommodate individual differences and needs between regions, districts and facilities.¹⁴ The design of this exercise drew strongly on the experiences of other countries and on two randomised trials that measured the effect of different outreach strategies for the implementation of KMC in South Africa.¹⁶⁻¹⁷

A standardised progress-monitoring instrument was used to collect quantitative and qualitative data for each hospital.¹⁸ The instrument makes provision for collecting comprehensive information on issues that could affect KMC practice and services. Items are organised under 18 headings (see Table 1). Some items rely on the self-report by health workers and others on observations. Some of the quantifiable items contribute towards a progress score out of 30 points. The number of points scored by a health facility indicates which level of implementation that facility has reached. The model, which is described in detail elsewhere,^{14,18} has six levels of implementation: (1) creating awareness; (2) adopting the concept; (3) taking ownership; (4) evidence of practice; (5) evidence of routine and integration; (6) sustainable practice. Sufficient progress with implementation refers to a score on levels 4, 5 or 6. The period of one year would not provide implementers time to achieve the level of “sustainable practice” and was therefore neither an anticipated nor realistic goal.

Table 1 Organisation of the progress-monitoring instrument in themes

1	Health care facility	10	Records in use for KMC information
2	Neonatal and kangaroo mother care	11	KMC education
3	Skin-to-skin practices	12	Documents
4	History of KMC implementation	13	Referrals, discharge and follow-up
5	Involvement of role-players	14	Staff orientation and training
6	Resources	15	Staff rotations
7	KMC space: continuous KMC	16	Strengths and challenges
8	Neonatal unit/nursery: intermittent KMC	17	Questions guiding informal interviews with mothers
9	Feeding and weight monitoring	18	General observations and impressions

The progress-monitoring process

The assessment exercise took place one year after the first workshops had been conducted. Altogether 38 hospitals were visited – 33 district hospitals, four regional hospitals and one teaching hospital. Participants

had already been prepared for the monitoring process during the advanced workshops conducted six months earlier, when they were required to continue with the refinement and further development of their action plans.

Additional guidelines providing information on what to prepare for the progress-monitoring visit were also distributed at a later stage, prior to the assessment.

In each region, members of the regional steering committee were nominated to be trained as progress monitors or assessors. A total of six monitoring teams were trained, one for each of the two smaller regions and two for each of the two larger regions. Each team consisted of three to four members.

The three-week progress-monitoring process consisted of three components, which ran consecutively:

(1) *Two-day preparation workshop* to train the KMC progress monitors. This interactive workshop included a role-play to introduce participants to the progress-monitoring tool. On the second day a local hospital was visited and scored by the freshly trained 'progress monitors'.

(2) *Visit to each district and regional hospital* in the four regions. Each team of monitors was accompanied by one of the three facilitators who had been involved in the *KMC Ghana* initiative from the outset and who had experience in monitoring progress with the implementation of KMC.

(3) *One- or two-day debriefing workshop* to compile the first draft of the report for each region. Feedback was given on the fieldwork and the quantitative data were collated and processed as far as possible. Each region collaboratively compiled its own report, which included recommendations and a discussion of the way forward.

The approach used differs somewhat from a formal summative evaluation at the end of a project. The progress-monitoring visits largely doubled as outreach visits used as an additional KMC learning opportunity for personnel at the health care facilities and for the trained progress monitors, who did not merely serve as data collectors, but also as peer facilitators. Table 2 summarises the typical course of events during the visit itself and the approach followed. Immediate supportive feedback, delivered in a cordial and non-threatening manner, was given at the conclusion of each visit. Recommendations for individual hospitals were made in a written report presented to management before departure.

Table 2 Main elements of each progress-monitoring visit

Sequence of events	Approach
<ul style="list-style-type: none"> • Courtesy call on the District Health Management Team and hospital management • Presentations by KMC representatives on activities in <ul style="list-style-type: none"> - hospital - district (including health centres) - neighbouring district (with no district hospital) • General discussion • Interview of role-players (using progress-monitoring tool) • Visit to and observations in KMC ward (using progress-monitoring tool) • Separate meeting of progress monitors to prepare feedback • Discussion of written feedback with representatives • Presentation of copy of report to KMC coordinator and or management 	<ul style="list-style-type: none"> • Three-fold purpose: <ul style="list-style-type: none"> - Outreach by means of supportive facilitation and supervision - Data collection - Immediate written feedback for maximum impact, motivation and continued momentum • Supportive facilitation and supervision <ul style="list-style-type: none"> - On-site assistance with problems - Critical thinking and problem solving, specifically regarding LBW infant management, KMC practices and operational efforts

Progress monitors also evaluated the preparation and debriefing workshops, the progress-monitoring visits and their experience of the whole process. At various points relating to a particular activity they were requested to respond to open-ended and structured questions.

