

## HIGH-RISK PREGNANCY DUE TO HYPERTENSION: CHILDBIRTH CARE AND ASSOCIATED FACTORS

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### Highlights:

(1). Maternal age and parity among high-risk pregnant women influence the choice of maternity facility. (2). High-risk pregnant women face difficulties in accessing maternity services. (3). Humanization guidelines are not effectively implemented in maternity hospitals within the Rede Cegonha program.

PRE-PROOF

(as accepted)

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### ABSTRACT

This study aimed to analyze the factors associated with high-risk pregnancy due to hypertension, as well as childbirth care in a high-complexity public maternity hospital linked to the Stork Network Program. This was a cross-sectional observational study conducted in a state tertiary referral maternity hospital for high-risk pregnancy and childbirth, part of the Stork Network Program, located in Fortaleza, Ceará, Brazil. A total of 300 postpartum women with high-risk deliveries participated. Most participants had low socioeconomic conditions and lived in situations of social vulnerability. Statistical associations were observed between age group and parity ( $p < 0.001$ ), educational level and first pregnancy ( $p = 0.002$ ), maternal age and choice of maternity hospital ( $p = 0.03$ ), and age and not being admitted at the first maternity hospital visited ( $p = 0.014$ ). High-risk pregnant women in socially vulnerable situations had access to prenatal care, starting in the first trimester, but faced difficulties in accessing maternity services, often going through two or more facilities in search of childbirth care. The maternity hospitals did not guarantee all the rights of pregnant women, weakening the humanization of care during childbirth and the postpartum period.

**Keywords:** High-Risk Pregnancy; Childbirth Care; Hypertension.

### INTRODUCTION

Obstetric care in Brazil has been the focus of public policies aimed at reorienting the model of care for women throughout the pregnancy-puerperal cycle. This process reflects a historical, political, and social construction within the Brazilian health system, designed to reduce maternal and infant mortality. Since the 1980s, women's health has been included in the governmental agenda, with investments directed toward expanding access to health care for women of childbearing age, such as through the Comprehensive Women's Health Care Program (Programa de Assistência Integral à Saúde da Mulher – PAISM). In pursuit of humanization and improved quality of maternal and child health care, further policies were implemented, including the Prenatal and Birth Humanization Program (Programa de Humanização do Pré-Natal e Nascimento – PHPN) in 2000, the National Policy for Comprehensive Women's Health Care (Política Nacional de Atenção Integral à Saúde da Mulher – PNAISM) in 2004, the establishment of the Stork Network Program (*Rede Cegonha* in Portuguese) in 2011, and the National Policy for Comprehensive Child

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Health Care (*Política Nacional de Atenção Integral à Saúde da Criança – PNAISC* in Portuguese). These initiatives established guidelines for organizing health practices and services<sup>1-4</sup>.

It is also noteworthy that the improvement of maternal health care was included among the Millennium Development Goals (MDGs) defined by the World Health Organization (WHO) in 2000, with specific targets set for 2015. Evaluations indicated that health indicators improved across various countries, including those specifically related to maternal health. Although not all goals were fully achieved, progress was positively assessed, leading to the adoption of new global actions and targets, among them reducing maternal mortality to fewer than 70 deaths per 100,000 live births, as incorporated in the “Transforming our World: The 2030 Agenda for Sustainable Development”<sup>2,5</sup>.

In Brazil, despite a decline in maternal mortality rates, the average in 2016 was 58 maternal deaths per 100,000 live births. In the state of Ceará, maternal mortality exceeded the national average, reaching 98 maternal deaths per 100,000 live births, with hypertension as the leading obstetric complication, followed by hemorrhage<sup>6</sup>.

The implementation of these public policies has yielded positive results in Brazil, particularly in reducing maternal and infant mortality. However, progress has not been uniform across regions<sup>4</sup>, likely reflecting social inequalities and disparities in access to health care. Furthermore, obstetric care remains characterized by the inappropriate use of interventions during the physiological process of childbirth, as evidenced by high rates of cesarean sections, episiotomies, amniotomies, and the administration of oxytocin—practices that may harm the mother-infant dyad. Consequently, maternal and neonatal morbidity and mortality persist, resulting both from barriers to accessing services and evidence-based practices and from the misuse of medical technologies<sup>1</sup>. This underscores ongoing challenges in guaranteeing both access to and the quality of care, particularly for high-risk pregnancies.

