ORIGINAL ARTICLE

Factors associated with the kangaroo method in Brazil

Fatores associados ao método canguru no Brasil

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ABSTRACT

Introduction: the kangaroo method was established as a health policy in Brazil; the Ministry of Health initiated an extensive process to disseminate it among Brazilian maternities assisting high-risk pregnancies since the year 2000. **Objective:** to analyze the factors that might have interfered with the implementation of the kangaroo method in Brazilian maternities. **Method:** this was a cross-sectional study that analyzed 176 (60.1%) out of the 293 maternities trained by the Ministry of Health. The instrument used was a posted questionnaire sent to managers of qualified maternities. The statistical analysis of multinomial logistic regression was conducted. **Results:** among the 176 analyzed maternities, 79 (47.3%) implemented the three stages of the kangaroo method as required by the Brazilian standards; 28 (15.9%) partially implemented it, and 68 (39.2%) did not implement it. Associations with public institutions (odds ratio: 2.6) and those that had a human milk bank (odds ratio: 5.7) were identified. The availability of hospital structures and services, annual number of births, percentage of C-sections, number of beds and professionals trained in the Kangaroo method, the Human Development Index, and incidence of poverty in the municipality where the maternity is located were not associated with the implementation of the Kangaroo method. **Conclusions:** little influence of the variables related to the maternities' characteristics were identified in the implementation of the kangaroo method. This suggests that other variables such as culture and institutional support, among others, can have a positive influence on the implementation of it.

Key words: Kangaroo-Mother Care Method; Infant, Low Birth Weight; Humanization of Assistance; Humanizing Delivery.

RESUMO

Introdução: *o método canguru foi estabelecido como política de saúde no Brasil e desde o ano de 2000 o Ministério da Saúde iniciou amplo processo para sua disseminação entre as maternidades brasileiras de atenção à gestação de alto risco.* ***Objetivo:*** *analisar os fatores que possam ter interferido na implantação do método canguru nas maternidades brasileiras.* ***Método:*** *estudo transversal que analisou 176 (60,1%) das 293 maternidades capacitadas pelo Ministério da Saúde. O instrumento utilizado foi questionário postal enviado aos dirigentes das maternidades capacitadas. Realizou-se análise estatística de regressão logística multinomial.* ***Resultados:*** *entre as 176 maternidades analisadas, 79 (47,3%) implantaram as três fases do método canguru, conforme determina a norma brasileira; 28 (15,9%) implantaram-no parcialmente e 68 (39,2%) não o implantaram. Identificam-se associações com instituições públicas (Odds Ratio: 2,6) e com as que possuíam banco de leite humano (Odds Ratio: 5,7). A disponibilidade de estruturas e serviços hospitalares, o número anual de partos, percentual de cesáreas, número de leitos e de profissionais capacitados no método Canguru, Índice de Desenvolvimento Humano e incidência de pobreza do município onde está sediada a maternidade não foram associados à implantação do método canguru.* ***Conclusões:*** *identif-*

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icou-se pouca influência de variáveis relacionadas às características das maternidades na implantação do método canguru. Isso sugere que outras variáveis como a cultura e apoio institucional, entre outras, possam ter influência positiva na implantação do mesmo.

Palavras-chave: *Método Canguru; Recém-Nascido de Baixo Peso; Humanização da Assistência; Parto Humanizado.*

INTRODUCTION

In 2000, the Kangaroo Method (MC) was established as a health policy in Brazil.[1] The Ministry of Health (MS) defines it as a perinatal care model focused on humanized care combining biopsychosocial intervention strategies.[2] The Brazilian proposal presents issues related to humanized care to complement the classic technological advances, thereby promoting the increase of the mother-child bond, increased breastfeeding prevalence, and increased competence and confidence in parents to care for their newborns.[3,4]

