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REVISTA DE ENFERMAGEM DA UFSM

UFSM
Rev. Enferm. UFSM - REUFSM
Santa Maria, RS, v. 10, e54, p. 1-17, 2020
DOI: 10.5902/2179769239398
ISSN 2179-7692

Original Article Submission: 08/05/2019 Acceptance: 05/06/2020 Publication: 08/07/2020

Factors associated with elective cesarean section in women met in a reference hospital in western Santa Catarina

Fatores associados à cesariana eletiva em mulheres atendidas em um hospital referência do oeste catarinense

Factores asociados con la cesárea electiva en mujeres atendidas en un hospital de referencia del oeste de Santa Catarina

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Abstract: Objective: to identify factors associated with elective cesarean section in women met in a reference hospital in western Santa Catarina. **Method:** cross-sectional study carried out with women submitted to cesarean section. The data collection occurred between August and September 2016, through a standardized questionnaire and information complemented by the medical records and prenatal card. Data were submitted to multivariate logistic regression. **Results:** 206 women were included in the study. The final result of the multivariate model showed independent association with the elective cesarean section paid privately or by health insurance (Odds Ratio = 39.9 p<0.01) and self-reported skin color white (Odds Ratio = 2.94 p=0.035). **Conclusion:** it is necessary to rethink the training of health care professionals qualified to meet pregnant women, empowering them to prenatal care and to the vaginal delivery, aiming, above all, to respect absolute indications of cesarean sections, especially in pregnant women met in the private sector.
Descriptors: Women's Health; Midwifery; Cesarean Section; Risk Factors; Supplementary Health

Resumo: Objetivo: identificar os fatores associados à cesariana eletiva em mulheres atendidas em um hospital referência do oeste catarinense. **Método:** estudo transversal realizado com mulheres submetidas à cesariana. A coleta de dados ocorreu entre agosto e setembro de 2016, por meio de questionário padronizado e informações complementadas pelo prontuário e cartão pré-natal. Dados foram submetidos à regressão logística multivariada.

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Resultados: foram incluídas no estudo 206 mulheres. O resultado final do modelo multivariado mostrou associação de forma independente com a cesariana eletiva ter sido paga via particular ou por plano de saúde (*Odds Ratio* = 39,9 p<0,01) e a cor da pele autorreferida branca (*Odds Ratio* = 2,94 p=0,035). **Conclusão:** é necessário repensar a formação dos profissionais da área da saúde habilitados a atenderem gestantes, capacitando-os para o cuidado pré-natal e para o parto vaginal, visando, sobretudo, o respeito às indicações absolutas de cesarianas, especialmente nas gestantes atendidas no setor privado.
Descritores: Saúde da Mulher; Tocologia; Cesárea; Fatores de Risco; Saúde Suplementar

Resumen: **Objetivo:** identificar los factores asociados con la cesárea electiva en mujeres atendidas en un hospital de referencia del oeste de Santa Catarina. **Método:** estudio transversal realizado con mujeres sometidas a cesárea. La recogida de datos se produjo entre agosto y septiembre de 2016, por medio de un cuestionario estandarizado y complementada por la información de los registros médicos y cartón prenatal. Los datos obtenidos fueron sometidos a la regresión logística multivariada. **Resultados:** se incluyeron 206 mujeres en el estudio. El resultado final del modelo multivariado mostró asociación independiente con la cesárea electiva ha sido pagada en privado o por un plan de salud (Odds Ratio = 39,9 p<0,01) y autorreporte del color de la piel blanco (Odds Ratio = 2,94 p=0,035). **Conclusión:** es necesario repensar la formación de los profesionales de atención de salud calificados para atender a las mujeres embarazadas, motivándolos a la atención prenatal y al parto vaginal, destinado, sobre todo, al respeto de las indicaciones absolutas de cesárea, especialmente en embarazadas atendidas en el sector privado.
Descriptores: Salud de la Mujer; Partería; Cesárea; Factores de Riesgo; Salud Suplemental

Introduction

Childbirth care has been marked by technological interventions and broad use of cesarean section as a form of birth. Despite the recommendations of the World Health Organization (WHO), the Ministry of Health (MH), associations, federations and federal and regional councils of Medicine and Nursing related to obstetrics, public health programs and policies, as well as networks and organizations of civil society, Brazil continues to be one of the countries in the world that most uses the surgical technique for the birth.[1]

Culturally, the cesarean section has ceased to be a procedure reserved for high-risk pregnancies and became a scheduled procedure, often without a real need for indication. A reflection of this is expressed by increasing rates of cesarean sections in Brazil, which exceeded the vaginal delivery, for the first time, in 2009.[2]

