The color of pain: racial iniquities in prenatal care and childbirth in Brazil

A cor da dor: iniquidades raciais na atenção pré-natal e ao parto no Brasil

El color del dolor: inequidades raciales en la atención pre-natal y partos en Brasil

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Abstract

Few studies on the influence of race/color on pregnancy and birthcare experiences have been carried out in Brazil. Additionally, none of the existing studies are of national scope. This study sought to evaluate inequities in prenatal and childbirth care according to race/color using propensity score matching. The data comes from the study Birth in Brazil: National Survey into Labor and Birth, *a national population study comprised of interviews and revisions of medical records that included 23,894 women in 2011/2012. We used logistic regressions to estimate odds ratios (OR) and respective 95% confidence intervals (95%CI) of race/color associated with the outcomes were analyzed. When compared with white-skinned women, black-skinned women were more likely to have inadequate prenatal care (OR = 1.6; 95%CI: 1.4-1.9), to not be linked to a maternity hospital for childbirth (OR = 1.2 95%CI: 1.1-1.4), to be without a companion (OR = 1.7; 95%CI: 1.4-2.0), to seek more than one hospital for childbirth (OR =1.3; 95%CI: 1.2-1.5), and less likely to receive local anesthesia for an episiotomy (OR = 1.5; 95%CI: 1.1-2.1). Brown-skinned women were also more likely to have inadequate prenatal care (OR = 1.2; 95%CI: 1.1-1.4) and to lack a companion (OR = 1.4; 95%CI: 1.3-1.6) when compared with white-skinned women. We identified racial disparities in care during pregnancy and childbirth, which displayed a gradient going from worst to best care provided to black, brown and white-skinned women.*

Ethnic Groups; Social Inequity; Prenatal Care; Midwifery

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Introduction

Over the past few decades, a substantial body of evidence has shown important racial disparities in Brazil in several dimensions of social life, including education, employment and living conditions [1,2]. Racial inequalities have also been documented in health studies, which show that underprivileged groups, including black-skinned, mixed-race and indigenous people, suffer from higher levels of disease and are more exposed to death from preventable causes, ranging from infectious and parasitic disease to violence [3,4,5,6]. Health studies point to the influence of race/color on the access to and the use of services [7,8,9,10]. Consequently, the government implemented initiatives to address this inequality, including the Program for Confronting Institutional Racism, launched in 2005 [11,12].

Among the program's components is the mandatory recording of race/color in the country's vital statistics, which has enabled comparative analyses among different racial groups and the monitoring of demographic, social, and health outcomes.

Though Brazil received a positive rating for most indicators in the recent Millennium Development Goals analyses, there were clear shortcomings regarding promotion of gender equality, women's autonomy and maternal mortality [13]. Elevated levels of maternal mortality indicates failures in obstetric care from the prenatal stage up to birth. Brazil has achieved universal coverage of prenatal care and hospital birth, but studies have shown deficiencies in healthcare quality contributing to these negative outcomes regarding maternal and newborn health [13,14,15]. Consistent with findings from other countries worldwide, pointing to markedly higher maternal mortality rates among ethnic and racial minority women [16,17], maternal mortality is two and a half times higher among black women than among white women in Brazil (Sistema de Informações sobre Mortalidade. http://tabnet.data sus.gov.br/cgi/tabcgi.exe?sim/cnv/mat10uf.def, accessed on 22/Apr/2016; Sistema de Informações sobre Nascidos Vivos. http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sinasc/cnv/nvuf.def, accessed on 22/Apr/2016).

Despite the importance of women and children's health in Brazilian health policy, until now there have been few studies that analyze the influence of race/color on pregnancy care and birthcare. Generally speaking, existing investigations had been carried out in specific local contexts, with no nationwide analysis [18,19]. Given this situation, the present paper sought to evaluate prenatal and childbirth care inequities in Brazil focusing on race/color using data from a nationwide investigation recently carried in the country.

Methods

Baseline study

This analysis is based on data from *Birth in Brazil: National Survey into Labor and Birth*, a population-based study of national scope on pregnancy and childbirth care in Brazil between February 2011 and October 2012 [20]. The sample was selected in three stages. The first stage included hospitals with 500 or more childbirths/year, stratified by the country's five macro regions, location (capital or non-capital) and type of hospital (private, public or mixed). The second stage included the number of days needed to interview 90 post-natal women (minimum of seven days in each hospital) and the third included the post-natal women themselves. We sampled 266 hospitals (23,894 women). A detailed description of the sample design can be found in Vasconcellos et al. [21].

Inclusion and exclusion criteria

In the study we included post-natal women admitted to maternity hospitals for childbirth and their live or dead offspring weighing ≥ 500g at birth and/or that had a gestational age ≥ 22 weeks. The exclusion criteria were: post-natal women with severe mental disorders that made it impossible for them to communicate with the interviewer; or who did not understand Portuguese; or who were deaf. Women were asked: "What is your color or race?" and were presented with the five categories used by the Brazilian Institute of Geography and Statistics (white, black, brown, yellow and indigenous).

Those who identified themselves as yellow or indigenous were not included in the present analysis due to the extremely small number of women in these categories.

