







Perinatal outcomes of pregnant women with teenage pregnancy and late pregnancy in Montes Claros

Resultados perinatais de gestantes com gravidez na adolescente e gravidez tardia em Montes Claros

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ABSTRACT

Introduction: An increase in the number of high-risk pregnancies has been observed. Many of the factors related to this phenomenon may be linked to teenage pregnancies and late motherhood. **Objective:** To scale the occurrence of births at extremes of age and their unfavorable outcomes **Methods:** Descriptive study that uses a qualitative approach based on birth certificates from 2007 to 2017. **Results:** The analyzed data showed differences between the groups, with a higher frequency of being single in the group of adolescents, along with low frequency of prenatal care and low schooling. Among pregnant women with late maternity, twins and cesarean births were more common when compared to the first group. Factors related to the occurrence of surgical delivery were: age ≥ 35 years, being married, a better educational level, having adequate prenatal care and low birth weight. **Conclusion:** The hypothesis of the presence of gestational risk among pregnant women at extreme ages was confirmed. Regarding the occurrence of prematurity, low birth weight and APGAR index below 7, there was no statistically significant difference between the groups studied.

Keywords: Gravidez na adolescência; Gravidez; Gestantes; Assistência perinatal; Enfermagem neonatal.

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RESUMO

Introdução: Tem sido observado aumento do número de gestações de alto risco. Muitos dos fatores relacionados a esse fenômeno podem estar ligados a gestações em adolescentes e à maternidade tardia.

Objetivo: Dimensionar a ocorrência de partos em extremos de idade e os seus desfechos desfavoráveis **Métodos:** Estudo de caráter descritivo que utiliza uma abordagem qualitativa partindo das Declarações de Nascidos Vivos durante a década de 2007 a 2017. **Resultados:** Os dados analisados apontaram diferenças entre os grupos mostrando no grupo de adolescentes maior frequência de ser solteira, ter baixa frequência ao pré-natal e baixa escolaridade. Entre as parturientes com maternidade tardia foi mais frequente a gemelaridade e o parto cesariana quando comparadas ao primeiro grupo. Os fatores relacionados à ocorrência de parto cirúrgico foram idade ≥ 35 anos, ser casada, melhor escolaridade, ter pré-natal adequado e baixo peso do recém-nascido. **Conclusão:** Foi confirmada a hipótese da presença de risco gestacional entre parturientes em idades extremas. Quanto à ocorrência de prematuridade, baixo peso ao nascer e índice APGAR abaixo de 7, não houve diferença estatisticamente significativa entre os grupos estudados.

Palavras-chave: Pregnancy in adolescence; Pregnancy; Pregnant women; Perinatal care; Neonatal nursing.

INTRODUCTION

Over the last few decades, an increase in the number of high-risk pregnancies has been observed, constituting a serious public health problem. These pregnancies occur in around 10% of cases and are responsible for high maternal and neonatal morbidity and mortality rates^{1,2}.

Several factors are related to high-risk pregnancies, among which we find that the pregnant woman's age has been identified as an important marker for the good progress of the pregnancy. Pregnancy at extremes of age, in adolescence (≤ 19 years) and in women with late motherhood (≥ 35 years) is identified as a risk factor for numerous gestational complications such as: pre-eclampsia, premature labor, premature rupture of membranes, amniotic disorders, low birth weight, anemia, intrauterine growth restriction, fetal and neonatal death, higher cesarean section rates, and increased risk of newborns with genetic syndromes³⁻¹⁵.

An increase in the frequency of pregnancy has been observed among women with late maternity. Alongside the postponement of the first pregnancy due to academic and/or professional growth, the improvement in care has allowed later pregnancy, even in the presence of chronic diseases. On the other hand, the proportion of teenage pregnancies has decreased when comparing the demographic censuses of 2000 and 2010. However, even when comparing these data, there has been an increase in the number of pregnancies in adolescents aged between 10 and 14 years^{12,16-21}.

Without disregarding the fact that teenage pregnancy may be related to an option due to limited prospects, the existence of negative implications is considerable. In addition to higher infant mortality rates, teenage pregnancy is also related to school dropout, greater predisposition to sexually transmitted diseases, drug use, as well as repeat pregnancy even in this age group, associated with limited job opportunities^{13-15,22-25}.

Without diminishing the relevance of complications associated with the outcome of a pregnancy at an early age, most authors agree that these results can be minimized in the face of favorable social conditions related to the level of education, marital status, family support and, particularly, in the face of an efficient prenatal²⁶⁻²⁹.

