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Adequacy of prenatal care in Brazil and association with race/skin color: a cross-sectional study

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ABSTRACT

Objective: To estimate the magnitude of global prenatal care indicators and to verify the association between the standardized prenatal adequacy index and the race/skin color of the women. **Method**: A cross-sectional population-based study conducted with data from the National Health Survey. Bivariate analysis was performed by means of a multinomial model using Odds Ratio (OR) as a measure for association, and its respective 95% confidence intervals. **Results**: The global prevalence of adequate prenatal care for Brazilian women is 10.8%. The adequacy of prenatal care was low both for the group of white and black women, 15.51% and 8.56%, respectively; however, there was a positive association between being black and having inadequate prenatal care. **Discussion**: Although there is an increasing prenatal coverage, when considering aspects related to the adequacy of care, there is an important reduction in this percentage. **Conclusion:** Black women are less likely to have adequate prenatal care.

Keywords: Prenatal Care; Health Inequalities; Public Health.

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INTRODUCTION

Prenatal care consists of monitoring and following up the pregnancy in order to identify and intervene in the event of possible risk situations and/or complications in the pregnancy, avoiding harm to maternal and fetal health and impacting on the reduction of negative perinatal outcomes. Studies have shown, however, that there are inequalities in the access of pregnant women to this type of assistance, with women in a condition of racial/ethnic, social, and economic vulnerability obtaining the worst results in the prenatal care provided in Brazil and in the world, especially in the least developed or developing countries[1,2,3].

In order to standardize conducts in prenatal and obstetric care in Brazil and to provide an equal reach of actions, in 2000 the Federal Government created the Program for the Humanization of Prenatal and Birth (PHPB) and in 2006 reiterated the guidelines through the Technical Manual on qualified and humanized care in prenatal care; both documents aimed at defining minimum criteria and procedures so that assistance in this area is carried out properly and reaches its objective in the entire population of women, regardless of race/skin color, class, nationality, or any other condition.

However, due to the persistence of avoidable negative outcomes in the gestational and parturitive period, many studies have devoted attention to the term "adequacy of prenatal care", which refers to the success of the desired effects on women's health in the gestational and postpartum period.[4,5,6,7].

The high rates of maternal and perinatal mortality, in addition to intercurrences, such as low birth weight, in the midst of almost 100% prenatal coverage, have raised questions about the quality of care offered and the population's access to this service[8,5,9].

Thinking then about the definition of conducts that can be applied in different socio-cultural and health contexts, the use of predefined parameters of adequate prenatal indicators and the creation of adequacy indexes are tools that operate to facilitate the comparability of results obtained and promote the use of more uniform criteria[10].

Regarding inequities in women's health care, the literature has shown that black women, with low schooling and an unfavorable economic condition, are more exposed to inadequate treatments and have less access to preventive care and procedures, especially in the area of reproductive health[3,11]. In this sense, health indicators confirm that black women are the main victims of illness and death due to obstetric causes and experience greater inadequacy in the prenatal care[4,5,2].

Taking into account that the skin color of women can have an influence on the type of prenatal care received, several research studies have highlighted that, in addition to less adequate assistance provided to black women, there is a strong association between skin color and family income, schooling and the use of public health services, these women being the least favored social sector[11,12].

In this sense, population-based studies with national and local data have pointed to the insistent relationship between discrimination and some health problems prevalent among black women in Brazil[2,7].

Recognizing the importance of studies that address racial inequality in the use of ade-

quate services and the identification of any and all forms of discrimination in health care, this study aims to estimate the magnitude of the global indicators of prenatal care and to verify the association between the standardized prenatal adequacy index and the race/skin color of the women.

METHOD

In this study, we used the minimum guidelines proposed by the Program for the Humanization of Prenatal and Birth (PHPB) and the Technical Manual for low-risk prenatal care (BRAZIL, 2012b) to build the adequacy index of prenatal care, standardized based on the z score. This is a cross-sectional population-based study, carried out with data from the National Health Survey (NHS), released through the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística*, BGE). The main objective of this type of research and of the studies that use it to produce knowledge is to provide nationally representative data on the health situation and lifestyles of the Brazilian population, as well as on the dynamics of health care, highlighting access to and use of the services, preventive actions, continuity of care, and financing of health care.

