

Measuring implementation progress in kangaroo mother care

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Abstract

Aim: To describe the development and testing of a monitoring model with quantitative indicators or progress markers that could measure the progress of individual hospitals in the implementation of kangaroo mother care (KMC). **Methods:** Three qualitative data sets in the larger research programme on the implementation of KMC of the MRC Research Unit for Maternal and Infant Health Care Strategies in South Africa were used to develop a progress-monitoring model and an accompanying instrument. **Results:** The model was conceptualized around three phases (pre-implementation, implementation and institutionalization) and six constructs depicting progress (awareness, adopting the concept, mobilization of resources, evidence of practice, evidence of routine and integration, sustainable practice). For each construct, indicators were developed for which data could be collected by means of the monitoring instrument used in a walk-through visit to a hospital. The instrument has been tested in 65 hospitals.

Conclusion: The progress-monitoring model enables the quantification of individual hospitals' progress in the process of implementing KMC and an objective measurement of the effectiveness of different outreach strategies. The model also has potential to be adapted for measuring progress in other innovative healthcare interventions on a large scale.

Key Words: Evaluation, evidence-based implementation, kangaroo mother care, South Africa, progress-monitoring model

Introduction

The practice of kangaroo mother care (KMC) has been well documented and described in the literature [1–11]. It has become accepted as an integral part of standard neonatal care in healthcare facilities and is considered a more appropriate way of caring for certain low-birthweight infants who would otherwise have been cared for in an incubator. In resource-poor countries with remote hospitals without incubators, continuous KMC may be saving the lives of many infants [12–15].

Many countries support the practice of KMC in their policies on neonatal care but not many have launched a systematic initiative to implement KMC throughout the health system at once. In some countries, or provinces or states within a country, more large-scale implementation programmes are starting to emerge, especially in the public healthcare sector [16]. This is also the case in South Africa, where a number of the provincial health authorities have embarked on a

more system-wide implementation of KMC [17]. Where some provinces leave it to the individual hospitals to decide on the way they would implement KMC, others initiated outreaches to assist the implementation process. Some outreaches aimed at reaching all hospitals at once, such as the Ukugona Outreach in the KwaZulu-Natal Province [18]. Others, for example the Fara Ngwana Outreach in Gauteng Province and the Ukubamba Umtwana Kuwe Outreach in Mpumalanga Province, follow a staggered approach, targeting a certain number of hospitals each year [19,20].

The problem confronting health departments in South Africa, however, was how to evaluate the progress of implementation. The aim of this article is to describe the development of an evidence-based progress-monitoring model and instrument to assist health authorities in monitoring the progress at a provincial or district level and to help with the identification of hospitals that may need more support in their implementation process.

Research question and methods

In 1999 the Medical Research Council of South Africa's Research Unit for Maternal and Infant Health Care Strategies started with a qualitative research project on the implementation of KMC in two large regional training hospitals in the north of South Africa. This gradually grew into a comprehensive, multi-disciplinary research programme comprising health-care facilities in three of the South African provinces. The first phase culminated in a research-based KMC implementation workbook [21,22], which forms part of a multimedia implementation package used in the three provinces.

As any implementation of a new intervention takes place over time, it mostly involves a gradual process of refining and improving practice. After a few hospitals started implementing KMC, a new research question emerged, namely whether indicators could be developed for measuring progress points in the KMC implementation process, with the ultimate aim of ensuring sustainability of the KMC practice in healthcare facilities.

Three different data sets from the research, as well as the implementation workbook [21], were available to inform the development of a progress-monitoring model:

- In the first qualitative study on the implementation of KMC in two hospitals in 1999/2000, interviews and observations were used as primary methods of data collection. The aim of this study was to identify important implementation issues in individual hospitals in South Africa. Some of these findings were also incorporated in the implementation workbook [21-23].
- Since 2000 regular KMC training workshops were held at the Kalafong Hospital in Pretoria, with participants from four of the nine provinces in South Africa. The workshops are evaluated by means of a questionnaire. Some of the

open-ended questions also refer to participants' experiences of enabling factors and barriers in currently practising KMC or in implementing KMC in future [24].

- In 2000 to 2001 the draft of the implementation workbook was piloted in four hospitals in the Mpumalanga Province. The hospitals were visited after about six months. Implementation practices were observed and interviews were held with the persons driving the process in each hospital, as well as with mothers and other staff members [25]. This led to the first conceptualizations of a model for evaluating the quality and progress of implementation. Key indicators or progress markers were translated into items for a preliminary instrument based on the model.