According to the most recent Brazilian data made available by DATASUS³⁰ and which cover part of the period included in the present study, between 1994 and 2000, there were increases in the rates of births in adolescence. From then onwards, these values tend to stabilize or even decline beginning in 2015. In 1994, the rate of births among women aged 10 to 19 years was 19.76%; in 2000 it went to 23.40%, while in 2015 it was 18.14% of all births.

On the other hand, the increase in pregnancies among women over 35 years of age is noteworthy. In Brazil³⁰, in 1994, 2000 and 2015, the birth rates among women aged over 35 years were 7.6%, 8.58% and 12.86% respectively.

This event involves improved health conditions with control of chronic diseases, assisted reproduction

techniques and numerous decisions related to life and career. Furthermore, the increase in women's life expectancy, as well as knowledge about aging and food, including their function at the cell level; and practices that improve quality of life have given to women over the age of 35 full physical vigor, and the mental and professional skills to be a mother in this age group, even while taking into account the drop in fertility that naturally occurs at this time.

The increased gestational risk in women aged over 35 years may involve clinical, biological and social factors. It is suspected that women of advanced age would have premature placental aging, worse genetic quality of embryos, and abnormalities in the structure of the placenta, which would contribute to a series of perigestational diseases^{16,17,31,32}. In addition, the higher frequency of surgical deliveries in this age group would be due to possible abnormalities in labor.

If the risks of unfavorable perinatal outcomes such as prematurity and low birth weight, among adolescents and women with late motherhood are similar in magnitude, one cannot fail to point out differences. In adolescence, the low frequency of prenatal care that could increase the gestational risk is a significant factor, as well as the increased frequency of twins, cesarean sections and the concurrence of chronic diseases. In late maternity, the risk is associated with increased maternal and perinatal morbidity^{3,4,7,12,18,31}.

The objective of the present study is to identify the maternal, maternal-fetal and newborn characteristics of adolescent mothers and women aged 35 years or older from 2007 to 2017 in Montes Claros, in the state of Minas Gerais, Brazil, to determine the frequency of adolescent deliveries and that of women over 34 years old, by comparing maternal, maternal-fetal and newborn characteristics among parturients at extremes of age, within the period established, and to determine the factors involved in the occurrence of prematurity, low birth weight of the newborn and cesareans, according to the maternal age group.

METHODS

This article used data obtained from a population of births that occurred between 2007 and 2017, through the declarations of live births from the Montes Claros Municipal Health Department. Hence, approval by the Ethics and Research Committee was not required.

This is a retrospective, descriptive and correlational observational study with secondary data guided by the STROBE tool.

The research was carried out in the town of Montes Claros in the North of the state of Minas Gerais, with an estimated population for 2016 of 398,288 inhabitants. It is the 6th largest city in terms of population in the Minas Gerais, with a municipal Human Development Index (HDI) of 0.770, ranking 7th in relation to the state's GDP.

Data collected were requested from the Montes Claros Municipal Health Department database, taken from the declarations of live births, through letters sent to the referred Department.

From the analysis of the documents, the parturients were characterized according to age and considered as follows: G1- adolescence (10 to 19 years old) and G2- late maternity (aged 35 years or older). The marital status was classified as: 1) single (single, widowed and separated) and 2) married (married and consensual union). Regarding education, the classification is: 1) illiterate or basic-elementary education and 2) secondary education or higher education.

In this study, prenatal care was considered 1) Adequate and 2) Inadequate. Those with at least 6 consultations were considered adequate and those with less than 6 prenatal consultations were considered inadequate. The mode of delivery was classified as: 1) vaginal and 2) cesarean section; while the type of pregnancy was considered: 1) single pregnancy and 2) twin pregnancy.

Newborns were classified according to gestational age as: 1) premature, with a gestational age of less than 37 weeks; and 2) full-term, those with 37 to 41 completed weeks. Newborns were considered: 1) Low Weight, those born up to 2499 grams; and 2) Normal Weight, with a weight greater than or equal to 2500 to 3749 grams. The 5th minute Apgar score was seen as, 1) satisfactory, with values over 7; and 2) unsatisfactory, with values below 7.

In addition, the outcome variables were the type of delivery, gestational age, and the weight of newborns. The mother's age group was considered an exposure variable, while other variables were considered control variables.

