



ORIGINAL ARTICLE

Promotion of breastfeeding: the importance of pediatricians with specific training

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Abstract

Objective: To study the factors involved in the maintenance of exclusive breastfeeding in healthy infants during the first 4 months of life, with emphasis on the role of pediatricians.

Material and methods: A longitudinal study was carried out with 101 healthy term babies at a pediatrics outpatient clinic in Uberaba, state of Minas Gerais, Brazil. The babies were divided at random into three groups: G1, receiving advice from a multiprofessional breastfeeding team; G2, receiving advice from a pediatrician trained in breastfeeding; and G3, receiving advice from a pediatrician with no breastfeeding training. Group randomization was confirmed by analysis of variance. The factors involved in the type of feeding at 4 months were analyzed by the chi-square test, by analysis of variance and by multiple variable analysis.

Results: At the end of follow-up, Groups 1 and 2 showed similar percentages with respect to exclusive breastfeeding. In addition, the percentage of exclusively breastfed babies in Groups 1 and 2 was significantly higher than in Group 3 ($p = 0.002$). The use of a pacifier was negatively correlated with exclusive breastfeeding ($p = 0.003$). More maternal schooling increased the chance of exclusive breastfeeding at 4 months ($p = 0.041$).

Conclusions: In this study, a pediatrician who was prepared and motivated to encourage breastfeeding performed similarly to a multiprofessional breastfeeding team in terms of promoting exclusive breastfeeding until 4 months.

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Introduction

The “Gold Standard” for feeding infants and the safest, most complete and efficacious method of achieving healthy growth and development up to the sixth month of postnatal life is to guarantee maternal breastfeeding (MB) right from the first extra-uterine hour.^{1,2}

During the seventies, in Brazil, a process of recovering a “breastfeeding culture” was begun. This resulted in much scientific work being produced providing evidence on the advantages of maternal milk³ and reporting on factors linked with weaning such as mothers returning to

work,⁴ their educational level,^{5,6} the type of delivery they had,⁷ the use of pacifiers,⁸⁻¹³ and the intervention by groups of professionals trained in lactation,¹⁴⁻¹⁶ among others.

Starting in the eighties, the Health Ministry began investing in programs and health policies favoring breastfeeding, by means of the National Maternal Breastfeeding Incentive Program (PNIAM - *Programa de Incentivo ao Aleitamento Materno*),¹⁷⁻¹⁹ interacting with international organs such as UNICEF, the WHO, International Baby Food Action Network (IBFAN), certain Non Governmental Organizations and professional bodies such as the Brazilian Pediatrics Society (*Sociedade Brasileira de Pediatria*). More recently, the Brazilian government, working through the national health service (SUS - *Sistema Único de Saúde*) and the Health Policy Secretariat, has adopted a strategy of substituting a model based on hospital care by a Family Health Program (PSF - *Programa de Saúde da Família*), in which preventative measures and the promotion of health are the primary concerns. The PSF medical teams are made up of a family or general practitioner, a nurse, a nursing assistant and community health agents,²⁰ although they exclude pediatricians from this process, in a universe in which 40.1% of the population is made up of children and adolescents,²¹ the model assumes MB to constitute one of the priorities of their activities.

It should be pointed out that some health services have encouraged MB by means of the creation of multidisciplinary teams of professionals to support breastfeeding, in which the few pediatricians engaged have important functions which are acknowledged and recognized individually and in interaction with the other professionals.²²

The importance of the pediatric act is also evident in UNICEF documents²³ and in childcare services, where these professionals intervene decisively in infant and adolescent health. Monitoring growth and development, nutritional and psychosocial guidance in addition to prevention of accidents and infections through hygiene and vaccination,²⁴ are other activities performed by the pediatrician, whose current challenges include the orientation of nutrition and habits of the whole family.²⁵ Despite these important functions related to infant nutrition, there is little demand for courses and training on MB in this country. Meanwhile, the national prevalence of exclusive MB (EMB) is no more than 18%²⁶ and a recent study showed that infants of an age to be feeding exclusively present gross feeding errors.²⁷

It is accepted that this multifactorial feeding scenario could be improved by efficient action on the part of pediatricians supported by health policies that give them incentives to achieve good rates of EMB, by means of continuous education and training courses in lactation. Therefore, this study investigated factors involved in the maintenance of EMB among healthy infants during the first 4 months of life, and in particular whether stimulation to

maintain EMB provided by a pediatrician, with or without continuing education and training in MB differs from that offered by a multidisciplinary MB team.

