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Implementation of the Brazilian Breastfeeding Network and prevalence of exclusive breastfeeding

ABSTRACT

OBJECTIVE: To evaluate the association between the level of implementation of the Brazilian Breastfeeding Network and the prevalence of exclusive breastfeeding.

METHODS: Cross-sectional study of a representative sample of 916 infants < 6 months, in Ribeirao Preto, SP, Southeastern Brazil, in 2011. Data on breastfeeding, place of outpatient care and other characteristics were collected during the National Vaccination Campaign. The factor studied is where outpatient care took place: Private; Non-Network Public; Public with Network Workshop; and Public certified by Network. The individualized effect of the factor studied on the outcome was analyzed using Poisson regression with robust variance.

RESULTS: The comparison between private (reference category) and other outpatient care showed significant dose-response relationship with a progressive increase in the prevalence of exclusive breastfeeding in public non-Network, public with Network Workshop and public accredited by Network outpatient care ($p = 0.047$). As regards the Basic Health Units accredited by Network category, the Prevalence Ratio of exclusive breastfeeding was equal to 1.47 (95%CI 1.00;2.17), after adjustment for confounding variables.

CONCLUSIONS: The prevalence of exclusive breastfeeding for infants < 6 months was higher in places accredited by the Brazilian Breastfeeding Network, which evinces the importance of investing in accreditation of Basic Units of Health by this strategy.

DESCRIPTORS: Breast Feeding. Infant Nutrition. Maternal-Child Health Centers. Primary Health Care. Cross-Sectional Studies.

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INTRODUCTION

Breastfeeding provides the child with innumerable health benefits and is the best way to promote overall development.^{12,15} No other food or modified processed milk is capable of offering what is provided by breast milk. This is the only food that has a composition specifically adjusted to the nutritional needs and metabolic and physiological limitations of the infant.¹⁵

In Brazil, the practice of breastfeeding falls short of World Health Organization (WHO) recommendations that infants should be exclusively breastfed for the first six months and complemented with other foodstuffs up to two years of age or more.¹⁵ The prevalence of exclusive breastfeeding in Brazilian children under six months was 41.0% in 2008, according to the *II Pesquisa de Prevalência de Aleitamento Materno nas Capitais Brasileiras e Distrito Federal – II Study of the Prevalence of Breastfeeding in Brazilian State Capitals and the Federal District*.^a The situation was similar in Sao Paulo, SP, Southeastern Brazil (39.1%). Such figures are considered “reasonable” according to the WHO.¹⁶

Health care provided to mother and child is among the factors that can contribute to the success of breastfeeding.⁸ Since the 1980s, in Brazil, there have been many public campaigns and policies aimed at encouraging breastfeeding.^b In 1991, the WHO and the United Nations Children’s fund (UNICEF) established the Baby Friendly Hospital Initiative,^c which raised awareness and mobilized health care professionals in hospitals to encourage breastfeeding. However, the coverage of measures adopted in hospitals is called into question without effective support in the centers where the infants’ outpatient care occurs, such as Primary Health Care Units (PHCU).²

The work performed in these units, which begins in the antenatal period and continues after discharge from hospital, is an opportunity to identify risks of early weaning and to establish interventions.⁸ Giving information on the advantages of breastfeeding may influence mothers who are undecided on how to feed their child.¹² In the first months of the infant’s life, many difficulties can interfere in continuing to breastfeed,⁹ and primary care is an environment in which this practice can be incentivized.¹⁰ In Brazil, there have been some campaigns launched within the area of primary care, aiming to encourage breastfeeding including the *Iniciativa Unidade Básica Amiga da Criança – Baby Friendly Primary Care Unit Initiative* (in Paraná) and

the *Iniciativa Unidade Básica Amiga da Amamentação – Breastfeeding Friendly Primary Care Unit Initiative* (in Rio de Janeiro).^b

Considering the potential for encouraging breastfeeding in such units,² it is necessary for health care professionals to understand it as a biological, social and cultural process and the importance of establishing a national strategy for promoting, protecting and supporting breastfeeding within primary care, the Brazilian Ministry of Health established the *Rede Amamenta Brasil – Brazilian Breastfeeding Network* in 2008. The network includes PHCU, health care centers and family health care units as places within the Brazilian Health System where breastfeeding can be encouraged.^{b,d}

