

Factors associated to maternal and child's health in Rio Grande do Sul, Brazil

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Abstract

Objectives: to analyze the factors associated to maternal and child's health from the Live Births Information System (Sinasc) in Rio Grande do Sul, 2012.

Methods: a cross-sectional ecological study with analysis on Sinasc variables from 19 Regional Health Coordinations in Rio Grande do Sul. The variables occurrence frequencies were calculated and analyzed by Spearman correlation.

Results: we observed that a higher maternal level of education, the presence of a partner and the adequate number of prenatal consultations reduced the frequency of vaginal delivery, as for the proportion of cesarean section, it was 62%. The frequency of low schooling was associated to prematurity ($\rho = 0.521$, $p=0.022$) and low birth weight ($\rho = 0.542$, $p=0.016$). The low prenatal coverage correlated positively with the Apgar score ≤ 7 in the 5th minute ($\rho = 0.467$; $p=0.044$) and negatively with adequate birth weight ($\rho = -0.500$; $p=0.029$).

Conclusions: this study allows to identify factors associated to maternal and child's health contributing information to the development of actions that qualifies pregnant women's healthcare.

Palavras-chave Maternal and Child Health, Live birth, Epidemiology

Introduction

Maternal and child health is a priority for the Brazilian health system that seeks to promote safe and free of complications at motherhood which arises during pregnancy. However, despite the progress achieved in relation to childbirth health-care, maternal morbimortality and perinatal remain high in this country, even being preventable in most cases.¹

Furthermore, childbirth has ceased to be a natural experience for all social classes in Brazil and this is due to the occurrence of vaginal delivery that is often painful with excessive medical interventions and the high rate of cesarean sections in the country. Many interventions performed during a normal delivery are at discordance with the Ministry of Health recommends and the numerous of cesarean sections that are pre-scheduled and performed unnecessarily.² The situation is not restricted to the Brazilian scenario, the cesarean rates have increased around the world, reaching almost all the countries.³

The absence of physiological mechanisms to adapt at childbirth, which occurs through the performance of cesareans sections, entails risks to the newborns' adaptation and their worst outcome may be evidenced by high rates of prematurity associated to respiratory disorders, such as tachypnea or hyaline membrane disease and low birth weight.⁴

Prenatal care is an essential component for women's healthcare and has as the main objective to reduce maternal and child's morbimortality. This reduction has a close relation to healthcare in which pregnant women receive during pregnancy and at the moment of the delivery.⁵ However, in spite of in Brazil, the prenatal healthcare coverage has become almost a universal practice, its adequacy is low in our country.⁶ Yet, it appears that health professionals have a certain hurry to promote the delivery, and in the process to accelerate the delivery disrespecting the pregnant women's autonomy, imposing their practices and the excess of interventions making labor healthcare in focusing only on medical decision.⁷

In this context, the vital statistics which cover births and deaths data are fundamental elements to understand the epidemiological profile and to plan and evaluate maternal and child health, especially in countries with large socioeconomic inequality, as in Brazil.⁸

In the 1990's, the Ministry of Health had implemented in Brazil, Live Births Information System (Sinasc). The Sinasc database was developed to collect and provide epidemiological information on

live births throughout nation territory. Through this system, it is possible to get information on births that occurred and the mothers, the characteristics of the delivery and pregnancy and the newborns' data, and the possibility of doing this is knowing the factors associated to maternal and child health.^{8,9}

The objective of this present study was to analyze the factors associated to maternal and child health from Sinasc in Rio Grande do Sul State, Brazil, 2012.

Métodos

This is a cross-sectional ecological study whose unit of analysis was constituted by live births in 2012, this was the last available information at the time when this study was developed, and children's mothers were living in Rio Grande do Sul State, according to the administrative division in the State. Rio Grande do Sul State is administratively divided into 19 Regional Health Coordinations (CRS) (Figure 1). The data were obtained from Sinasc database of the Ministry of Health.