Matching variables

The women were categorized by the following variables: geographic region (North, Northeast, Southeast, South and Central); economic class (A+B, C, D+E) [22]; mother's age (< 20, 20-34, ≥ 35 years); years of schooling (< 8, 8-10, 11-14, 15 or more); source of funding for delivery (public or private), and parity (nulliparous, one previous childbirth, two previous childbirths, three or more previous childbirths). We used these variables to produce the propensity scores described below. Women who delivered in public hospitals and those who delivered in mixed hospitals, but whose births were not paid for by private health insurance, were classified as having a "public source of funding". Women whose deliveries were payed for by private health insurance, whether they gave birth in private or mixed hospitals, and those who gave birth in private hospitals, regardless of whether or not the delivery was payed for by private health insurance, were classified as having a "private source of funding".

Outcome variables

We considered the following outcomes: adequacy of prenatal care according to the Brazilian Ministry of Health guidelines; advice during prenatal care regarding possible complications during pregnancy (yes/no); advice given during prenatal care about early signs of labor (yes/no); linking to a maternity hospital for childbirth – pregnant women received advice regarding the unit where they would be admitted for delivery (yes/no); to seek more than one hospital for childbirth – pregnant women had to seek more than one hospital because she was refused in the first one (yes/no); presence of a companion during labor and birth (at no time/at some time/at all times); type of birth (vaginal/cesarean); use of oxytocin (yes/no); episiotomy (yes/no); local anesthesia for an episiotomy (yes/no); epidural anesthesia (yes/no); gestational age at birth in weeks (early preterm – up to 33; late preterm – 34 to 36; early term – 37 and 38; full term – 39 to 41, post-term – 42, and more); and reported women's satisfaction with the care they received (excellent, good and regular/bad/terrible).

The right to access a maternity hospital was established in the *Law 11,634*, article 1, which states that "*every pregnant woman assisted by the Unified Health System – SUS is entitled to previous knowledge of, and access to, the maternity hospital in which her delivery will take place*" [23].

In order to estimate the adequacy of prenatal care, we used an indicator of minimum prenatal care adequacy which considered sufficient prenatal care as: initiation of prenatal care up to the 12th gestational week; adequate number of appointments according to gestational age at birth, as recommended by the Brazilian Ministry of Health (at least one appointment in the first gestational trimester, two in the second, and three in the last trimester); records of at least one result for each of the recommended exams: glycaemia, urine, serology for syphilis, serology for HIV and ultrasound; and receiving advice from the maternity hospital regarding birthcare [15].

The explanatory hypotheses regarding the association between race/skin color and prenatal and childbirth care can be found in the supplementary diagram in Figure 1.
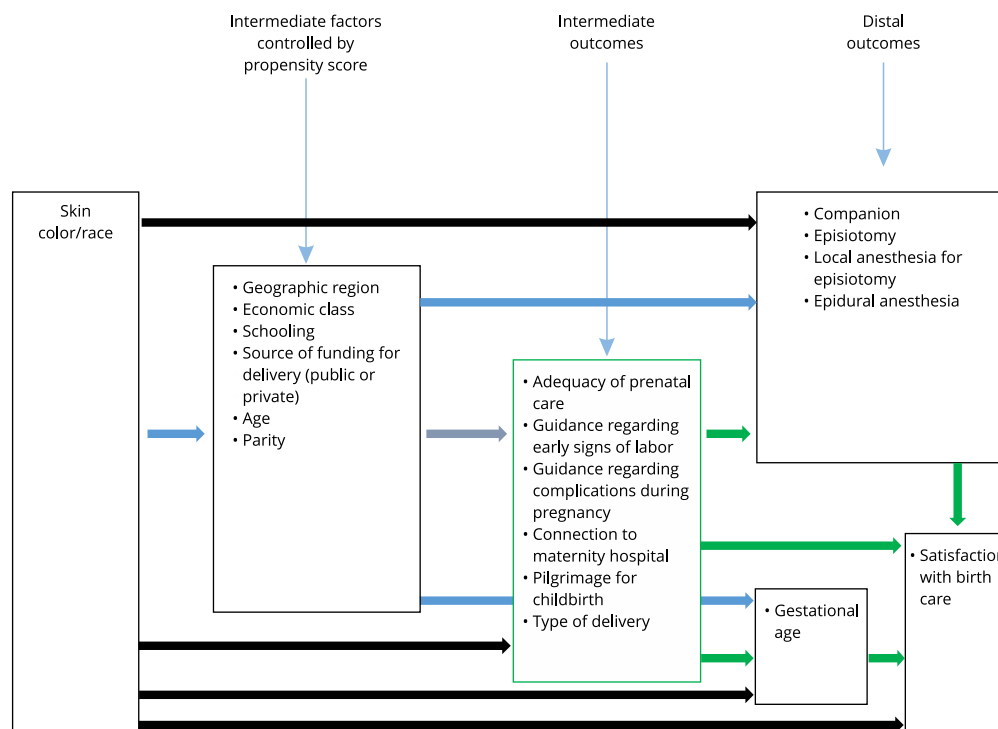
Propensity scores

The independent variable was the women's post-natal race/color as identified by themselves, either white, black or brown-skinned. We separated the analysis into three distinct, binary comparisons: black versus white, black versus brown and brown versus white.

The multiple regression analysis, which is commonly used for adjusting potentially confounding factors, may be inadequate for the type of data analysis used in this study. This technique was initially developed to regulate small imbalances in randomized studies when, due to the study's own design, those who are exposed and those who are unexposed to a treatment have an equivalent distribution of covariables. In our study, the distribution of outcomes and covariables related to prenatal and obstetric care vary greatly among regions in Brazil.

Figure 1

Association between race/skin color and prenatal and childbirth care. Explanatory hypotheses.