The researchers revisited the original transcripts of all interviews, all the observations and other field notes, as well as other relevant documents. The three data sets and multiple data sources allowed for sequential triangulation that contributes to the rigour of the research process [26]. The data were subjected to inductive analysis, that is "categories and patterns emerge from the data rather than being imposed on data prior to data collection" [27]. After the initial conceptualizations, some readings on educational change [28,29] stimulated the further refinement of the model. In the first half of 2002, during the implementation of the Ukugona Outreach in KwaZulu-Natal, the instrument based on the progress-monitoring model was finalized by the authors. Finally, the instrument was again checked against the implementation workbook [21] by an independent assessor, to ensure that all important issues had been included in the indicators. These measures were undertaken to confirm the validity of the instrument.

Figure 1 gives an indication of the research process followed in the development of the model and the accompanying instrument.

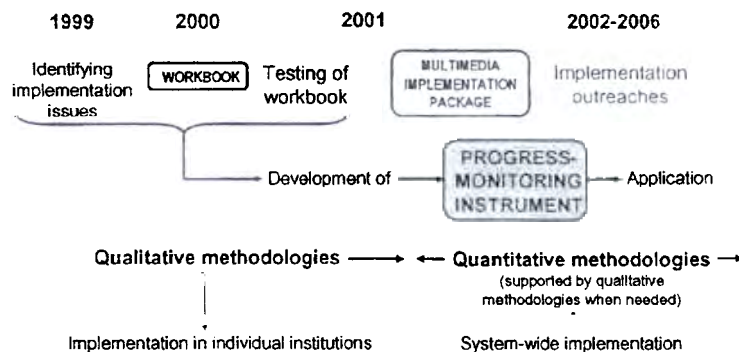


Figure 1 Timeline for the development of the progress-monitoring model and research methodologies employed.

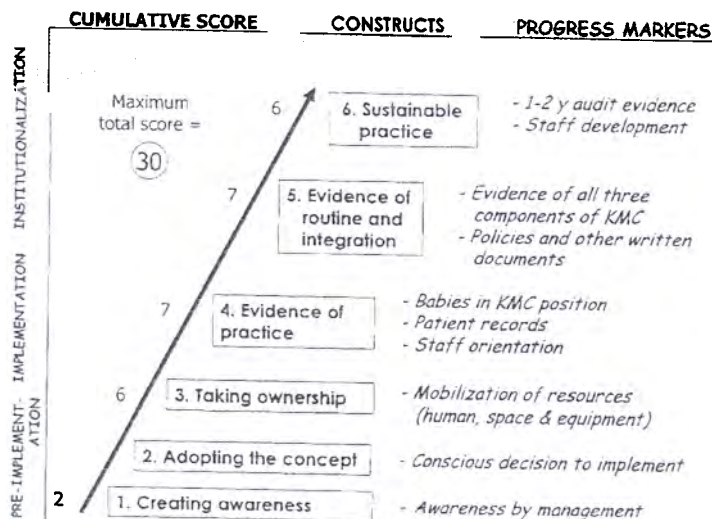


Figure 2. The progress-monitoring model.

Results: The model and instrument

The basic progress-monitoring model is conceptualized around three phases (pre-implementation, implementation and institutionalization) and six constructs that depict a progression in implementation (awareness, adopting the concept, mobilization of resources, evidence of practice, evidence of routine and integration, sustainable practice). In Figure 2 the six progress constructs are represented in an upward-moving arrow as a visual representation for progress. For each construct, a number of quantitative indicators or progress markers were developed. The notion of progress markers was borrowed from the work of the International Development Research Centre (IDRC), which describes progress markers as a "set of gradual indicators of changed behaviours ... that focus on the depth and quality of change" [30]. The progress markers are summarized in italics on the right in Figure 2.

Table I gives a more detailed breakdown of the various progress markers identified for each of the constructs. The items of the instrument developed from this model were quantified and allocated to each construct. The maximum score a hospital can achieve is 30. The scores for each progress marker and item are also displayed in Table I. This indicates the relative weight of each marker in relation to the total.

The instrument is used during a walk-through visit of a hospital and takes between 30 and 60 min to complete. A database and program have been developed allowing for simple and objective calculation of scores.

The progress-monitoring instrument has already been tested in 65 hospitals in South Africa [18-20]. Table II gives a summary of the median scores achieved by urban and rural hospitals, whereas Table III gives a breakdown of median scores according to the number of births conducted per hospital per year.

In six hospitals three assessors scored each hospital's progress independently. The inter-scorer reliability was very high, with a Cronbach's coefficient α of 0.98 and Pearson product moment correlations of 0.97, 0.99 and 1.00 for the different combinations of the three assessors.