The network is considered a facilitating and innovatory strategy. It adopts critical-reflexive education, which considers the learning process in an integrated and qualitative way, as the referential framework. The team discusses their work processes for encouraging breastfeeding during a workshop and, on revealing difficulties and successes, the team itself seeks solutions based on this reality. This methodology of working concords with the proposal of ongoing education in health care, one of the main differentials of this campaign.^b

This campaign was integrated into the *Estratégia Amamenta e Alimenta Brasil – Brazilian Breastfeeding and Feeding Strategy* (which corresponds to the joining of the Brazilian Breastfeeding Network and the *Estratégia Nacional de Promoção da Alimentação Complementar Saudável – National Strategy to Encourage Healthy Complementary Feeding*) at the beginning of 2012. As it was launched so recently, it is still in the implementation stage.^e

The first PHCU were accredited by the Network at the end of 2010.^b There are no studies evaluating the influence of this network on the prevalence of breastfeeding. The pro-breastfeeding health care provided by the PHCU have a positive impact on the length of time the mother breastfeeds exclusively.^{9,10}

The benefits of exclusive breastfeeding for the first six months and the importance of the role attributed to health care professionals and to where the routine follow up of this population occurs are essential in encouraging, protecting and supporting breastfeeding

^a Ministério da Saúde. Secretaria de Atenção à Saúde, Departamento de Ações Programáticas e Estratégicas. Pesquisa de prevalência de aleitamento materno nas capitais brasileiras e Distrito Federal. Brasília (DF); 2009.

^b Ministério da Saúde. Secretaria de Atenção à Saúde, Área Técnica de Saúde da Criança e Aleitamento Materno. Rede Amamenta Brasil: os primeiros passos (2007-2010). Brasília (DF); 2011.

^c Ministério da Saúde. Iniciativa Hospital Amigo da Criança. Brasília (DF); 2011.

^d Ministério da Saúde. Portaria MS/GM nº 2799 de 18 de novembro de 2008. Institui, no âmbito do Sistema Único de Saúde – SUS –, a Rede Amamenta Brasil. *Diário Oficial Uniao*. 19 nov 2008;Seção 1:124.

^e Ministério da Saúde. Lançada nova Estratégia Amamenta e Alimenta Brasil. Brasília (DF); 2012 [cited 2012 Sept 17]. Available from: http://dab.saude.gov.br/noticia/noticia_ret_detalle.php?cod=1528

The aim of this study was to analyze the association between the degree of implementation of the Brazilian Breastfeeding Network and the prevalence of exclusive breastfeeding for the first six months.

METHODS

This was a cross-sectional study of 916 infants aged less than six months in Ribeirao Preto, SP, Southeastern Brazil, in August 2011. The data were obtained from the *Projeto Amamentação e Municípios – Breastfeeding and Municipalities Project (AMAMUNIC)*, which since 1998 has annually collected data on breastfeeding practices in infants aged less than 1 year, on the day of the *Campanha Nacional de Vacinação contra a Poliomielite – National Poliomyelitis Vaccination Campaign*.^a This data includes closed questions on consumption of breast milk, other milk and foods, referring to the day preceding the survey.¹⁴ The AMAMUNIC uses current status as this recommended for describing infant feeding practices in order to minimize memory bias.¹⁷ Characteristics of mother and baby are obtained, including where the routine health care monitoring takes place.

The sample size required was 1,000 infant aged less than 1 year, which would enable the prevalence of different infant health related events to be estimated with 95% certainty, within the confidence intervals of a maximum $\pm 3.0\%$; this accuracy was expected for events with a prevalence of 50.0%.⁴ The sample was obtained by systematically two stage sampling: first, the (clustered) vaccination points were selected, followed by selecting infants in each location. As all infants had the same probability of belonging to the selected sample, this was considered equiprobabilistic: larger points had a greater chance of being selected in the first stage, and infants at smaller points had a greater chance of being selected in the second stage.¹⁴

Only infants aged less than six months and born in maternity wards in the municipality of Ribeirao Preto, SP, were included. Those for whom no data was available on place of birth were excluded from the analyses. A total of 1,755 infants aged less than one year participated in the AMAMUNIC, of which 953 were aged less than six months. Of these, 37 were excluded as they did not meet the eligibility criteria. Thus, 916 infants less than six months were included.

Ribeirao Preto, SP, is a medium sized municipality in the northeast of the state of Sao Paulo, 313 km from the state capital.^f In 2011, it had around 618 thousand

inhabitants, an infant mortality rate of 9.8 and 11,790 live births, almost all of which took place in hospital.^{g,h}

The Primary Care network in Ribeirao Preto, SP, has 40 health care units, including 30 PHCU and six family health care units. In 2011, fifteen units took part in the Breastfeeding Network Workshop, eight of them becoming certified.