Propensity score matching is an alternative that deals with differences between groups in studies with non-experimental designs, such as the *Birth in Brazil* study. Since it is not possible to measure the effect of race/color for the same woman and compare situations in which she does and does not exhibit a certain outcome, we performed a comparison between similar post-natal women [24]. According to Rosenbaum & Rubin [25], in order to identify an association it is necessary to have a valid comparison group similar in all characteristics to the group of treated individuals, except for race/color. The propensity score is the predicted probability, obtained through a multiple regression probit, of one case receiving a certain treatment versus a control case, subjected to the observed covariables. In this study, propensity scores were estimated based on the following variables: geographic region, economic class, mother's age, years of schooling, source of payment for the childbirth and parity.

Statistical analysis

We selected individuals based on the "nearest neighbor matching within caliper" method, with a fixed maximum absolute difference of 0.2 between propensity scores, which generated distinct subsamples for each analysis. For the comparison of black-skinned post-natal women (treatment group) versus white-skinned post-natal women (control group) we adopted a 1:4 matching. We selected four white-skinned women for each black-skinned woman. The same was done for the comparison between black (treatment group) and brown-skinned post-natal women (control group). Finally, for the comparative analysis of brown (treatment group) versus white-skinned post-natal women (control group), we adopted a 1:1 strategy.

We used simple, non-conditional logistical regression to estimate the odds ratios (OR) and respective 95% confidence intervals (95%CI) of the outcomes in the three comparisons: black versus white, black versus brown and brown versus white. We calculated these after matching with the propensity scores. We used the SPSS statistical package, version 22.0 (IBM Corp., Armonk, USA).

Ethical considerations

This study followed the guidelines of the Brazilian National Health Council's *Resolution n. 196/1996*, which establishes recommendations and standard procedures for research on humans. It was approved by the Ethics Research Committee of the Sergio Arouca National School of Public Health/Oswaldo Cruz Foundation under the process n. 92/10. All institution directors and interviewed post-natal women signed informed consent forms.

Results

All sociodemographic characteristics used for the propensity score matching were associated with race/color. In comparison with white-skinned women, black and brown-skinned women were more concentrated in the North and Northeast regions, where public funding for delivery was more common, more mothers tended to be adolescents, levels of schooling were lower, and they tended to belong to the economic classes D and E and had had three or more previous childbirths (Table 1).

The comparative analysis of black versus white-skinned post-natal women generated a sub-sample of 6,689 women, 1,840 of which were black and 4,849 were white, after propensity score matching. Black-skinned post-natal women were more likely to have inadequate prenatal care (OR = 1.62; 95%CI: 1.38-1.91), to not have been informed or linked to a maternity hospital for childbirth (OR = 1.23; 95%CI: 1.10-1.37), to be without a companion (OR = 1.67; 95%CI: 1.42-1.97) and to search more than one hospital for childbirth (OR = 1.33; 95%CI: 1.15-1.54). Black-skinned women also received less advice during prenatal care about early signs of labor and possible complications during pregnancy. Despite having lower odds of cesarean birth and of painful interventions during vaginal birth, such as episiotomy and use of oxytocin, when compared with white-skinned women. Black-skinned women were also less likely to receive local anesthesia when episiotomies were performed (OR = 1.49; 95%CI: 1.06-2.08). The odds of post-term birth, in relation to full term birth (39-41 weeks), were greater among black-skinned women than among white-skinned women (see Table 2).

The comparison between brown and white-skinned post-natal women produced a sub-sample of 13,318 women, of which 6,659 were brown and 6,659 white. Brown-skinned women were more likely to have inadequate prenatal care (OR = 1.24; 95%CI: 1.12-1.36) and to be without a companion (OR = 1.41; 95%CI: 1.27-1.57). Brown-skinned women had lower odds of giving birth via caesarean section or having an episiotomy and lower odds of oxytocin use during vaginal birth. They also had higher odds of post-term births when compared with white-skinned women (Table 3).

In the comparison between black and brown-skinned women, the sub-sample comprised 9,006 women, of which 1,804 were black-skinned and 7,202 were brown-skinned. Inadequate prenatal care, no information or linking to a maternity hospital and lack of advice regarding early signs of labor during prenatal care were more frequently observed among black-skinned women. There were significant differences for the remaining outcomes (Table 4).

Discussion

The analysis of the variables selected for matching in the construction of the propensity score showed large social and economic disparities among women according to race/color. Nonetheless, after being matched based on all those characteristics, we found that black and brown-skinned women received poorer prenatal care and birthcare when compared with white-skinned women. Despite the fact that black and brown-skinned women shared some similarities, adequacy of prenatal care and access to a maternity hospital was worse among black-skinned women.

Table 1

Sociodemographic characteristics used as controls in the propensity score matching.

	White (%) [n = 8,077]	Black (%) [n = 2,051]	Brown (%) [n = 13,404]	p-value *
Region				< 0.001
North	3.7	6.5	13.5	
Northeast	18.2	33.0	34.7	
Southeast	48.8	46.1	38.2	
South	23.5	8.7	6.6	
Central	5.7	5.7	7.0	
Source of funding				< 0.001
Public	67.9	92.2	85.5	
Private	32.1	7.8	14.5	
Mother's age (years)				< 0.001
< 20	15.4	19.8	21.2	
20-34	72.0	69.8	69.4	
35 or more	12.6	10.4	9.3	
Mother's schooling (years)				< 0.001
< 8	17.7	38.1	30.1	
8-10	22.1	24.6	27.8	
11-14	43.9	34.3	36.8	
15 or more	16.3	3.0	5.3	
Economic score				< 0.001
Class D+E	13.1	33.9	28.4	
Class C	47.5	55.3	54.3	
Class A+B	39.4	10.8	17.3	
Parity				< 0.001
Nulliparous	50.1	43.8	45.4	
1 previous childbirth	30.6	28.2	28.9	
2 previous childbirths	12.0	13.4	14.2	
≥ 3 previous childbirths	7.3	14.7	11.5	

* Chi-squared test.