Discussion

The progress-monitoring model that has been developed allows for the quantification of progress that leads to a cumulative implementation progress score for a hospital. However, built into the model is a notion of progress that is not merely linear, but also allows for moving forwards and backwards; in other words, one step does not need to be fully completed before continuing with the next step, and hospitals can also regress in their implementation practices.

The results obtained from scoring different hospitals could be used in two ways: to give feedback to individual hospitals on their own progress in relation to the ideals set out by the model, or to give feedback to a country, province or district on progress of the individual hospitals. Feedback is easily achieved as the model lends itself to visual representations of the progress of individual hospitals and of healthcare facilities in a province or country.

Table I. Indicators for each implementation construct.

Implementation construct (and score)	Progress marker (indicator)	Instrument items related to progress marker (with scores)
1 Creating awareness (maximum = 2 points)	1-1 Number and type of (senior) managers involved in implementation process (in relation to size of hospital)	<ul style="list-style-type: none"> • Special persons who take specific effort in promoting KMC <ul style="list-style-type: none"> - Management (manager, CEO, nursing service manager, ward manager, other) - Professionals (doctors, nurses, allied health workers) - Driving forces (contact person, KMC committee, other individuals or group) (1.5 points) • Impressions regarding the intensity of involvement of senior management in establishing KMC (past or future) (a lot, some, little/neutral/resistant) (0.5 points)
2 Adopting the concept (maximum = 2 points)	Minuted decision to implement KMC or recall by leaders of occasion and date of decision	<ul style="list-style-type: none"> • Knowledge of original decision to implement (e.g. occasion, date, minutes, who was involved) • Impression of recall of history of implementation (good, some, none) (1 point) • If KMC is not implemented yet: Has a formal decision in this regard been made? (1 point)
3 Taking ownership (mobilization of resources) (maximum = 6 points)	2-2 Signing of baseline datasheet to enrol in the outreach	<ul style="list-style-type: none"> • Baseline data sheet together with permission from the CEO or medical superintendent to participate in the outreach has been submitted (1 point)
	Allocation of space	<ul style="list-style-type: none"> • Practice of intermittent KMC in the neonatal unit (nursery/NICU) (1 point) • Special area or ward for continuous KMC 24 h per day (1 point)
	3-2 Ability to lodge mothers	<ul style="list-style-type: none"> • Existence of a lodger mother facility for mothers to stay while infants are still in incubators (0.5 points)
	3-3 Procurement of equipment	<ul style="list-style-type: none"> • Special equipment or facilities enhancing the practice of KMC in the neonatal unit or KMC ward: <ul style="list-style-type: none"> - Comfortable chairs - Wrappers to hold infant in KMC position - Low beds - Other (e.g. back rests) (0.5 points)
	3-4 Removal of cribs	<ul style="list-style-type: none"> • All cribs removed from KMC ward (1 point)
	3-5 Information for mothers	<ul style="list-style-type: none"> • Availability of brochures and information sheets • Posters on display • Other (e.g. videos) (1 point)
	3-6 Other resources	<ul style="list-style-type: none"> • Allocations from the hospital budget to establish KMC facility (0.5 points) • Other sponsors (0.5 points)
4 Evidence of practice (maximum = 7 points)	4-1 Evidence of the KMC position	<ul style="list-style-type: none"> • Intermittent KMC practised in high care (1 point) • Number of infants doing intermittent KMC in neonatal unit <ul style="list-style-type: none"> - Observed - Verified from records - Verified other (e.g. from mothers) (1 point) • Separate KMC ward or area (1 point) • Number of mother-infant pairs enrolled for continuous KMC in separate KMC ward or area in another ward (e.g. postnatal ward) <ul style="list-style-type: none"> - Number of mothers observed having infants in KMC position (1 point)

Table I. Continued.

