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Women's Preference for Type of Delivery and Rates of Cesarean Sections in Brazil, 2010-2013

Paulo Fontoura Freitas[1]*, Julia Ronchi[1], Leisa Beatriz Grando[2], Roxana Knobel[2] Marcia Regina Kretzer[1]

[1]Universidade do Sul de Santa Catarina (UNISUL). Curso de MedicinadaUnidade Grande Florianópolis-Santa Catarina, Brasil; [2]Universidade Federal de Santa Catarina. Hospital Universitário Ernani Polydoro de São Thiago, HU-UFSC., Florianópolis-Santa Catarina, Brasil.

*pfreitas.epidemio@gmail.com

***Corresponding Author:** Paulo Fontoura Freitas, Rua Beco da Lua nº 232 – Lagoa da Conceição, CEP: 88062-490. Florianópolis SC, Brasil.*

Abstract

Objective: *To investigate an associations between women's preference for type of delivery and rates of cesarean section at the Hospital of the Federal University of Santa Catarina in 2010-2013.*

Methods: *A cross-sectional study analyzed data from all deliveries occurred in a university hospital, in South Brazil, in this period.*

Results: *The preference for cesarean delivery was reported by 15.3% of the 4,853 women in the study. The proportion of cesarean sections was higher among women with a preference for cesarean section (60.1%) compared to those prefering a normal delivery (31.1%). However, an association between the preference for cesarean delivery and the occurrence of this type of delivery was significantly mediated by age, previous cesarean section and early admission, after adjustment for these covariates (Non-adjusted PR=2,13(1,89;2,39) versus Adjusted PR=1,31(0,88-1,21).*

Conclusion: *Women 's preference for the type of delivery at the university hospital did not play an important role in the final decision for type of delivery,at the study site.*

Keywords: *Cross-Sectional Studies; Cesarean Section;Delivery;Patient Preferences; Obstetrics; Public Hospitals.*

Introduction

Throughout the world, especially in the decades 2000 to 2010, there has been a significant increase in the proportion of cesarean deliveries [1,2]. In Brazil, the proportion of cesarean deliveries increased from 41.7% in 2004 to 56.6% in 2014, according to data from the Live Birth Information System[3]. Cesarean delivery is associated with a higher risk of morbidity and mortality for mother and child[4-6], besides contributing to a increase in the costs of public health financing, given the higher financial burden associated with the surgical procedure itself and the longer hospitalization time for cesarean sections compared to normal delivery.

Different studies suggest that the birth process in Brazil reflects sociocultural factors and the local obstetric practice[2],as well as institutional, [8] geographical, [9] financial[5], ethnic, and legal factors[10]. Significant differences in the proportion of cesarean deliveries when comparing private institutions and public maternity hospitals have already been raised by several studies[2,8,11], corroborating the assumption

that the birth decision is influenced especially by the payment method inherent to subsystems of health care[12].

Although "on-demand cesarean section" has been identified as one of those responsible for the high proportions of cesarean deliveries in Brazil[13,14], the issue of women's preference for the surgical procedure is controversial. Results from different studies suggest that the understanding of the subject needs a deeper understanding of the multifactorial and interrelation between clinical factors, such as differences in interpretation when classifying absolute or relative indications, convenience for the professional, and degree of acceptance of the woman's request as part of the final decision concerning type of delivery[2,8,12].

The proportion of cesarean deliveries in Brazil is in agreement with the hypothesis that this type of delivery is performed, in large part, to meet the convenience of the medical agenda, thus evidencing a new order of medical-practice that privileges the delivery of childbirth by appointment.[2] The decisive role of the obstetric team in the construction of a less interventionist culture and in the promotion of good practices has been investigated[12,15]. According to one of these studies[12], carried out with data from a recente cohoort nationwide study "Birth in Brazil", almost 90% of cesarean sections, among women in the private sector, were decided at the end of gestation, with no evidence of complications and evidence based medical indications justifying the final decision. Also, pregnant women accompanied by the same physician during prenatal care and delivery presented cesarean sections not based only on intercurrences during pregnancy. Having the same obstetrician in prenatal and childbirth has been previously associated with the chances of having a cesarean section, which suggests the existence of favorable counseling for cesarean section as part of antenata care[16,17].