We identified a gradient of worse to better care among black, brown and white-skinned women for most of the outcomes analyzed, showing aspects of everyday health services that resulted in different opportunities and benefits according to race/color, to the detriment of brown-skinned and black-skinned women. Even after controlling for sociodemographic variables using propensity score matching, black and brown-skinned women, when compared with white-skinned women, presented worse prenatal and birth care outcomes. Although black and brown-skinned women shared several similarities in terms of the analyzed outcomes, black-skinned women showed worse results regarding the quality of prenatal care. Thus, the analyses presented in this study signal clear and worrying evidence of race/color inequalities in prenatal and birth conditions for Brazilian women, previously investigated based on case studies in specific locations in the country [18,26]. Even if the population composition and inequality levels are different, there is evidence of inequities in the prenatal and birth care conditions for several other countries whose vital statistics and service use records include data on ethnic-racial identity [27,28].

At first glance, it would appear that lower exposure to interventions such as oxytocin use, episiotomy and births via caesarean section among black and brown-skinned women when compared with white-skinned women improves care, as the recommendations of the Brazilian Ministry of Health would suggest [29]. However, in clinical practice, the obstetric assistance model adopted in Brazil favors

Table 2

Prenatal and obstetric care indicators: comparison between brown and white women before and after propensity score matching.

	Black (%) [n = 1,840]	White, before propensity score matching (%) [n = 8,077]	White, after propensity score matching (%) [n = 4,849]	OR (95%CI)
Adequacy of prenatal care				
Inadequate	67.9	57.7	58.7	1.62 (1.38-1.91)
Partially adequate	19.6	23.6	23.8	1.16 (0.96-1.40)
Adequate	12.4	18.7	17.5	1.00
Guidance regarding early signs of labor				
No	53.9	54.0	48.9	1.22 (1.09-1.36)
Yes	46.1	46.0	51.1	1.00
Guidance regarding complications during pregnancy				
No	41.4	33.8	36.9	1.21 (1.08-1.35)
Yes	58.6	66.2	63.1	1.00
Connection to maternity hospital				
No	45.3	37.3	40.2	1.23 (1.10-1.37)
Yes	54.7	62.7	59.8	1.00
Pilgrimage for childbirth				
No	82.5	87.8	86.3	1.00
Yes	17.5	12.2	13.7	1.33 (1.15-1.54)
Presence of a companion during hospital stay				
At no time	33.8	18.9	23.7	1.67 (1.42-1.97)
At some time	50.0	56.1	57.3	1.02 (0.88-1.19)
At all times	16.2	25.0	19.0	1.00
Type of delivery				
Vaginal	53.9	39.4	43.2	1.00
Cesarean	46.2	60.6	56.8	0.65 (0.58-0.72)
Episiotomy *				
No	58.5	50.5	51.2	1.00
Yes	41.5	49.5	48.8	0.74 (0.64-0.87)
Local anesthesia for episiotomy *				
No	10.7	8.5	8.0	1.49 (1.06-2.08)
Yes, before the cut	49.3	52.7	54.9	1.00
Yes, before the stitches	40.0	38.8	37.1	1.20 (0.98-1.47)
Use of oxytocin **				
No	54.0	45.4	46.9	1.00
Yes	46.0	54.6	53.1	0.75 (0.65-0.87)
Epidural anesthesia *				
No	97.9	96.1	97.9	1.00
Yes	2.1	3.9	2.1	0.98 (0.55-1.76)
Gestational age				
Early preterm	2.4	2.8	2.7	0.93 (0.66-1.32)
Late preterm	8.1	8.4	8.2	1.03 (0.84-1.26)
Early term	35.7	37.6	34.3	1.09 (0.97-1.22)
Full term	50.4	49.5	52.7	1.00
Post-term	3.4	1.6	2.0	1.72 (1.24-2.39)
Satisfaction with birth care				
Excellent	46.5	53.5	49.9	1.00
Good	41.8	37.5	39.8	1.13 (0.98-1.30)
Regular/Bad/Terrible	11.7	8.9	10.3	1.22 (0.97-1.52)

95%CI: 95% confidence interval; OR: odds ratio.

* Only for women who had vaginal births, totaling 992 black women and 2,094 white women;

** Use of oxytocin in order to accelerate labor. Only for women who went into labor, totaling 1,148 black women and 2,513 white women.

Table 3

Prenatal and obstetric care indicators: comparison between brown and white women before and after propensity score matching.