RESULTS

Twenty-six of the 38 participating hospitals (68%) demonstrated sufficient progress with KMC implementation. Table 3 summarises the results according to the six levels of KMC implementation. The detailed results of individual hospital scores on progress with KMC implementation are the subject of a separate report.¹⁴

Table 3 Implementation according to the different progress levels

Implementation level	n hospitals	% hospitals	Implementation status
1. Creating awareness	2	5	On the way to implementation
2. Adopting the concept	3	8	
3. Taking ownership	7	18	
4. Evidence of practice	19	50	Sufficient implementation progress
5. Evidence of routine and integration	7	18	
6. Sustainable practice	-	-	
TOTAL	38	100	

Feedback from the progress monitors

The trained monitors considered the progress-monitoring exercise successful with regard to the process, the immediate feedback to each facility and the additional skills developed in the process (e.g. data collection, problem solving, evaluation and report writing). Progress monitors in three of the regions emphasised the evidence base built into the monitoring. The recommendations made to individual hospitals and the written report presented at the end of each visit typically included points related to the following: improvement of communication between KMC midwives and maternity and hospital management; improvement of record keeping and statistics; improvement of written documents and guidelines on strengthening KMC; better integration of KMC into antenatal care activities; continuation of on-the-job training of midwives working in maternity units and the sensitisation of other staff. All role-players indicated that the written report immediately following the visit was highly appreciated.

In-hospital services and practice

At the time of the progress-monitoring visits, the self-report of hospitals on the type of KMC they were practising was as follows: five hospitals with both intermittent and continuous KMC (13%); 26 hospitals continuous KMC only (68%); and one hospital intermittent KMC only (<1%). The others were, as yet, not practising KMC.

In 15 hospitals, infants were observed in the KMC position during the visit (40%). Where no LBW infants were present at the time of the visit, records were scrutinised for evidence of practice. Twenty-five hospitals used a special register or collective record for infants receiving KMC (66%). These generally corresponded with the 24 hospitals that were able to provide figures for the number of infants who had received KMC (63%). With regard to positioning for KMC, handling techniques that might provoke stress and other negative physiological reactions in the neonate were observed.

A feeding job-aid for LBW infants created during the intervention was displayed in half of the hospitals, but it was difficult to establish whether this was being used and how correctly the described regime was being followed.

Nineteen (19) hospitals had a separate KMC ward (50% of the total), and 13 hospitals indicated that they used beds in the lying-in or postnatal ward (34%). Not much had been done to make the environment comfortable for those mothers and infants who needed to remain within facilities for an extended period of time – six hospitals had low beds (16%), two provided pillows (5%) and 10 had comfortable chairs (26%). Although not probed in depth, most of the facilities did not provide food for the mothers, who were thus then dependent on their relatives for their daily sustenance. Qualitative information obtained from mothers present during visits demonstrated that the concept and practice of KMC was generally acceptable and that they were able to cite the benefits of KMC. As a motivational factor, mothers and health workers also mentioned various success stories of infants who had survived having been nursed in KMC.

Documentation and information

Other documentation that is known to promote sustainable KMC practice had not been developed at most hospitals. None of the hospitals had a written checklist for procedures on admission to KMC, and only seven hospitals had some form of written guidelines, protocols or policies related to some aspect of KMC (e.g. discharge criteria) (18%). Although all 26 baby-friendly hospitals were expected to have a written feeding policy, only 21 indicated having such a policy (81%). Twenty-three hospitals indicated that they had a long-term plan to ensure that all health workers were trained in KMC (61%). However, only nine of the 23 (39%) were able to show a written plan.

Thirty hospitals displayed the 'KMC made easy poster' provided as part of the outreach (79%). Six hospitals had developed their own posters as well (16%). Three hospitals had erected billboards at the entrance or at the maternity ward to advertise their KMC services (8%). Other forms of publicising KMC included notices to the effect that KMC was being practised and displaying photographs of mothers and infants who had delivered at the hospital. Eight hospitals displayed KMC vision statements (21%). The KMC DVD provided as part of the original orientation was used regularly by eight hospitals (21%).

