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Neonatal visits in the first week of life in primary care: low prevalence and related factors

Consulta neonatal na primeira semana de vida na atenção primária: baixa prevalência e fatores relacionados

Consulta neonatal durante la primera semana de vida en la atención primaria: baja prevalencia y factores relacionados

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ABSTRACT

Objectives: to identify the prevalence of and factors related to access to neonatal consultation in the first week of life, in Brazil. **Methods**: a secondary data analysis from a national cross-sectional survey involving 14,133 mothers from primary care services. Pearson chi-square was used to analyze the prevalence of access to appointment and Poisson regression to analyze related factors, considering prevalence ratio (PR) and confidence intervals (95%CI). **Results**: the prevalence of healthcare visits was 63.0% in Brazil. Children of mothers, aged 30-39 years (PR=1.065; CI=1.029-1.103), and of single mothers (PR=1.021; CI=1.00-1.042) had higher prevalence of access. Children from the northern region of Brazil had a lower prevalence of healthcare visits compared to children from other regions. **Conclusions**: low prevalence of access to neonatal visits was identified in the first week of life in primary care services; the region of residence, maternal age, and marital status were identified among the related factors.

Descriptors: Health Services Accessibility; Newborn; Pediatric Nursing; Primary Health Care; Brazil.

RESUMO

Objetivos: identificar a prevalência e fatores relacionados ao acesso à consulta neonatal na primeira semana de vida no Brasil. **Métodos:** análise de dados secundários de inquérito nacional transversal com 14.133 mães usuárias de serviços de atenção primária. Utilizou-se qui-quadrado de Pearson para analisar a prevalência de acesso a consulta e regressão de Poisson para analisar fatores relacionados, considerando razão de prevalência (RP) e intervalos de confiança (IC95%). **Resultados:** a prevalência de acesso foi de 63,0% no Brasil. Filhos de mães com idade entre 30-39 anos (RP=1,065; IC=1,029-1,103) e de mães solo (RP=1,021; IC=1,00-1,042) tiveram maior prevalência de acesso. Crianças da região Norte apresentaram menor prevalência de acesso em relação a crianças das demais regiões. **Conclusões:** identificamos baixa prevalência de acesso a consulta neonatal na primeira semana de vida nos serviços de atenção primária e, dentre os fatores relacionados, identificamos a região de residência e a idade e estado civil materno.

Descritores: Acesso aos Serviços de Saúde; Recém-Nascido; Enfermagem Pediátrica; Atenção Primária à Saúde; Brasil.

RESUMEN

Objetivos: identificar la prevalencia y los factores relacionados de acceso a la consulta neonatal en la primera semana de vida en el Brasil. **Métodos**: análisis de datos secundarios de investigación nacional transversal con 14.133 madres que usan los servicios de atención primaria. Se utilizó qui-cuadrado de Pearson para analizar la prevalencia del acceso a la consulta y la regresión de Poisson para analizar los factores relacionados, considerando la razón de prevalencia (RP) e intervalos de confianza (IC95%). **Resultados**: a prevalencia de acceso fue de 63,0% en Brasil. Hijos de madres con edad entre 30-39 años (RP=1,065; IC=1,029-1,103) y de madres solteras (RP=1,021; IC=1,00-1,042) tuvieron mayor prevalencia de acceso. Niños de la región Norte presentaron menor prevalencia de acceso en relación a los niños de las demás regiones. **Conclusiones**: identificamos baja prevalencia de acceso a la consulta neonatal en la primera semana de vida en los servicios de atención primaria y entre los factores relacionados, identificamos la región de residencia, la edad y el estado civil materno.

Descriptores: Accesibilidad a los Servicios de Salud; Recién Nacido; Enfermería Pediátrica; Atención Primaria de Salud; Brasil.

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INTRODUCTION

Although worldwide there have been advances in reducing infant mortality rates, about 2.6 million newborns die before their 28th day of life, every year, especially in the poorest countries[1]. Of these, up to three quarters die within the first week, characterizing early neonatal mortality.

The infant mortality rate decreased from 47.1 to 13.9 per 1000 live births between 1990 and 2019, in Brazil, however important regional differences still persist[2]. About 70% of deaths in recent years occurred in the neonatal period, and, among these, 54% were in the early neonatal period, which has shown a less pronounced reduction trend than the other age components of infant mortality[2]. However, a significant part of deaths in this period is associated with failures of care during the postpartum period because, in general, they are consequence of preventable etiologies. Among these causes are specific infections of the neonatal period, pneumonia, respiratory distress syndrome of the newborn, short-term pregnancy disorders, low birth weight, and newborns affected by maternal diseases[3].