The NHS is a household survey carried out by means of conglomerate sampling in three stages: the census sectors or set of sectors, which are the primary sampling units; the households, which form the secondary units and the residents aged 18 or over who represent the third stage; among these, we highlight the women who had a childbirth in the period from 10/28/2011 to 07/27/2013, considering as the last childbirth.

The study's population was composed of 1,851 women who underwent prenatal care between 2011 and 2013, distributed throughout Brazil; however, there was a 2.1% loss related to non-response to specific questions in the research questionnaire, and the analysis was carried out with 1,812 women. The study's exposure variable was the race/skin color of the women who underwent prenatal care. The definition of race/skin color used by the IBGE was considered, which currently consists of the following skin colors/races/ethnicities: white, black, brown, indigenous and yellow and, for this study, self-declared black and brown women are classified as "black".

The indicators of adequate prenatal care were defined according to the guidance of the PHPB, of the Technical Manual for cares related to low-risk prenatal care and complemented by questions regarding counseling during the monitoring of pregnant women, resulting from the answers present in the NHS questionnaire. Together, they composed the "prenatal adequacy index" outcome variable, of the polytomous type, with the response categories classified as: Adequate, Intermediate, and Inadequate. Adequate prenatal care was considered to be one that met the criteria of the 21 binary variables being used, namely: first consultation done until the 12th week of gestation, minimum of 6 consultations, request for HIV testing, request for urinary examination, laboratory tests (blood count, syphilis serology - venereal disease research laboratory test - VDRL, and anti-HIV testing), clinical obstetric assessment (blood pressure measurement, weight measurement, uterine height measurement, heart

rate evaluation and physical examination of the breasts), provision of advice related to smoking, alcohol, hair dye, absence from appointments, healthy eating; and guidance on signs of labor, signs of obstetric risk, guidance on breastfeeding and on the reference maternity for childbirth assistance.

The creation of the prenatal adequacy index was performed by obtaining a standardized score that is based on the z score. In it, from the 21 binary variables used as indicators, a score was generated that ranged from 0 to 21 points for the i-th woman, i = 1,2,3, ..., 1,851 and these notes were transformed into standard deviation units or z scores(a). The calculation of the z score deals with the distance of each woman in relation to the mean.The theoretical distribution of the z score has a mean of zero (μ=0) and a standard deviation of 1.0 (σ=1.0), which means that an original value equal to the mean is equivalent to z=0. For analysis purposes, the cut-off point was adopted at 1.0 Standard Deviation (SD) and the scores created were categorized at three levels: a) Inadequate (<-1sd), b) Intermediate (-1sd to +1sd) and, c) Adequate (>+1sd).

Figure 1 displays the normal curve that demonstrates the standardized score created, which represents the distance, in standard deviations, from the original score of the i-th woman in relation to the sample mean of the study.

Data analysis was performed using descriptive statistics, obtaining measures of central tendency (means, medians, and standard deviation), frequencies, and percentages. The bivariate tabular analysis was performed using a multinomial model to verify the association of the race/skin color variable (white and black group) with the prenatal adequacy index. The gross and adjusted Odds Ratios (ORs) and their respective 95% confidence intervals were used as a measure of association. The "Inadequate" category was the level of the outcome adopted as a reference,

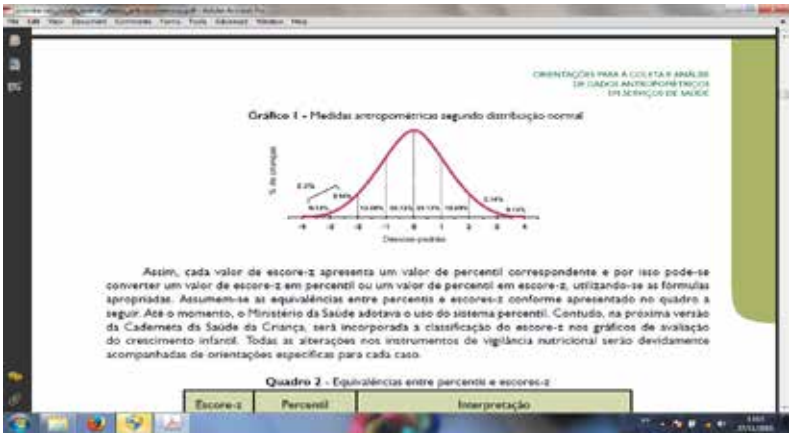

Fig1. Distribution of the adequacy index for prenatal care according to the standard normal curve (Z SCORE). Brazil, 2011-2013.