Methods

The work was carried out at the Pediatric Clinic at the *Triângulo Mineiro* Medical school (FMTM) in Uberaba/MG, which has 12 pediatric consulting rooms, provided with the necessary material for appropriate childcare, general pediatric and pediatric specialty consultations, in addition to a breastfeeding clinic with an MB team from the Maternal Breastfeeding Support Group (GAMA - *Grupo de Apoio Materno à Amamentação*). In this last, in addition to the baby being cared for by a pediatrician trained in lactation, all nursing mothers have a meeting with the GAMA team, which is made up of a pediatrician trained in MB, a social worker, a psychologist, a dentist and a nurse, and where any difficulties that are being experienced with breastfeeding are discussed and proposals and solutions are offered as a group. The more complex cases are dealt with separately by one of the professionals involved, depending on needs.

In addition to the specialists, there are three general pediatricians who provide childcare at the center and who also teach clinical practice to students and medical interns, thus aiding the Pediatrics Department. Two are professionals qualified in a number of different areas of pediatrics, although without official training in breastfeeding with teams specialized in the subject. The other pediatrician is part of the GAMA breastfeeding team.

Children born at the FMTM Teaching Hospital, at full term, disease-free, with normal weight for gestational age and weighing a minimum of 2,500 g at birth, whose first consultation was less than 30 days post-partum, of either sex were included. All mothers had had prenatal care at the Obstetrics Clinic at the institution and used the Pediatrics Clinic for postpartum childcare and when the appointment was made were breastfeeding. Patients were included between August 2000 and July 2002.

Children were not included if their mothers expressed a preference for a specific pediatrician. Children were excluded if, although breastfed when the appointment was made were already weaned by the time they attended. The percentage of exclusions was similar across all three groups ($p = 0.523$). It is necessary to explain that at this service (the Pediatric Clinic at the FMTM - annexed to the Uberaba/MG Teaching Hospital) it is rare for children to fail to appear at the first appointment; nevertheless, as this is a regional center of excellence, children with pathologies at birth are given priority. Healthy children habitually attend the first appointment for the results of examinations performed at birth and which are often not available by the time of discharge, and to request referral to a Basic Health Unit (UBS - *Unidade Básica de Saúde*) close to their residence or to register at this service. This being the case it is only possible to be sure who is going to remain at the second

appointment since a large proportion of the healthy children are monitored at UBSs close to their houses. All of the children were followed for 4 months.

The babies were randomly allocated to three monitoring groups by a simple lots system when the appointment was made, defined as: *group 1*: monitoring by a trained pediatrician accompanied by the multidisciplinary breastfeeding team (GAMA); *group 2*: monitoring by the same trained pediatrician from the GAMA team, but in individual consultations; *group 3*: monitoring by one of the pediatricians without formal MB training. There were, therefore, two pediatricians and three groups, all aware of the research objective.

Information was collected by the author of each child's medical record, since the center has a clinical record card specifically for breastfeeding monitoring, which was developed by the same pediatricians in a pilot study performed six months previously.

Sample calculation

In dealing with a cohort intervention study (exposed and not exposed), in which exposure is to specialized EMB promotion (groups 1 and 2), to achieve a 95% confidence interval, with 80% statistical power, with the previous knowledge that the national prevalence of EMB at 4 months is 18%²⁷ and hoping that intervention would at least triple this prevalence, the minimum number of children in each group should be 32 at the end of the 4 months of monitoring. The calculation was performed using Epi-Info 6, version 6.04b.²⁸

Variables and statistical analyses

The following variables were used to test if the three groups were homogeneous with respect to certain factors which are important from a pediatric point of view: average age of the children at the start of the study, average maternal age at the start of the study, average time in education of the mothers, average birth weight of the children, average weight of the children at the first appointment, average length of the children at birth, average length of the children at the first appointment, use of a pacifier at the first appointment, parity of the mother, previous experience of more than 6 months MB and whether the mother was working at 4 months.