In light of this situation, the Brazilian Ministry of Health has advocated, since 2004, in the Agenda of Commitments to Comprehensive Child Health and Infant Mortality Reduction, childcare by means of lines of care, including the First Week of Comprehensive Health[4]. According to this approach, the monitoring of the newborn should begin in the first week of life in order to assess the health conditions of the mother-baby binomial and implement comprehensive care, preferably during home visits[4]. The purpose of assessment in this period is to identify signs of risk to the healthy growth and development of the newborn, provide guidance on child care, encourage breastfeeding, offer support for any difficulties, verify and schedule vaccines, provide childcare consultation, and referrals for neonatal screening tests, contributing to the reduction of infant mortality[4-6].

However, regardless of the emphasis established by public policies and international organizations[4], the prevalence of neonatal assessment in the first week of life in primary care services in Brazil is unknown. But studies, which in general reflect very particular contexts, indicate important barriers to its effectiveness[6]. In other countries, either in offices or by home visits, the prevalence of access in the first week has been quite variable, ranging from 14.5% to 92.2%[7-10]. It is well known that service-related factors can increase newborn appointments in the first week of life, but some gaps regarding the relationship between maternal sociodemographic, family economic, and Brazilian regional factors and access to neonatal consultation are evident[10-19].

OBJECTIVES

To identify the prevalence of and factors related to access to neonatal visits in the first week of life in Brazil.

METHODS

Ethical aspects

Research developed using public domain data with unrestricted access.

Study design, period and location

This was a study using secondary data from a national cross-sectional survey: the third cycle of external evaluations of the National Program for Improving Primary Care Access and Quality OR National Program for Access and Quality Improvement in Primary Care - *Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica* (PMAQ-AB)[20], of the Ministry of Health. Using the Strengthening of Observational Studies in Epidemiology (STROBE) tool, the present study explored the survey containing data collected between September of 2017 and October of 2018, in all the regions of the country, which was conducted by the Ministry of Health in partnership with 41 federal teaching and research institutions, under the leadership of the Oswaldo Cruz Foundation - Fiocruz.

Sample and inclusion and exclusion criteria

The original data contained 140,444 interview records. The inclusion criteria for the sample of this study were: mothers with children, up to two years of age, who could answer whether, after birth, the child had a healthcare appointment in the first week of life. Applying these criteria, the final sample was composed of 14,133 mothers. In this third cycle of external evaluations, 93.9% of the primary health care services in Brazil were included.

Study protocols

Module III of the PMAQ-AB[20] external evaluations was used for this study, which included structured interviews administered to primary care service patients. About one thousand interviewers, chosen by public selection, participated in data collection using electronic devices (tablets), after receiving training. To answer the questions, the interviewer approached four clients, of any age or sex, who were present for services on the day of the external evaluation, without considering the sample weight. The questionnaire responses were automatically sent to a central server, and the evaluation of data consistency was performed under the coordination of the Department of Primary Care of the Ministry of Health. The database used is open access and is available at <https://aps.saude.gov.br/ape/pmaq/ciclo3/>.

The dependent variable was "access to neonatal visit in the first week of life" (yes or no). This variable was extracted from the following question: "Did the healthcare team provide a visit within seven days of life (first week), after the child was born?" The independent variables were maternal sociodemographic and family economic variables. The sociodemographic variables included were: age, marital status, race or self-reported skin color, and maternal education, considering eight years or less of complete education as low level education[4]. The family economic variables were the poverty line (daily per capita income below US$5.5, equivalent to R$420.00 per capita per month, at the time of the study)[21], and family participation in the *Bolsa Família* cash transfer program. Additionally, geographic data according to regions of the country (North, Northeast, Midwest, South, and Southeast) were included.

Analysis of results and statistics

The SPSS software, version 15.0, was used for data analysis. First, the characteristics of the study population were analyzed, considering absolute and relative frequencies. The prevalence of access was calculated based on the number of children who were seen in the first week of life over the total number of children studied, multiplied by 100. The differences in the prevalence of access were analyzed by Pearson's chi-square test and confidence interval (95%CI). The Poisson regression was used, with robust variances, estimating prevalence ratios and their respective 95%CI, to analyze associations between maternal sociodemographic, family economic, and geographic characteristics with access to health appointment in the first week of life, individually, and with a multivariate model. For the multivariate model, variables with p-value <0.20 were inserted in the bivariate analysis. The Wald test was used for regression analyses. Statistical significance was established at 5% (p≤0.05).