The following criteria, proposed by the Brazilian Ministry of Health for certifying PHCU, were used: participation of at least 80.0% of the team in the Workshop; monitoring breastfeeding indicators in the area they cover (using the *Sistema de Vigilância Alimentar e Nutricional – Food and Nutrition Surveillance System*); carrying out at least one campaign agreed in the above mentioned workshop; and creating and implementing a flowchart of mother-baby care during the period of breastfeeding. Each unit in the Network has a tutor responsible for monitoring their development of activities encouraging breastfeeding and for assisting the team in case of difficulties.^b

The outcome of this study was exclusive breastfeeding (EB), meaning the infant receives only breast milk, no other types of liquid or solid food.¹⁷ The covariates correspond to the characteristics of the infant (age in days, sex: male; female, birth weight: < 2,500 g; 2,500 g and over, type of birth: vaginal or cesarean); and of the mother (age group: < 20; 20 to 35; 35 and over, previous births: first birth; multiparous, work status: working outside the home; not working outside the home; on maternity leave, schooling in years of study: ≤ 8 ; 9 to 11; and 12 or more).

The factor studied corresponded to where outpatient care took place. These were stratified as follows, dividing the public network into categories that expressed to what degree the Network was established: private; non-Network Public (had not participated in a Breastfeeding Network Workshop and were not certified by the Network); Public with Network Workshop (participated in a Breastfeeding Network Workshop but were not certified by the Network); and Public certified by Network.

The association between independent variables and the response variable was assessed by unadjusted analysis using the Chi-square test. The individualized effect of the factor studied on EB was assessed using Poisson regression analysis with robust variance. Values for the unadjusted prevalence ratios (PR) and their respective 95% confidence intervals (95%CI) were obtained based on this analysis. The Poisson

^f Prefeitura da Cidade de Ribeirão Preto. Dados Geográficos: Ribeirão Preto; 2012 [cited 2012 Sept 28]. Available from: <http://www.ribeiraopreto.sp.gov.br/crp/dados/local/i01localacesso.htm>

^g Fundação SEADE. Perfil Municipal de Ribeirão Preto. São Paulo; 2012 [cited 2012 Sept 28]. Available from: <http://www.seade.gov.br/produtos/perfil/perfil.php>

^h Sistema de Informações de Nascidos Vivos. Nascidos Vivos - Ribeirão Preto (SP). Dados referentes a Nascidos Vivos no Município de Ribeirão Preto. Ribeirão Preto; 2012 [cited 2012 Sept 28]. Available from: <http://www.ribeiraopreto.sp.gov.br/ssaude/vigilancia/vigep/tabnet/i16nascidos.php>

regression with robust variance was used as it was the best alternative for use in cross-sectional studies with binary outcomes and as it produces good point and interval estimates for the PR.¹

Covariables with $p < 0.20$ in the unadjusted analysis and that modified the prevalence ratio of the factor studied by more than 10.0%⁷ when introduced into the multiple model were included as variables of adjust.

Table 1. Proportion of infants breastfed exclusively and respective prevalence ratios and confidence intervals according to characteristics of the infants and the mothers and to the type of outpatient follow up care. Ribeirao Preto, SP, Southeastern Brazil, 2011.

Variable	n	EBF (%)	PR	95%CI	p
Age of infant (months)					< 0.001 ^a
> 1	123	62.2	1		
1 2	135	45.5	0.73	0.58;0.92	
2 3	152	38.1	0.61	0.48;0.79	
3 4	185	28.7	0.46	0.35;0.60	
4 5	161	23.6	0.38	0.28;0.52	
5 6	160	11.5	0.18	0.12;0.29	
Sex					0.358
Male	474	31.8	1		
Female	442	34.7	1.09	0.91;1.31	
Birth weight (g)					0.158
< 2,500	78	26.0	1		
2,500 +	817	34.1	1.32	0.90;1.95	
Type of delivery					0.992
Cesarean	540	33.2	1		
Vaginal	376	33.2	1.00	0.91;1.10	
Maternal age group (years)					0.044 ^a
< 20	103	22.6	1		
20 35	188	37.3	1.65	1.14;2.40	
35 +	105	35.3	1.57	1.00;2.44	
Births					0.001
First	415	29.6	1		
Multiparous	398	40.9	1.38	1.14;1.68	
Work status					< 0.001 ^a
Working outside the home	163	23.5	1		
Not working outside the home	415	35.5	1.52	1.12;2.06	
On maternity leave	234	42.5	1.81	1.32;2.49	
Schooling (years)					0.106 ^a
≤ 8	189	32.0	1		
9 12	444	34.5	1.08	0.84;1.38	
12 +	181	40.2	1.26	0.95;1.66	
Outpatient care					0.851 ^a
Private	379	34.8	1		
Public non-Network ^b	378	31.5	0.91	0.74;1.11	
Public with Network Workshop ^b	50	30.6	0.88	0.56;1.37	
Public Network certified ^b	45	38.6	1.11	0.75;1.65	

