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Evaluation of implementation of humanized care to low weight newborns – the Kangaroo Method

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Abstract

Objective: To evaluate the implementation of the kangaroo mother method in hospitals trained by the Brazilian Ministry of Health.

Method: Cross-sectional study, evaluating 176 (60.1%) out of 293 hospitals that were trained by the Brazilian Ministry of Health from 2000 to 2003 in Brazil. This study was conducted in two phases. The first phase consisted of sending a questionnaire to 293 hospitals; in the second phase an *in loco* visit was made in a sample of 29 among those hospitals. The instrument for data collection was sent to all hospitals by mail, fax or e-mail through the Ministry of Health and they addressed the three dimensions of the normative assessment: structure, processes, and results. The second phase consisted of an evaluation of the process, using a structured guide of non-participant observation. To estimate the reliability of the variable "deployment of the steps of the method" between questionnaire and site visit, we used the kappa test.

Results: The first stage of the kangaroo mother method was implemented in 84.9% of the hospitals, but only 47.3% of them implemented the three stages according to the Brazilian norm. The kappa test results indicated a moderate agreement for the first stage, and substantial for the second and third stages of the method.

Conclusion: Hospital training was important for triggering the implementation process of the kangaroo mother method. However, they were not enough to promote the implementation of the three phases of the method.

J Pediatr (Rio J). 2010;86(1):33-39: Kangaroo mother method, low birth weight infant, health services evaluation.

Introduction

The Kangaroo Method (KM) consists of an infant support technology that implies early skin contact between the mother and the low weight infant in a progressive form during the time that both of them find pleasing enough, permitting a bigger participation of the parents in taking care of their newborn.[1] This method is applied in various countries in different ways, according to social and cultural features and to the availability of human, material, and technological resources.[2]

The KM was introduced in Brazil in the 1990s, due to some maternity hospitals' own initiative and expended rapidly to the whole country.[3] From the recognition of this practice as a newborn support humanization method, the Ministry of Health started a broad dissemination process for it through measures to stimulate and broaden the improvement of infant support quality in public sector. These measures appeared at the Portaria MS/GM 693, published in 2000, that established the Humanized Care Norm for the Low Weight Infant – Kangaroo Method (Norma de Atenção Humanizada ao Recém-Nascido de Baixo Peso – Método Canguru, AHRNBP-MC) and the organization and undertaking, between 2000 and 2003, of training courses for professionals who work with high risk cases in neonatology. Those courses were developed in 9 reference centers in KM, accredited by the Ministry of Health.

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Aiming to advance in the assessment process of the KM implementation in the country, the Ministry of Health, through the Infant Health Technical Area, created 2 workgroups. One group was dedicated to evaluate the clinical neonatal results through a cohort, comparing infants interned in public neonatal units, accompanying them from birth to discharge, assisted or not by the Kangaroo Method.[4] And the present group was committed to assess the implementation of this method in trained institutions.

Method

It is a cross-sectional study conducted in 2004 and 2005, aiming at evaluating the implementation of the Kangaroo Method in 293 maternity hospitals trained by the Ministry of Health, using courses administered by the following supporting centers: Instituto Materno Infantil de Pernambuco, Recife (PE), Maternidade Escola Assis Chateaubriand and Hospital César Calls, Fortaleza (CE), Hospital Universitário do Maranhão, São Luis (MA), Secretaria Municipal de Saúde do Rio de Janeiro, Rio de Janeiro (RJ), Hospital Universitário de Santa Catarina, Florianópolis (SC), Hospital Regional de Taguatinga, Taguatinga (DF), Hospital Municipal Universitário de São Bernardo do Campo, São Bernardo do Campo (SP), and Hospital Geral de Itapecerica da Serra, Itapecerica da Serra (SP), Brazil.