The information of the age groups was summed up, by way of the intended comparison, to compose the set of the decade. The proportions, and absolute (n) and relative (%) frequencies of births in adolescence, in adulthood and in mothers with late pregnancy were calculated throughout the entire period.

In the descriptive analysis, frequencies and X² were calculated, with the respective p value, to assess the magnitude of associations between groups and maternal, maternal- fetal and fetal characteristics.

Bivariate analyses and multivariate analyses were conducted using binary logistic regression. The magnitude of associations between outcome variables and independent variables was evaluated using odds ratios (OR) with their respective 95% confidence intervals.

All analyses were performed with the PASW Statistic software; SPSS®, V.20.

RESULTS

According to Table 1, the frequency of births in adolescents shows a decrease in rates over the period, from 18.5% in 2007 to 11.9% in 2017; the opposite occurring in pregnant women with late maternity: in 2007 it was 9.9% and in 2017 it reached 16.9%.

According to Table 2, the proportion of single teenage mothers was 75.7%, the opposite occurring among mothers aged 35 years or older, where the majority were married (71.7%). The difference between groups was significant, with ($p < 0.000$).

Regarding final education, as expected, rates above the average level were higher in the group of older parturients, with values of 78.6%, and 70.5% in the group of adolescents. Lower education was more frequent in the group of teenage mothers, being 29.2%; while it was 21.2% in the other group, demonstrating statistically significant differences.

In the case of prenatal care, which is fundamental in the evaluation of pregnancy outcomes, the data revealed that in adolescence, the frequency of inadequate prenatal care was more frequent, and in the studied population, the adequacy rates were higher than those of prenatal care. inadequacy. The frequency of vaginal delivery in the group of adolescents was 74.1%, while in the group over 34 years old it was 40.9%.

As for the type of pregnancy, it is noted that twin pregnancies are more frequent in the group of patients over 35 years old.

As previously announced, data related to NBs showed low weight, prematurity and low Apgar scores at the 5th minute, although in small proportions, without statistical significance between the groups, which reinforces the similarity and the gestational risk in these groups.

Of the variables considered as the outcome, the newborn's weight, gestational age and type of delivery were selected for the multiple model, although only the latter was statistically different between the groups.

The results of the multivariate analysis (Table 3) indicated that the occurrence of prematurity among parturients was 1.5 times more frequent when prenatal care was inadequate; in the low weight variable, on the other hand, this concomitance was to be expected in view of prematurity.

The following variables entered the initial model: maternal age, marital status, education and type of delivery. These variables were removed because they had a *p*-value greater than 0.05, leaving only those described above in the final model.

In relation to Table 4, attention is drawn to the 40% increase in the chances of a newborn having low weight, when the mother had inadequate prenatal care; in 36% when the delivery was a cesarean section. In 71% this was at times associated with a low Apgar, at 5'.

In relation to Table 5, these results indicate that the chance of cesarean section among older women is 1.99 times higher than what is observed among women at a younger age, with the other variables of the model kept constant. It was found that the newborn's weight (OR=1.23 times, *p*<0.000) showed a statistically significant association with the prevalence of cesarean sections.

It is very interesting to observe that, when prenatal care was adequate, as well as education and having a partner, the chance of having a cesarean section increased.

Table 1. Distribution of parturients according to stage of life over the decade - 2007 to 2017.

Age	2007 n %	2008 n %	2009 n %	2010 n %	2011 n %	2012 n %	2013 n %	2014 n %	2015 n %	2016 n %	2017 n %	TOTAL
Adolescents	1064 18.5%	855 16.9%	979 16.5%	798 13.9%	809 14.4%	795 13.7%	843 14.6%	857 13.8%	870 13.8%	758 12.9%	743 11.9%	9371 14.6%
Adults	4110 71.6%	3664 72.4%	4298 72.7%	4302 75.1%	4107 73.3%	4250 73.5%	4158 72.3%	4510 72.4%	4488 71.5%	4216 71.9%	4441 71.2%	4654 72.5%
Late Maternity	570 09.9%	544 10.7%	636 10.8%	627 11.0%	684 12.3%	737 12.8%	752 13.1%	860 13.8%	921 14.7%	889 15.2%	1053 16.9%	8273 12.9%
Grand total	5744 100%	5063 100%	5913 100%	5727 100%	5600 100%	5782 100%	5753 100%	6227 100%	6279 100%	5863 100%	6237 100%	64188 100%

Table 2. Maternal characteristics, among adolescents and parturients aged 35 years or older according to maternal, maternal-fetal and newborn variables. Montes Claros, 2007.