After the MC establishment as a perinatal care model, the MS initiated an extensive process to spread it among hospitals assisting high-risk pregnancies and belonging to the Unified Health System (SUS).[1] The strategy adopted was the training of professionals in this method, to act as disseminators of the proposal in their home institutions. In this training program, the nomination and selection of hospitals were conducted by state health departments. Note that the adhesion to this training was voluntary. In its first phase, this program trained 1,685 professionals in 293 hospitals in 53 courses conducted by reference centers, which were defined by the Ministry of Health in different Brazilian regions. The training of 40 hours took place for one week in these reference centers.[1]

The MC, created in Colombia, has spread internationally and is now adopted in many developed and developing countries, in different continents,[5,6] proving to be a valuable intervention of low cost.[7] This was mainly due to the production of scientific evidence on the positive effects of the MC on newborns and countries.[8] In Brazil, it aims to promote the humanization of perinatal care, showing that it is possible to provide safe, high quality, and at the same time, humanized care.[1] Thus, the adoption of such a strategy by the largest number of hospitals that assist in risky births is fundamental to improve the quality of this type of care.

After the first phase of MC dissemination held by the Brazilian MS, among 176 (60.1%) out of 293 trained hospitals, only 79 (47.3%) had fully implemented the kangaroo method.[9] Thus, the fact that more than half of the trained hospitals did not implement it as required by the Brazilian norms is questioned. What are the factors that may have interfered with the implementation process of this method in these hospitals?

There are few studies in the literature that analyze factors that might interfere with the MC implementation, such as structure and availability of maternity technologies, training of professionals, and socioeconomic and cultural aspects.[10] Therefore, this study sought to analyze which factors may have interfered with the implementation of the kangaroo method in Brazilian hospitals trained by the MS.

METHOD

Type of study

This was a cross-sectional study that analyzed 176 (60.1%) out of the 293 hospitals trained by the MS in the first dissemination phase for the implementation of the kangaroo method in Brazil. The study was funded by the Pan American Health Organization (PAHO) and the Brazilian MS.

Analyzed variables

the response variable "kangaroo method implementation in maternities" was categorized as: not implemented, partially implemented, and implemented. Maternities that have implemented the three stages of the MC as required by the Brazilian norms were considered as implemented.[1] Those that responded having implemented any step or only the first step were classified as non-implemented, and those that reported having implemented the first and second stages were classified as partially implemented.

The MS states that the method should be developed in three stages. The first begins during the prenatal period of high-risk pregnancies, followed by the assistance to the preterm and/or low birth weight newborns in the neonatal unit. In the second stage, the care of newborns are provided in the kangaroo housing, continuously staying with the mother, preparing them for hospital discharge. The

kangaroo position should be held for as long as possible. In the third stage, the newborn and his family will be treated as outpatients and/or at home until reaching the weight of 2,500 gramas.[1]

The evaluated explanatory variables were: institution (public and private); availability of structures and technologies (milk bank, transfontanellar ultrasound, computed tomography, and rooming beds); annual number of births; percentage of cesarean sections; number of beds (in the neonatal intensive care unit and rooming-in); number of doctors and other trained professionals; Human Development Index (HDI); and incidence of poverty in the municipality where the institution is located. The variable "other trained professionals" brings together nurses, nursing assistants and technicians, psychologists, speech therapists, physiotherapists, occupational therapists, social workers, and nutritionists.

They used the IDH and incidence of poverty as contextual socioeconomic indicators of the cities where the maternities were located and interfered in the MC implementation. The IDH is a summary measure of human development that takes into account the gross domestic product (PIB) per capita, longevity, and education.[11] The incidence of poverty is an estimate of the percentage of people below the poverty line.[11]

Data collection

Data related to response and explanatory variables: type of service; availability of structures and technologies; percentage of cesarean sections; the number of beds; and the number of trained professionals were obtained through a postal questionnaire mailed to 293 trained hospitals. A total of 176 responses (60.1%) were obtained. On-site visit to 29 responding hospitals was conducted to verify the reliability of responses. The Kappa test results were 0.55, 0.64, and 0.78 for the first, second, and third stages, respectively, indicating moderate agreement to the implementation of the first stage, and substantial for the second and third stages.