The courses took 40 hours with the participation of at most 5 superior level professionals in each maternity hospital, selected by the State Secretaries of Health. This training policy had as its goal contemplating maternity hospitals that were part of the hospital's maternity support system, and it counted with the support of the National Social and Economic Development Bank (Banco Nacional de Desenvolvimento Econômico e Social, BNDES) and the ORSA Foundation.

Professionals were trained for using the Kangaroo Method, according to the norm of the Ministry of Health, in an interdisciplinary perspective, enabling them to the humanization of hospital and ambulatory care to pregnant, puerperal, and in risk infant. The norm posits that the KM must be developed in three stages:

- Stage 1 – Identification of early labor, with the infant having weight lower than 2,500 grams, especially lower than 1,500 grams, who, unable to be moved to joint lodgment, needed to be interned in Neonatal Intensive Treatment Unit (NICU). During this period the mother and the family must be oriented in relation to the conditions of the infant, highlighting the importance of the KM.

- Stage 2 – Infants in stable clinical condition is moved to the kangaroo nursery, where he or she will be accompanied by the mother and will actually assume the kangaroo position for as longer as it is possible, being stimulated to remain 24 hours/day in that position, functioning as an adaptation period for mother and child to be discharged from hospital.

- Stage 3 – It consists of ambulatory attendance until the infant reaches the weight of 2,500 grams, being moved, afterwards, to attendance in primary healthcare units.[1]

To this study we have conducted the normative evaluation that consists of assessing an intervention comparing resources employed and its organization (structure), services provided (process), and results obtained with criteria and norms.[5-7] As reference, criteria established by he norm AHRNBP-MC, of the Ministry of Health,[1] were used. The study was conducted in two phases: first a questionnaire was sent to the maternity hospitals, and afterwards site visits were made in a sample of these.

First phase

In this phase the data collection instrument addressed the dimensions of normative evaluation[5]:

a) Maternity hospital structure: number of beds, number of pediatricians/neonatologists who were part of the team, services available 24hours/day: laboratory, radiology, computer tomography, transfontanel ultrasound, magnetic resonance, minor surgery procedures, access to specialties and surgeons, special ambulatory to infants discharged from kangaroo nursery and proper place for the parents staying.

b) Processes: use of protocols [reduction of vertical transmission of aquired immunodeficiency syndrome (AIDS), treatment for jaundice, prevention and treatment for congenial syphilis, prenatal steroids, early parental nutrition, prevention of septicemia by β-hemolytic Streptococcus]; evaluation of humanizing practices: care with the position of the infant, milking practice, decrease of light and noise intensity, free access to parents, strategies to facilitate the presence of the parents (lodgment, transportation, meals), skin contact at the NICU and incentive to infant care, individualization of the infant (name, clothes, toys), strategies for addressing pain and discomfort, parents' group, active search by the Municipal Secretary of Health/ Family Health Program (SMS/PSF).

c) Results obtained with the implementation of the AHRNBP-MC: exclusive breastfeeding in discharge and caesarian births proportion per maternity hospital.

The respondents were asked to use as data source for the information rendering hospital files of all the consults of the previous year in each maternity hospital.

The questionnaire was sent at least thrice for all the maternity hospitals by mail, fax and e-mail through the Ministry of Health. The filling requirement was directed to the KM or neonatal unit coordinator. The sending was preceded by a phone call to the services, warning about and preparing for the questionnaire filling. Finally, when there was no feedback, the supporting centers and state secretaries got in touch with the maternity hospitals reinforcing the importance of the collection

instrument filling and participation in the research. The questionnaires were sent back by e-mail, in envelopes previously labeled.

Second phase

Due to operational, time, and budgetary limitations it was not possible to visit all the maternity hospitals. In face of this fact the following criteria for inclusion were used: the maternity hospital could not be a reference for training, it should have performed at least 2,000 births in the previous year, being at least 100 of infants with weight inferior too 2,000 grams and be located in a big urban center. Twenty-nine maternity hospitals, across 20 states, fulfilled all inclusion criteria.