Discharge and follow-up

Discharge of infants appeared to be a particularly challenging area. Very few hospitals had consistent discharge criteria to help with effective discharge decisions. One of the discharge criteria for KMC infants is that they should gain weight before being discharged. However, at most hospitals there was a tendency to discharge LBW infants within 72 hours and in facilities with a high patient turnover within as little as two hours. Informants ascribed this to the prevailing general practice and inadequate community sensitisation regarding LBW infants and KMC – mothers did not stay in hospital for long after delivery and insisted on going home and, where there was space, the hospital or health centre did not provide food for the mothers (not even for those who lived far away). In some areas, cultural practices dictating that all infants be discharged from hospital within 24 hours after birth were perceived to be a barrier to sensitisation and to interfere with the continuity of extended hospitalisation.

Although 23 of the 38 hospitals indicated that infants born there could return for review (61%), it was evident from the qualitative feedback that the follow-up arrangements to ensure the well-being of these infants were generally not well structured or the referral and/or feedback network within the district was not functioning well. Even where a good follow-up system was in place, many mothers did not come back for review because of the difficulty they experienced in returning to the hospital. Only 14 of the 23 hospitals providing follow-up care kept records of follow-up visits (61%).

Health workers

Eighty of the 89 hospital health workers originally oriented in KMC were still working in KMC (90%). Twenty-six hospitals did not rotate their KMC staff to wards outside the maternity and/or neonatal unit (68%). Hospitals that did not rotate their staff had a slightly higher mean progress score than those hospitals with a rotation policy, but this was not statistically significant.

The redeployment of one steering committee member also impacted negatively on at least one district's ability to achieve any measure of effective practice since in that case the nurse had taken the resource materials along.

Generally, districts reported making use of or creating opportunities for sensitising other health workers such as traditional birth attendants and community health nurses to KMC, although exact numbers were difficult to obtain. Most activities appeared to have been in the form of a *durbar* or a short slot as part of other health care activities. Only a few hospitals or districts organised larger scale half-day or full-day orientation sessions for health workers. In contrast, one hospital trained all 150 staff members at the hospital in a similar fashion as is required if a hospital is to become a baby-friendly hospital. On-the-job orientation and training of midwives involved in deliveries also appears to have been of variable quality and to have taken different forms.

Structural, systems and personnel factors derived from the feedback that were conducive to KMC implementation included the following: support from management; good communication at all levels; leadership demonstrated by KMC coordinators; the ability of KMC-trained health workers to continue with education and sensitisation; having a wide range of health care workers on board; and the efficient functioning of the regional KMC steering committee.

DISCUSSION

The progress-monitoring exercise was a complex process that elicited data on a number of issues from a vast number of institutions and individuals. The main findings relate to the progress of individual hospitals and the collective group of hospitals participating in the initiative. It is clear from the results that the majority of hospitals managed to mobilise towards implementation and were able to demonstrate evidence of KMC practice.

Results on KMC practices, services and facilities indicate that many hospitals have gone a long way towards taking the necessary measures to institute KMC with the potential for KMC practices to become institutionalised there. The two areas of greatest concern were that the environment of health care facilities did not enable LBW infants and their mothers to remain in hospital for a longer period of time because family support for their daily needs would have been required, and that most mothers did not have access to adequate review opportunities, as is required for LBW infants after discharge.

The problem of providing adequate postnatal care for full-term and LBW infants is virtually universal in low- and middle-income countries. In a study in Malawi only 54 per cent of KMC infants discharged home completed their review schedule at the hospital.¹⁹ This study cites transport issues as one of the main barriers to accessing health care. This also seems to be the case in Ghana. An in-depth investigation into the functioning of the current follow-up network for LBW infants after discharge from hospital may be needed to identify the gaps in the system. An investigation into how community health nurses, community and mother support groups, traditional birth attendants and other opinion leaders could be involved in strengthening the system could also contribute to the finding of appropriate solutions.

Although most mothers and health workers seemed to understand the benefits of KMC, personal and community cultural beliefs and practices may have contributed to resistance to and non-compliance with KMC following the discharge of some mothers from hospital. Nguah and colleagues found that perceived community attitudes did not affect continued KMC practice in Kumasi, an urban area.¹³ Innovative ways of accommodating KMC in current cultural practices, especially in rural areas, is an area requiring more research. The Newhints intervention for newborn care in the Brong-Ahafo region in Ghana is an example where cultural practices informed the design and execution of the project.²⁰⁻²³ In a community-based skin-to-skin care project in rural India the practice was found to be highly acceptable where communication and behavioural change strategies were compatible with prevailing cultural paradigms.²⁴ This could also pave the way for more research into the introduction of community KMC, which is currently not widely advised as a result of one trial in Bangladesh that did not show a significant improvement in neonatal and infant mortality.^{1,25} There is therefore a need for strong linkages between community and facility systems in this regard.