A systematic review[13] indicated a preference of 15.6% for cesarean delivery, being higher among women with a previous cesarean (29.4%). However, rates of cesarean section, both in the private and in the public system were higher than the proportion of women reporting preference for cesarean delivery[12,14].

Despite the well known relationship between caesarean sections rates and the standandards of childbirth, with higher rates in the private sector compared to the public sector[2,5], some Brazilian studies show that other factors, besides the form of payment for childbirth, can increase the chances of cesarean delivery among women in the public sector. This includes higher educational level, early admission to birth, and low incentive of humanized practices in childbirth care[2,5,51]. It has also been suggested that those women who are able to pay for the procedure, would increase their chances of obtaining a cesarean section through "negotiation" with the obstetrician during a private prenatal care consultation[2,14,17].

The quality of information received during prenatal care has been reported as a factor influencing the chances of a vaginal delivery in both the public and private sectors. A study conducted with data from the "Birth in Brazil" cohort compared the proportions of cesarean deliveries among hospitals defined as "atypical" models of perinatal care, because they presented humanized practices ("child-friendly hospital") and hospitals with conventional care, called "standard" hospitals, found much lower rates among "atypical" hospitals when compared to those using the "Standard" model (47.8% vs. 90.8%, respectively)[7].

The assumption of this study is that in a public hospital-school, the scheduling of a cesarean section on demand is virtually non-existent, and thus, decisions concerning type of delivery, would be mostly linked to eventual intercurrences during gestation or labor. The present study aimed to analyze the factors associated with the preference of the woman for type of delivery and its association with the event of a cesarean delivery on a public school-hospital in Santa Catarina, South Brazil.

Methods

A cross-sectional study with data concerning all deliveries occurring at the Maternity Hospital of the

Federal University of Santa Catarina (HU-UFSC), was conducted from July 2010 to 2013. The HU-UFSC, gives assistanceexclusively to the Brazilian National Health System users. Data was obtained from the the Clinical Perinatal Database(CPD) information wich is collected daily as part of admission, pre-delivery and delivery and routinely reviewed based on medical records before being stored.

The outcome variable preference for type of delivery wasclassified as: preference for caesarean section; preference for vaginal delivery and without preference for type of delivery. Exposure factors investigated as potentially associated with preference for type of delivery were categorized into three groups: (1) socio-demographic: age (14-19, 20-34, 35 or more); schooling (0-3, 4-7, 8 or more complete study years); marital status (married, stable, single, others); skin color (white, not white); (2) reproductive and clinical: planned pregnancy (yes, no); previous vaginal delivery (primiparous, vaginal only, vaginal and cesarean, only cesarean); gestational age (up to 36, 37 weeks or more), number of prenatal visits (up to 6, 7 or more); disease in pregnancy (yes, no); (3) admission, delivery, institutional and, or obstetric practice: dilation at admission (0-3,> 3 cm); type of delivery (vaginal, cesarean); companion at birth (no, yes).

Reproductive risk was classified according to guidelines of the Brazilian Ministry of Health[18]. The variable "disease during pregnancy" included any event that occurred during pregnancy with a potential influence on women's health or on the fetus. These complications included: Tuberculosis, History of previous Reproductive SystemSurgery, Diabetes, Hypertension, Infertility, HIV, Cardiopathy, Nephropathy, Severe Medical Condition, Epilepsy, Anemia, Asthma and / or psychiatric disorders.

A gestation was considered "planned" when the conception and/or pregnancy was a desire or planning of the couple and "not scheduled" when "occurred without planning, due to the absence of contraceptive methods or other events.

Firstly, the distribution of puerperae was described according to socio-demographic, reproductive, gestational and labor variables, stratifying the sample according to type of delivery (no preference, preference for normal delivery and preference for cesarean section). Differences in the distribution of independent variables according to type of delivery were investigated and tested using the Pearson's Chi-square test at the significance level of 5% ($p < 0.05$). The Crude and adjusted Prevalence Ratios (PR) and their respective 95% Confidence Intervals were calculated for all variables potentially associated with preference for type of delivery nin the study.