Implementation construct (and score)	Progress marker (indicator)	Instrument items related to progress marker (with scores)
	4-2 Orientation for new staff	<ul style="list-style-type: none"> • Face-to-face oral orientation • Written orientation • Other (e.g. video) <p>(0.5 points)</p> <p>(All types of staff orientation to be verified from in-service training or other records)</p>
	4-3 Records that document KMC	<ul style="list-style-type: none"> • Records in use and nature thereof (ward register, special form for every single KMC infant, special collective record kept for all infants who receive(d) KMC, any other relevant record) <p>(1 point)</p>
	4-4 Ability to provide figures of number of infants going through KMC	<ul style="list-style-type: none"> • Records can be used for calculation of <ul style="list-style-type: none"> - number of infants receiving intermittent and continuous KMC - length of intermittent and continuous KMC of outreach infant - weight on admission to intermittent and continuous KMC - weight gain while in intermittent and continuous KMC <p>(1.5 points)</p>
	5 Evidence of routine and integration (maximum = 7 points)	<p>5- Further evidence of KMC position</p> <ul style="list-style-type: none"> • Kangaroo position (skin-to-skin contact) is practised by HIV + mothers of infants in the neonatal unit and KMC ward <p>(1 point)</p> <p>5-2 Evidence of KMC nutrition</p> <ul style="list-style-type: none"> • There is a <i>written</i> feeding policy in the neonatal ward for intermittent KMC and in the KMC ward for continuous KMC <p>(1 point)</p> <p>3 Evidence of KMC discharge and ambulatory KMC (follow-up system)</p> <ul style="list-style-type: none"> • Follow-up arrangements (infants return to ward, outpatients, clinic, home care/visits) • Written evidence of follow-up system • Written evidence of record-keeping <p>(3 points)</p> <p>5-4 Evidence of KMC included in policy and protocol documents</p> <ul style="list-style-type: none"> • Statements and policies in which KMC appears (vision, mission, declaration of quality of service) <p>(0.5 points)</p> <ul style="list-style-type: none"> • Guidelines and protocols regarding the practice of KMC (for nursing staff, doctors, ward clerk, allied health workers) <p>(1.5 points)</p>
Sustainable practice (maximum = 6 points)	6-1 Audit results for at least 1 y	<ul style="list-style-type: none"> • Audit figures containing evidence of ongoing KMC practice for at least 1 y can be provided <p>(2 points)</p>
	6-2 Evidence of staff development policy	<ul style="list-style-type: none"> • Special plan to ensure that all staff get adequate training in KMC <p>(0.5 points)</p> <ul style="list-style-type: none"> • Evidence of a written plan <p>(0.5 points)</p> <p>(Also evaluate against the requirements of the South African Skills Development Act)</p>
	6-3 Evidence of staff training (additional to facilitation that is part of the outreach)	<ul style="list-style-type: none"> • Whether one or more staff members got special training in past year <p>(1 point)</p>
	6-4 Score on first five constructs (divided by 12)	<p>(The score on the first five constructs will influence sustainability)</p> <p>(2 points)</p>
<i>Maximum total score</i>		30 points

Table II. Median scores of hospitals according to location (urban/rural).

Location	Number of hospitals	Maximum score	Median score	Range
Urban	35	30	14.58	
Rural	30	30	11.36	
Total	65			

Table III. Median scores of hospitals according to number of births per year.

Number of births ^a	Number of hospitals	Maximum score	Median score	Range
300-1499	12	30	12.06	
1500-2499	13	30	16.25	
2500-4999	14	30	15.98	
≥5000	10	30	15.55	
Total	49			

^a Not available for 16 hospitals.

Feedback to hospitals or healthcare authorities could be further refined and interpreted, using the following breakdown:

0	No implementation of KMC
1-2	Awareness of KMC
3-4	"Political will" to implement KMC
5-9	In the process of taking ownership of the concept of KMC
10	Some ownership of the concept of KMC
11-16	On the road to KMC practice
17	Evidence of KMC practice
18-20	On the road to institutionalized KMC practice
21-23	Evidence of institutionalized practice
24	Institutionalized KMC practice
25-27	On the road to sustainable KMC practice
28-30	Sustainable KMC practice

Another point of importance is the involvement of management in the change process, especially in the initial stages. The "human factor" is also important, and any implementation should make provision for implementation dips [28]. In the case of KMC, the critical dip seems to be the process of going from ownership to actually getting mothers to practise KMC.

Conclusion

The progress-monitoring model is a useful conceptual tool to evaluate the progress of implementing KMC on a large scale. The instrument developed from the model proved to be suitable for the South African context and allowed for quantification. It should also

be tested in other contexts. The progress-monitoring instrument measures the *outcomes* of KMC implementation initiatives and will in the long run be complemented by a health *impact* evaluation measuring clinical outcomes, a cost-benefit analysis and an evaluation of the quality of practices related to KMC.

Another advantage of the progress-monitoring model is that health authorities such as provincial or district managements can be provided with an objective overview of how well facilities are faring with the implementation process after a particular period of time. The progress markers in the model provide individual hospitals with a tool to improve existing practices as part of a continuous cycle of quality improvement. The model could furthermore be used to evaluate the effectiveness of different educational and implementation outreach strategies [18].

Although kangaroo mother care was the example through which this progress-monitoring model was developed, it also has potential to be adapted for measuring progress in other innovative healthcare interventions on a large scale.

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