The latest available data on live births from the Department of Informatics of the Unified Health System (DATASUS)[2] show that, in 2017, Brazil accounted for a total of 2,923,535 births. Of these, 1,627,302 occurred by cesarean section and 1,294,034 by vaginal route, demonstrating

that the rates of this type of surgery surpass the vaginal route. In the Southern region, there were 397,323 live births, of which 243,780 (61.3%) were cesarean sections. In Santa Catarina, of 98,279 live births, 57,012 (58%) occurred through a cesarean operation.[3]

This modification in the form of birth of Brazilians has made cesarean sections the first option for many women, totaling 56.7% of all births that occurred in the country, and this percentage reaches 85% in private health services.[4] In this context, important statement from the WHO warns that, at population level, cesarean rates greater than 10% are not associated with reduced maternal and neonatal mortality.[5]

In this way, although the cesarean section is considered a safe surgery and is important for the maternal and child health,[4] when carried out indiscriminately and not based on scientific evidence, can expose women and their newborns to unnecessary risks.[6]

In this context, a study showed that the risk of post-cesarean section maternal death was almost three times higher when compared to the post-vaginal childbirth, resulting from postpartum hemorrhage and complications of anesthesia.[7] A systematic review with meta-analysis, whose objective was to determine the risk of severe acute maternal complications associated with cesarean section without a medical indication, corroborated the greatest chances of occurrence of maternal death after this surgery and also found higher chances of postpartum infection.[8]

UHS data also showed a higher risk of puerperal infection (4.35 times higher) and maternal mortality (3 times more) in women submitted to cesarean section when compared to women who had vaginal childbirth or abortion.[9] Other risks, such as accidental lesion of organs and surgical site infection, were also observed.[9] It is important to note that the risk of infections and surgical complications increases in places without infrastructure and/or capacity for safe cesarean sections.[5]

Given the above, and considering that there are gaps in scientific knowledge produced in relation to birth routes in western Santa Catarina, allied to the high rates of cesarean section in this state, it is important to develop researches on this problem aiming to understand the situation, its causes and consequences in order to implement actions that can reduce the high rates currently observed. In this sense, the present study aimed to identify factors associated with elective cesarean section in women met in a reference hospital in western Santa Catarina.

Method

A cross-sectional based study was carried out with all postpartum women admitted to the maternity of a reference hospital in western Santa Catarina, regardless of having been subjected to vaginal or cesarean route. Inclusion criteria were: being postpartum woman, in the first 48 postpartum/post-cesarean section hours and being hospitalized in the maternity unit of the hospital. The exclusion criteria were: being underage, not speaking Portuguese and being in clinical conditions that prevented the participation in the study (example: post-anesthesia headache, pain by cesarean surgery). There was an exclusion criterion related to language due to many Haitian immigrants received in western Santa Catarina in recent years, who have difficulties to understand and speak Portuguese.

The data collection was carried out between August and September 2016, through a standardized questionnaire applied by the researchers at the bedside of each puerperal women. The questionnaire was developed specifically for this research, and addressed information regarding clinical and obstetric history, current childbirth(s), newborn(s) and prenatal care. Information was complemented by analyzing the medical records and the prenatal card of each puerperal women, including the number of pregnancies, childbirths, cesarean deliveries and abortions, number of prenatal consultations, gestational age in accordance with the first ultrasound and the date of last menstruation, results of examinations, reason or indication of

cesarean delivery, Apgar scores of the newborns, among others. In order to avoid selection bias, the participants included in the study were selected through the researchers' duty, within seven days of the week, whereas all postpartum women admitted to the maternity hospital of the study were invited to participate.

The hospital where the research was developed is responsible for meeting approximately 92 cities in western Santa Catarina and 26 cities in Paraná and Rio Grande do Sul, covering a population of approximately 1,000,000 inhabitants. In this way, this institution is a reference to health care for women in labor, delivery and postpartum, offering services by the public health system, by health insurance and privately.

The present study analyzed only the cesarean sections among the total sample of the base study. The dependent variable was elective cesarean section whose medical record was "delivery by elective cesarean section" (ICD-10 O82.0) and/or cesarean reported by puerperal women at the time of application of the questionnaire. The independent variables were analyzed as associated with cesarean section and divided into blocks of variables: biological, socioeconomic, clinical, related to the health service and to the newborn.