The multivariate analysis of the independent effect of the factors associated with preference for the type of delivery used the Robust Cox Regression. Prevalence Ratios were adjusted according to a hierarchical model of analysis (Figure 1). The input of the variables following the hierarchical model was given according to the chronological order of the occurrence of the events. In this study, the variables related to the socio-demographic characteristics (Level 1) were first included. Next, the variables of gestation and reproductive history (Level 2), frequency of prenatal care (Level 3) and finally the variables of admission and delivery (Level 4). Initially, those variables with a significance level equal to or less than 0.20 in the crude analysis were included in the adjusted model. At each level, the variables that, after adjustment, showed association with the outcome ($p < 0.05$) were maintained in the model at the lower hierarchical levels, adopting the same procedure for all hierarchical levels. Finally, multivariate analysis of the factors associated with the occurrence of cesarean section, stratified by type preference, was conducted using the same hierarchical model described above. The statistical significance of the associations was calculated by the likelihood ratio test. A significance level of 5% was adopted. The analyzes were developed using SPSS: Statistical Package for Social Sciences18.0 (SPSS Inc., Chicago, USA).

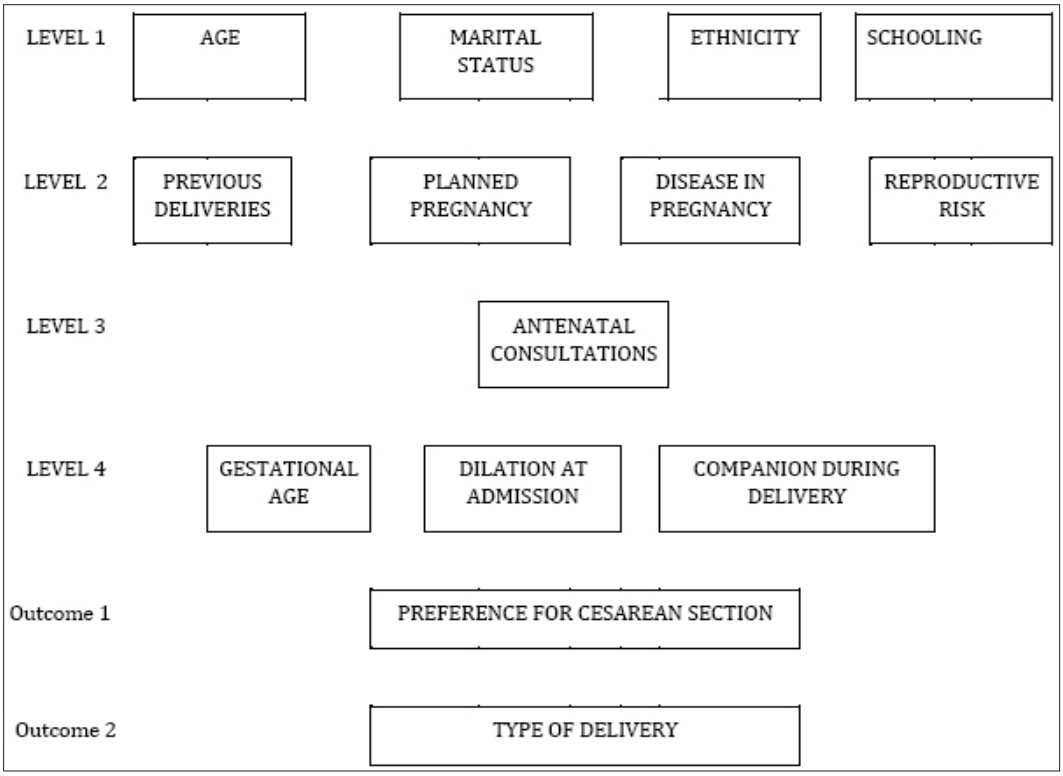

Figura 1. *Hierarchical modelo of Analysis. Factors associated with women's preference for cesarean section and type of delivery. University Hospital (UFSC) 2010-1013.*

Results

Data regarding 4,853 women having delivery during the study period were analyzed. The proportion of cesarean section was 35.5%. Table 1 shows the distribution of puerperae according to socio-demographic, reproductive, gestational and labor variables according to preference for type of delivery (cesarean, vaginal or non-declared preference). Preference for cesarean section was reported by 15.1% of women in the period as a whole, while a higher proportion (62.3%) declared a preference for normal birth and 22.6% stated that they had no specific preference.