Variables	Adolescents (%)	Late Maternity (%)	<i>p</i> -value *
Maternal Characteristics			
Marital status			
No partner	7044 (76%)	2278 (28%)	
With partner	2226 (24%)	5872 (72%)	
Total	9270 (100%)	8150 (100%)	0
Education			
Low	2710 (29,3%)	1744 (21,3%)	
Proper	6548 (70,7%)	6454 (78,7%)	
Total	9258 (100%)	8198 (100%)	0

Variables	Adolescents (%)	Late Maternity (%)	<i>p</i> -value *
Maternal Fetal Characteristics			
Prenatal appointments			
Inappropriate	1292 (25,3%)	774 (14,3%)	
Adequate	3810 (74,7%)	4627 (85,7%)	
Total	5102 (100%)	5401 (100%)	0
Childbirth			
Vaginal	6922 (74,1%)	3369 (40,9%)	
Cesarean section	2424 (25,9%)	4878 (59,1%)	
Total	9346 (100%)	8247 (100%)	0
Type of pregnancy			
Single pregnancy	9251 (98,9%)	7977 (96,7%)	
Twinning	104 (1,1%)	275 (3,3%)	
Total	9355 (100%)	8252 (100%)	0
Features of the newborn			
APGAR at 5 minutes			
Normal	9215 (98,7%)	8124 (98,6%)	
Low	123 (1,3%)	118 (1,4%)	
Total	9338 (100%)	8242 (100%)	0,515
Newborn weight			
Normal	1042 (11,1%)	939 (11,4%)	
Low	8329 (88,9%)	7334 (88,6%)	
Total	9371 (100%)	8273 (100%)	0,628
Gestational age			
Premature	628 (12,3%)	678 (12,4%)	
Pregnancy to term	4494 (87,7%)	4769 (87,6%)	
Total	5122 (100%)	5447 (100%)	0,771

Legend: *Chi-square test.

Table 3. Multiple Logistic Regression (POISSON), with Gestational Age as the dependent variable, according to odds ratio, confidence interval and *p*-value.

Variables	Gestational Age: 0 = Full term; 1 = Premature		
	OR	Confidence interval	<i>p</i> -value
Newborn weight			
Normal	1		
Low	8.27	7.51 – 9.09	0.000
Prenatal			
Adequate	1		
Inappropriate	1.5	1.43 – 1.73	0.000

Table 4. Multiple logistic regression (POISSON) with Newborn Weight as the dependent variable, according to odds ratio, confidence interval and *p*-value.

Variables	Newborn weight: 0 = Normal weight; 1 = Low weight		
	OR	Confidence interval	<i>p</i> -value
Prenatal			
Adequate	1		
Inappropriate	1,4	1,27 – 1,56	0,000

Variables	Newborn weight: 0 = Normal weight; 1 = Low weight		
	OR	Confidence interval	p-value
Childbirth			
Vaginal	1		
Cesarean section	1,36	1,24 – 1,51	0,000
APGAR 5'			
Normal	1		
Low	1,71	1,46 – 2,01	0,000
Gestacional age			
Pregnancy to term	1		
Premature	9,6	8,59 – 10,73	0,000

Table 5. Multiple logistic regression (POISSON) with type of delivery as the dependent variable, according to OR, CI and p-value.

Variables	Childbirth: 0 = Vaginal; 1 = Cesarean section.		
	OR	Confidence interval	p-value
Prenatal			
Adequate	1		
Inappropriate	0,88	0,83 – 0,94	0,000
Maternal Age			
Adolescent	1		
Late maternity	1,99	1,88 – 2,11	0,000
Educatiot			
Proper	1		
Low	0,74	0,69 – 0,79	0,000
Marital status			
With Partner	1		
No Partner	0,86	0,81 – 0,90	0,000
APGAR 5'			
Normal	1		
Low	0,79	0,63 – 0,98	0,036
Newborn weight			
Normal	1		
Low	1,23	1,17 – 1,3	0,000

DISCUSSION

Pregnancy at the extremes of age is surrounded by recommendations or even bans, due to potential gestational risks. Maternal mortality, which is considered the worst obstetric outcome, is twice as frequent after 35 years and five times more frequent after 40 years. Among adolescents aged 10 to 16 years, the risk of death is four times higher when compared to pregnant women aged 20 to 34 years³³.