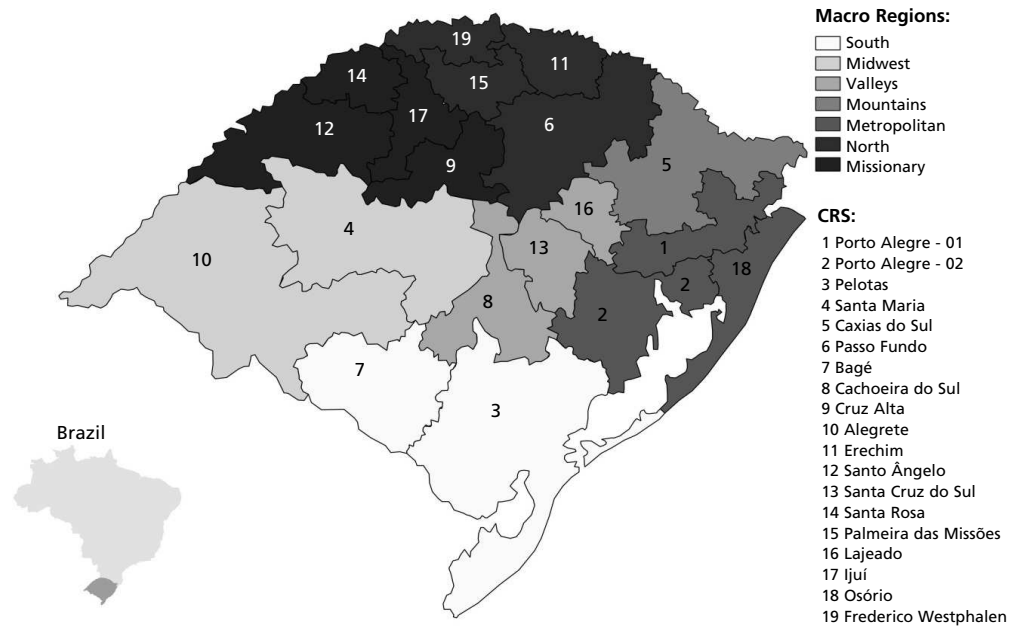
Among the Sinasc variables, eight that have epidemiological significance in relation to the mother and the newborn were selected, classified in sociodemographic, healthcare and results. The sociodemographic variables included the mother's age (<20, 20 to 34 and 35 to 49 years), the mother's schooling level in years (<4, 4 to 11 and ≥ 12), and the mother's marital status (with and without a partner). The healthcare variables were constituted on the number of prenatal consultations (<4, 4 to 6 and ≥ 7 consultations) and the type of childbirth (vaginal and cesarean section). The result variables considered the gestation length (<37 weeks and 37 to 42 weeks), birth weight (<2,500g, 2,500 to 3,999g and $\geq 4,000$ g), and the Apgar score at the 5th minute (≤ 7 and 8 to 10).

For each variable and its categories was performed to collect data from the Sinasc database, the database was built in the Excel Software 2010. The variables frequency of occurrence by the CRS was calculated and the Spearman correlation coefficient was used to evaluate the existence of association between the relative frequencies (*fr*) of the variables in this study. The *Statistical Package for Social Sciences Software* (SPSS) version 18.0 was used in the statistical analysis of the data. The level of significance was at $p \leq 0.05$. The category on information ignored was deleted from all the variables.

This study was conducted within the ethical principles contained in the *Declaration of Helsinki and in accordance to the Resolution Number 466 in 2012*

Figure 1

Regional Health Coordinations (CRS) and Macro Regions of the State. Rio Grande do Sul, Brazil, 2012.



Fonte: Santos DM, Mattei F 2015, adapted to Regional Coordinations, Health Secretary of State / RS.

of the Ministry of Health. As this is a study performing secondary data, accessible to the public and without identifying the individuals' names, there has been an exemption in submitting to the Ethics Research Committee at the University of Vale do Taquari - Univates.

Results

The total number of live births registered in the Sinasc in Rio Grande do Sul, in 2012, was 138,941, of which the percentage of information ignored ranged between 0.01% to the maternal age variable and 2.5% for the length of pregnancy variable.

As for the sociodemographic characteristics (Table 1), it was observed a predominance of mothers aged 20 to 34 years (69.2%), with 4 to 11 years of schooling (78%) and the same proportion of mothers with and without a partner (50%). The CRS in Alegrete, Bagé and Palmeira das Missões presented a greater proportion of one or more of the worst socio-demographic indicators, although there are other CRS with higher percentages of teenage mothers, low schooling levels and mothers without a

partner. The CRS in Lajeado was pointed out with the smallest number of teenage mothers (10.7%), low schooling levels (1.6%) and mothers without a partner (22.2%).

In relation to the healthcare variables, 71.7% of the mothers had seven or more prenatal visits in the State. The lowest coverage proportions on prenatal healthcare (<4 consultations) were found in the CRS in Pelotas (16%) and Alegrete (11.3%). The cesarean sections occurred in 62% of the total live births in 2012, with a higher percentage in the CRS in Palmeira das Missões (81.6%) and the lowest of the CRS in Porto Alegre-02 (50.7%) (Table 2).