The most important differences in the distribution of women according to preference for type of delivery were observed for the variables age, schooling, previous reproductive experience and reproductive risk. The group declaring preference for cesarean showed higher proportions of parturients over 35 years of age, those with lower levels of schooling, with reproductive risk, having cesarean section in previous deliveries and those with early admission. On the other hand, although a lower frequency of prenatal care, unplanned pregnancy and gestational age <37 weeks were more common among women declaring preference for cesarean, compared to those who preferred vaginal delivery, the proportions were similar to those found among women in the group without any preference. Gestational disease, although more frequent among women preferring cesarean section, did not show differences when comparing the other two groups.

Moreover, almost 75% of the women (1,218 out of 1,636) who underwent cesarean section had not declared preference for this mode of delivery at the time of admission, whereas almost 70% (2,062 out of 2,975) of those who had vaginal delivery had expressed a preference for this compared to only 9.3% (278 out of 2.975), those showing preference for cesarean delivery and vaginal delivery (data not shown in the table).

Table 1. *Women's distribution according to sociodemographic, reproductive, pregnancy and delivery variables, and preference for type of delivery. UniversityHospital (UFSC 2010-2013).*

	Preference for type of delivery								
	Cesarean		Vaginal		Without preference		Total		
Age	n	(%)	n	(%)	n	(%)	n	(%)	P
<20	69	(10,0)	420	(14,8)	180	(17,5)	669	(14,6)	<0,001
20-34	485	(70,4)	2162	(76,0)	730	(70,8)	3377	(73,9)	
35+	135	(19,6)	263	(9,2)	121	(11,7)	519	(11,5)	
Ethnicity									
White	502	(74,4)	2139	(76,4)	733	(71,9)	3374	(73,91)	<0,001
Non-white	173	(25,6)	659	(23,6	287	(28,1)	1119	(24,51)	
Marital status									
Married	569	(81,8)	2395	(83,3)	874	(84,0)	3838	(84,07)	<0,001
Single/others	127	(18,2)	479	(16,7)	167	(16,0)	773	(16,93)	
Years of schooling									
0-3	56	(8,1)	149	(5,2)	64	(6,2)	269	(5,89)	<0,001
4-7	188	(27,3)	764	(26,9)	336	(32,7)	1288	(28,21)	
8+	444	(64,5)	1930	(67,9)	626	(61,0)	3000	(65,72)	
Prenatal consultations									
0-6	277	(39,7)	969	(33,5)	422	(40,2)	1668	(36,54)	<0,001
7+	421	(60,3)	1920	(66,5)	628	(59,8)	2969	(65,04)	
Previous deliveries									
Primiparae	204	(29,2)	1517	(52,5)	495	(47,1)	2216	(48,54)	<0,001
Only vaginal	126	(18,0)	1099	(38,0)	345	(32,9)	1570	(34,39)	
Vaginal and cesarean	74	(10,6)	107	(3,7)	54	(5,14)	235	(5,15)	
Only cesarean	295	(42,2)	166	(5,7)	156	(14,9)	617	(13,52)	
Planned pregnancy									
Yes	195	(27,9)	972	(33,7)	296	(28,3)	1463	(32,05)	<0,001
No	504	(72,1)	1910	(66,3)	751	(71,7)	3165	(69,33)	
Disease in pregnancy									
Yes	382	(55,2)	1158	(40,4)	431	(41,5)	1971	(43,18)	<0,001
No	310	(44,8)	1707	(59,6)	607	(58,5)	2624	(57,48)	
Dilation at admission									
0-3 cm	463	(69,4)	1355	(47,8)	533	(51,7)	2351	(51,50)	<0,001
4-10 cm	204	(30,6)	1481	(52,2)	498	(48,3)	2183	(47,82)	
Gestational age									
<37	79	(11,3)	191	(6,6)	132	(12,6)	402	(8,81)	<0,001
37+	620	(88,7)	2698	(93,4)	918	(87,4)	4236	(92,79)	
Companion at delivery									
No	47	(6,8)	126	(4,4)	63	(6,1)	236	(5,17)	<0,001
Yes	644	(93,2)	2720	(95,6)	967	(93,9)	4331	(94,87)	
Reprodutive risk									
Yes	378	(61,6)	886	(34,6)	400	(43,2)	1664	(36,45)	<0,01
No	236	(38,4)	1676	(65,4)	526	(56,8)	2438	(53,41)	