a) <-1sd (Inadequate): It is expected that in a population with adequate prenatal care, 15.9% of the women will be found below this value.
b) -1sd to +1sd (Intermediate): It is expected that in a population with adequate prenatal care, 68.26% of the women will be found among these values.
c) >+1sd (Adequate): It is expected that in a population with adequate prenatal care, 15.9% of the women above this value will be found.

thus comparing and obtaining the OR of the black race/skin color in relation to the white according to the intermediate and adequate levels, respectively.

For this study, the data used came from a public domain source, from a research approved by the National Research Ethics Commission - Conep, of the National Health Council - NHC, in June 2013, as a prerequisite for the disclosure of the data from the National Health Survey. In these provisions, this study did not need to be assessed by a local ethics committee.

RESULTS

Table 1 shows the distribution of the women according to sociodemographic characteristics. The mean age of the study population is 27 years old (SD 6.2), mostly black (65.9%). Women predominated with a steady partner (78.1%), high-school education (44.8%), employed by a public or private company (26.7%), and with an income between 1 and 3 minimum wages (25.9%). Just over a third of the women were primiparous before the pregnancy that investigated the characteristics of prenatal care (37.5%) and 70.8% used the SUS to perform the follow-up.

The prenatal adequacy index shown in **Table 2** demonstrated that there was a greater concentration of women in the category of Intermediate prenatal care, 73.04%, followed by those who had assistance classified as Inadequate (16.15%) according to the requirements of the PHPB and of the Technical Manual for the low-risk pre-natal. The lowest overall proportion was related to the performance of prenatal care considered adequate for Brazilian women in the period from 2011 to 2013, only 10.8%.

Table 3 shows the adequacy index created from the standardization that is based on the z score, according to the race/skin color of the women who underwent prenatal care in Brazil between 2011 and 2013. The adequacy of prenatal care was low both for the group of white women and for the group of black women, 15.51% and 8.56%, respectively; however, there was a positive association between being black and having had inadequate prenatal care.

Regarding the "Intermediate" adequacy level, a statistical difference was observed between the groups. Black women registered a 25% lower chance of having an intermediate prenatal care when compared to white women (OR=0.75; 95% CI 0.57-0.99). With regard to adequate prenatal care, it was found that white women are more prevalent at this level of follow-up and, in this study, being black meant a 60% chance of obtaining assistance considered adequate according to the pre-criteria defined by the Ministry of Health, showing statistically significant differences between the groups (OR=0.40; 95% CI: 0.28-0.59).

In the adjusted model, the categories showed the same meaning as the unadjusted model, but with a decrease in the effects on the outcome. While the level of intermediate adequacy lost magnitude in association with race/skin color, the "Adequate" category remained statistically significant at the level of 5%. In the first category, there was a 7% loss of effect and in the second, referring to the "Adequate" level, the reduction was only 5%.

Table 1. Distribution of women who underwent prenatal care in Brazil, according to sociodemographic characteristics. Brazil, 2013.

Characteristic Sociodemographic	Women who performed prenatal care in Brazil between 2011 and 2013	
	N	%
Age Group (1,851)		
18 to 24 years old	606	33.4
25 to 35 years old	980	54.1
≥ 36 years old	226	12.5
Conjugality (1,812)		
With partner	1,416	78.1
No partner	396	21.8
Schooling (1,812)		
No schooling	120	6.6
Elementary school	572	31.6
High school	812	44.8
Higher education	308	17.0
Occupation (1,812)		
Non-remunerated	21	1.2
Freelancer	149	8.2
Housekeeper	83	4.6
Public/Private employee	483	26.7
Employer	14	0.8
Not informed	1,062	58.6
Monthly income (1,812)		
≤ 1 minimum wage	170	9.4
1 to 3 minimum wages	470	25.9
≥ 4 minimum wages	87	4.8
Not informed	1,085	59.9
Parity (1,812)		
1 childbirth	680	37.5
2 childbirths	590	32.6
≥ 3 childbirths	542	29.9
Type of service (1,786)		
Exclusively public	1,310	70.8
Public and private	79	4.3
Exclusively private	435	23.5

a. Monthly income of 678.00 reais in 2013
Source: National Health Survey/IBGE. 2013