	Brown (%) [n = 6,659]	White, before propensity score matching (%) [n = 8,077]	White, after propensity score matching (%) [n = 4,849]	OR (95%CI)
Adequacy of prenatal care				
Inadequate	65.2	57.7	60.0	1.24 (1.12-1.36)
Partially adequate	19.4	23.6	22.6	0.98 (0.87-1.09)
Adequate	15.4	18.7	17.5	1.00
Guidance regarding early signs of labor				
No	47.0	54.0	45.5	1.06 (0.99-1.14)
Yes	53.0	46.0	54.5	1.00
Guidance regarding complications during pregnancy				
No	35.4	33.8	34.4	1.04 (0.97-1.12)
Yes	64.6	66.2	65.6	1.00
Connection to maternity hospital				
No	38.2	37.3	37.3	1.04 (0.97-1.11)
Yes	61.8	62.7	62.7	1.00
Pilgrimage for childbirth				
No	87.8	87.8	88.4	1.00
Yes	12.2	12.2	11.6	1.07 (0.96-1.18)
Presence of a companion during hospital stay				
At no time	24.1	18.9	20.0	1.41 (1.27-1.57)
At some time	55.6	56.1	56.3	1.16 (1.06-1.26)
At all times	20.3	25.0	23.7	1.00
Type of delivery				
Vaginal	41.7	39.4	37.2	1.00
Cesarean	58.3	60.6	62.8	0.83 (0.77-0.89)
Episiotomy *				
No	58.5	50.5	49.7	1.00
Yes	41.5	49.5	50.3	0.70 (0.63-0.78)
Local anesthesia for episiotomy *				
No	9.4	8.5	8.6	1.18 (0.92-1.50)
Yes, before the cut	50.9	52.7	55.0	1.00
Yes, before the stitches	39.7	38.8	36.4	1.18 (1.02-1.36)
Use of oxytocin **				
No	53.5	45.4	47.1	1.00
Yes	46.5	54.6	52.9	0.77 (0.69-0.86)
Epidural anesthesia *				
No	97.2	96.1	96.5	1.00
Yes	2.8	3.9	3.5	1.29 (0.92-1.80)
Gestational age				
Early preterm	2.7	2.8	2.5	1.06 (0.86-1.32)
Late preterm	7.5	8.4	8.1	0.92 (0.81-1.05)
Early term	36.7	37.6	37.0	0.99 (0.92-1.07)
Full term	50.8	49.5	50.8	1.00
Post-term	2.2	1.6	1.6	1.42 (1.10-1.83)
Satisfaction with birth care				
Excellent	50.0	53.5	53.0	1.00
Good	40.2	37.5	38.1	1.12 (1.03-1.22)
Regular/Bad/Terrible	9.8	8.9	9.0	1.15 (0.99-1.33)

95%CI: 95% confidence interval; OR: odds ratio.

* Only for women who had vaginal births, totaling 2,479 brown women and 2,775 white women;

** Use of oxytocin in order to accelerate labor. Only for women who went into labor, totaling 3,019 brown women and 3,276 white women.

Table 4

Prenatal and obstetric care indicators: comparison between black and brown women before and after propensity score matching.

	Black (%) [n = 1,804]	Brown, before propensity score matching (%) [n = 13,404]	Brown, after propensity score matching (%) [n = 7,202]	OR (95%CI)
Adequacy of prenatal care				
Inadequate	67.9	66.8	65.7	1.22 (1.05-1.43)
Partially adequate	19.6	19.6	19.5	1.19 (0.99-1.43)
Adequate	12.4	13.6	14.8	1.00
Guidance regarding early signs of labor				
No	53.9	51.1	50.7	1.14 (1.02-1.26)
Yes	46.1	48.9	49.3	1.00
Guidance regarding complications during pregnancy				
No	41.4	39.7	39.2	1.10 (0.99-1.22)
Yes	58.6	60.3	60.8	1.00
Connection to maternity hospital				
No	45.3	43.1	42.1	1.14 (1.03-1.26)
Yes	54.7	56.9	57.9	1.00
Pilgrimage for childbirth				
No	82.5	80.4	82.5	1.00
Yes	17.5	19.6	17.5	1.00 (0.88-1.15)
Presence of a companion during hospital stay				
At no time	33.8	26.6	29.5	1.03 (0.88-1.20)
At some time	50.0	56.4	55.8	0.82 (0.70-0.94)
At all times	16.2	17.0	14.6	1.00
Type of delivery				
Vaginal	53.9	52.0	52.6	1.00
Cesarean	46.1	48.0	47.4	0.97 (0.87-1.07)
Episiotomy *				
No	58.5	59.3	58.8	1.00
Yes	41.5	40.7	41.2	1.04 (0.90-1.20)
Local anesthesia for episiotomy *				
No	10.7	8.6	9.2	1.22 (0.89-1.66)
Yes, before the cut	49.3	51.2	51.5	1.00
Yes, before the stitches	40.0	40.3	39.3	1.06 (0.88-1.88)
Use of oxytocin **				
No	54.0	55.3	55.2	1.00
Yes	46.0	44.7	44.8	1.05 (0.92-1.20)
Epidural anesthesia *				
No	97.9	97.5	98.3	1.00
Yes	2.1	2.5	1.7	0.87 (0.52-1.43)
Gestational age				
Early preterm	2.4	3.3	2.9	0.88 (0.63-1.23)
Late preterm	8.1	7.9	7.3	1.15 (0.95-1.40)
Early term	35.7	33.7	34.4	1.08 (0.96-1.02)
Full term	50.4	52.1	52.5	1.00
Post-term	3.4	3.0	2.9	1.22 (0.91-1.64)
Satisfaction with birth care				
Excellent	46.5	45.1	45.2	1.00
Good	41.8	42.4	42.6	0.94 (0.82-1.08)
Regular/Bad/Terrible	11.7	12.6	12.2	0.94 (0.76-1.16)

95%CI: 95% confidence interval; OR: odds ratio.

* Only for women who had vaginal births, totaling 992 black women and 3,866 brown women;

** Use of oxytocin in order to accelerate labor. Only for women who went into labor, totaling 1,148 black women and 4,493 brown women.

intervention and healthcare professionals largely perceive these practices not only as adequate, but as indicative of "good care" [30].