High-risk pregnancy is characterized when women present clinical and/or obstetric conditions that endanger their own health and/or that of the fetus. These conditions, inherent to pregnancy, can trigger metabolic changes. In this context, hypertension during pregnancy is one of the main causes of maternal and perinatal morbidity and mortality, occurring in approximately 10% of pregnancies worldwide. In Brazil, prevalence ranges from 0.6% to 31.4% of all pregnancies<sup>7</sup>.

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The creation of the Stork Network Program, the first thematic network within the Unified Health System (SUS), represented a strategy to ensure access to and the quality of obstetric care, with the overarching goal of reducing maternal mortality. Among its objectives are: early enrollment in prenatal care with risk classification to guarantee timely access to high-risk prenatal care; management of complications during pregnancy; provision of diagnostic tests for both low- and high-risk pregnant women; referral and linkage to maternity hospitals for delivery; and the implementation of evidence-based practices for childbirth and newborn care, including the presence of a companion of the woman's choice<sup>2,8</sup>.

Nonetheless, despite improved access to prenatal care in primary health care settings, studies reveal persistent weaknesses in the Stork Network Program. Chief among them is the difficulty of effectively linking pregnant women to referral maternity hospitals, which undermines continuity of care. This often results in women—particularly those with high-risk pregnancies—seeking care at two or more maternity hospitals during labor, a situation that worsens clinical conditions and increases the risk of maternal death<sup>9,2</sup>.

Within this perspective, it is essential to develop studies that analyze dimensions of childbirth care in maternity hospitals participating in the Stork Network Program, taking into account the factors associated with high-risk pregnancy, especially those related to hypertension, which remains the leading cause of obstetric complications. It is also relevant to investigate childbirth care in high-complexity maternity hospitals linked to the Stork Network Program, given their mandate to improve access and quality of obstetric care, while recognizing the challenges that may persist in the organization of services and clinical practices. Such analyses can inform the development of targeted interventions. Accordingly, this study aimed to analyze the factors associated with high-risk pregnancy due to hypertension, as well as childbirth care provided in a high-complexity public maternity hospital participating in the Stork Network Program.

### **MATERIALS AND METHODS**

This was a cross-sectional observational study conducted in a tertiary maternity hospital, a state reference center for high-risk pregnancy and childbirth, integrated into the Stork Network Program, and located in Fortaleza, Ceará, Brazil. It is noteworthy that three high-complexity maternity hospitals operate in the state capital, and the study site was selected based on the

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following criteria: (1) the first to implement childbirth and birth humanization processes through initiatives such as the National Program for the Humanization of Prenatal and Birth Care (Programa Nacional de Humanização do Pré-Natal e Nascimento) and the National Policy for the Humanization of Health Care and Management (Política Nacional de Humanização da Atenção e Gestão em Saúde – PNH); (2) the first to implement the Kangaroo Method; (3) participation in the Qualification Plan for Maternities and Perinatal Networks; (4) the first maternity hospital in the state to establish a Casa da Gestante (Mother's Home) to accommodate high-risk pregnant women referred from rural areas; and (5) certified as a Baby-Friendly Hospital.

The study sample consisted of 300 postpartum women whose pregnancies were classified as high risk and who gave birth at the selected tertiary maternity hospital in Fortaleza. Sample size calculation was based on the total of 3,882 deliveries in 2017 among women admitted to this maternity hospital due to complications arising from hypertensive disorders of pregnancy. A simple random probability sampling method was applied.

Inclusion criteria were: age  $\geq 18$  years, prenatal care performed in the public health system, classification of pregnancy as high risk related to hypertension, residence in Ceará, and clinical condition permitting interview participation. Exclusion criteria were postpartum women admitted to the intensive care unit during data collection. It is noteworthy that all invited participants agreed to take part in the study.