The IDH variables and incidence of poverty in the city where the maternity is located were obtained from the database of the Brazilian Institute of Geography and Statistics (IBGE).[12] The number of annual births in 2004 was obtained in the Live Births Information System database (SINASC).

Statistical analysis

Data were processed in the Statistical Package for Social Sciences (SPSS) 17.0. Double entry of data was conducted for quality control and subsequent comparison.

Univariate analysis was performed using the chi-square test for categorical independent variables and the Kruskal-Wallis test for numerical variables with asymmetrical distribution to evaluate factors associated with the implementation of the Kangaroo method.

The model of multinomial logistic regression was used in the multivariate analysis. The p value of less than 0.25 was established for the input of variables in the model in the univariate analysis; the forward discretion was used imputing variables one by one in the model and according to their significance. In the final model, a significance level of 5% was considered. The odds ratio values were estimated within the respective ranges of 95% confidence interval. The model fitness was assessed using the Deviance statistics.

Ethical issues

This study met the ethical principles of the Resolution 466/12 of the National Health Council and was approved by the Ethics Committee of UFMG under protocol ETIC 168.

RESULTS

Among the 176 hospitals participating in this study, 79 (47.3%) implemented the three phases of the MC as required by the Brazilian norms, 28 (15.9%) implemented it partially, and 68 (39.2%) did not implement it. Table 1 shows the distribution of hospital characteristics analyzed in this study. Most of the participating hospitals in this study are public and have a human milk bank. About one-third (33.5%) are private institutions, 41 are charitable institutions, and 18 are for-profit. Only 25.4% of these have implemented the three phases of the MC while the implementation proportion in public hospitals reached 55.2%.

Regarding the structure available in the studied maternity hospitals, it was found that most offer access to computed tomography and transfontanellar ultrasound. As for available beds, 23 (14.8%) of the hospitals reported they did not have beds in the Neonatal Intensive Care Unit (UTIN), thus indicating not

being a reference maternity for risky births, which is an indication criterion recommended by the MS[1] (Table 2). It is noteworthy that some Brazilian maternity wards, even not having accredited beds in the UTIN, provide assistance to newborns at risk.

Table 1 - Characteristics of participating maternities in the implementation of the Kangaroo Method – Brazil

Categorical variables	n	%
Institution	116	65.9
Public	59	33.7
Private	1	0.6
Without information		
Human Milk Bank	59	33.5
No	112	63.6
Yes	5	2.9
Without information		
Access to Transfontanellar Ultrasound	40	22.7
No	128	72.7
Yes	8	4.6
Without information		
Access to computerized tomography	41	23.3
No	125	71.0
Yes	10	5.7
Without information		

Table 2 - Characteristics of participating maternities in the implementation of the Kangaroo Method – Brazil

Numerical variables	n*	Median (1st and 3rd quartiles)
Annual deliveries	174	2.205 (1.253 – 3.676)
IDH in the municipality	175	0.805 (0.774 – 0.841)
Poverty incidence in the municipality (%)	175	31.71 (23.74 – 40.86)
% Cesarean sections	151	36 (28 – 46)
Beds in the UTIN	155	8 (5 – 12)
Beds related to median and high risk	163	10 (6 – 16)
Beds in joint rooming	147	0 (0 – 3)
Number of trained doctors	112	3 (2 – 6.7)
Number of other professionals trained	113	5 (3 – 31)

* Without the information in some records. varying from 1 to 64.

On average, the participating hospitals in this study performed 2,588 births in 2004, accounting for a total of 450,475 births, representing 15% of the total number of births in Brazil in the same year. However, 36 (20.5%) of them had less than 1,000 births, and seven (4%) less than ten annual deliveries. The average proportion of cesarean deliveries was 36%; in 25 (16.5%) hospitals these proportions were greater than 50%, and only three (2%) reached these proportions at less than 15%, as determined by the World Health Organization.