RESULTS

The sample of mothers included in the study had children with a mean age of 11.08 months (SD 7.62). Most mothers were between 20 and 29 years old, married or living in a stable union, self-declared as brown or mixed race, and had completed elementary school or more (Table 1). From an economic point of view, more than half lived below the poverty line and in families that participated or had participated in the *Bolsa Família* program. The Northeastern and Southeastern regions had the highest number of mothers in the study.

Table 1 - Sociodemographic, family economic, and geographic characteristics regarding the study population, Brazil, 2017-2018, (n=14,133)

	n	(%)
Mother's age (in years)		
18-19	1,353	(9.6)
20-29	7,722	(54.2)
30-39	4,506	(31.9)
40 or more	552	(3.9)
Marital status		
Married or stable union	9,862	(69.8)
Solo	3,922	(27.8)
Separated or widowed	349	(2.5)
Race or skin color (n=14,037)		
Brown or mixed race	8,044	(57.3)
White		
Black	1,921	(13.7)
Yellow	488	(3.5)
Indigenous	128	(0.9)
Education (n=14,127)		
≥8 years of study	11,104	(78.6)
< 8 years of study	3,023	(21.4)
Poverty Line (n=11,659)		
Below (1)	8,866	(76.0)
Above (2)	2,793	(24.0)
Bolsa Família program (n=13.943)		
Never participated	5,637	(40.4)
Participating or has participated	8,306	(59.6)
Geographic region		
North	1,522	(10.8)
Center-West	1,052	(7.4)
Northeast	5,183	(36.7)
Southeast	4,922	(34.8)
South	1,454	(10.3)

(1) monthy income per capita < R$420.00; (2) monthly per capita ≥ R$420.00; n – number of respondents.

The overall prevalence of access to neonatal visits within the first week of life was 63.0% (95%CI:62.2-63.8) (Table 2). Mother's age, according to age groups, significantly influenced the access, with children of older mothers having a higher prevalence. In addition, race or skin color of the mother and region of residence also influenced significantly, with higher prevalence of access identified among children of white mothers and among those who lived in the southern region of the country(p<0.05).

Table 2 - Analysis of the prevalence of access to neonatal visits in the first week of life in primary care services, Brazil, 2017-2018, (n=14,133)

	Access to the health visit in the first week of life			
	n	(%)	(95% CI)	*p**
Brazil	8,910	(63.0)	(62.2-63.8)	
Mothers age (in years)				**< 0.001**
18-19	802	(59.3)	(56.6-61.9)	
20-29	4,827	(62.5)	(61.4-63.6)	
30-39	2,922	(64.8)	(63.4-66.2)	
40 or more	359	(65.0)	(60.9-69.0)	
Marital status				0.127
Married or stable union	6,164	(62.5)	(61.5-63.5)	
Separated or widowed	223	(63.9)	(58.6-68.9)	
Solo	2,523	(64.3)	(62.8-65.8)	
Race or skin color (n=14.037)				**0.003**
Indigenous	72	(56.3)	(47.2-64.9)	
Brow or mixed color	4,988	(62.0)	(60.9-63.1)	
Yellow	307	(62.9)	(58.4-67.2)	
Black	1,218	(63.4)	(61.2-65.6)	
White	2,267	(65.6)	(64.0-67.2)	
Education (n=14.127)				0.545
≥8 years of study	6,986	(62.9)	(62.0-63.8)	
< 8 years of study	1,920	(63.5)	(61.8-65.2)	
Poverty Line (n=11.659)				0.101
Below (1)	5,584	(63.0)	(62.0-64.0)	
Above (2)	1,807	(64.7)	(62.9-66.5)	
Bolsa Família program (n=13.943)				0.171
Participating or has participated	5,195	(62.5)	(61.5-63.6)	
Never participated	3,590	(63.7)	(62.4-64.9)	
Geographic region				**< 0.001**
North	787	(51.7)	(49.2-54.2)	
Center-west	650	(61.8)	(58.8-64.7)	
Northeast	3,218	(62.1)	(60.7-63.4)	
Southeast	3,220	(65.4)	(64.1-66.7)	
South	1,035	(71.2)	(68.8-73.5)	