Values in bold: $p < 0.20$

EBF: Exclusive Breastfeeding

^ap linear trend.

^b“Public non-Network”: public outpatient care that had not taken part in a Breastfeeding Network workshop and were not certified by the Brazilian Breastfeeding Network; “Public Network Workshop”: public outpatient care that had taken part in a Breastfeeding Network workshop but were not certified by the Brazilian Breastfeeding Network; “Public Network certified”: public outpatient care certified by the Brazilian Breastfeeding Network.

Variables with more than two categories were introduced into the model as dummies.

Those variables with PR values between 0 and 1 were interpreted as factors which decreased the prevalence of EB, and $PR > 1$ were interpreted as factors which increased the prevalence of the outcome.

Data analysis made use of the Stata/SE 11.1 program. The association between the factor studied and the outcome was considered significant when $p < 0.05$.

This research project was approved by the Ethics Committee of the Faculty of Public Health (no. 435, year: 2010) and by the Ribeirao Preto Municipal Health Department (no. 396991, year: 2011). The mothers gave verbal consent for the questionnaire to be applied.

RESULTS

The prevalence of EB was 33.2% (95%CI 30.1;36.3). The percentage of infants who had received breast milk in the previous 24 hours was 82.8% (data not shown in the tables).

The percentage of infants born with low birth weight was 8.7% and mean birth weight was 3,140.2 g (SD 16.70) (Table 1). The mean age was 94.6 days (SD 1.63). Most mothers (74.4%) were aged between 20 and 35, with a mean age of 27.3 (SD 0.22) (data on mean not shown in Table 1). The majority of the women (54.6%) had between nine and 11 years of schooling; 55.5% of the infants received outpatient care in the public network. In the unadjusted analysis, the prevalence of EB was not shown to be statistically different between where care took place.

The co-variables which met the criteria established for inclusion in the multiple analysis were infant's age, mother's age and mother's schooling (Table 2). The variable infant's age had a negative association with the outcome. The variables mother's age group and mother's schooling had a positive association with the outcome. Comparison of private (reference category) and other outpatient care showed a significant dose-response relationship, with a progressive increase in the prevalence of EBF in public non-Network, public with Network Workshop and public accredited by Network outpatient care ($p = 0.047$). The PR for BE was 1.47 (95%CI 1.00;2.17) for the strata of PHCU accredited in the Network.

DISCUSSION

The prevalence of EBF showed a positive dose-response relationship in infants < 6 months who received outpatient care in public non-Network, public with Network Workshop and public accredited by Network PHCU. This prevalence was higher in infants cared for in

Table 2. Adjusted prevalence ratio and respective confidence interval values for exclusive breastfeeding according to where outpatient care took place. Ribeirao Preto, SP, Southeastern Brazil, 2011.

Variable	PR	95%CI	p ^a
Outpatient care			0.047
Private	1		
Public non-Network ^b	1.07	0.86;1.35	
Public with Network Workshop ^c	1.32	0.82;2.13	
Public Network certified ^d	1.47	1.00;2.17	

EBF: Exclusive Breastfeeding

^a p linear trend.

^b "Public non-Network": public outpatient care that had not taken part in a Breastfeeding Network workshop and were not certified by the Brazilian Breastfeeding Network.

^c "Public Network Workshop": public outpatient care that had taken part in a Breastfeeding Network workshop but were not certified by the Brazilian Breastfeeding Network.

^d "Public Network certified": public outpatient care certified by the Brazilian Breastfeeding Network.

public Network accredited PHCU, after controlling for confounding variables.