Data collection was conducted from the first week of May 2018 to January 2019 and was carried out exclusively by a trained obstetric nurse responsible for approaching participants and applying the research instrument. Secondary data sources included medical records of the postpartum women hospitalized for delivery in the maternity hospital studied and birth certificates of their newborns. For this purpose, a structured form was used to register the study variables. Primary data were obtained using a questionnaire developed based on the Commitment Term for Maternal Death Reduction<sup>10</sup>, a document inherent to the structure of the Stork Network Program, which was applied directly to the participants.

The variables considered in this study included (1) sociodemographic factors, such as age, marital status, educational level, income, self-reported race, place of residence, employment, and housing conditions; (2) obstetric factors, including gestational age at the first prenatal consultation, number of prenatal consultations, location of prenatal care, number of children, number of abortions

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and deliveries, gestational age at delivery, information regarding pregnancy risk, and referral to high-risk prenatal care; and (3) factors related to childbirth care, such as linkage to a maternity hospital, choice of maternity hospital, admission to the first chosen maternity hospital, reasons for seeking maternity care, and type of delivery.

Data were analyzed using Stata version 14.0. For qualitative variables, descriptive statistics were applied, calculating absolute and relative frequencies. After testing data normality using the Shapiro-Wilk test ( $p < 0.05$ ), 95% confidence intervals and the 25th and 75th percentiles were calculated. The Chi-square test, Mann-Whitney test, and Kruskal-Wallis test were performed to verify associations between sociodemographic variables and obstetric or childbirth care-related variables. A significance level of 5% ( $p < 0.05$ ) was adopted for all analyses.

The study was approved by the Research Ethics Committee of the Ceará State University (Certificate no. 70225917.8.0000.5534) and the Dr. Cesar Cals General Hospital (Certificate no. 70225917.8.3001.5041). Participants were informed about the study objectives, assured of their right to refuse participation, and guaranteed anonymity and confidentiality. The first contact with participants occurred in the maternity ward, after which the data collection instrument was applied in a private space provided by the hospital staff. Written informed consent was obtained prior to participation, in compliance with all ethical principles governing research involving human subjects.

### **RESULTS**

Table 1 shows that the majority of postpartum women (77.3%) were aged 35 years or younger, lived with a partner (78.7%), and had an income below the minimum wage (77.0%). Slightly more than half had no source of income (52.0%), most did not own housing (60.7%), and just over half were from rural areas of the state (51.0%). These findings indicate that the maternity hospital is integrated into the hierarchical network of health services and functions as a state referral center for high-risk pregnancy and childbirth, including open-access care through its obstetric emergency unit.

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Table 1. Sociodemographic characteristics of high-risk pregnant women assisted at the emergency department of a public maternity hospital participating in the Stork Network Program. Fortaleza, Ceará, Brazil, 2023.

Variables	Result (n)	%
Age (years)		
≤35	232	77.3
>35	68	22.7
Own income		
No income	156	52.0
<1 minimum wage <sup>1</sup>	109	36.3
1-3 minimum wages	34	11.3
>3 minimum wages	1	0.3
Household income		
<1 minimum wage <sup>1</sup>	231	77.0
1-3 minimum wages	68	22.7
>3 minimum wages	1	0.3
Educational level		
Illiterate	1	0.3
Elementary school	109	36.3
High school	157	52.3
Higher education	33	11.0
Place of residence		
Capital	147	49.0
Countryside	153	51.0
Marital status		
With partner	236	78.7
Without partner	64	21.3
Employment status		
Employed	139	46.3
Unemployed	156	52.0
Receiving benefits	5	1.7
Home ownership		
Yes	117	39.3
No	181	60.7
		<b>Mean (sd)*</b>
Total household residents		2.43 (0.53)

<sup>1</sup> Minimum wage in Brazil in 2023 = R\$ 954.00.

\* standard deviation

Regarding obstetric characteristics of pregnant women with hypertension (Table 2), most women (71.5%) reported that the pregnancy was unplanned, and the majority had no history of abortion (76.9%). Less than half (44.7%) were primigravida, and slightly more than half (51.7%) had no previous children. Nearly all participants attended prenatal care (98.0%), with the majority

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beginning care in the first trimester (90.7%), and most attending six or more consultations (73.0%), primarily at Family Health Units (93.0%). Furthermore, the majority of women were referred to high-risk prenatal care (57.7%) during the second trimester, although a smaller proportion (37.3%) had been informed about their pregnancy-related risk.