**p value: Pearson Chi-Squared Test. Data not available for preference (n=242; 4,9%); age (n=110; 2,2%); ethnicity (n=185; 3,8%); marital status (n=63; 1,2%); Schooling (n=127; 2,6%); antenatal consultations (n=30; 0,6%); previous delivery (n=110; 2,2%); ; disease in pregnancy (n=79; 1,6%); dilation at admission (n=134; 2,7%); gestational age (n=29; 0,59%).*

Table 2 presents the results of the bivariate and multivariate analysis of the factors associated with preference for cesarean. In the bivariate analysis, preference for cesarean section was statistically associated with previous cesarean delivery, being five times more common among women having only cesarean section in previous pregnancies (PR = 5.19I; CI: 4.35 - 6.21) and more than tripled between those having cesarean section and vaginal (PR = 3.42; CI: 2.62 - 4.46), when compared to primiparous women. Women older than 35 years, those admitted with the lowest levels of dilation and those classified as reproductive risk presented a more than twice times higher proportion of preference for cesarean compared to those women under 20 years of age (PR = 2, 52b; 1.89 - 3.37), with those admitted with more advanced dilation (PR = 2.11; IC: 1.79 - 2.49), and compared to the group withoutreproductive risk (PR = 2.35; CI: 1.99 –2.77), respectively. Although gestational disease, low educational level and gestational age of <37 weeks were also associated with a higher prevalence of preference for cesarean, smaller differences were found when compared to those without pregnancy complications (PR = 1.64 IC: 1, (PR = 1.34; CI: 1.06 - 1.69), with higher education (PR= 1.41; IC: 1.04 - 2.02); and with those without companion at delivery (RPb = 1.34 CI: 1.02; 1.80), respectively.

When adjusting for the combined effect of variables in the hierarchical model, the effects and statistical significance remained practically unchanged for maternal age above 35 years and cesarean section in previous gestation, which presented associations of higher magnitude with preference for cesarean section. With the exception of gestational age of <37 weeks and companion at delivery, which lost significance after adjustment, all other variables showing association in the bivariate analysis remained statistically significant after adjustment, although with a decrease in the relative effect in the multivariate model.

Table 3 presents the results of the association between preference for type of delivery and the rates of cesarean section, crude and after adjustment for potentially confounding covariates, according to the hierarchical model of analysis. The results show that the association between preterm delivery and cesarean section rates almost completely lost their effect after adjustment (PR = 2.13, CI: 1.89-2.39) versus (PR = 1, 07, IC: 0.86-1.34), suggesting an important mediating role of other variables, associated with both the preference for type of delivery and increased chances of occurrence of cesarean delivery. Decreases in the effect of variables such as age, previous caesarean pathology in gestation, reproductive risk and early admission, after adjustment, point to the potential mediating effect of these variables.

Table 4 presents the results of the factors associated with cesarean section, by stratifying according to two groups: 1) preference for cesarean section and 2) preference for normal delivery or without declared preference. As can be observed, cesarean rates were around twice most frequent, for practically all variables, among women with preference for cesarean. On the other hand, when comparing women reporting preference for cesarean versus those prefering vaginal delivery for factors classically associated with cesarean delivery such as prior caesarean section (PR = 2.0; CI: 1.33-3.16 versus PR = 2.05; CI: 1.46-2.75) and pathology during pregnancy (PR = 1.15; CI: 0.94-1.41 versus PR = 1.38; CI: 1.23-1.55), suggesting that clinical-obstetric factors did not play a relevant role in these groups. Moreover, these results corroborate the previously described for Caesarean crude Prevalence Ratios, in Table 3, where a proportion of more than double of cesarean sections among women with preference for caesarean loses almost all of their effect after adjustment.