As for the result variables, the majority of the pregnancies lasted from 37 to 42 weeks (87.6%). The high proportions of prematurity (gestational length <37 weeks) were observed in the State (12.4%), pointing out for the CRS in Santa Maria (15.3%) and Cachoeira do Sul (14%). Regarding the Apgar score at the 5th minute, most newborns showed good vitality (Apgar score 8-10), totaling 97.7% of live births. The low vitality of the newborn at the 5th minute (Apgar ≤7) concentrated higher values of the CRS in Pelotas (3.7%), Alegrete (3.0%)

Table 1

Percentage on the distribution of the mother's sociodemographic variables, according to the Regional Health Coordination, Rio Grande do Sul, Brazil, 2012.

	Mother's age (years)			Mother's schooling (years)			Mother's marital status	
	< 20	20-34	35-49	< 4	4-11	≥ 12	With partner	Without partner
(1) Porto Alegre-01	15.8	70.8	13.4	2.4	81.1	16.5	41.3	58.7
(2) Porto Alegre-02	16.5	68.3	15.2	2.9	76.7	20.3	42.7	57.3
(3) Pelotas	17.0	69.8	13.2	4.7	78.3	17.0	46.3	53.7
(4) Santa Maria	16.7	67.9	15.4	3.1	77.2	19.7	43.0	57.0
(5) Caxias do Sul	14.2	70.3	15.5	2.6	74.5	22.9	65.7	34.3
(6) Passo Fundo	16.9	68.5	14.7	3.2	76.1	20.8	68.6	31.4
(7) Bagé	20.4	65.5	14.1	2.3	85.0	12.7	32.9	67.1
(8) Cachoeira do Sul	17.2	69.4	13.4	4.9	80.7	14.4	38.1	61.9
(9) Cruz Alta	17.4	71.1	11.5	3.8	75.1	21.0	46.5	53.5
(10) Alegrete	20.8	66.3	12.9	3.1	83.8	13.1	48.8	51.2
(11) Erechim	16.5	68.7	14.8	2.7	77.8	19.5	71.4	28.6
(12) Santo Ângelo	18.2	65.3	16.5	3.0	78.1	19.0	57.3	42.7
(13) Santa Cruz do Sul	14.1	71.7	14.2	3.1	78.8	18.0	47.3	52.7
(14) Santa Rosa	13.5	69.4	17.1	1.9	75.3	22.8	50.4	49.6
(15) Palmeira das Missões	18.9	68.2	12.8	5.4	77.5	17.1	60.9	39.1
(16) Lajeado	10.7	72.6	16.7	1.6	77.3	21.1	77.8	22.2
(17) Ijuí	15.0	71.9	13.2	3.1	75.7	21.3	61.0	39.0
(18) Osório	16.8	70.4	12.8	2.8	80.6	16.6	55.8	44.2
(19) Frederico Westphalen	16.7	69.8	13.6	1.9	76.5	21.7	58.6	41.4
Total	16.3	69.2	14.5	3.0	78.0	19.0	50.0	50.0

and Santa Rosa (3.0%) (Table 3).

Most of the live births (85.6%) weighed between 2,500g and 3,999g, although 9.4% presented low birth weight (<2,500g) in the State, pointing out the highest percentages of the CRS in Passo Fundo (11.3%), Caxias do Sul (10.7%) and Palmeira das Missões (10.7%). The live births with equal weight or greater than 4,000g predominated the CRS in Osório (6.4%) and Alegrete (6.1%) (Table 3).

Conducting the Spearman correlation test, there were statistically significant associations between the relative frequencies of some variables of this study. Observe in Figure 2, a direct association between the frequency of low birth weight and the frequency of prematurity, is statistically significant ($\rho = 0.505$; $p = 0.027$). There was also a direct statistically significant relation between the frequency of mothers with low schooling levels and the frequency of prematurity ($\rho = 0.521$; $p = 0.022$).

It was detected that the increase in the low coverage frequency of prenatal healthcare significantly increases the newborn's low vitality frequency at the 5th minute ($\rho = 0.467$; $p = 0.044$). In addition, a direct relation statistically significant

was verified between the frequency of seven or more prenatal consultations and the frequency of mothers with a partner ($\rho = 0.607$; $p = 0.006$) (Figure 2).

It was observed that the higher the frequency of mothers with a partner, who had 12 years or more of schooling and that had seven or more prenatal consultations, the lower the frequency of vaginal delivery, increasing the frequency of cesarean sections. The associations were statistically significant (Figure 2).