Table 2. Obstetric characteristics of high-risk pregnant women assisted at a public maternity hospital participating in the Stork Network Program. Fortaleza, Ceará, Brazil, 2023.

Variables	Result	%
	N	
Prenatal care		
Sim	294	98.0
Não	6	2.0
Prenatal care location		
Family health unit	279	93.0
Hospital	15	5.0
Other	6	2.0
Number of consultations		
< 6	75	25.0
6	42	14.0
>6	177	59.0
None	6	2.0
Planned pregnancy		
Yes	85	28.5
No	213	71.5
Prenatal care initiation		
1st trimester	272	90.7
2nd trimester	22	7.3
Not applicable <sup>1</sup>	6	2.0
Parity		
1 pregnancy (Nulliparous)	134	44.7
2-3 pregnancies (Multiparous)	121	40.3
≥4 pregnancies (Grand multiparous)	45	15.0
Informed about pregnancy risk during prenatal care		
Yes	112	37.3
No	188	62.7
Referred to high-risk prenatal care		
1st trimester	26	25.0
2nd trimester	60	57.7
3rd trimester	18	17.3
Linkage with maternity hospital during prenatal care		
Yes	287	95.7
No	7	2.3
Unknown	6	2.0

<sup>1</sup>Not applicable – corresponds to women who did not attend any prenatal consultations.



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During prenatal care in facilities integrated into the Stork Network Program, pregnant women should be linked to a maternity hospital to facilitate access to childbirth care. Indeed, the majority of study participants (95.7%) reported being informed about the maternity hospital to which they were linked for delivery (Table 2).

Regarding childbirth care characteristics, Table 3 shows that, despite being linked to a maternity hospital for delivery, only a small proportion of participants (16.0%) were actually linked to the maternity hospital under study. Furthermore, the largest proportion (39.0%) was not admitted to the linked hospital due to lack of available beds, and another portion (36.7%) was referred from hospitals or maternity units that do not provide high-risk delivery services, located in rural areas of the state. It is noteworthy that most women (82.0%) were examined at the first maternity hospital they sought for delivery care.

However, all postpartum women (100.0%) reported feeling welcomed at the maternity hospital under study. Initial care was provided in the obstetric emergency department by a nursing technician (99.3%) for information collection and vital signs assessment. Subsequently, all participants were directed to the risk-assessment reception area, with the largest proportion classified as “red” (66.0%). These findings indicate that the maternity hospital studied has a structured care flow in which all pregnant women are evaluated and maternal-fetal risks are classified. Upon admission, all women received a medical diagnosis of hypertension, with the majority specified as severe preeclampsia (56.0%). All women received prescribed medication.

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Table 3. Distribution of variables characterizing high-risk childbirth care at a public maternity hospital participating in the Stork Network Program. Fortaleza, Ceará, Brazil, 2023.

Variables	Result	%
	N	
Choice of maternity hospital for delivery		
Linked during prenatal care	48	16.0
Close to home	9	3.0
First maternity hospital full	117	39.0
Recommended by friends	16	5.3
Referred from hospital/maternity in rural areas	110	36.7
Reason for non-admission to first maternity hospital		
No obstetric bed available	117	39.0
No neonatal unit bed available	1	0.3
Does not provide high-risk delivery	110	36.7
Not a referral maternity	1	0.3
Not applicable <sup>1</sup>	71	23.7
Examined at first maternity hospital sought		
Yes	246	82.0
No	54	18.0
Gestational age at delivery		
<25 weeks	1	0.3
25-36 weeks	126	42.0
≥37 weeks	173	57.7
Type of delivery		
Vaginal	21	7.0
Cesarean	279	93.0
Newborn care		
Rooming-in	161	53.7
Neonatal Intensive Care Unit	139	46.3

<sup>1</sup>Not applicable = the woman was admitted to the first maternity hospital she sought.