The chi-square (χ^2) test was used for categorical variables and analysis of variance for continuous variables in order to assess possible distribution differences between these variables at the end of the 4 months' monitoring, according to the type of feeding being practiced: Exclusive Maternal Breastfeeding (EMB) or Other Feeding Practice (OFP). The following variables were included in this analysis: birth weight of the children, length at birth, maternal age at the start of study, age of children at the end of the monitoring period, weight of the children at 4 months, length of the

children at 4 months, maternal education, and, as categorical variables: monitoring group, sex, race, use of pacifier, primiparous mother, whether the mother was working at the time, if the mother was studying at the time, planned pregnancy, vaginal delivery, previous MB for more than six months, family support for breastfeeding, use of oral contraceptives, whether the child was sleeping for six hours at night without waking.

Associations were analyzed between the presence or absence of EMB at 4 months, by means of unadjusted logistic regression, and the same categorical and continuous variables listed above with the exception of: age of the children at the end of the study and length of children at birth and at the end of the study. Given that 61 children were still on EMB at the end of 4 months, up to 12 variables could be included in the adjusted analysis since a minimum of five positive events are necessary for each variable to be studied.²⁹ As the primary variable under investigation - monitoring group - contained three categories, nine variables were chosen for the final model, those which presented the lowest level of significance ($p < 0.30$ in Table 1) in association with EMB at 4 months in the unadjusted logistic regression analysis, and for which extant literature describes the greatest associations with the phenomenon (vaginal delivery, primiparity, sleeping for 6 hours at night and weight at 4 months). These were therefore included in the multiple logistic regression model with retrograde variable elimination. The individual contribution made by each risk factor was calculated (Table 2), with a significance level of 5% ($p < 0.05$). These operations were performed using Excel and Stata 5.0.

This project was approved by the Committee for Ethics in Research of the FMTM.

Results

Of the 190 children who attended their first consultation at the clinic and who fulfilled the criteria inclusion when the appointment was made, 89 did not take part in the study because they were either not breastfeeding at the first consultation or their mothers preferred to obtain their childcare Basic Health units closer to their homes.

The 101 children who reached the end of the four months of monitoring were distributed as follows: 51 (50.5%) were male, 63 (62.4%) were white, averages / standard deviations (SD) for birth weight of 3,145.89g/DP: 371.97 and for length of 48.41 cm/DP: 2.16, respectively. Minimum birth weight was 2,520 g and maximum was 4,250 g. There were 80 (79.2%) vaginal deliveries, and 21 (20.8%) surgical ones.

Table 3 shows that the distribution of the variables studied across the three groups did not reveal statistically significant differences confirming their homogeneous nature.

Table 1 - Frequency of EMB at 4 months according to the monitoring group, mothers/infants characteristics and respective whole odds ratios

Variable	n4m	nEMB	%	OR	95% CI	p
Monitoring group						< 0.001
Group 1	35	29	82.9	1.00		
Group 2	33	22	66.7	0.41	0.13; 1.29	
Group 3	33	10	30.3	0.09	0.03; 0.28	
Use of pacifier at 4 months	41	16	39.0	0.21	0.09; 0.50	< 0.001
Female	50	28	56.0	0.69	0.31; 1.55	0.372
Caucasian	33	20	60.6	1.01	0.43; 2.37	0.976
Planned pregnancy	37	25	67.6	1.62	0.69; 3.78	0.264
Vaginal delivery	80	49	61.2	1.19	0.45; 3.14	0.732
Primiparous mother	65	39	60.0	1.05	0.46; 2.41	0.913
Previous MB > 6 months	24	15	62.5	1.34	0.42; 4.33	0.738
Use of oral contraceptive	57	37	64.9	1.54	0.69; 3.45	0.292
Working mother	10	6	60.0	0.98	0.26; 3.72	0.979
Student mother	6	4	66.7	1.33	0.23; 7.64	0.747
Family support for breastfeeding	97	59	60.8	0.78	0.07; 8.86	0.839
Child was sleeping for six hours at night	51	32	70.4	1.22	0.55; 2.71	0.626
Mother's level of education (years)				1.20	1.02; 1.36	0.024
Birthweight (g)				0.99	0.99; 1.00	0.625
Weight at 4 months (g)				1.00	0.99; 1.00	0.424
Mother's age (years)				1.00	0.93; 1.07	0.909

n4m: number of children being followed up to 4 months; nEMB: number of children receiving exclusive breastfeeding at 4 months; OR: odds ratio; CI: confidence interval.