Table 2. *Multivariate Analysis of factors associated wit preference for cesarean section. University Hospital(UFSC) 2010-1013.*

Variables			Preference for cesarean section					
	n	(%)	PR (Cr)	($CI_{95\%}$)	p	PR (Adj)	($CI_{95\%}$)	p
Age								
<20	69	(10,3)	1	1		1		
20-34	485	(14,4)	1,39	(1,08;1,79)	0,013	1,38	(1,07;1,79)	0,012
35+	135	(26,0)	2,52	(1,89;3,37)	0,004	2,46	(1,84;3,31)	<0,001
Ethnicity								
White	502	(14,9)	1					
Non-white	173	(15,5)	1,04	(0,87;1,23)	0,66	1,05	-	-
Marital status								
Married	569	(14,8)	1	**1**		**1**		
Single/others	127	(16,4)	1,11	(0,91;1,34)	0,29	1,17	-	-
Years of schooling								
0-3	56	(20,8)	1,41	(1,04;2,02)	0,013	1,22	(0,92;1,61)	0,173
>3	632	(14,7)						
Previous deliveries								
Primiparae	204	(9,2)	1	**1**		**1**		
Only vaginal	126	(8,0)	0,87	(0,69;1,09)	0,23	0,78	(0,60;1,00)	0,051
Vaginal and cesarean	295	(31,5)	3,42	(2,62;4,46)	<0,01	2,52	(1,85;3,42)	<0,001
Only cesarean	74	(47,8)	5,19	(4,35;6,21)	<0,01	4,16	(3,38;5,12)	<0,001
Planned pregnancy								
Yes	195	(13,3)	1	**1**		**1**		
No	504	(15,9)	1,19	(1,01;1,41)	0,04	0,91	(0,76;1,08)	0,276
Disease in pregnancy								
Yes	382	(19,4)	1,64	(1,41;1,91)	<0,01	1,25	(1,05;1,49)	0,013
No	310	(11,8)	1	1				
Reproductive Risk								
Yes	378	(22,7)	2,35	(1,99;2,77)	<0,01	1,53	(1,27;1,85)	<0,001
No	236	(9,7)	1	1		1		
Antenatal consultations								
0-6	277	(16,6)	1,17	(1,01;1,36)	0,03	0,94	(0,79;1,11)	0,454
7+	421	(14,2)	1	1		1		
Companion at delivery								
No	47	(19,9)	1,34	(1,02;1,80)	0,04	1,14	(0,84;1,55)	0,404
Yes	644	(14,9)	1	1		1		
Dilation at admission								
0-3 cm	463	(19,7)	2,11	(1,79;2,49)	<0,01	1,44	(1,19;1,72)	<0,001
>3 cm	204	(9,3)	1	1		1		
Gestational age								
<37 weeks	79	(19,7)	1,34	(1,06;1,69)	0,003	1,03	(0,79;1,35)	0,787
37+ weeks	620	(14,6)	1			1		

RP(Cr): Crude Prevalence Ratios; RP(Adj): Adjusted Prevalence Ratios

Table 3. *Multivariate Analysis of the association between preference for type of delivery and cesarean section rates adjusted for the covariates according to the hierarchical model. University Hospital (UFSC) 2010-1013.*

Variables			Cesarean section rates					
	n	(%)	RP (br)	($IC_{95\%}$)	p	RP (aj)	(IC 95%)	p
Preference for type of delivery$_A$								
Cesarean	418	(60.1)	2,13	(1,89;2,39)	<0,001	1.03	(0,88;1,21)	0,672
Vaginal	810	(28,2)	1	1				
No Preference	408	(39,1)	1,39	(1,23;1,56)	<0,001	0,84	(0,73;1,31)	0,431
Age								
<20	198	(28,5)	1	1				
20-34	1.231	(35,0)	1,23	(1,06;1,43)	0,08	1,22	(1,05;1,42)	0,009
35+	256	(47,9)	1,68	(1,06;1,42)	<0,001	1,68	(1,39;2,03)	<0,001
Ethnicity								
White	1.250	(35,7)	1	1				
Non-white	412	(35,4)	1,01	(0,91;1,13)	0,882	-	;	-
Marital status								
Married	1.428	(36,0)	1	1				
Single/others	278	(34,0)	1,11	(0,93;1,20)	0,297	-	;	-
Years of schooling								
0-3 years	105	(37,0)	1,04	(0,87;1,26)	0,609	-	;	-
> 3 years	1.574	(35,4)		1				
Previous deliveries								
Primiparae	274	(16,8)	1	1				
Only vaginal	873	(37,8)	2,25	(1,96;2,58)	<0,001	2,46	(2,11;2,86)	<0,001
Vaginal and cesarean	112	(44,6)	2,65	(2,13;3,31)	<0,001	2,16	(1,70;2,74)	<0,001
Only cesarean	458	(72,4)	4,31	(3,71;4,99)	<0,001	3,74	(3,18;4,40)	<0,001
Planned pregnancy$_B$								
Yes	566	(37,5)	1,08	(0,98;1,19)	0,06	1,05	(0,94;1,17)	0,402
No	1.148	(34,7)	1	1				
Disease in pregnancy$_B$								
Yes	882	(43,1)	1,44	(1,31;1,58)	<0,001	1,12	(1,01;1,26)	0,044
No	820	(30,0)		1				
Reprodutive Risk$_B$								
Yes	1.156	(49,8)	2,11	(1,82;2,21)	<0,001	1,67	(1,48;1,87)	<0,001
No	744	(23,6)						
Antenatal consultations$_B$								
0-6	670	(31,3)	1,17	(1,06;1,31)	<0,001	1,14	(1.02;1,27)	0,023
7+	1.449	(36,7)		1				
Companion at delivery$_C$								
No	113	(39,4)	1,15	(0,96;1,44)	0,090	2,72	(2,37;3,11)	<0,001
Yes	1.960	(34,3)		1				
Dilation at admission$_C$								
0-3	1.610	(52,8)	3,7	(3,21;4,01)	<0,001	1,16	(0,93;1,46)	0,190
>3	412	(14,2)		1				
Gestational age$_C$								
<37	277	(52,5)	1,58	(1,36;1,78)	<0,010	1,15	(0,97;1,36)	0,101
37+	1.846	(33,1)		1				