Table 2. Distribution of the women who underwent prenatal care according to the global prenatal adequacy index. Brazil, 2013

Adequacy index	Z score	N	(%)
Inadequate (2-14)	< -1sd	299	16.15
Intermediate (15-20)	-1sd at +1	1,352	73.04
Adequate (21)	>+1sd	200	10.80

Source: National Health Survey/IBGE. 2013

Table 3. Association between the standardized adequacy index of prenatal care and the race/skin color of women, adjusted by age, education, and marital status. Brazil, 2013.

	White (n=593)	**Black** (n=1,219)		
Adequacy index (z score)	n Prev%	n Prev%	Gross OR (95% CI)	OR (95% CI) adjusted to
Inadequate	77 (12.98)	217 (17.80)		
Intermediate	424 (71.50)	897 (73.58)	0.75 (0.57-0.99)	0.82 (0.61-1.10)
Adequate	92 (15.51)	105 (8.61)	0.40 (0.28-0.59)	0.45 (0.30-0.67)

a. Adjusted by the age, education, and marital status variables
Source: National Health Survey/IBGE. 2013

DISCUSSION

The results of this study indicate that, although the coverage of prenatal care has increased throughout Brazil, only 10.8% of the women received assistance considered adequate according to the minimum criteria established by the Program for the Humanization of Prenatal Care and Birth. Previous studies similar to this one also indicate low rates of global adequacy, although they are higher than what was found in our study: 21.6%, 25.7%, and 22.6% respectively[6,14,12]. In this regard, institutional data and studies developed in Brazil highlight that, although we have increasing prenatal coverage, when considering aspects related to the adequacy of care, there is an important reduction in this percentage[15,2,6]. In a study carried out in Mexico, the differences in coverage of care by identified geographic areas between the states were also highlighted, emphasizing that the probability of receiving adequate prenatal care is greater in places with women of higher socioeconomic status, with more years of experience of education and health insurance, being a scenario similar to the Brazilian one[11,15].

In an investigation carried out with women users of the public health service in the legal Amazon and in cities in the Northeast, it was demonstrated, similarly to our findings, that the lowest percentage of users comprised the group that performed an adequate prenatal care, presenting, however, a lower rate than our survey, of only 1.5% in Acre and 6.3% in Rio Grande do Norte. The rate of inadequacy in our study, in turn, was twice as high as that identified in these locations, 16.15% and 8% respectively; the intermediate level of adequacy was represented by the highest percentage of women, as well as our results, showing that the majority of pregnant women, both regionally and nationally, still experience a partially inadequate care[4].

The differences in the concepts of adequacy of prenatal care may vary according to the inclusion of the components used in the creation of the indexes and, therefore, generate limitations in the comparison of the adequacy indicators[16,17]. However, when using the same standardized parameters and indexes in the studies, it is possible to establish parallels between the research studies and to provide results that can be compared and generalized. A number of studies that also used the PHPB have converged with our results as, using this program as a minimum protocol of actions that seeks to standard-

ize conduct in obstetric care in Brazil, it demonstrates its qualitative scope and the differences in the distribution of assistance in the population[10].

The national and international scientific literature has highlighted that prenatal care is unevenly distributed among women, and the levels of adequacy are strongly associated with the sociodemographic issues[1,2,6,12,3,11]. In this sense, we draw the attention to the racial aspect as a prominent point in the theme of access to adequate care, about which our study highlights that the highest percentage of women who experienced inadequate prenatal care in Brazil declared themselves as black while, for assistance considered adequate, white women represented almost twice the population when compared to black women.

For Leal and collaborators, the scenario of inequality between black and white women is related to both racial discrimination and structural factors, such as income and education[6]. On this last factor, a study in Bangladesh denounces the relationship between the low social status of the women and the difficulty of making decisions about the use of maternal care[1]. In a study, with a majority of the black population, the women studied associated the low quality of the received care with racial and social discrimination, denouncing superficial care, with more time spent for the care of white women. Accordingly, Massignam emphasizes that, in addition to race/skin color, low purchasing power and social class are common reasons for discrimination in health care and should also be considered among the social markers of inequality[18].