When a PHCU carried out pro-breastfeeding activities, such as support groups for pregnant women and nursing mothers, the duration of breastfeeding increases significantly.^{3,5,9-11,13}

A study in Rio de Janeiro, RJ, Southeastern Brazil, noted that, after implementing the Breastfeeding Friendly Primary Care Unit Initiative (a strategy similar to the Brazilian Breastfeeding Network although only covering the state of Rio de Janeiro),^b the prevalence of EBF at < 6 months was significantly higher: among those aged < 4 months, the prevalence of EBF went from 68.0% to 88.0%, and in those aged from four to 5.9 months, it increased from 41.0% to 82.0%.³ An intervention study in Montes Claros, MG, Southeastern Brazil, based on training for this initiative, noted that the length of EBF was significantly higher in places where the intervention took place: duration went from 104 to 125 days for those mothers cared for by teams that participated in the training.² Another study sought to identify factors associated with the prevalence of EBF in infants less than six months in relation to PHCU activities promoting, protecting and supporting breastfeeding. It showed that breastfeeding support groups and guidance on managing it significantly increased prevalence: the PR of EBF for these factors were 1.14 (95%CI 1.01;1.28) and 1.20 (95%CI 1.08;1.33), respectively.¹³

In this study, more than half of the infants' outpatient care took place within the public network. These are considered those mainly responsible for monitoring infants during their first year of life. They continue the work begun in antenatal care and that of the maternity wards during hospitalization for the birth. They

identify the difficulties mothers may have breastfeeding and establish intervention measures to provide them with the necessary support.^{9,10} Breastfeeding can be encouraged in the PHCU sequentially: during the antenatal and postnatal periods and in case of future pregnancies for the same woman.⁵

Ribeirao Preto has developed activities to promote, protect and support breastfeeding in partnership with the public university there since 1988. These activities include adherence to the Baby Friendly Hospital Initiative by three of the six maternity wards, celebrations during Worldwide Breastfeeding Week – including events with health care professionals and authors, posters on breastfeeding in health care institutions and meetings with the public to encourage breastfeeding – and encouraging identifying the breastfeeding situation through regular AMAMUNIC surveys. However, the Network was established in the municipality a year before the data for this study were collected; therefore, few infants were cared for in public units that had taken part in a Network Workshop or were certified. New studies are needed with wider municipal coverage and a higher percentage of children in the public network who experienced the strategy versus those who did not.

Even in a municipality in which actions to encourage breastfeeding take place, the prevalence of EBF in infants less than six months tends to be higher just from a Brazilian Breastfeeding Network Workshop taking place. As the Workshop involves at least 80.0% of staff in each location, it is plausible to assume that it positively influences the prevalence of the outcome studied.

This is the first study to assess the association between the degree of implementation of the Network and the prevalence of EBF. Using cross-sectional surveys to analyze the association between outpatient care and the prevalence of breastfeeding can be considered a rapid and simple way of investigating this association. This is because the methodology is relatively simple and it can constitute an important evaluation instrument for health care managers, bearing in mind the scarcity of studies on outpatient care provided and prevalence of breastfeeding.

Public outpatient centers accredited by the Network have been shown to be associated with higher prevalence of EBF in infants less than six months. Investment in certifying PHCU through this campaign thus becomes relevant.

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Article based on the master's dissertation of Passanha A., entitled: "Padrão de aleitamento materno em menores de seis meses do Município de Ribeirão Preto segundo apoio recebido em maternidades e no acompanhamento ambulatorial", presented to the *Faculdade de Saúde Pública* of the *Universidade de São Paulo*, in 2012.

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The authors declare that there are no conflicts of interest.

HIGHLIGHTS

In 2008, the Brazilian Ministry of Health drew up a proposal for the promotion, protection and support of breastfeeding in primary care, the so-called Brazilian Breastfeeding Network, with the aim of increasing rates of breastfeeding in the country. This study aimed to evaluate whether exclusive breastfeeding was more prevalent for babies who received outpatient care in locations certified by the Brazilian Breastfeeding Network.

It was noted that babies who were monitored in primary health care units that met the criteria or had been certified by the Brazilian Breastfeeding Network were more likely to be exclusively breastfed than those who were monitored in units that had undertaken a Brazilian Breastfeeding Network Workshop but were not certified or those monitored in private health care outpatient networks.

In 2012, the Brazilian Breastfeeding Network became part of the National Strategy for Promoting Healthy Eating, giving rise to the Brazilian Breastfeeding and Feeding Strategy. This new strategy preserved the majority of Brazilian Breastfeeding Network certification directives and criteria, integrating activities promoting breastfeeding and complementary feeding into primary health care teams. Thus, the results of this study show the importance of expanding this strategy, due to its potential impact on increasing the prevalence of exclusive breastfeeding in infants aged under six months.

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