RP(Cr): Crude Prevalence Ratios; RP(Adj): Adjusted Prevalence Ratios: RP(aj): A: Adjusted for all variables in the model; B: for age, previous deliveries, planned pregnancy, disease in pregnancy, reproductive risk; C: for age, previous delivery, planned pregnancy, disease in pregnancy, reproductive risk and antenatal consultations

Table 4. *Multivariate Analysis of factors associated with cesarean sections stratified by preference by tipe of delivery. University Hospital(UFSC) 2010-1013.*

	Cesareansection rates									
Variables	**Preference for cesareansection**					**Preference for vaginal delivery/without preference**				
	n	**% cesarean**	**$RP_{(Aj)}$**	**($CI_{95\%}$)**	**p**	**n**	**% cesarean**	**$RP_{(Aj)}$**	**($IC_{95\%}$)**	**p**
Age										
<20	24	35,8	1			165	27,7	1		
20-34	292	60,3	1,65	(1,06-2,57)	0,027	881	30,6	1,06	(0,88-1,26	0,525
35+	95	70,4	1,89	(1,18-3,03)	0,008	151	39,8	1,43	(1,14-1,80)	0,002
Ethnicity										
White	304	60,8	1,05	(0,83-1,32)	0,690	884	31,0	0,98	(0,86-1,13)	0,794
Non-white	102	59,3	1			295	31,3	1		
Marital status										
Married	350	61,8	1,14	(0,86-1,49)	0,372	1.019	31,4	0,99	(0,85-1,17)	0,988
Single/others	67	52,8				193	30,0	1		
Years of schooling										
0-3years	35	62,5	1	(0,77-1,18)	0,643	67	31,6	1,16	(1,02-1,33)	0,021
4+years	374	59,5	0,95			1127	31,0	1		
Previous deliveries										
Primiparae	39	31,0	1			219	15,3	1		
Only vaginal	94	46,5	1,65	(1,11-2,46)	0,019	740	36,9	2,71	(2,29-3,21)	<0,001
Vaginal and cesarean	49	66,2	2,05	(1,33-3,16)	0,006	54	33,8	2,00	(1,46-2,75)	<0,001
Only cesarean	236	80,3	2,53	(1,79-3,58)	0,000	205	64,7	4,22	(3,46-5,16)	<0,001
Planned pregnancy										
Yes	126	64,9	1,07	(0,86-1,34)	0,609	421	33,5	1,05	(0,93-1,19)	0,331
No	292	58,2				793	30,0	1		
Disease in pregnancy										
Yes	247	65,0	1,15	(0,94-1,41)	0,633	597	37,8	1,38	(1,23-1,55)	0,084
No	168	54,4	1			610	26,5	1		

Discussion

The cesarean section rate in the study was 35.6%. Preference for cesarean section was reported by 15.1% of the women, while 62.3% declared a preference for normal delivery and 22.6% stated that they had no specific preference. About 75% of women who underwent cesarean section did not declare a preference for this mode of delivery at the time of admission, and almost 70% of those who had vaginal delivery had expressed preference for this route, compared to only 9.3% of those manifesting preference for cesarean section and having vaginal delivery.