In Brazil, there is an excess number of births at gestational ages of 37 and 38 weeks, which is mainly due to scheduled cesarean births [31]. However, black and brown-skinned women differ from white-skinned women in that they present higher post-term birth prevalence, probably a reflection of "less care" due to fewer interventions than necessary, which may have been required for children born post-term. Though this study was not specifically designed to address this issue, we believe this pattern of different levels of care may be related to discrimination due to race/color.

What is especially abnormal, as well as revealing of the impacts of race/color inequality, is the finding that women belonging to the most highly discriminated ethnic-racial groups are less likely to receive analgesia. Several investigations, many in the United States, have shown abnormalities in the use of analgesia in emergency services for adults and children, especially victimizing African Americans [32,33,34,35]. Results for Brazilian women, even after controlling for sociodemographic variables, indicate a lower use of analgesia in black-skinned women. A decade ago, in a study carried out in a sample of a maternity hospitals in Rio de Janeiro municipality, Leal et al. [18] also found that anesthetic procedures for vaginal births were less commonly offered to black and brown-skinned women, with even lower proportions for women with poorer education.

According to Hoffman et al. [36], it is possible that the disparity in the use of analgesia according to racial groups is associated with social perceptions based on the existence of intrinsic biological differences concerning pain sensibility. These authors interviewed medical students and residents and found that perspectives they identified as "internalized racism" were common. According to these perspectives, when comparing black and white-skinned individuals, the former were perceived to be more resistant to pain. The topic of healthcare professionals' perceptions regarding relationships between race and resistance to pain has yet to be studied in Brazil. Even though this was not systematically analyzed in the *Birth in Brazil* study, there were occasions, such as in obstetrics services in Rio de Janeiro, in which healthcare professionals made reference to the fact that black women's pelvises were better adapted to giving birth, which would justify not using analgesia.

This study's findings indicate that, beyond the events immediately surrounding birth, race/color inequalities extended to the broader process of pregnancy. Black and brown-skinned women, in addition to having fewer prenatal care appointments and exams, had poorer access to maternity hospitals for delivery and received less advice, which resulted in seeking more than one hospital and travelling long distances to give birth. The right of women to have a companion during labor was also affected, which was more often violated among black and brown-skinned women than among white-skinned women, following the color gradient. Despite the fact that the right to a freely-chosen companion is guaranteed for all pregnant women by the *Law 11,108*, the *Birth in Brazil* study found that 25% of women were left with no companions during their entire hospital stay [37,38]. As a result of several issues, especially the inability of maternity hospitals to guarantee this right to all women, some form of selection was shown to occur during admission for birth. Well-informed women who are aware of their rights, who are linked to a maternity hospital during their prenatal care, who have friends or relatives among the maternity staff, may be at an advantage. Faced with the study's data, it would not be unreasonable to imagine that black and brown-skinned women would be less likely to be granted the right to have companionship. Solitude during the hospital stay was associated with reports of greater mistreatment by the health services, a worse relationship with healthcare professionals and lower levels of satisfaction with the care provided [39].

Inequalities in access to and in the process of care, according to Donabedian [39], have distinct origins. The first is related to the structure of the health services, such as, for instance, human resources and equipment availability, geographic accessibility, service supply and acceptance of, or adhesion to, treatment; the second mainly encompasses activities carried out by healthcare professionals and is directly related to the quality and equity of the care it provides. These definitions may help to better identify critical areas for reducing the racial differences we have observed. The effects and consequences of exposure to racial discrimination for individuals and groups may be lasting, if not permanent, as is widely acknowledged in other literature on the subject. In the health field, continued racial discrimination may generate high levels of physical and psycho-social stress and contribute to poor medical practices such as not adhering to proper treatment, which could even lead to disease [40,41].

Brazilian data point to a greater prevalence of postpartum depression among black-skinned women, even after controlling for confounding factors such as socioeconomic characteristics, in addition to negative outcomes for the newborn [7].

Internationally, especially in North-American literature on racial discrimination in health services between white-skinned and African-American people, there is a growing number of studies concerning racial discrimination in health services, including at the institutional and interpersonal levels and at the level of internalizing discriminatory experiences [33]. One of the difficulties faced when conducting this type of inquiry is the availability of instruments for measuring the frequency of discrimination [42,43]. In Brazil, despite the increasingly available literature on the topic, studies are still predominantly descriptive, rarely focusing on measuring racial discrimination in healthcare services and/or analyzing user perceptions [44].

As multiple authors have highlighted, we must acknowledge the considerable intersectionality that is present in cases of discrimination, with which race/color are associated and reinforce dimensions related to the socioeconomic and gender conditions, among others [45,46]. In two nationwide Brazilian studies, carried out in 2003 and 2013, the main reasons identified for the perception of discrimination in health services were poverty and social class [47,48]. The explicit mention of race/color was much lower, occupying fifth place in both studies, which is in line with other analyses of social perceptions of relationships between race/color and health in Brazil [49]. It is worth highlighting that Boccolini et al. showed that, though women did not report race/color as the main reason for discrimination, in the multivariate analysis black-skinned women were the ones who reported discrimination most, albeit for reasons other than just race/color [48].