CONCLUSION

Implementing KMC into the health care of newborns in the four focus regions of Ghana was a visionary, but challenging undertaking. After one year, there was evidence of sufficient progress in 68% of the targeted hospitals where KMC had been unknown before. Not much evidence is available on the scale-up of KMC to district hospitals in low- and middle-income countries.³ The lessons learned from *KMC Ghana* could therefore inform other projects, even those beyond KMC. In future KMC should also be linked to and integrated into relevant programmes and approaches such as Essential Newborn Care (ENC), the Baby-friendly Hospital Initiative (BFHI), the Integrated Management of Neonatal

and Childhood Illnesses (IMNCI) and High Impact Rapid Delivery (HIRD).

Other KMC scale-up projects elsewhere in the world found it important to continuously support regions for two to three years so as to enable health care facilities and districts to strengthen their KMC services and integrate KMC into all relevant programmes. Although health care workers participating in *KMC Ghana* were receptive and eager to learn about KMC, support for the initiative should continue, especially through the development of KMC centres of excellence and outreach programmes.

ACKNOWLEDGEMENTS

The Ghana Health Service gave written permission for the execution of this project and the publication of findings. The agreement of the Director-General, the Director of Family Health and the Directors of Health Services of the four regions to participate in the project and the enthusiastic participation of the members of the steering committees, the progress monitors, health workers, communities and mothers are acknowledged with appreciation. Dr. Elias Sory, Prof. Bob Pattinson, Dr. Mark Young and Joanne Greenfield are thanked for their constructive inputs and Dr. Anirban Chatterjee for his assistance.

The project was financially supported by the United Nations Children's Fund. The views expressed in this paper are those of the authors and not necessarily those of the Ghana Health Service, UNICEF or the South African Medical Research Council

REFERENCES

1. Conde-Agudelo A, Belizán JM, Diaz-Rossello J. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. *Cochrane Database Syst Rev* 2011; Issue 3: Art. No.: CD002771. (DOI: 10.1002/14651858.CD002771.pub2). Available at: <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD002771.pub2/abstract>.
2. Darmstadt GL, Bhutta ZA, Cousens S, Adam T, Walker N, de Bernis L, for the Lancet Neonatal Survival Steering Team. Evidence-based, cost-effective interventions: how many newborn babies can we save? *Lancet* 2005; 365:977-988.
3. Victora CG, Rubens CE and the GAPPS Review Group. Global report on preterm birth and stillbirth (4 of 7): delivery of interventions. *BMC Pregnancy and Childbirth* 2010;10(Suppl 1):S4. Available at: <http://www.biomedcentral.com/1471-2393/10/S1/S4>.
4. Lawn JE, Kerber K, Enweronu-Laryea C, Cousens S. 3.6 Million neonatal deaths – what is progress-