The rate of cesarean sections among the women

investigated in the study, although above the 15% recommended by the World Health Organization (WHO)[19], is close to the results reported by other authors for the public sector and school hospitals[16], and also below the 55 , 7% from theBrazilian Live Birth Information System, for Brazil in 2013.

A trend in the preference for cesarean delivery among Brazilian women has been suggested when compared to other cultures[2,13]. In the study under discussion, the proportion of women declaring preference for cesarean section at admission varied from 13.7% in 2010 to 15.7% in 2013. These results are very close to the findings of a systematic review[13] reporting a preference for a cesarean section of 15.6% (12.5-18.9), as well as a study that investigated the decision process by type of delivery in Brazil[12].

In the Unified Health System (SUS), in the UFSC University Hospital, most women are accompanied by different professionals during prenatal care, and childbirth care is offered under work-shifts. Thus, the scheduling of a cesarean section, as part of a deal between parturient and obstetrician, would be limited by the characteristics of the public system.

In the study by Domingues et al.[12], 51.2% of the multiparas with a previous cesarean section, performed in the public sector, declared a preference for cesarean, a number very close to the results of our study.

Although higher rates of cesarean section were found among women with a preference for cesarean, higher Prevalence Ratios among women reporting a preference for vaginal delivery for variables such as: previous cesarean section, diesease gestational, and reproductive risk suggests that the role of clinical factors, in this population, was not relevant when comparing women according to preference for type of delivery.

These results are consistent with the assumption that the organization of the obstetric system in public hospitals in general, and in university hospitals in particular, limits the influence of women's preference for type of delivery. We postulate that one of the factors influencingthe low cesarean rates in this scenario is not having the same doctor during prenatal care and labor[17]. Although evidence pointing to an association between continuity of care by midwifes care and the lower chance of cesarean delivery, [21,15,22] this is not the case among obstetricians in countries with high cesarean rates such as Brazil where the opposite effect of an increased chance of cesarean can be expected[23].

Regarding early admission, which appears to influence cesarean among all women and particularly common among women who wish to have a cesarean section, it is known that hospitalization when labor is not yet in its active phase increases the probability of a cesarean section by a series of factors such as misdiagnosis of failure to progress, more liberal use of oxytocin, need for analgesia interfering with the parturient's confidence in her caregivers, and her perception of the birth process. This issue seems to be much more complex and involves different areas, from the lack of training of obstetricians to vaginal delivery nowadays,to the current obstetric model of practice, where the absence of expectant attitude towards the natural development of labor and early intervention, including the misuse of induction, by itself, initiates a process known as "cascade of interventions" leading to an primarily unnecessary cesarean that is now seen as an emergency.

A potential bias in cross-sectional studies refers to the impossibility of accessing the temporal relationship between potential associated factors and the outcome. In the current study, the information regarding preference for type of delivery collected as part of hospital admission may have minimized, at least in part, the potential confounding effect of women's individual experience during pregnancy

A high rate of caesarean sections among low-risk women with no preference for this mode of delivery makes unlikely that decisions are influenced by women's preference and, on the other hand, brings out the limited control of women, with preference

for vaginal delivery, regarding the decisions of the obstetric decisons concerning the way of delivery.

Although most decisions on cesarean delivery in a university hospital may be based on absolute indications, results showing a higher proportion of cesarean sections, for factors not necessarily associated with strictly clinical indications, suggest that some practices often linked to " the culture obstetrics in Brazil "may be the norm, even in a public hospital.

The findings also suggest that both, a lower proportion of women reporting preference for cesarean and lower cesarean rates among women surveyed in a public and university hospital compared to those found in mixed or private care hospitals are mainly mediated by socioeconomic factors and obstetric practice. Also, the absence of previous contact of the pregnant woman with the obstetrician who are in charge of delivery, the form of payment and the guidelines recommended by a hospital directed to humanized childbirth have a fundamental role.

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