It was noted the existence of a positive relation statistically significant difference between the frequency of low schooling level and the frequency of low birth weight ($\rho = 0.542$; $p = 0.016$), on the other hand, the increased frequency of mothers with 12 years or more of schooling, increases the frequency of newborns with appropriate birth weight ($\rho = 0.460$; $p = 0.048$). A negative correlation statistically significant was observed in the associations between the frequency of low coverage of prenatal healthcare and the frequency of the newborn's weight between 2,500g and 3,999g ($\rho = -0.500$; $p = 0.029$). Therefore, the increase in the frequency of low coverage of prenatal healthcare decreases the

Tabela 2

Percentage on the distribution of maternal healthcare, according to the Regional Health Coordination, Rio Grande do Sul, Brazil, 2012.

	Number of prenatal consultations			Type of childbirth delivery	
	< 4	4-6	≥ 7	Vaginal	Cesarean
(1) Porto Alegre-01	7.9	22.0	70.1	40.1	59.9
(2) Porto Alegre-02	10.3	21.7	68.0	49.3	50.7
(3) Pelotas	16.0	20.9	63.1	38.2	61.8
(4) Santa Maria	8.6	21.3	70.1	36.1	63.9
(5) Caxias do Sul	4.5	11.9	83.6	28.4	71.6
(6) Passo Fundo	5.6	18.3	76.1	32.7	67.3
(7) Bagé	8.5	24.1	67.4	35.2	64.8
(8) Cachoeira do Sul	6.3	19.9	73.8	34.4	65.6
(9) Cruz Alta	6.3	20.5	73.2	24.1	75.9
(10) Alegrete	11.3	27.0	61.7	34.7	65.3
(11) Erechim	5.4	20.5	74.0	34.5	65.5
(12) Santo Ângelo	6.7	23.5	69.8	34.0	66.0
(13) Santa Cruz do Sul	4.1	16.8	79.1	35.2	64.8
(14) Santa Rosa	4.0	15.0	81.0	20.1	79.9
(15) Palmeira das Missões	4.1	19.3	76.7	18.4	81.6
(16) Lajeado	3.4	14.3	82.3	20.9	79.1
(17) Ijuí	3.5	19.5	76.9	24.9	75.1
(18) Osório	8.3	22.4	69.3	41.8	58.2
(19) Frederico Westphalen	2.1	15.3	82.6	28.4	71.6
Total	8.2	20.1	71.7	38.0	62.0