Table 2 - Frequency of EMB at 4 months according to the monitoring group, mothers/infants characteristics and respective adjusted odds ratios

Variable	n4m	nEMB	%	OR	95% CI	p
Monitoring group						0.002
Group 1	35	29	82.9	1.00		
Group 2	33	22	66.7	0.39	0.12; 1.36	
Group 3	33	10	30.3	0.11	0.03; 0.39	
Use of pacifier at 4 months						0.003
No	60	45	75.0	1.00		
Yes	41	16	39.0	0.23	0.08; 0.60	
Primiparous mother						0.303
No	36	22	61.1	1.00		
Yes	65	39	60.0	1.88	0.58; 5.74	
Planned pregnancy						0.317
No	64	36	56.3	1.00		
Yes	37	25	67.6	1.70	0.60; 4.78	
Use of oral contraceptive						0.462
No	44	24	54.5	1.00		
Yes	57	37	64.9	1.47	0.53; 4.10	
Child sleeps 6 h at night						0.790
No	50	29	58.0	1.00		
Yes	51	32	62.7	0.87	0.31; 2.40	
Birthweight	101			1.24	0.34; 4.48	0.744
Weight at 4 months	101			1.01	0.99; 1.10	0.280
Mother's level of education (years)	101			1.20	1.01; 1.44	0.041

n4m: number of children being followed up to 4 months; nEMB: number of children receiving exclusive breastfeeding at 4 months; OR: odds ratio; CI: confidence interval.

Tables 4 and 5 demonstrate that the distribution of continuous and categorical variables according to feeding practice at 4 months (EMB or OFP) did not present significant differences, with the exception of monitoring group ($p < 0.001$), the use of pacifiers ($p < 0.001$) and maternal education ($p = 0.02$).

Unadjusted analysis

Table 1 illustrates that the type of care associated with EMB at 4 months of age, with group 1 (MB team) and group 2 (pediatrician trained in MB) revealing no difference in terms of EMB, while group 3 (pediatrician

with no MB training) revealed a negative relationship with EMB ($p < 0.001$). The use of a pacifier was negatively related to EMB ($p < 0.001$), with children who used pacifiers having greater chances of being weaned by 4 months. The proportion of EMB increases with increasing levels of maternal education ($p = 0.024$).

Adjusted analysis

In Table 2 it will be observed that, after adjustment, the type of care remains associated with EMB, with group 1 (MB team) and group 2 (pediatrician trained in MB) continue to show no statistical difference in terms

Table 3 - Distribution of averages and standard deviations of the continuous variables and percentage of the categorical variables according to the monitoring group

Monitoring group	G1	G2	G3	p		
Number of children	n = 35	n = 33	n = 33			
Continuous variables						
Age at the first medical visit (days)				0.197		
Average	17.49	16.48	15.45			
Standard deviation	5.80	4.38	3.29			
Mother's age (years)				0.544		
Average	21.83	23.27	22.82			
Standard deviation	5.16	5.82	5.54			
Mother's educational level (years)				0.255		
Average	7.69	7.45	6.64			
Standard deviation	2.81	2.72	2.60			
Birthweight (g)				0.838		
Average	3,095.43	3,126.36	3,218.94			
Standard deviation	292.13	333.72	470.80			
Weight at the first medical visit (g)				0.873		
Average	3,514.57	3,481.06	3,544.39			
Standard deviation	514.10	409.96	547.83			
Length at birth (cm)				0.520		
Average	48.21	48.11	48.61			
Standard deviation	1.84	2.02	1.80			
Length at the first medical visit (cm)				0.992		
Average	51.43	51.41	51.36			
Standard deviation	2.32	2.48	2.21			
Categorical variables						
	n	%	n%	n	%	
Use of pacifier at the first medical visit						0.585
Yes	13	37.1	11	33.3	15	45.4
No	22	62.9	22	66.4	18	54.6
Primiparous mother						0.857
Yes	23	65.7	22	66.4	20	60.6
No	12	34.3	11	33.3	13	39.4
Previous MB > 6 months						0.506
Yes	8	22.8	6	18.2	10	0.3
No	27	77.2	27	81.8	23	69.7
Mother working at 4 months						0.147
Yes	6	17.1	3	9.1	1	3.0
No	29	82.9	30	90.9	32	97.0