*(1) monthly income per capita < R$420.00; (2) monthly per capita ≥ R$420.00; n – number of respondents; CI – confidence interval; *statistical test (Pearson Chi-Square).*

In the multivariate analysis, the factors related to higher prevalence of access were maternal age, marital status of the mother, and region of residence (Table 3). Children of mothers aged 30 to 39 years had higher prevalence of access than children of adolescent mothers. Regarding marital status, children of single mothers had higher prevalence of access than those of married or cohabiting mothers. Children born to mothers living in the northern region had lower prevalence of access than those born to mothers living in any other region.

DISCUSSION

The findings of this study showed that in Brazil, only 63 children per 100 had access to a neonatal visit with a health professional in the first week of life in primary care services. Children of mothers

Table 3 - Analysis of factors associated with access to neonatal visits in the first week of life in the primary care services, Brazil, 2017-2018, (n=14,133)

	Access to health visit in the first week of life					
	Bivariate analysis			Multivariate analysis		
	PR	(95% CI)	*p**	PR	(95% CI)	*p***
Mother's age (in years)						
18-19		1.000			1.00	
20-29	**1.033**	**(1.004-1.063)**	**0.025**	1.029	(0.995-1.064)	0.093
30-39	**1.057**	**(1.026-1.089)**	**0.000**	**1.065**	**(1.029-1.103)**	**< 0.001**
40 or more	**1.059**	**(1.010-1.111)**	**0.018**	1.055	(0.999-1.114)	0.056
Marital status of mother						
Married or stable union		1.00			1.00	
Solo	**1.018**	**(1.000-1.037)**	**0.044**	**1.021**	**(1.000-1.042)**	**0.048**
Separated or widowed	1.014	(0.963-1.067)	0.594	1.013	(0.957-1.072)	0.652
Race or skin color (n=14.037)						
White		1.000			1.00	
Black	0.978	(0.953-1.005)	0.108	0.994	(0.964-1.024)	0.685
Yellow	0.973	(0.930-1.019)	0.240	0.981	(0.932-1.032)	0.464
Brow or mixed color	**0.965**	**(0.947-0.983)**	**0.000**	0.995	(0.973-1.018)	0.680
Indigenous	**0.911**	**(0.835-0.994)**	**0.036**	0.981	(0.891-1.081)	0.705
Maternal education (n=14.127)						
≥ 8 years of study		1.000				
< 8 years of study	1.006	(0.987-1.026)	0.545			
Poverty Line (n=11.659)						
Below		1.000		1.00		
Above	1.017	(0.997-1.038)	0.099	0.995	(0.971-1.018)	0.649
Bolsa Família program (n=13.943)						
Participating or has participated	1.011	(0.995-1.028)	0.170	0.999	(0.979-1.020)	0.949
Never participated		1.000			1.00	
Geographic region						
North		1.00			1.00	
Center-west	**1.106**	**(1.064-1.150)**	**0.000**	**1.087**	**(1.040-1.135)**	**< 0.001**
Northeast	**1.109**	**(1.078-1.141)**	**0.000**	**1.100**	**(1.065-1.136)**	**< 0.001**
Southeast	**1.147**	**(1.115-1.180)**	**0.000**	**1.131**	**(1.094-1.169)**	**< 0.001**
South	**1.215**	**(1.174-1.257)**	**0.000**	**1.189**	**(1.142-1.238)**	**< 0.001**

*(1) Wald Chi-Square. In the bivariate analysis, we considered the maternal variables age, marital status, and race or skin color, the economic variables of poverty line and participation in the Bolsa Família program, and geographic regions. *PR = Prevalence Reason; CI – confidence interval; n – number of respondents; *statistical test (Pearson Chi-Square); **statistical test (Wald Chi-Square).*

aged 30 to 39 years, compared to those of mothers aged 18 or 19, and children of single mothers, compared to those married or in a stable union, had a higher prevalence of access. Furthermore, children living in the northern region were less likely to have access than children living in the other regions.

Our findings on the prevalence of access to neonatal consultation in the first week of life in primary care services indicate important barriers to the continuity of comprehensive care of children in the Brazilian Health Care Network. When compared to other studies, the prevalence found can be considered intermediate[8,10-11,13,22], although, it indicates that the ordinance No. 2668 of 2016, which determines the first visit between the third and fifth day after birth, has not been met[8].