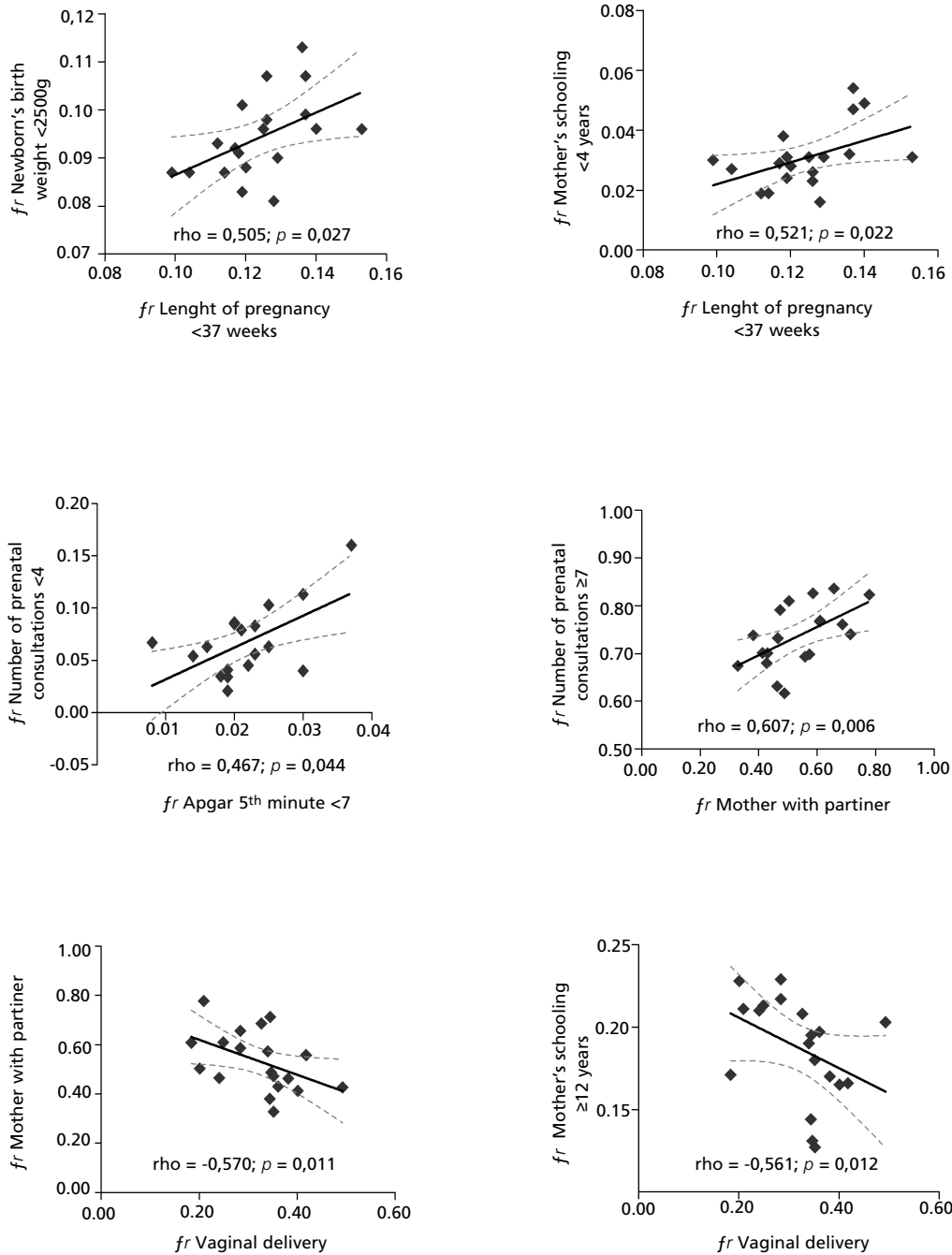
Tabela 3

Percentage on the distribution of the newborns result variables, according to the Regional Health Coordinations, Rio Grande do Sul, Brazil, 2012.

	Length of pregnancy (weeks)		Apgar 5 th minute		Newborn's weight (grams)		
	< 37	37-42	≤ 7	8-10	< 2,500	2,500-3,999	≥ 4,000
(1) Porto Alegre-01	11.9	88.1	2.1	97.9	8.3	86.3	5.4
(2) Porto Alegre-02	11.7	88.3	2.5	97.5	9.2	85.4	5.4
(3) Pelotas	13.7	86.3	3.7	96.3	9.9	84.6	5.5
(4) Santa Maria	15.3	84.7	2.0	98.0	9.6	85.8	4.6
(5) Caxias do Sul	12.6	87.4	2.2	97.8	10.7	85.7	3.6
(6) Passo Fundo	13.6	86.4	2.3	97.7	11.3	85.4	3.3
(7) Bagé	12.6	87.4	2.0	98.0	9.8	84.3	5.9
(8) Cachoeira do Sul	14.0	86.0	1.6	98.4	9.6	85.6	4.8
(9) Cruz Alta	11.8	88.2	2.5	97.5	9.1	87.6	3.3
(10) Alegrete	12.9	87.1	3.0	97.0	9.0	84.9	6.1
(11) Erechim	10.4	89.6	1.4	98.6	8.7	87.0	4.3
(12) Santo Ângelo	9.9	90.1	0.8	99.2	8.7	86.9	4.3
(13) Santa Cruz do Sul	12.5	87.5	1.9	98.1	9.6	84.5	5.8
(14) Santa Rosa	11.2	88.8	3.0	97.0	9.3	85.5	5.2
(15) Palmeira das Missões	13.7	86.3	1.9	98.1	10.7	87.2	2.1
(16) Lajeado	12.8	87.2	1.9	98.1	8.1	86.4	5.5
(17) Ijuí	11.9	88.1	1.8	98.2	10.1	86.4	3.5
(18) Osório	12.0	88.0	2.3	97.7	8.8	84.8	6.4
(19) Frederico Westphalen	11.4	88.6	1.9	98.1	8.7	87.5	3.7
Total	12.4	87.6	2.3	97.7	9.4	85.6	5.0

Figure 2

Dispersion diagram for the variables that resulted in significant associations, according to the coefficient correlation of Spearman. Rio Grande do Sul, Brazil, 2012.