Table 4 - Distribution of averages and standard deviations of the continuous and categorical variables according to feeding practice at 4 months

Feeding practice	EMB	OFP	p
Number of children	n = 61	n = 40	
Birhtweight (g)			0.629
Average	3,131.3	3,168.1	
Standard deviation	365.1	385.8	
Length at birth (cm)			0.820
Average	48.4	48.5	
Standard deviation	2.0	2.4	
Mothers' age in the beginning of this study (years)			0.929
Average	22.6	22.7	
Standard deviation	5.1	6.1	
Children's age at the end of this study (days)			0.334
Average	121.0	121.8	
Standard deviation	3.92	4.3	
Children's weight at the end of this study(g)			0.427
Average	6,449.0	6,317.0	
Standard deviation	857.1	744.1	
Children's length at the end of this study (cm)			0.861
Average	62.9	62.8	
Standard deviation	2.8	2.8	
Mothers' level of education (years)			0.020
Average	7.8	6.5	
Standard deviation	2.4	3.0	

EMB: exclusive maternal breastfeeding; FDP: other feeding practices.

of EMB, while group 3 (pediatrician with no MB training) continues to result in less chance of reaching 4 months of age on EMB ($p = 0.002$). Children who used pacifiers had a greater chance of being weaned by 4 months ($p = 0.003$); maternal education revealed a positive association, in which the proportion of EMB increases with education ($p = 0.041$).

Discussion

After an adjusted analysis, this study detected that the factors associated with EMB at the end of four months' monitoring were maternal education ($p = 0.041$), the use of pacifiers ($p = 0.003$) and the monitoring group to which the child had been allocated ($p = 0.002$), while other factors such as maternal employment and delivery type were not associated with EMB. These last can be explained by the 4-month follow-up period, since the majority of nursing mothers were still on maternity leave or did not work away from the home, and by the absence of elective caesarians.

The characteristics of this pediatric service, which is a center of excellence for the whole region of Uberaba,

revealed the existence of obstacles to all 190 children who fulfilled the inclusion criteria being followed. This being the case, a large part of them procured childcare at health centers closer to home. The lack of a breastfeeding guidance service during the immediate postnatal period resulted in many children arriving at the first consultation having already been weaned. Mothers returning to work or looking for employment meant that it was not possible to maintain monitoring until the sixth month as would have been ideal. This, indeed, is evidence of a contradictory message, in which EMB is recommended, and officially so, until the sixth month, but the necessary social support is not provided for this.

The fact that the pediatrician from the multidisciplinary MB team (group 1) was the same one who monitored the children in group 2 was considered to be a strength of the study, since it reduced bias from differences in empathy and personal competence, natural to this type of care.

The association between maternal education and breastfeeding has been confirmed by a number of different studies⁶⁻⁸ and should be given due value in any program aimed at improving MB indices, particularly in cases of community projects in poor socio-economic conditions,

Table 5 - Distribution of the children according to the categorical variables and to the feeding practice at 4 months