A site visit was made by especially trained professionals, using non-participant and structured information collection instrument contemplating the processes' dimension. This instrument was adapted to this study from the evaluators' external guide of the Ministry of Health[8] and by Costa et al.[9]

The study was submitted and approved by the Research Ethics Committee of the Universidade Federal de Minas Gerais (UFMG) (168/04), with all the respondents signing the informed consent protocol.

Results

Initially 43.2% (130/293) of the maternity hospitals returned the questionnaires answered. After the contact by the reference centers, State and Municipal Health Secretaries, the total of hospitals responding reached 60.1% (176/293).

In relation to the distribution per states, it was identified that all the hospitals in Amazonas, Pernambuco, Espírito Santo and Roraima responded to the mail questionnaire. Six states (DF, MG, PI, PB, SE, and SP) had a response above 70%, and in 13 states the proportion of respondents was inferior to 50%. The two trained maternity hospitals in Amapá did not return the questionnaires.

In relation to the type of organization, 31.8% (56) are state-owned, 23.4% (41) are philanthropic, 15.9% (28) are municipal, 14.8% (26) are university-owned, 3.4% (6) are private, 3.9% (7) do not match any of the categories described, and 6.8% (12) did not respond.

In Table 1 the stages of the KM implemented in maternity hospitals studied, according to postal questionnaire data and site visit, are presented. It is identified that, according to the questionnaires, 47.3% (79) of the maternity hospitals evaluated implemented the method completely according to the Brazilian norm, while 14.2% (25) did not implement any of the stages. The agreement between the two instruments (postal and site visit), to the variable 'implementation of KM stages' was of 0.55, 0.64, and 0.78 for the first, second, and third stages, respectively, indicating a moderate agreement for the first stage, and substantial for the second and the third stages.[10]

Table 1 - Frequency distribution of the Kangaroo Method's implementation stages according to postal questionnaire and site visit in maternity hospitals trained by the Ministry of Health (Brazil, 2004-2005)

Kangaroo method stages*	Postal questionnaire n (%)	Site visit n (%)
Stage 1	141 (84.9)	19 (65.5)
Stage 2	104 (63.0)	18 (62.1)
Stage 3	79 (47.3)	10 (34.5)
No stage	25 (14.2)	10 (34.5)

* No information for 5.1 to 6.5% depending on the stage.

In Table 2 the items that compose the structure evaluation for the maternity hospitals are presented. 366 neonatal beds were identified, only 21% (77) of them being kangaroo nursery. It is worth noticing the low number of hospitals with an adequate place for parents' stay while the children are interned, and that 34.1% (58) of the hospitals do not have a milk collection station/bank.

A total of 59% (92) of hospitals reported they did not possess any registration system of children assisted by the KM, and 88.6 (140) reported they did not use the official Information System made available by the Ministry of Health to the KM.

In Table 3 existing assistance and humanizing practices/processes are described. The existence of technological structures in neonatal units, excepting magnetic resonance, protocol of β-hemolytic streptococcus generated septicemia and access to pediatrician anesthetist, is observed in a high proportion. The other practices analyzed were reported in more than 60%.

A rarely found practice was the parents' group, in only 40.1% (65) of the hospitals. On the other hand, some practices as milking during the infant internment in the NICU, attention to the positioning, and free access for parents were reported by more than 90% of the hospitals (Table 2).

In relation to nutritional aspects of the children assisted by the AHRNBP-MC, 83.3% (135) of the maternity hospitals reported the performance of the minimal enteral nutrition before 72 hours of life, given that 78.9% (127) started that practice using the mother's own milk or pasteurized milk, and 97.6% (162) reported offering orientations and training to the mothers about milking.