Regarding delivery, the majority of births occurred at a gestational age of 37 weeks or more (57.7%). Cesarean delivery was performed in most postpartum women in this study (93.0%). It is noteworthy that most participants arrived at the maternity hospital accompanied by a companion (75.3%); however, they did not have a companion of their choice during delivery (98.0%) (Table 3).

Table 4 shows a statistically significant association between age group and parity ( $p < 0.001$ ), with the highest concentration of women aged 35 years or younger corresponding to primigravida status. An association was also observed between educational level and primigravida status ( $p = 0.002$ ).

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Table 4. Association of sociodemographic variables with obstetric characteristics of high-risk pregnant women at a maternity hospital participating in the Stork Network Program. Fortaleza, Ceará, Brazil, 2023.

Variables	Type of delivery		p*	Gestational age at delivery			p*	N of pregnancies			p*
	Normal	esarean		<25 weeks	25-36 weeks	≥37 weeks		1 pregnancy	2-3 pregnancies	4 pregnancies	
	n (%)			n (%)				n (%)			
Age			0.503				.412				<0.001
≤35	15 (6.5)	217(93.5)		0	93 (40.1)	138(59.9)		119(51.3)	92(39.7)	21 (9.0)	
>35	6 (8.8)	62 (91.2)		0	33 (48.1)	35 (51.9)		15 (22.1)	29 (42.6)	24 (35.3)	
Education level			0.828				.798				0.002
Illiterate	0	1 (100.0)		0	0	1 (100.0)		1 (100.0)	0	0	
Elementary school	6(5.5)	103(94.5)		0	51 (46.8)	58 (53.2)		38 (34.9)	42(38.5)	29(26.7)	
High school	3 (8.28)	144(72)		1(0.64)	62 (39.49)	94 (59.87)		77 (49.04)	65(41.40)	15 (9.55)	
Higher education	2(6.06)	31 (93.94)		0	13 (39.39)	20 (60.61)		18 (54.55)	14(42.42)	1(3.03)	
Own income			0.730				.879				0.224
No income	9 (5.8)	147 (94.3)		1(0.6)	64 (41.0)	91 (58.3)		79(50.6)	57(36.5)	20(12.8)	
<1 minimum wage	10 (9.2)	99 (90.8)		0	46 (42.2)	63 (57.8)		38 (34.9)	5 (47.7)	19(17.4)	
1-3 minimum wages	2(5.9)	32(94.1)		0	15 (44.1)	19 (55.9)		16 (47.1)	12 (35.3)	6 (17.6)	
>3 minimum wages	0	1 (100.0)		0	1 (100.0)	0		1(100.0)	0	0	
Family income			0.956				.298				0.686
<1 minimum wage	16(6.9)	215(93.1)		0	98 (42.4)	133 (57.6)		106 (45.9)	90 (38.9)	35(15.1)	
1-3 minimum wages	5(7.3)	63 (92.7)		1 (1.5)	27 (39.7)	40 (58.8)		27 (39.7)	31(45.6)	10(14.7)	
>3 minimum wages	0	1 (100)		0	1(100)	0		1 (100)	0	0	

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Regarding childbirth care, a statistically significant association was observed between maternal age and the choice of maternity hospital ( $p = 0.03$ ), as well as with non-admission to the first maternity hospital sought by the pregnant woman ( $p = 0.014$ ). This highlights the challenges in providing care to women with hypertension, where linkage during prenatal care and/or referral by physicians from facilities in rural areas does not guarantee admission to the first maternity hospital sought for delivery (Table 5).

Table 5. Association of sociodemographic variables with obstetric characteristics and admission to the emergency department of a public maternity hospital participating in the Stork Network Program. Fortaleza, Ceará, Brazil, 2023.