The unfavorable situations associated with teenage pregnancy draw attention due to their complexity and severity: early sexual initiation, greater predisposition to sexually transmitted diseases, a short breastfeeding period, higher infant mortality rates, low education with consequent lower professional qualification and multiparity, all of which may further complicate this woman's future.

On the other hand, late motherhood entails two different situations: nulliparous women who are often healthy and

postponed pregnancy due to other plans, and multiparous women who started their reproductive life earlier, but may present pathologies such as diabetes mellitus, chronic arterial hypertension, heart disease, among others, contributing to potentialize the risk already inherent to age itself. Placental insufficiency, prematurity, twinning, fetal death and a significant increase in cesarean section rates are then more frequent.

As shown in the present study, there are several similarities, and important differences, between pregnant women at extremes of age, considering adolescents and women with late maternity².

Over the decade under analysis, there was a reduction in the rates of adolescent mothers and an increase in women becoming mothers over 35 years of age. These results point to different events: greater access to health services, information related to pregnancy and contraception methods and a higher frequency of postponing pregnancy due to professional improvement, in addition to more

effective control of chronic diseases and improvement of assisted reproduction techniques.

In our study, the birth rate in adolescents was 14.6% while in mothers with late pregnancy it was 12.9% of the total births that occurred in the decade. In adolescents, these rates have shown a decline; in 2013 it was 14.6% and in 2017 it decreased to 11.9%; in late maternity there was an increase: in 2013, it was 13.1% and in 2017 it was 16.9%; confirming our initial hypothesis.

Compared with state data, in 2007 the birth rate in adolescents from Minas Gerais was 18.7%, reaching 14.6% in 2016; in late maternity, an increase was observed: in 2006 it was 11%, reaching 15.3% in 2016. The same movement was observed in Brazil as a whole: in 2006 and 2016, the rates of deliveries in late maternity, were 9.5% and 13.5%, while in adolescence they were 21.4% and 17.5% of all births³⁰.

With regard to marital status, it was revealed that most adolescents were single, while the opposite was observed in pregnant women over 35 years old, with the majority being married. This suggests better pregnancy planning and postponement of pregnancy among women over 35 years old^{7,9,10}.

Family support and the presence of better final education are protective factors of relevance at any maternal age and can avoid a series of bad outcomes during pregnancy, since it is related to a higher frequency of prenatal care and a better understanding and follow-up of the medical guidelines.

It has been shown that adolescent mothers have less schooling than mothers with late maternity. These data suggest a greater association between school dropout and pregnancy in adolescence and the postponement of pregnancy, possibly due to academic improvement, with those aged over 35 years^{5-7,16,17,19,21,22}.

Considering prenatal care, the rates of inadequacy were higher in adolescent mothers than in those over 35 years of age, which suggests that less access to health services, in addition to less favorable socioeconomic conditions and greater exposure to social risks are factors that may be related to this finding²³⁻²⁵.

If, on the one hand, low frequency of prenatal care, low education and lack of family support (marital status) are more frequent in adolescents, the frequency of twins is higher in mothers with late maternity, which can make these perinatal outcomes equivalent. Twin pregnancies are considered high risk, since they are more closely related to premature births, hypertensive syndromes and malformations.

The verification of a higher frequency of twins in pregnant women over 35 years of age also points to the improvement of in vitro fertilization and assisted reproduction techniques, in agreement with previously collected data^{16,17,31,32}.

Adverse perinatal outcomes such as prematurity, low birth weight and a low Apgar score at the 5th minute tend to be similar at the extremes of maternal age, as our study showed. These data reinforce that the pregnant woman's age is an important factor in determining gestational risk, in addition to the greater presence of gestational complications in both groups^{3-10,12-15,31,32,34}.

A study carried out in Liverpool³⁴ demonstrated that the prevalence of preterm birth and low birth weight showed a U-shaped curve, considering maternal age, with minimum values in adulthood and high values at both extremes of age.

Low birth weight, an important marker of perinatal morbidity and mortality, also showed similar results at the extremes of age in our study. Among the risk factors for low birth weight, vasculopathies are closely related to restricted intrauterine growth, although at the extremes of age the causes are different: pre-eclampsia predominates in younger women and pre-existing hypertension and collagenosis in older women³⁵.

The verification of the relationship between prematurity, low birth weight and cesarean delivery with inadequate prenatal care reinforces data found in the literature, which emphasize the importance of adequate prenatal care as the main protective factor for complications related to pregnancies at extremes of age^{3,13,29,26,27}.