A total of 2,737 professionals were trained in the evaluated maternities. Of these, 816 (29.8%) are doctors. It is noteworthy that in 49 (43.8%) of these maternities only two or fewer physicians were trained. Being a public institution, having a milk bank, and having trained doctors and other professionals were associated with the full implementation of the MC in the univariate analysis (Tables 3 and 4).

According to the results of the multivariate analysis, the full implementation of all stages of the MC was associated with the human milk bank and public institution status (Table 5). Comparing with the maternities that have not implemented the MC and had a partial implementation, this association was not significant. The comparison between maternities that have not implemented the method with those that have a milk bank was six times more likely associated with the method implementation. Public hospitals had 2.5 times more chances of implantation compared to private hospitals.

DISCUSSION

We sought to analyze the factors that might have interfered with the success of MC implementation in Brazil. It was identified that being a public institution (p: 0.02) and having a human milk bank (p <0.001) were variables associated with the implementation of the method.

The MS recommends that the method is implemented in the medical clinics that are in the SUS network.[1] Thus, it tends to be compulsory in maternity wards linked to the SUS, and optional in the private health system.[4] The association between the MC implementation and public hospitals reinforces this statement. In addition, this fact may indicate that public services are more concerned with the incorporation of humanization in the care practice.

The MC dissemination process developed by the MS by the year 2004 would be more effective if the choice of maternities to be trained were guided by strategic criteria. Part of capacitated maternities are not adequate for providing appropriate care for preterm infants because about 15% did not have UTIN beds, and 20.5% had less than 1,000 annual births.

Table 3 - Univariate analysis according to levels of implementation of the Kangaroo Method in participating maternities, Brazil

Trained Maternities	Not implemented	Partially implemented	Implemented	p*
Institution				
Public	39 (57.4)	14 (50.0)	64 (81.0)	<0.001
Private	29 (42.6)	14 (50.0)	15 (19.0)	
Human Milk Bank				
No	33 (51.6)	14 (50)	12 (15.2)	<0.001
Yes	31 (48.4)	14 (50)	67 (84.8)	
Access to Transfontanellar Ultrasound				
No	20 (32.8)	7 (25)	13 (16.5)	0.08
Yes	41 (67.2)	21 (75)	66 (83.5)	
Access to computerized tomography				
No	20 (32.8)	6 (18.2)	15 (19.5)	0.18
Yes	41 (67.2)	27 (81.8)	62 (80.5)	

* P value obtained using the Pearson x^2 test for proportions.

Table 4 - Univariate analysis according to levels of implementation of the Kangaroo Method in participating maternities, Brazil

Numerical variables	Not implemented Median (1st and 3rd quartiles)	Partially implemented Median (1st and 3rd quartiles)	Implemented Median (1st and 3rd quartiles)	p*
Annual deliveries	1.965 (907 – 2.972)	2.558 (1.433 – 3.734)	2.479 (1.357 – 3.928)	0.99
IDH in the municipality	0.796 (0.766 – 0.833	0.816 (0.761 – 0.840)	0.806 (0.783 – 0.842)	0.63
Poverty incidence (%)	32.51 (23.85 – 47.39)	28.09 (20.05 – 37.56)	31.71 (23.85 – 40.6)	0.18
% Cesarean sections	30 (26.2 – 49.6)	33.9 (28 – 40.4)	39 (30.5 – 44.5)	0.15
Beds in the UTIN	6 (3 – 10)	8 (5.5 – 10)	8 (5 – 12)	0.40
Beds related to median and high risk	8.5 (4 – 12)	10 (5 – 14)	12 (7.5 – 20)	0.16
Beds in joint rooming	0 (0 – 0)	2 (0 – 4)	0 (0 – 4)	0.19
Number of trained doctors	2 (1 – 3)	2 (1.25 – 3.75)	5 (3 – 14)	<0.001
Number of other professionals trained	3 (2 – 5)	4 (3 – 19)	17 (4 – 40)	0.02

* P value obtained by the Kruskal-Wallis test to compare medians.