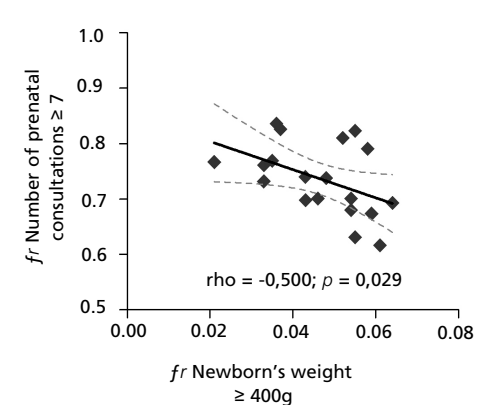
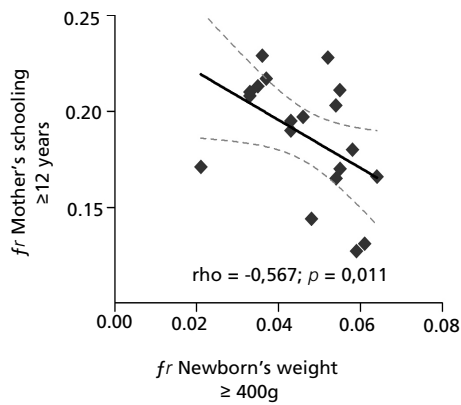
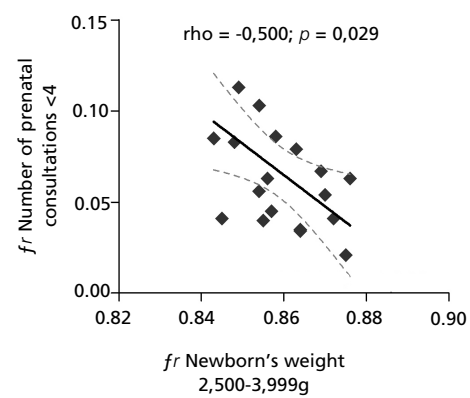
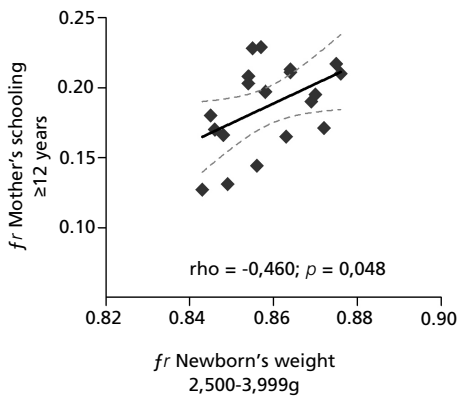
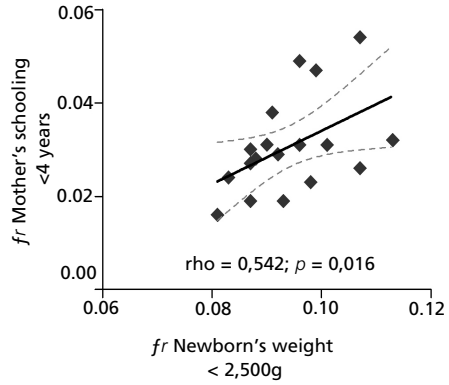
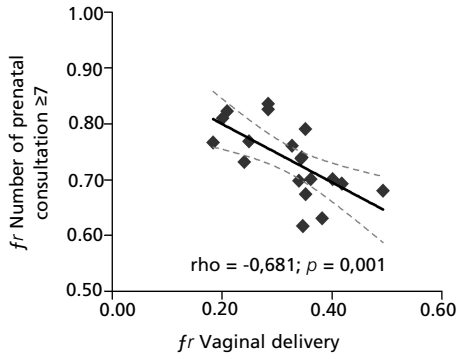


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Figure 2

concluded

Dispersion diagram for the variables that resulted in significant associations, according to the coefficient correlation of Spearman. Rio Grande do Sul, Brazil, 2012.



frequency of newborns with appropriate birth weight (Figure 2).

The frequency of mothers with 12 years or more of schooling showed an inverse relation statistically significant with the frequency of newborns weighing 4,000g or more at birth ($\rho = -0.567$; $p = 0.011$). There was also an inverse relation statistically significant difference between the frequency of seven or more prenatal consultations with the weight of 4,000g or more at birth ($\rho = -0.500$; $p = 0.029$). So, the higher the frequency of mothers with at least 12 years of schooling, as well as, mothers who had seven or more prenatal consultations, the lower the frequency of newborns with 4,000g or more at birth (Figure 2).

Discussion

The results of this study showed the association of sociodemographic factors, health care and as a result, in determining the health of mothers and their children, as well as the heterogeneity among the regions in Rio Grande do Sul. The 19 CRS in the State, eight (Pelotas, Bagé, Cachoeira do Sul, Cruz Alta, Alegrete, Santa Rosa, Passo Fundo and Palmeira das Missões) had higher proportions of more than one factor considered at risk for maternal and child health, when compared to the other CRS. These findings can serve as a warning to the local managers and as subsidies for health planning.