In our study, the chance of low birth weight was 40% and the NB being premature was 50%, when prenatal care was inadequate.

Regarding the mode of delivery, it was found that the most frequent mode of delivery in pregnant women at an early age was vaginal; on the other hand, the cesarean section was the most common among women over 35 years old. In our study, following national studies, cesarean rates were statistically very different between age groups; in adolescents they were 25.9% and in late motherhood 59.1%.

Data from DATASUS indicate that in 2016, Brazil registered more cesarean sections than normal births. There were 55.4% of cesarean deliveries and 44.6% of vaginal deliveries, which has placed Brazil in the position of world champion or vice-champion of cesarean surgeries in the world³⁶.

This occurrence has several explanations, such as mastery of operative techniques, an increase in high-risk pregnancies, poor training of obstetricians to perform maneuvers during childbirth, a lack of information, fear of medical procedures, a preference for cesarean section by Brazilian women, in addition to the cultural aspects involved^{11,36}.

The reasons for indicating cesarean sections in young women include acute hypertensive syndromes, rupture of membranes associated with infections and extreme prematurity^{37,38}. In older parturients, the reasons for the greater indication of cesarean section are not entirely clear: dystocias occur more frequently, in addition to the greater frequency of myomatosis, which can compromise the much-needed contractility during labor.

We must also remember that in addition to the greater cohabitation with chronic diseases in women with late maternity, there is a group of healthy nulliparous women, in which the pregnancy is often the result of a painful process of in vitro fertilization that can lead the obstetrician to perform a cesarean section out of fear or apprehension of complications that could put and end to a pregnancy that has been dreamed of³⁹.

In addition, older parturients, because they have a higher socioeconomic level, as well as social and family support,

education, access to information and adequacy of prenatal care, are more encouraged than younger women in terms of choosing the mode of delivery, which may suggest some social pressure or a clear intention to "ensure an adequate prognosis" for older pregnant women and their newborns.

In the studied population, it was not possible to carry out an investigation according to social class, which could have suggest an indication character that this type of delivery has acquired over the years in Brazil, becoming a consumer good that can be used for those who have resources to pay for it⁴⁰.

A major challenge in childbirth care in Brazil is facing the significant number of cesarean sections performed without obstetric indication. Any and all surgeries carry a risk of maternal death due to hemorrhage, infection or anesthetic complications. In addition, uterine scarring is a risk factor for placental accreta and the risk of bleeding¹¹.

CONCLUSION

This study recognizes the limitations inherent to its method, since its analysis is based on information taken from a database, which may imply challenges in establishing direct causal relationships. However, due to the significant statistical robustness of the data examined, it is possible to draw some relevant conclusions.

Adolescents showed decreasing birth rates throughout the decade in contrast to the increasing rates among women over 35 years of age. The group of older pregnant women also exhibited high rates of cesarean births and twin births compared to younger women. Although it is possible that improvements in health services have contributed to the reduction in adolescent births, health care for women at extreme ages continues to be a challenge, given the growing proportion of women over the age of 35 and the increase in the risk of associated complications.

Furthermore, despite similar rates of low birth weight, prematurity and a low Apgar score at the 5th minute for the newborns of pregnant women in both groups at extreme ages, women under 20 years of age had lower rates of a stable union, education and suitability for prenatal care. These findings indicate that, despite possible advances, prenatal care for adolescents can still be improved.

With regard to cesarean sections, according to the WHO, which recommends a rate of 15% for cesarean sections as ideal, the rates found in this study - above 50% - are considered very high, even when acknowledging that they take place in high-risk hospitals, which indicate the need for intervention, mainly at the primary level of health care in our city.

AUTHOR'S CONTRIBUTION

The following proposed the theme, carried out the bibliographic survey and data analysis: Maria do Carmo Tolentino Figueiredo Guimarães Santos and Francis Balduino Guimaraes Santos. Felipe Tolentino Figueiredo Guimaraes Santos *participated in the theoretical discussion,*

writing of the chapter and preparation of the final version of the chapter. Tulio Jose de Oliveira *participated in the theoretical discussion, writing of the chapter and preparation of the final version of the chapter.* Luís Felipe Marinho and Marina Luiza Resende Abritta *participated in the review of the text and preparation of the final version.* All authors *discussed, read and approved the final version of the chapter.*

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