Feeding practice	EMB		OFP		p
	n = 61	(%)	n = 40	(%)	
Number of children	n = 61	(%)	n = 40	(%)	
Monitoring group					< 0.001
Group 1	29	47.5	6	15.0	
Group 2	22	36.1	11	27.5	
Group 3	10	16.4	23	57.5	
Sex					0.371
Male	33	54.1	18	45.0	
Female	28	45.9	22	55.0	
Race					0.976
Caucasian	41	67.2	27	67.5	
Non-caucasian	20	32.8	13	32.5	
Use of pacifier at 4 months					< 0.001
Yes	16	26.2	25	62.5	
No	45	73.8	15	37.5	
Primiparous mother					0.913
Yes	39	63.9	26	65.0	
No	22	36.1	14	35.0	
Mother working					0.754
Yes	6	9.8	4	10.0	
No	55	90.2	36	90.0	
Student mother					0.667
Yes	4	6.6	2	5.0	
No	57	93.4	38	95.0	
Planned pregnancy					0.262
Yes	25	41.0	12	30.0	
No	36	59.0	28	70.0	
Vaginal delivery					0.731
Yes	49	80.3	31	77.5	
No	12	19.7	9	22.5	
Previous MB > 6 months					0.809
Yes	15	24.6	9	22.5	
No	46	75.4	31	77.5	
Family support of breastfeeding					0.930
Yes	59	96.7	38	95.0	
No	2	3.3	2	5.0	
Use of oral contraceptive					0.291
Yes	37	60.7	20	50.0	
No	24	39.3	20	50.0	
Child sleeps up to 6 hs at night					0.626
Yes	32	52.4	19	47.5	
No	29	47.6	21	52.5	

EMB: exclusive maternal breastfeeding; OFP: other feeding practices.

since current breastfeeding campaigns are primarily reaching those people with the greatest access to information.

Many studies have found associations between the use of pacifiers and reduced AM duration.⁸⁻¹³ Notwithstanding, pacifiers in the style of 30 years ago, which physically close the mouth, have been defended as improving the performance

of babies with suction problems.³⁰ This association with weaning should be analyzed in greater depth since there are arguments for the pacifier in fact being an indication of problems with breastfeeding.^{10,11,13}

The most significant association was between the monitoring group and EMB at 4 months. The trained pediatrician was as effective as the MB team and surpassed

the pediatrician with no MB training, who, in turn, exhibited good performance when compared with national 4 month EMB levels.²⁶ Without doubt this pediatrician was aided by their training in children's health, by the clinical record card developed for the monitoring (which obliged certain questions to be asked which in themselves implied guidance in breastfeeding techniques) and their own effort in the light of the research. In addition, all three groups had a proportion of their performance improved by the fact that children with diseases or other abnormalities at birth were not included in the monitoring.

A number of health policies and programs to encourage breastfeeding have helped nursing mothers overcome obstacles to achieving EMB, such as the Child Friendly Hospital Initiative and human milk banks; others less so, such as maternity leave which allows the mother four months away from employment while the recommendation is that EMB should continue to the six month. The employment legislation (CLT- Section 1, Article 396), which guarantees two work breaks of 30 minutes a day for breastfeeding between the 4th and 6th months, does not allow for transport difficulties from employment to the baby or vice versa. Making day care obligatory and adequate at businesses, for example, could reduce these difficulties.

There is no question that the multidisciplinary MB team is the "Gold Standard" for the care of nursing mothers and their babies who want to overcome the difficulties of breastfeeding. However, in our reality, this group of professionals united to care especially for MB is very often difficult to put into practice for financial reasons. The importance of the team rests in its use for cases where MB is at risk, such as prematurity, babies with congenital diseases, mothers with inflammation of the breasts, psychological problems and others, and also for training health service professionals.

Continuous and wide-ranging instruction on the practice of MB in medical schools and the training of pediatricians by multidisciplinary MB teams from the public health system should be further stimulated. This could be a health policy directive of low cost and great effectiveness, generating great advances in public health, with improvements in EMB rates (a median of just 23.4 days for urban Brazil, after 20 years of government campaigns).²⁶

This study aimed to highlight the importance of pediatric doctors to infant nutrition and in particular their role in MB, bearing in mind that these professionals continue to occupy a position of prominence within the *Sistema Único de Saúde* (Brazilian National Health System) and a position of trust and respect in the healthcare of children and adolescents whose families turn to them. Furthermore, this should be taken as an alert to pediatricians, that they should seek continuous and specific training in MB.

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