The data collected from DATASUS showed that Chapecó accounted for 3,183 live births in 2013 (the year in which the project was built), and 74 live births were due to double pregnancy, no triple pregnancy and three types of ignored pregnancy. Considering these data, the number of 3,146 puerperal women was raised in the year 2013. From these findings and percentage of cesarean sections described in the literature,[10] the sample size calculated was 156 puerperal women, considering a sample error of 5% and a confidence level of 95%.

The analysis of associated factors was made through multivariate logistic regression, using Odds Ratio. The logistic regression allows calculating or predicting the likelihood of a specific event (dependent variable) being explained through multiple independent variables. After bivariate analysis, i.e., of the dependent variable with each independent variable, the

independent variables with p value <0.20 were included in the forward multivariate model by blocks of variables, remaining in the final model only the variables with association p<0.05. In the forward multivariate model, the variables are added one by one according to their strength of association (from the lowest to the highest p value). The data were analyzed with the program Stata version 12.

The study followed the ethical precepts of the Resolution of the National Health Council number 466, 2012, and was approved by the Research Ethics Committee of the Federal University of Fronteira Sul, under opinion number 1.575.071, on June 5, 2016. All participants signed the Informed Consent Form before answering the questionnaire, as well as before the access to information from their medical records and/or prenatal card.

Results

Of the puerperal women that met the inclusion criteria, three refused to participate in the study, totaling 343 participants. Of these, 206 (60.1%) were submitted to cesarean surgery and comprised the sample.

Table 1 describes the characteristics of the puerperal women included in the study.

Table 1- Characteristics of the cesarean sections performed in a reference hospital in Western Santa Catarina. Chapecó-SC, 2016.

Characteristics	**Total n (%)**	**Mean (min. - max.)**
Sociodemographic		
Age		28.8 (18 - 42)
Self-reported skin color		
White	126 (61.2)	
Parda or mulatto	67 (32.5)	
Black	05 (2.4)	
Yellow or Asian	02 (1.0)	
Indigenous	04 (1.9)	
Unknown	02 (8.0)	
Clinical and laboratory variables		
Risk events during pregnancy		
Gestational diabetes	12 (5.8)	
High pressure	32 (15.5)	
Placenta previa	07 (0.34)	
Eclampsia or seizure	09 (4.4)	
Cerclage	03 (1.5)	
Uterine rupture	01 (0.5)	
Mean gestational age (in weeks)		38.6 (28 - 42)
Preterm (below 37 weeks of gestation)	21 (10.2)	
Term (between 37 and 41 weeks and 6 days)	182 (88.3)	
Post-term (42 weeks or more)	03 (1.5)	
Reagent Human Immunodeficiency Virus (HIV)	00 (0.0)	
Reagent Syphilis (VDRL)	01 (0.5)	
Variables related to the health service		
Completion of prenatal	206 (100%)	
Newborn-related variables		
Newborn's weight		3126.9 (950 - 4570)
Twin newborn weight		1952.1 (625 - 2940)
First-minute Apgar		9 (1 a 10)
First-minute Apgar of the twin		8 (8 a 9)

The mean age of the participants was 28.8 years (18 - 42), all completed the prenatal care and the percentage of preterm deliveries was 10.2% (21). The elective cesarean sections corresponded to 88.3% (182) of births at term and mean gestational age of participants, at the

time of interruption of pregnancy, was 38.6 weeks. The newborns had favorable first- and fifth-minute Apgar scores.

Table 2 presents the results of the bivariate analysis of the variables evaluated for elective cesarean section at the hospital where the study was conducted. The variables for the multivariate analysis were: maternal age of 30 to 42 years, paid cesarean section, the occurrence of some event during pregnancy and having performed three or more ultrasounds during pregnancy. The variable self-reported skin color white was included in the multivariate model as it presented a borderline p-value.

In the present study, some variables, such as complications during pregnancy, number of prenatal consultations and previous cesarean sections, were not significant when related to elective cesarean section.

Table 2- Frequencies and bivariate analysis of biological, socioeconomic, clinical, health service-related and newborn-related factors associated with the elective cesarean section. Chapecó-SC, 2016.