Our study showed that children of mothers aged between 30 and 39 years had more access to health visits than children of adolescent mothers. This outcome may be related to the greater access to prenatal care by women in their 30s[13], which increases the chances of newborns returning for assessment in the first week of life[5,15]. Another explanatory factor suggested in previous studies is that children of adolescent mothers are less likely to access a healthcare visit in the first week of life[8].

Among children born to mothers who declared themselves to be single, the prevalence of access to neonatal visits in the first week of life was higher than among those born to mothers who were married or in a stable union. This finding contradicts a strong social stigma of inferiority and incapacity of women who are not in a marital relationship. In Brazil, such stigma is strongly influenced by Christianity, which recognizes marriage as the only possibility for family constitution[23]. Accordingly, for a long time, marriage has been linked to a better social status for women[24]. However, some studies have shown that the existence of a permanent partner can be seen as a positive factor to encourage the attendance to health care visits and the follow-up of health teaching[16,25].

Despite the satisfactory findings for single mothers in our study, it is necessary to reflect on the social construction of care as a female attribution. Even today, women are mainly responsible for childcare and household duties, and fathers are often seen as "those who help", thus occupying the role of coadjuvants in the upbringing of their own children[26]. This release of male responsibility overloads women and has the potential to generate behavioral and cognitive disorders in children[25].

Moreover, the region of residence influenced access to health care visits. Our study showed that among newborns residing in northern Brazil, the prevalence of access to neonatal consultation in the first week of life was lower than in any of the other regions. This finding should be considered with great concern, since the northern region has maintained the highest infant mortality rates in the country[2]. One particularity of the northern region

that may have impacted access to neonatal visits in the first week of life is the presence of more marked geographical barriers to access to care by health professionals[27-28]. Confirming the issue of geographical barriers, greater distance between home and the nearest service has been associated with low utilization of postnatal care[22]. Moreover, the northern region presents the so-called "care gaps", which are territorially extensive areas covered by few health services. In some states, such as Amazonas and Acre, the healthcare teams are concentrated along the banks of large rivers, and in others, such as Pará, Rondônia and Tocantins, the services are concentrated along roads, leaving uncovered the populations living far from these locations[29].

Study limitations

Our study has some limitations related to the methodological characteristics of the external evaluations of PMAQ-AB. One of them refers to the fact that we only considered mothers who were present in the services at the time of the external evaluation. Under this criterion, a mother of a child who did not have access to a visit in the first week after birth, because she used the service less frequently, could have less chance of being in the service at the time of the data collection and not be included in the study. Also, the analyses were limited to the variables collected by the PMAQ-AB. Another limitation is in the variable maternal age, as it refers to the time of data collection, not the time of birth of the child. Thus, when the child was born, the mothers could be up to two years younger than the data indicate. Still, one cannot fail to consider the values found, considering that our study is pioneering and presented results that may help in the understanding and actions on the factors that hinder access to neonatal visits in the first week of life.

Contributions to Nursing, Health or Public Policy

This study reveals that access to neonatal visits in the first week of life is less than ideal and that regional factors, age, and maternal marital status influence it. The identification of the low prevalence of this access, as well as the related factors, under regional and maternal aspects, can contribute to the understanding that comprehensive care in the first week of life needs to be expanded. By showing that being born in the northern region is associated to lower access to postnatal care by newborns, it is hoped that the responsible entities will drive resources to correct this discrepancy and to increase the prevalence of access in Brazil as a whole to address infant mortality, especially neonatal mortality.

The establishment of an early link between primary care teams and the mother-child binomial is paramount to guaranteeing complete follow-up of the child's growth and development, significantly reducing the chances of future complications. More accessible services, from the geographical perspective, and healthcare teams committed to comprehensive and equitable care will be fundamental in expanding this access.

CONCLUSIONS

According to our analyses, we identified low prevalence of access to the neonatal visit in the first week of life in primary care in Brazil; the region of residence, maternal age, and marital status were identified among the related factors.

This study is a pioneering analysis of the access to neonatal visits in the first week of life in the Brazilian National Health System. Our findings may be useful for strengthening public policies and recommendations of international organizations involved with the issue of infant mortality, especially early neonatal mortality. The recognition of regional and sociodemographic maternal factors influence in the access to health care assessment in the first week of life may contribute to failures of care in the first days of life of children.

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