In relation to the sociodemographic variables, most mothers who studied were aged between 20 and 34 years, followed by teenage mothers. This finding is in line with the national statistics¹⁰ and with other Brazilian studies, in which the percentages ranged from 62.2%¹¹ to 69.3%¹² of mothers aged 20 and 34 years and 17.5%¹³ to 20.5%¹² teenage mothers. In this study, the proportion of mothers aged 35 to 49 years was higher when compared to the national average¹⁰ and those found in other consulted studies, ranged from 4.4%¹¹ to 10.2%.¹²

The results on marital status showed that the percentage of mothers with a partner was equal to the percentage of mothers without a partner in Rio Grande do Sul. When analyzed by the CRS, only four proportions presented mothers with a partner, this was similar to or higher than the national average of more than 64%.¹⁰ On maternal schooling, the observation of the percentage of years studied reveal a better situation in relation to other regions in the country, in which the proportions of women at reproductive age with low schooling levels ranged from 6% in the Southeast and 12.9% in the

Northeast.¹⁰

One possible explanation for the high concentration of teenage mothers in the CRS in Alegrete and mothers without a partner of the CRS in Bagé can be a result of the characteristics in these regions, which presents predominance of medium level of socioeconomic development in these municipalities (0.600-0.699).¹⁴ On the other hand, the lowest percentages of teenage mothers, low schooling and mothers without a partner were found at the CRS in Lajeado, which is located in the macro region valleys, a well economical developed region.¹⁵

The prenatal is configured as an essential component of the women's healthcare during pregnancy.⁶ Regarding the number of prenatal consultations, seven or more consultations were presented in this study, this was superior to the proportions found by other researchers in studies in the States of São Paulo¹² and Paraná,¹⁶ with 60% and 63.6% of the mothers who had seven or more consultations, respectively. However, despite the number of prenatal consultations offering subsidies to analysis the coverage of this service, it does not necessarily reflect on the quality of healthcare provided at the consultations, thus, the quality and the professionals who attended the patients are unknown, and this fact has already been mentioned by other researchers.^{12,16}

In addition, although most mothers have performed at least seven prenatal consultations, the results of a low coverage of service were high for both the State and for some CRS, in particular, in Pelotas and Alegrete, comparing them with the proportions found in a national study with 23,940 puerperal, which identified 7.4% of the mothers who were attended less than four prenatal consultations in the South region and 9.2% in the country.⁶

The low coverage for prenatal care was concentrated in regions (the CRS in Pelotas and the CRS in Alegrete) which understood that the municipalities had a medium level of socioeconomic development at the Health Unit (0.700 - 0.799). The Health Unit uses indicators of maternal and child's health, general conditions of health and longevity to measure the degree of development in the municipalities in Rio Grande do Sul, one of the three blocks was the Socioeconomic Development Index (IDESE). On the other hand, regions with a high degree of socioeconomic development at the Health Unit (0.800 - 1.000) showed the highest percentage of mothers who had seven or more prenatal consultations, among them were the CRS in Caxias do Sul, Frederico Westphalen and Lajeado.¹⁴

In relation to the type of childbirth delivery,

Brazil is known worldwide for its high rate of cesarean sections, which was confirmed in this study that showed rates of cesarean section exceeding vaginal deliveries in the 19 CRS. The results found are alarming when compared to the ones observed as in a national level, 43.89%¹⁰ and 53.7%,¹⁷ as in other Brazilian studies^{11-13,16} which ranged from 31.1%¹² to 56.3%.¹³

However, the proportion of cesarean sections found in this study, corroborates with the proportions identified in 2012 and 2013 in the South Region and were circulated recently by the Ministry of Health, 62% and 62.7%, respectively.¹⁸ Yet, other studies with data from Sinasc in the South Region, also found high percentages of cesarean sections, 60.1% in the South Region in 2011¹⁷ and 60.3% in Santa Catarina State, in 2012.¹⁹

The authors presume that living in rich regions in the country, as the South Region, it favors the use of private health services, which have high rates of cesarean sections, between 80% and 90%.¹⁷ This observation seems to be in favor with the findings of this study, in which the identified region with the highest proportion of cesarean sections was the CRS in Palmeira das Missões, in the North Region, which stood out as the third highest Socioeconomic Development Rate in the State (0.795).²⁰ The results suggest that a cesarean section may be associated to a better socioeconomic condition of the population. However, it should be pointed out that the increased number of cesarean sections among users of the Public Health System (SUS) also contributed to the increase of these rates in the country.¹⁷

The proportion of cesarean section in Rio Grande do Sul State and in other regions in the country is a concern and presents more than the above level of 15% that is recommended by the World Health Organization (WHO).²¹ The high cesarean section rates in the country represent a great challenge for the Brazilian health policy. The performance of indiscriminate cesarean sections generate an additional cost to the health system and involves unnecessary risks for the mother and the child's health, among them, the increased risk of maternal death in 3.5 times more.²²