In Table 4 some work processes analyzed in the hospitals visited are presented. It is identified that around 90% (15) implemented kangaroo nursery to the development of the second stage, as recommended by the norm.[1] It was also

Table 2 - Frequency distribution of structure existing in neonatal units of 176 maternity hospitals trained by the Ministry of Health (Brazil, 2004-2005)

Existing structures	n (%)
Neonatal beds (n = 366)	
Intensive neonatal care	132 (36.1)
Intermidiate care	157 (42.9)
Kangaroo nursery	77 (21.0)
Milk collection station/bank existence	
Yes	112 (65.9)
No	58 (34.1)
Pediatrician/neonatologist, 24 hours/day per week	160 (95.3)
Laboratory service, 24 hours/day per week	157 (94.0)
Radiology service, 24 hours/day per week	150 (89.3)
Access to minor surgical procedures	143 (87.2)
Access to computer tomography	125 (77.3)
Transfontanel ultrasound	128 (77.3)
Imediate access to specialties and surgeons	
Ophthalmology	106 (63.9)
Cardiology	115 (69.3)
Neurology	117 (70.9)
Pediatritian surgeon	124 (74.3)
Pediatrician anesthetist	88 (53.0)
Special ambulatory to infants discharged from kangaroo nursery	102 (61.5)
Adequate local (solarium, free air area) to the parents' stay while the babies are interned in the NICU/high risk	49 (29.2)

NICU = neonatal intensive care unit.

observe that in 62.1% (18) training was handed over to the teams.

In relation to the proportion of infants under exclusive breastfeeding by the time of discharge, it was observed that in 24.2% (22) of the maternity hospitals the proportion was lower than 70%; 62.7% (57) was between 70 and 99%, while 30.8% (28) of the hospitals informed that 100% of them were under exclusive breastfeeding by the time of discharge.

Discussion

The KM implementation evaluation after normalization by the Ministry of Health through the AHRNBP-MC norm constituted a unique opportunity to check the diffusion of humanization practices to the infant in the Unified Health System (Sistema Único de Saúde, SUS) and the Ministry of Health's induction capacity.

The dissemination of the KM in Brazil is slow, but it already presents significant changes, in respect to the incorporation of certain humanizing practices. It is important to highlight that the method idealized for our country differs much from already actualized experiences in other countries. The norm published in 2000 started training courses, demonstrating that it is necessary to maintain an effective proposal of dissemination, once the Brazilian proposal is a safe alternative, for it presented clinical results similar to the conventional treatment and a good promoting strategy to breastfeeding,[4] in addition to its cost being around a third when compared to traditional assistance.[11]

The Kangaroo Method implementation stages

The high proportion (84.9%) of hospitals that implemented the first stage showed a relative success mainly in respect to using humanizing practices in these environments, highlighted by the skin contact with the parents, which seems to have been incorporated to the daily services. However, it was observed that only 47.3% (79) of the maternity hospitals implemented the 3 stages according to the Brazilian norm, demonstrating that the method is not completely implemented in most of the institutions trained by the Ministry of Health. It is observed that the implementation percentages of the stages differ in the two phases of the study, being lower in the site visits. Even if the 29 hospitals visited are included in the 176 that responded the postal questionnaire, the implementation percentages are not immediately comparable. However, it is important to highlight the good concordance reflected in the values of the kappa test.

Table 3 - Frequency distribution of existing assistance practices in neonatal units of the 176 maternity hospitals trained by the Ministry of Health (Brazil, 2004-2005)