A nationwide study on racial differences in access to care during pregnancy and childbirth showed that in socioeconomic terms and access to health, black women exhibited disadvantages, occupying the lowest economic classes, having the lowest years of schooling, the worst incomes and having inadequate access to prenatal procedures, as well as exhibiting worse experiences during the childbirth, with less attachment to motherhood, greater absence of a companion and pilgrimage to childbirth, in addition to a history of less local anesthesia for episiotomy[2,5]. These women are exposed to at least triple discrimination of gender, race, and class, which hinders access to the health services and interferes with their processes of illness and death.

Regarding the research studies on the adequacy of prenatal care, focused on the investigation of characteristics that mark social inequities, with an emphasis on skin color, it is highlighted that women with black skin, with little education and low income are often those who experience more inadequate assistance[12]. This fact was confirmed by studies that evaluated the adequacy of prenatal care in Brazil and worldwide, with results referring to the population of the United States of America, national data and in specific regions of Brazil, where the highest percentage of non-white women corresponded to those who had their prenatal care classified as inadequate, both in the global aspect and for performing isolated procedures[19,2,12, 13].

The association of race/skin color with family income and the use of public health services has been reiterated by several studies, showing that black women, less economically favored, have less access to private insurance

and, therefore, are the ones who most use public services, including prenatal care[2,4]. A survey carried out in Sub-Saharan Africa, Serra Loa, which analyzed maternal care in the public health service, found out that structural inequalities influence the degree in which women in different social classes can access and use maternal health services at an adequate quality level[20].

Therefore, black women, priority users of the Unified Health System (*Sistema Único de Saúde*, SUS), are more exposed to the limitations of the functioning of the public network, mainly because they face inequities in care, obtaining the worst results while using the services. In a population-based survey, Almeida et al. emphasize that the access barriers are important reasons for not performing prenatal care[2]. Other studies highlight the inadequacy of assistance as an effect of multi-factors that contribute to failure in using the health service, like structural and organizational issues of the system and the individual aspects of the user, making the women most affected by the occurrence of negative outcomes be the least benefited by prenatal care[15,11,20].

FINAL CONSIDERATIONS

Our findings point out to a global adequacy for prenatal care of 10.8%, below what has been pointed out by the national literature. The results also show an association between the level of prenatal adequacy and race/skin color, showing that black women are less likely to have a prenatal care considered adequate according to the adequacy criteria proposed by the Ministry of Health. We also evidenced that a large part of the Brazilian women is placed in the range that configures an intermediate prenatal care as for adequacy, which shows that, even after the great increase in the coverage of prenatal care in recent years, most Brazilian women still experience superficial care and no guarantee of quality of care, which is accentuated when these women are black and poor.

The model adjustment according to age, schooling and marital status shows that the response categories remain within the same meaning as the unadjusted model, with a small decrease in the effects on the outcome. In this sense, the "Adequate" level regarding prenatal care remained statistically significant even after adjustment, which allows inferring that black women are unable to achieve the adequacy of prenatal care even when socioeconomic factors are adjusted so as not to interfere in this result, which shows that racism may be the factor that operates in the women's access to qualified health services.

This study proposed to create a prenatal adequacy index that is based on the guidelines of the PHPB and of the technical manual for low risk prenatal care, signaling them in the methodological description, and used the standardization of the index through the Z score, which works with measures of central tendency such as mean and standard deviation, facilitating the comparison, in order to remedy the limitation of the study regarding the diversity of concepts related to the adequacy of prenatal care, which may come to generate limitations in the comparability between the studies. Because those are recent national data, their importance for monitoring the applicability and effectiveness of

the PHPB and the implementation of actions guided by standards and technical manuals is highlighted, thus being an important tool capable of generating programmatic and strategic actions.

It is important to discuss the racial and social issues that involve the general population, and the female in particular, and to encourage studies and actions on the processes of social exclusion caused by racism and impoverishment in our society. Its implications for care are fundamental to understand the dynamics of the health/disease processes.

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