In relation to the result variables, it was found that in the 19 CRS, most pregnancies had a length of 37 to 42 weeks, however, the proportions of prematurity presented were larger than the estimated 9.2% of prematurity in Brazil, described in a report by the World Health Organization in 2010.²³ Yet, the results for prematurity were high when compared to other studies of the data from Sinasc in Paraná State, which presented 8.1%,²⁴ in Paraíba Valley in São

Paulo with 6.4%¹³ and in the South Region, in Santa Catarina State with 10.6% of prematurity in 2012.¹⁹ The highest concentration of prematurity was observed in the CRS in Santa Maria, a medium level region in of the socioeconomic development,¹⁴ this finding seems to be in favor with the description in the study of the data from Sinasc in Santa Catarina, which found a higher prevalence of prematurity among women with a less privileged socioeconomic level.¹⁹

The Apgar score showed that most newborns had good vitality at the 5th minute, corroborating with the research developed in six maternity hospitals in São Paulo State, which identified the same proportions described in this study for good vitality (97.7%) and for low vitality (2.3%) in the 5th minute.¹² It was observed that the concentration of percentages of newborns with low vitality in regions inferior of the socioeconomic indicators, a medium level of development in the Health Unit in most municipalities, as the CRS in Pelotas and Alegrete.¹⁴

The birth weight represents an important factor in determining the immediate and future pattern of the child's health.²⁵ In this study, most of the newborns presented adequate weight, followed by newborns with low birth weight and in a smaller proportion of newborns with 4,000g or more. These results showed to be consistent with the values found in a study in Campinas, São Paulo, based on the data from Sinasc, in which 90.4% of the live births weighed more than 2,500g and 9.6% presented low weight.²⁶

It is known that low birth weight is related to morbidity and mortality and its frequency is related to the factors of maternal health and the family's social conditions.²⁵ It is noteworthy that four CRS (Passo Fundo, Caxias do Sul, Palmeiras das Missões and Ijuí) presented proportions of newborns with low birth weight exceeding the value below 10% accepted internationally,²⁷ indicating the presence of problems in maternal and child healthcare in these regions. The four regions presented a high Socioeconomic Development Index.²⁰ A study using the data from Sinasc in Paraná State did not observe a direct correlation between the proportion of newborns with low birth weight in areas with adverse social conditions, however, this association may not be considered to occur in studies with other research methods.²⁴

The significant associations found in this study corroborate with other consulted studies.^{7,10,11,13,28-30} It was observed that the low maternal schooling is associated to negative outcomes for the maternal and child health, such as inadequate prenatal care with a

low number of consultations and a high risk for low birth weight and prematurity.²⁸

The low coverage of prenatal care has been identified as a risk factor for the health of mothers and children¹² and has been associated to low birth weight and prematurity,²⁹ in this study, there was also a significant association to a low Apgar score at the 5th minute. The great number of prenatal consultations is significantly associated to the mothers' socioeconomic and demographic characteristics.¹⁰

The association between mothers with a partner, 12 years or more of schooling and having seven or more prenatal consultations with the increase of the frequency of cesarean sections shows a pattern that is known in Brazil.^{7,11,13} A national study with primiparous adolescents found that the greatest number of prenatal consultations exposed the teenagers in having a cesarean section, suggesting that the result is related to the fact that women who have more consultations with medical professionals, have more opportunity to be convinced of the best childbirth delivery, according to the professional's point of view.³⁰

Analyzing the factors associated to maternal and child health is necessary, since they reflect the mothers and their children's quality of health, as well as the healthcare quality provided for women's

health in their reproductive period and the child's health. In addition, maternal mortality and perinatal remain high in our country, suggesting problems in the quality of the maternal and child healthcare, such as those identified in this study and those who are passive in preventing.

This study performed the knowledge of a great depth of various aspects, as for example, the prevalence of cesarean section in all the CRS and the identification of regions with a priority for interventions of high proportions of factors considered to be at risk for maternal and child health. The health team plays a fundamental role in healthcare for women and children, therefore, it is necessary to know the factors associated to maternal and child health to adapt their practices as the epidemiological reality site, aiming at a comprehensive and the quality for women and children's health since the preconception.

As for the limitations in this study, one can mention the use of the aggregated data, preventing the control of confounding factors. However, even with this limitation, the analysis of the maternal and child's health in Rio Grande do Sul presented important characteristics to be pointed out and fundamental action plan for the maternal and child healthcare.

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