Existing practice	n (%)
AIDS vertical transmission reduction protocol	158 (95.2)
Jaundice treatment - protocol	158 (94.6)
Congenial syphilis treatment and prevention protocol	154 (92.8)
Minimal early enteral nutrition	151 (89.9)
Prenatal steroids	136 (85.0)
Early parental nutrition	129 (77.3)
Septicemia by β-hemolytic Streptococcus prevention protocol	69 (46.0)
Magnetic ressonance	62 (37.8)
Baby positioning care	165 (98.2)
Milking practice during baby internment in the high NICU/high risk	157 (94.0)
Free access for parents	152 (91.0)
Facilitating strategies to mother's presence (lodgment, transportation, meals)	148 (89.7)
Skin contact with parents practice in the NICU	144 (88.3)
Light intensity decrease practice	138 (82.6)
Mother participates in care to the baby in the NICU/high risk	131 (78.4)
Baby individualization practice (name, clothes, toys)	130 (78.3)
Noise decrease practice	121 (72.9)
Strategy to address pain and discomfort	122 (72.6)
Skin contact/touch practice with the high risk infant in the maternity wards	97 (58.1)
Skin contact with father in kangaroo lodgment	95 (57.9)
Parents group	65 (40.1)
SMS/PSF active search, in relation to the pre-term infants who remain interned for prolonged period	48 (29.5)

AIDS = aquired immunodeficiency syndrome; SMS/PSF = Municipal Secretary of Health/Family Health Program (Secretaria Municipal de Saúde/Programa de Saúde da Família); NICU = neonatal intensive care unit.

Table 4 - Frequency distribution for 29 maternity hospitals, according to selected features of the service (Brazil, 2004)

Feature	n (%)
Routine availability (the Ministry of Health's or own)	
Yes	17 (58.6)
No	12 (41.4)
Team training in the institution	
Yes	18 (62.1)
No	11 (37.9)
Any pain-handling measure was observed*	
Yes	7 (28.0)
No	18 (72.0)
Are there fathers present in the neonatal unit (1st stage)*	
Yes	24 (85.7)
No	4 (14.3)
Was there penumbra for the whole unit or individual*	
Yes	8 (28.6)
No	20 (71.4)
Coverage in the incubator machine is adequate*	
Adequate	15 (53.6)
Insufficient/inadequate	6 (21.4)
There is no coverage	7 (25.0)
Kind of lodgment in which the second stage is developed*	
Kangaroo nursery	15 (88.2)
Collective lodgment	2 (11.8)

* No information for some registrations.

It was observed that the biggest difficulties in the implementation of the method are in the actualization of the second and third stages, mainly the ambulatory for special follow-up. Charpak & Ruiz-Peláez, in analyzing the implementation of the KM in maternity hospitals in 25 developing countries, observed that the biggest difficulty found was the implementation of the ambulatory for follow-up after discharge followed by the resistance to the method by the professionals, mothers, and families.[12]

Selection of services and professionals

The training process undertaken by the Ministry of Health and used as a national dissemination strategy of this proposal had as its target to reach the 225 maternity hospitals that are part of the Hospital Attention System for the High Risk Pregnant. It is worth noticing the importance of the 293 trained hospitals in assistance to delivery, once they were responsible, in the year 2006, according to data from the born living information system (SISNASC), for the performance of 1/3 (34.2%) of the births of children with weight inferior to 2,500 grams in the country.

To check if the selection criterion of the maternity hospitals was adequate, in terms of attention for the high risk infant, the SINASC was analyzed in 2006, and it was observed that in Brazil 2,944,928 were born, and from this amount 8.2% had weight inferior to 2,500 grams at the time of birth. The 293 hospitals were responsible in this period for the performance of 22.7% of the births in Brazil. Among the births of children with weight inferior to 2,500, 1,499, and 999 grams, the trained units were responsible for 32.8, 43.0, and 40.7%, respectively. It stands out that the reference centers in kangaroo attention are included in this universe. Therefore, the selection criterion of the hospitals to be trained was adequate, covering a big part of the risk infants in the country, possible beneficiaries of this kind of practice.

What seems inadequate was the methodology for selecting the indicated professionals to participate in the training, which was not clear, for it is imagined that they would be professionals directly linked to the service and who could coordinate the change of practices to a humanized assistance to the risk infant.