	Elective Cesarean Eletiva			
	No **n (%)**	**Yes** **n (%)**	**OR (IC 95%)**	***p***
Biological Variables				
Self-reported skin color				
Non-White	67 (85.9)	11 (14.1)	1.0	
White	91 (72.2)	35 (27.8)	2.34 (1.11 – 4. 95)	0.026
Age				
18 - 29 years	90 (86.5)	14 (13.5)	1.0	
30 - 42 years	70 (68.6)	32 (31.4)	2.94 (1.46-5.93)	0.003
Socioeconomic Variables				
Household city				
Chapecó	127(77.4)	37 (22.6)	1.0	
Other cities	33 (78.6)	09 (21.4)	0.94 (0.41 – 2.13)	0.875
Variables related to the health service				

Type of payment of the cesarean section				
Public	146 (93.6)	10 (6.4)	1.0	
Private	14 (28.0)	36 (72.0)	37.54 (15.4 – 91.4)	0.000
Prenatal follow-up				
Different professionals	49 (86.0)	8 (14.0)	1.0	
Always or mostly with the same professional	111 (74.5)	38 (25.5)	2.10 (0.91 – 4.82)	0.082
Clinical Variables				
Previous Cesarean section				
No	84 (77.1)	25 (23.0)	1.0	
Yes	76 (78.3)	21 (21.7)	0.93 (0.48 – 1.79)	0.825
Any event in the current pregnancy *				
No	118 (73.7)	42 (26.3)	1.0	
Yes	42 (91.3)	4 (8.7)	0.27 (0.09 – 0.80)	0.017
Number of prenatal consultations				
Six or more	132 (78.1)	37 (21.9)	1.0	
Five or less	16 (76.2)	5 (23.8)	1.11 (0.38 – 3.24)	0.842
Number of ultrasound(s) during pregnancy				
Up to two	40 (90.9)	04 (9.1)	1.0	
Three or more	116(73.4)	42 (26.6)	3.62(1.22 – 10.73)	0.020
Newborn-related Variables				
Baby diagnosed with complication				
No	148 (76.7)	45 (23.3)	1.0	
Yes	12 (92.3)	01 (7.70)	0.30 (0.03 – 2.16)	0.220
Newborn's weight				
<3000g	56 (71.8)	22 (28.2)	1.0	
≥3000g	94(79.7)	24 (20.3)	0.65 (0.33 – 1.26)	0.205
1st-minute Apgar				
7 - 10	142 (76.0)	45 (24.0)	1.0	
0 - 6	12 (92.3)	01 (7.7)	0.26 (0.03 – 2.10)	0.205

* Gestational diabetes, high blood pressure, placenta previa, eclampsia, cerclage and/or uterine rupture.

A forward multivariate analysis by block of variable was carried out, adding each one according to the strength of the association, being excluded in case it did not remain significant. The final result of the multivariate model is presented in Table 3, remaining

associated independently with the elective cesarean section: surgery paid via privately or by a health insurance (OR = 39.9 p<0.01) and self-reported skin color as white (OR = 2.94 p=0.035).

Table 3- Final model of the forward multivariate regression of the association between studied exposures and elective cesarean section. Chapecó-SC, 2016.

	OR (IC 95%)	***p***
Type of payment of the cesarean section		
Public	1.0	
Private	39.9 (15.8 – 101.1)	0.000
Self-reported skin color		
Non-White	1.0	
White	2.94 (1.08 – 8.03)	0.035

Discussion

The results showed that all women that underwent elective cesarean section had a prenatal follow-up, with ultrasound and with few risk events during pregnancy, such as gestational diabetes, high blood pressure, placenta previa, eclampsia, cerclage and/or uterine rupture. Despite being a reference hospital for the entire western region of the state of Santa Catarina, most cesareans were of women in Chapecó. Private surgery (privately paid or through a health insurance) and self-reported skin color as white became associated with the accomplishment of the elective cesarean section.

A Brazilian study showed an association between cesarean section in women with high socioeconomic level and who used the private sector. Furthermore, the high schooling was associated with a higher risk for elective cesarean.[11]

The type of private payment was strongly associated with elective cesarean section, presenting a chance 40 times greater when compared to women who had cesarean section by the public health system. Other studies also showed a higher incidence of cesarean section in

the private sector in comparison with the public sector. Of the women who had gestational outcomes through the private system, 93.8% were cesarean section, and, of the childbirths by the UHS, 55.5% were abdominal deliveries.[12-13] A research pointed to a cesarean rate of 51.9%, with 42.9% in the public sector and 87.9% in the private sector[10] and another study found that in private or health-insurance hospitalizations, the cesarean section was 2.43 times more prevalent when compared to hospitalization through the UHS.[6]

In this way, the occurrence of elective cesarean section can be associated with a higher purchasing power, which often facilitates the payment for this service, since, in many cases, ceased to be a method to improve perinatal outcomes and became a consumer product, whose rates are lower among the poorest women, increasing with the purchasing power of the population.[12] A study found a relationship between the preference for the high-route childbirth and better socioeconomic condition (schooling and higher economic level).[14]