Differences in this study regarding satisfaction with care received during admission to childbirth among white, brown and black-skinned women were not statistically significant. One possible explanation is that this satisfaction is influenced by other factors not including those we have already discussed, such as wanting to be pregnant and negative outcomes in the newborn (prematurity, fetal death, congenital malformation, neonatal death and admission to a neonatal intensive care unit) which were not studied in this article. In a supplementary analysis, white and brown-skinned women who did not want to be pregnant, or wanted to be pregnant but not at that time, reported lower levels of satisfaction with the care they received during their hospital stay than women who wanted to be pregnant at that time, even after using the propensity score (Table 5). However, this fact was not observed among black-skinned women, which suggests that other factors may be responsible for dissatisfaction with care in this cohort.

In regard to studies on race/color inequalities in Brazil, this research is of methodological value at the level of data analysis, and has implications that go beyond the health component. Over the course of the past decade, social movements have emphasized the centrality of the "black population" ("*população negra*") construct, which generally involves the grouping together of black and brown-skinned categories [4]. With the development of policies related to race/color, there are authors who suggest that the fusion of the brown and black-skinned women categories could result in interpretations that underestimate patterns of inequality [50,51]. As such, this study's findings are illustrative of the importance of separating analyses as much as possible. For example, the association of race/color and analgesia was present in the comparison between black and white-skinned women, but would not be explicit if white-skinned women had been compared to a group consisting of both black and brown-skinned women. Therefore, when generating analytical race/color categories, both in data collection and analysis, it is important to explore associations in the different strata, without using a priori groupings, as important as they may be from a social-political perspective.

This investigation has several strengths. Firstly, this was the first national study that included primary data on labor and birth, originating from a representative sample of pregnant women in the year 2011, encompassing all Brazilian states. Secondly, the data relating to medical procedures were collected from hospital records, which increases their internal validity. Lastly, we used the propensity score matching technique, an analytical tool which enables meticulous matching of the groups being compared, making them very similar except for the variable of interest (in this study, race/color). It is a type of analysis which enables a precise adjustment of confounding factors and has been used in studies on race/color inequalities, not only cases relating to social determinants and healthcare, but also in other facets of social life (education, justice, among others) [24,52].

Table 5

Factors associated with satisfaction with childbirth care among women according to race/color after weighting by propensity score.

| | **Blacks** | | | | **Whites** | | | |
	Excellent	Good	Regular/Bad/Terrible	p-value	Excellent	Good	Regular/Bad/Terrible	p-value
Gestational age				0.75				0.38
Early preterm	44.4	44.4	11.1		42.5	43.7	13.8	
Late preterm	42.2	46.7	11.1		51.5	40.1	8.5	
Early term	50.1	37.7	12.1		51.7	40.1	8.3	
Full term	44.7	43.7	12.1		48.7	39.4	11.9	
Post-term	44.7	43.7	11.6		56.3	39.1	4.7	
Wanted to become pregnant				0.03				0.02
Yes, at that moment	49.7	37.9	12.4		52.7	38.5	8.9	
Yes, but wanted to wait longer	46.4	39.7	13.9		48	40.8	11.2	
Did not want	42.4	48.1	9.5		47.4	41.2	11.2	
Problems related to newborn *				0.03				0.02
No	46.6	42.5	10.9		50.5	39.4	10.0	
Yes	46.3	37.5	16.3		45.8	42.0	12.2	

| | **Browns** | | | | **Whites** | | | |
	Excellent	Good	Regular/Bad/Terrible	p-value	Excellent	Good	Regular/Bad/Terrible	p-value
Gestational age				0.87				0.12
Early preterm	50.0	36.2	13.8		36.1	47.5	16.4	
Late preterm	53.7	38.8	7.4		51.9	39.0	9.1	
Early term	54.8	38.0	7.2		52.1	39.1	8.8	
Full term	51.6	38.1	10.3		49.1	40.7	10.2	
Post-term	54.4	38.2	7.4		47.4	44.3	8.2	
Wanted to become pregnant				< 0.01				< 0.01
Yes, at that moment	55.8	36.7	7.6		54.0	37.9	8.1	
Yes, but wanted to wait longer	50.4	39.5	10.1		47.6	42.5	9.8	
Did not want	50.2	39.5	10.3		45.2	42.2	12.6	
Problems related to newborn *				0.04				0.06
No	53.5	37.8	8.7		50.4	40.2	9.4	
Yes	48.8	39.7	11.5		47.2	40.2	12.6	

(continues)

Table 5 (continued)

| | Blacks | | | | Browns | | | |
	Excellent	Good	Regular/Bad/Terrible	p-value	Excellent	Good	Regular/Bad/Terrible	p-value
Gestational age				0.75				0.02
Early preterm	44.4	44.4	11.1		36.6	41.2	22.1	
Late preterm	42.2	46.7	11.1		44.0	45.8	10.1	
Early term	50.1	37.7	12.1		47.2	40.7	12.1	
Full term	44.7	43.7	11.6		35.1	32.0	33.5	
Post-term	51.5	39.4	9.1		53.1	54.9	53.2	
Wanted to become pregnant				0.03				< 0.01
Yes, at that moment	49.7	37.9	12.4		49.2	40.1	10.7	
Yes, but wanted to wait longer	46.4	39.7	13.9		43.2	43.8	13.0	
Did not want	42.4	48.1	9.5		40.8	45.5	13.7	
Problems related to newborn *				0.12				0.01
No	46.6	42.5	10.9		45.2	43.1	11.7	
Yes	46.3	37.5	16.3		45.0	39.1	15.9	

* Including congenital malformation and fetal or neonatal death.