Structure analysis

As for the structure's critical points, the great percentage of hospitals without an adequate local to parents while the infants are interned in the NICU, the lack of a better integration of the hospitals with the public health services, mainly primary health units, and the non-actualization of active search and follow-up for the recently discharged infants stand out. The existence of an adequate physical space for the parents to stay is important, for it permits the gradual confidence in their capacity of taking care and protecting their children.[13]

The use of the software developed by the Ministry of Health to record the follow-up of the infants assisted in the Kangaroo Method presented a low adherence of the hospitals, which prevents the use of information on the assistance provided and the monitoring of these infants in the units.

Process analysis

Some of the positive points in the organization of the neonatal assistance in the hospitals stand out, such as the free access of parents, the existence of strategies to facilitate the mother's stay in the hospital unit (lodgment, transportation and meals) and the high proportion of units with practices of noise and light intensity decrease. These points evidence the preoccupation of the units in implementing humanizing practices associated to neonatal assistance.

As for the critical points, in 27.4% (460 of the hospitals there is no adoption strategy to address the risk newborn's pain/discomfort. The effect of the pain in the newborn may have a negative reflect through organic, physiologic, and behavioral alterations, reverberating in the newborn' central nervous system development and in the baby-mother interaction.[14]

In the second phase some of the highlighted points were the high proportion of hospitals that used as a space for the second stage of the method the kangaroo nursery and the presence of the parents in the neonatal unit, showing the incorporation of humanizing practices by these services. Other important observation was that in 37.9% of them the training was not handed over to the other professionals, probably contributing to the low rates of implementation of the method's second and third stages.

Results analysis

The high proportion of hospitals without the availability of a human milk collection station/bank may interfere directly in the beginning and maintenance of breastfeeding, once various studies[15-19] evidenced that children assisted in the Kangaroo Method presented a significant increase in the time of exclusive breastfeeding. The presence of milk collection station/bank works as an orientation center and support to mothers with problems to breastfeed.[20]

This paper found high proportions of exclusive breastfeeding in time of discharge of the nursery, indicating other great success of the AHRNBP-MC. However, the fact that 30.8% (28) of the hospitals reported that 100% of the infants in the time of discharge were receiving exclusive breastfeeding suggests an information bias or an experience of absolute success, which requires a more detailed investigation. Conflicting results with those of our study were reported by Lamy Filho et al.,[4] who found in Brazil a proportion of breastfeeding in the time of discharge

of 69.2% among the children assisted by the reference centers to the kangaroo method of the Ministry of Health,[4] being 2.3 times more frequent when compared to children assisted by the conventional model.

Limitations of the study

Within the boundaries of our knowledge, this is the only study published in Brazil evaluating the trained maternity hospitals in all the units of the federation. However, some limitations must be mentioned.

One of them is the relatively high proportion of non-respondent maternity hospitals (39.1%), despite the numerous attempts to minimize information losses. In the analysis of the losses it is worth noticing that the proportion of low weight infants among the non-respondent maternity hospitals was 27.3% of the total of births performed by the trained hospitals and only 9.3% of the births of low weight newborns in Brazil. One hypothesis for the silent services consists of the fact that they did not implement the Kangaroo Method and, therefore, chose not to participate. It is possible that the proportion of services with the AHRNBP-MC completely implemented be even lower, when we consider the results of the *in loco* visit, which may have resulted in an over estimation of the real implementation in trained maternity hospitals. It is necessary to highlight the limitation inherent to the type of data collections used in the first phase, although this strategy is not uncommon in observational studies. In this sense, the kappa test results indicated, in general, an adequate agreement between the two data collection methodologies.

Final considerations

Training was important to the beginning of the process, but it did not reach the sufficient induction level to change the practice in the second and third stages of the method. Other mechanisms certainly would be necessary to attain this objective, such as the sustainability of practices, supervision, financing, information material, experiences interchange, and adequate selection of professionals for training. As the method applied in Brazil differs from the practice developed in other countries, new investigations are necessary, once there is only one study[4] evaluating this technology in Brazil.

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