Table 5 - Multivariate analysis of variables associated with the implementation of the Kangaroo Method in Brazil

Implementation*	p†	*Odds Ratio*	CI (95%)
Partially implemented			
Human Milk Bank	0.85	1.09	0.45 – 2.68
Public institution	0.20	0.55	0.22 – 1.36
Implemented			
Human Milk Bank	<0.001	5.7	2.58 – 12.73
Public institution	0.02	2.6	1.15 – 5.68

*Reference category = not implemented.
† Value of p in the Deviance test 0.317.

This suggests the failure in the ministerial statement – of being a maternity for risky births – on the part of state health departments.

The association between MC implementation and existence of human milk banks (BLM) can also be related to the strong concern of these institutions to the humanization of neonatal care. Besides the function of collecting and distributing human milk, BLMs develop actions to encourage breastfeeding promoting the humanization of assistance.[13]

The social conditions of the city where the maternity is inserted, represented by the incidence of poverty (p: 0.18) and IDH (p: 0.63), were not associated with the implementation of the MC. The MC in Brazil serves more families with low income and education levels than otherwise.[4] This can be explained by the fact that the MC is implemented in greater numbers in public services, where the majority of users have more vulnerable socioeconomic status. However, the social conditions of the city where the maternity is

located did not affect the MC implementation process in the evaluated hospitals.

Another highlight, even if it had not been associated with the MC implementation, is the number of trained professionals (p: 0.02). The incorporation of the MC by Brazilian hospitals depends, among other factors, on the incorporation of the concepts and techniques involved in implementing the method by the professionals. The involvement of professionals in the use of the method promotes positive results in the organization of service and satisfaction among users.[14] Professional attitudes are fundamental in influencing parents to carry out the MC; these attitudes can act favorably or establish barriers to the implementation and development of the method.[5]

Many professionals know the MC, however, feel insecure about adopting it.[10] Because the first step is performed essentially in the UTINs, its acceptance by the multidisciplinary team is critical. The analysis of MC implementation in hospitals from 25 developing countries identified that one of the main difficulties in the implementation was resistance by health professionals.[10]

Even with the high number of trained professionals, less than one-third corresponds to medical professionals; in 43.8% of studied maternities, two or fewer physicians were trained. A study with 148 professionals in public maternity hospitals in Rio de Janeiro showed that most professionals, even trained, associate the MC to the kangaroo position only.[16] These professionals correlate humanized assistance to other practices such as reducing noise and light. It was expected that sites with high numbers of trained professionals would show high rates of implementation. However, this did not happen.

The care of newborns at risk (preterm and/or low birth weight) requires hospital facilities with great technological apparatus. These environments, even being extremely important for the care of newborns at risk, have stressors in addition to hinder contact between parents and newborns for long periods.[17] Thus, the MC implementation becomes essential for institutional change in the search of focused attention on humanized care for newborns and their families.[18]

The limitations of this study should also be considered. One is the relatively high proportion of non-responding maternity hospitals (39.1%) despite the numerous attempts to minimize loss of information. Another limitation is inherent to the type of data collection adopted (postal questionnaire), although this strategy is not common in several studies. In this regard, the Kappa test results indicated, in general, adequate concordance in the use of this instrument. It is worth also noting that within the limit of our knowledge, this is the only study developed in Brazil evaluating a set of trained maternity hospitals in all units of the Federation.

The Brazilian MC proposal, in addition to being an MS policy, proved to be a safe humanization strategy that promotes breastfeeding[19,20] and inexpensive when compared to the conventional assistance.[20,21]However, it is still not widely implemented in Brazil.

Briefly, a small influence of variables, related to the characteristics of hospitals, on the MC implementation was identified. This suggests that several variables, such as culture and institutional support, among others, can have a positive influence on the method's implementation. Thus, other actions are necessary along with training, such as continuous support to institutional managers and maintenance of a national policy stimulating the method. It is also important to establish criteria to choose maternities that perform a minimum number of deliveries of underweight newborns, who are the target audience for this method.

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