Nonetheless, this study has its limitations. One is that the *Birth in Brazil* study was not designed to specifically investigate actors and mechanisms involved with discrimination based on race in prenatal and birth healthcare services in the country. For this reason, aspects such as using a scale to measure discrimination, as well was carrying out a qualitative study on race/color, were not considered. Furthermore, in addition to the women's self-classification, it would be useful to know how healthcare professionals classify these women (hetero-classification), since this classification formed the basis for the observed inequalities. There are recent studies in Brazil which point to important differences when comparing self- and hetero-classifications on an individual level, especially within the brown-skinned category [53,54]. Lastly, despite the study's scope, we did not address all segments of the population, such as indigenous Brazilians, who are known to be vulnerable in terms of their health condition and general socioeconomic situation [55].

The improvement in the quality of healthcare requires the elimination of racial inequity. As we have shown in this study, these components should not be separated. Racial inequality in prenatal and birthcare contributes to disparities in health indicators. The Brazilian health system has as its principles of universality, comprehensiveness and social participation [56]. We recognize that these inequalities have their origins in society and that an isolated effort by the health sector may not be able to correct such inequality. Nevertheless, we suggest that the current situation is modified by eliminating racial discrimination, along with other factors, in the healthcare system, since this item is an indicator of service quality for accrediting hospitals, as recommended by Fiscella et al. [32]. At the same time, it is crucial that we broaden the debate and awareness surrounding the matter so as to identify and confront practices that potentially result in the inequities we have observed. This will be achieved primarily by educating healthcare professionals about the issue.

Contributors

M. C. Leal contributed to the study design and critically reviewed the paper; is responsible for all aspects of the article. S. G. N. Gama contributed to the study design and carried out a critical revision of the paper. A. P. E. Pereira contributed to the study design and critically reviewed the paper. V. E. Pacheco and C. N. Carmo contributed to the study design and data analysis and interpretation; critically reviewed the paper. R. V. Santos contributed to the study design and critically reviewed the paper.

Acknowledgments

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Resumo

Poucas pesquisas com foco nas influências da raça/cor no tocante à experiência de gestação e parto foram conduzidas no Brasil, sendo inédita a análise de abrangência nacional. Este estudo teve como objetivo avaliar as iniquidades na atenção pré-natal e parto de acordo com a raça/cor utilizando o método de pareamento baseado nos escores de propensão. Os dados são oriundos da pesquisa Nascer no Brasil: Pesquisa Nacional sobre Parto e Nascimento, *um estudo de base populacional de abrangência nacional com entrevista e avaliação de prontuários de 23.894 mulheres em 2011/2012. Regressões logísticas simples foram utilizadas para estimar as razões de chance (OR) e respectivos intervalos de 95% de confiança (IC95%) da raça/cor associada aos desfechos analisados. Em comparação às brancas, puérperas de cor preta possuíram maior risco de terem um pré-natal inadequado (OR = 1,6; IC95%: 1,4-1,9), falta de vinculação à maternidade (OR = 1,2; IC95%: 1,1-1,4), ausência de acompanhante (OR = 1,7; IC95%: 1,4-2,0), peregrinação para o parto (OR = 1,3; IC95%: 1,2-1,5) e menos anestesia local para episiotomia (OR = 1,5 (IC95%: 1,1-2,1). Puérperas de cor parda também tiveram maior risco de terem um pré-natal inadequado (OR = 1,2; IC95%: 1,1-1,4) e ausência de acompanhante (OR = 1,4; IC95%: 1,3-1,6) quando comparadas às brancas. Foram identificadas disparidades raciais no processo de atenção à gestação e ao parto evidenciando um gradiente de pior para melhor cuidado entre mulheres pretas, pardas e brancas.*

Grupos Étnicos; Iniquidade Social; Cuidado Pré-Natal; Tocologia

Resumen

Existen pocas investigaciones realizadas en Brasil centradas en las influencias de la raza/color, en lo que se refiere a la experiencia de la gestación y parto, siendo inédito un análisis de alcance nacional. Este estudio tuvo como objetivo evaluar las inequidades en la atención pre-natal y parto, de acuerdo a la raza/color, utilizando el método de apareamiento, basado en los marcadores de propensión. Los datos provienen de la investigación Nacer en Brasil: Investigación Nacional sobre Parto y Nacimiento, *un estudio de base poblacional de alcance nacional con entrevista y evaluación de historiales médicos de 23.894 mujeres en 2011/2012. Se utilizaron regresiones logísticas simples para estimar las razones de oportunidad (OR) y sus respectivos intervalos de un 95% de confianza (IC95%) de la raza/color asociados a los desenlaces analizados. En comparación a las blancas, las puérperas de color negro tuvieron un mayor riesgo de tener un período pre-natal inadecuado (OR = 1,6; IC95%: 1,4-1,9), falta de vinculación a la maternidad (OR = 1,2; IC95%: 1,1-1,4), ausencia de acompañante (OR = 1,7; IC95%: 1,4-2,0), grandes desplazamientos para el parto (OR = 1,3; IC95%: 1,2-1,5) y menos anestesia local para episiotomía (OR = 1,5; IC95%: 1,1-2,1). Las puérperas mulatas también tuvieron un mayor riesgo de tener un período pre-natal inadecuado (OR = 1,2; IC95%: 1,1-1,4) y ausencia de acompañante (OR = 1,4; IC95%: 1,3-1,6), cuando se comparan con las blancas. Fueron identificadas disparidades raciales en el proceso de atención a la gestación y al parto, evidenciando un gradiente de peor para mejor cuidado entre mujeres negras, mulatas y blancas.*

Grupos Étnicos; Inequidad Social; Atención Prenatal; Tocología