Women in the private sector featured 87.5% of cesarean section, with increased choice of the abdominal route of childbirth at the end of pregnancy, regardless of diagnosed complications.[2] The disincentive to vaginal childbirth was strongly observed during the prenatal care performed by the private system, in which the follow-up is exclusively medical, whereas, in the UHS, in many cities, the consultations are alternated between medical and nursing professionals.[12] Another study also pointed out that the choice of cesarean suffers strong influence of medical practice.[14]

Cross-sectional research that aimed to identify sociodemographic factors, characteristics and gestational complications associated with the accomplishment of elective cesarean corroborates the evidence newly exposed.[15] In that research, the pregnant women followed-up in the supplementary health network presented a greater chance of elective cesarean section, confirming the association between this modality of childbirth and location of prenatal care and delivery.[15]

The cesarean sections scheduled with advance can be perceived as a new type of birth that eliminates unpredictability, besides allowing the planning and the participation of family members and friends in childbirth and the postpartum period. These aspects of the social order also relate to the growing increase of this birth route.[11]

A research that used data from the *Nascer no Brasil* survey assigned the previous scheduling of cesarean sections to a "contamination" caused by the way the private hospitals are organized, considering both the maternal desire as the convenience of the medical professional.[16]

The predominance of elective cesarean sections can also be related to a false perception that this surgery is a safer birth mode, less painful and a symbol of social status for many Brazilian women.[11] In this sense, a survey found that, among women in the private sector, there was a greater perception that the cesarean section is the a birth route safer for the baby when compared to the vaginal delivery.[2] Thus, the choice of cesarean deliveries can be influenced by various reasons, being related to the decisions of the woman herself, the professionals and health services, and even by family and social pressures.

In the present study, the white skin color was associated with three times more elective cesarean sections than other skin colors, even with the control by payment type. A study also showed a higher proportion of this birth route among white women.[17]

A research conducted in California showed that Afro-American women showed higher rates of cesarean sections when compared to other women.[18] It also highlighted that the poor communication between health professionals and women may be an important risk factor for the high rate of cesarean sections performed. However, in the results found, Afro-American women with previous cesarean sections did not show a significant probability of performing a new cesarean section, whether elective or emergency.[18]

In contrast, a Brazilian study related white skin color to higher rates of cesarean section, especially when the surgery occurred through the private system. Furthermore, it revealed that women with previous cesarean section had greater chances of undergoing another cesarean section, when compared to vaginal delivery as previous childbirth route.[19]

White women, when compared to Black and mulatto women, presented a higher risk of having an inadequate prenatal care, lack of bond with the maternity, absence of a companion, pilgrimage for childbirth and less local anesthesia for episiotomy.[20] In this way, there were differences in the assistance evidenced by racial disparities in the care process to pregnancy and childbirth, with a gradient of worse to better care for Black, *Pardas* and White women, respectively.

In this context, it is important to mention that the hospital that served as study site for the data collection of this research still does not adopt the Robson classification,[5] as suggested by the WHO. This classification system considers five obstetric characteristics, categorizing the pregnant women in one of the 10 existing groups.[5] In addition to the non-use of this instrument, there is the fact that the obstetricians' behaviors are often guided by the physician's choices, since protocols are still being constructed regarding some specific situations of obstetrical care.

Conclusion

The private cesarean section (privately paid or through a health insurance) and self-reported skin color as white became associated with the accomplishment of the elective cesarean section in the final result of the multivariate model, suggesting that women who have improved economic conditions can opt for this surgical procedure with greater ease. The white skin color can also demonstrate that the childbirth care with women depends on the socioeconomic class, since black- or *pardo*-skinned women are more submitted to vaginal delivery than elective cesarean section.

Thus, there is need to rethink the training of health care professionals qualified to meet pregnant women, empowering them to prenatal care and to the vaginal delivery, aiming, above all, to respect absolute indications of cesarean sections, especially in pregnant women met in the private sector. Therefore, this manuscript is believed to contribute scientifically to activities related to education, to problematize and foster future research and extension projects and qualify the assistance.

Since the present study has quantitative nature, further investigations should be developed to assess qualitatively the process of elective cesarean section through an approach that considers the desire of the woman regarding delivery route, with subsequent satisfaction with her choice. Another possibility would be analyzing the view of the medical staff about the risks and benefits of elective cesarean section.

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How to cite this article

Rossetto M, Schmalfuss JM, Bedin K, Pinheiro AM, Batista JDL. Factors associated with elective cesarean section in women met in a reference hospital in western Santa Catarina. Rev. Enferm. UFSM. 2020 [Cited: Year Month Day]; vol.10 e54: 1-17. DOI: https://doi.org/10.5902/2179769239398