- ing and what is not? *Semin Perinatol* 2010;34:371-386.
5. Barros FC, Bhutta ZA, Batra M, Hansen TN, Victora CG, Rubens CE and the GAPPS Review Group. Global report on preterm birth and stillbirth (3 of 7): evidence for effectiveness of interventions. *BMC Pregnancy Childbirth* 2010;10(Suppl 1):S3. Available at: <http://www.biomedcentral.com/1471-2393/10/S1/S3>.
 6. Ludington-Hoe SM, Morgan K, Abouelfetoh A. A clinical guideline for implementation of kangaroo care with premature infants of 30 or more weeks' postmenstrual age. *Adv Neonatal Care*, 2008; 8(3 Suppl):S3-S23.
 7. Ruiz JG, Charpak N, et al. *Evidence-based clinical guidelines for an optimal use of the kangaroo mother method in preterm and/or low birthweight infants at birth*. Bogotá, Colombia: Fundación Canguro and Department of Clinical Epidemiology and Biostatistics, School of Medicine, Pontificia Universidad Javeriana; 2007.
 8. Nyqvist KH, Anderson CG, Bergman N, Cattaneo A, Charpak N, Davanzo R, Ewald U, Ibe O, Ludington-Hoe S, Mendoza S, Pallás-Allonso C, Ruiz Peláez JG, Sizun J, Widström A-M. State of the art and recommendations: Kangaroo mother care: application in a high-tech environment. *Acta Paediatr*, 2010;99:812-819.
 9. Charpak N, Ruiz-Peláez JG. Resistance to implementing Kangaroo Mother Care in developing countries, and proposed solutions. *Acta Paediatr* 2006;95:529-34.
 10. Nyqvist KH, Anderson CG, Bergman N, Cattaneo A, Charpak N, Davanzo R, Ewald U, Ibe O, Ludington-Hoe S, Mendoza S, Pallás-Allonso C, Ruiz Peláez JG, Sizun J, Widström A-M. Towards universal Kangaroo Mother Care: recommendations and report from the First European conference and Seventh International Workshop on Kangaroo Mother Care. *Acta Paediatr*, 2010;99:820-6.
 11. World Health Organization (WHO). *Kangaroo mother care: a practical guide*. Geneva: WHO, Department of Reproductive Health and Research; 2003.
 12. Lawn J, Mwansa-Kambafwile J, Barros FC, Cousens S. 'Kangaroo mother care' to prevent neonatal deaths due to preterm birth complications. *Int J Epidemiol* 2010; 39:i144-i154.
 13. Nguah SB, Wobil PNL, Obeng R, Yakubu A, Kerber KJ, Lawn JE, Plange-Rhule G. Perception and practice of kangaroo mother care after discharge from hospital in Kumasi, Ghana: A longitudinal study. *BMC Pregnancy Childbirth* 2011; 11:99. (doi:10.1186/1471-2393-11-99)
 14. Bergh AM, Manu R, Davy K, Van Rooyen E, Quansah Asare G, Awoonor Williams JK, Dedzo M, Twumasi A, Nang-beifubah A. Translating research findings into practice - the implementation of kangaroo mother care in Ghana. *Implementation Science* 2012; 7:75.
 15. Patton MQ. *Qualitative research & evaluation methods* (3rd ed). Thousand Oaks, CA; Sage Publications; 2002.
 16. Pattinson RC, Arsalo I, Bergh A-M, Malan AF, Patrick M, Pattinson RC, Phillips N. Implementation of kangaroo mother care: A randomised trial of two outreach strategies. *Acta Paediatr* 2005;94(7):924-927.
 17. Bergh A-M, Van Rooyen E, Pattinson RC. 'On-site' versus 'off-site' facilitation: a randomised trial of outreach strategies for scaling up kangaroo mother care. *Hum Resour Health* 2008;6:13 (23 Jul 2008).
 18. Bergh A-M, Arsalo, I, Malan AF, Patrick M, Pattinson RC, Phillips N. Measuring implementation progress in kangaroo mother care. *Acta Paediatr* 2005;94(8):1102-1108.
 19. Blencowe H, Kerac M, Molyneux E. Safety, effectiveness and barriers to follow-up using an 'early discharge' kangaroo care policy in a resource poor setting. *J Trop Pediatr* 2009;55(4): 244-248.
 20. Hill Z, Manu A, Tawiah-Agyemang C, Gyan T, Turner K, Weobong B, Ten Asbroek AH, Kirkwood BR. How did formative research inform the development of a home-based neonatal care intervention in rural Ghana?. *J Perinatol* 2008;28 (Suppl 2):S38-45.
 21. Hill Z, Tawiah-Agyemang C, Manu A, Okyere E, Kirkwood BR. Keeping newborns warm: beliefs, practices and potential for behaviour change in rural Ghana. *Trop Med Int Health* 2010;5(10):1118-1124.
 22. Hill Z, Tawiah-Agyemang C, Okeyere E, Manu A, Fenty J, Kirkwood B. Improving hygiene in home deliveries in rural Ghana: how to build on current attitudes and practices. *Pediatr Infect Dis J* 2010;29(11):1004-1008.
 23. Tawiah-Agyemang C, Kirkwood BR, Edmond K, Bazzano A, Hill Z. Early initiation of breastfeeding in Ghana: barriers and facilitators. *J Perinatol* 2008;28(Suppl 2):S46-52.
 24. Darmstadt GL, Kumar V, Yadav R, Singh V, Singh P, Mohanty S, Baqui AH, Bharti N, Gupta S, Misra RP, Awasthi S, Singh JV, Santosham, and the Saksham Study Group. Introduction of community-based skin-to-skin care in rural Uttar Pradesh, India. *J Perinatol* 2006; 26:597-604.
 25. Sloan NL, Ahmed S, Mirta SN, Choudhury N, Chowdhury M, Rob U, Winikoff B. Community-based kangaroo mother care to prevent neonatal and infant mortality: a randomized controlled cluster trial. *Pediatrics* 2008;21(5):e1047-e1059. ☼