Variables	Choice of maternity hospital for delivery					p*
	Linkage	Proximity	Lack of vacancy	Recommendation	Other	
	n (%)					
Age						0.03
≥35	31 (1.4)	9 (3.9)	98 (42.2)	11 (4.7)	83 (35.8)	
>35	17 (25.0)	0	19 (27.9)	5 (7.3)	27 (39.7)	
Educational level						0.921
Illiterate	0	0	1 (100)	0	0	
Elementary school	20 (18.3)	4 (3.7)	38 (34.9)	4 (3.7)	43 (39.4)	
High school	22 (14.0)	4 (2.5)	63 (40.1)	11 (7.0)	57 (36.3)	
Higher education	6 (18.2)	1 (3.0)	15 (45.4)	1 (3.0)	10 (30.3)	
Own income						0.265
No income	28 (17.9)	5 (3.2)	63 (40.4)	8 (5.1)	52 (33.3)	
<1 minimum wage	13 (11.9)	2 (1.8)	36 (33.0)	6 (5.5)	52 (47.7)	
1-3 minimum wages	7 (20.6)	2 (5.9)	17 (50.0)	2 (5.9)	6 (17.6)	
>3 minimum wages	0	0	1 (100.0)	0	0	
Family income						0.503
<1 minimum wage	37 (16.0)	8 (3.5)	84 (36.4)	15 (6.5)	87 (37.7)	
1-3 minimum wages	11 (16.2)	1 (1.5)	33 (48.5)	1 (1.5)	22 (32.3)	
>3 minimum wages	0	0	0	0	1 (100.0)	

**Reasons for non-admission to the first maternity hospital**

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	No obstetric vacancy	No neonatal vacancy	Does not provide high-risk delivery	Not a referral maternity hospital	Not applicable*	
Age						
≤35	99 (42.7)	0	83 (35.78)	0	50 (21.5)	0.014
>35	18 (26.5)	1 (1.5)	27 (39.7)	1 (1.5)	21 (30.9)	
Educational level						
Illiterate	1 (100.0)	0	0	0	0	0.766
Elementary school	35 (32.1)	1 (0.9)	44 (40.4)	1 (0.9)	28 (25.7)	
High school	66 (42.0)	0	56 (35.7)	0	35 (22.3)	
Higher education	15 (45.5)	0	10 (30.3)	0	8 (24.2)	
Own income						
No income	64 (41.0)	0	52 (33.3)	1 (0.6)	39 (25.0)	0.086
<1 minimum wage	36 (33.0)	0	51 (46.8)	0	22 (20.1)	
1-3 minimum wages	16 (47.1)	1 (2.9)	7 (20.6)	0	10 (29.4)	
>3 minimum wages	1 (100.0)	0	0	0	0	
Family income						
<1 minimum wage	83 (35.9)	1 (0.4)	88 (38.1)	1 (0.4)	58 (25.1)	0.588
1-3 minimum wages	34 (50.0)	0	21 (30.9)	0	13 (19.1)	
>3 minimum wages	0	0	1 (100.0)	0	0	

\*Not applicable = the woman was admitted to the first maternity hospital she sought.

## DISCUSSION

The analysis of factors associated with high-risk pregnancies related to arterial hypertension and childbirth care within the Stork Network Program revealed that the participants of this study lived under conditions of socioeconomic vulnerability. Associations were observed between maternal age ≤35 years and educational level with primigravidity. Furthermore, the study highlighted apparent weaknesses in the maternity linkage process during prenatal care, as evidenced by the low proportion of women formally linked to a maternity hospital and the high proportion of women not admitted to the first maternity hospital sought at the time of delivery, particularly among women aged 35 years or younger.

Regarding the sociodemographic profile, similar findings were reported in Campinas, where most high-risk pregnant women were under 35 years old and had completed high school<sup>2</sup>.

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Maternal age and educational level were also identified as predictive factors for gestational risk in a study conducted in Espírito Santo<sup>10</sup>.

The low socioeconomic status of pregnant women with hypertension seems to reflect the broader vulnerability imposed by extreme social inequalities in Brazil, which generate inequities by placing individuals and social groups at a disadvantage in relation to opportunities to maintain health and by limiting access to healthcare services, particularly during high-risk childbirth<sup>10,4</sup>.

Social factors, including education and household income, may influence health literacy, risk perception, adoption of contraceptive methods, and care strategies, which may explain the high proportion of primigravidas with unplanned pregnancies observed in this study. Comparable findings were reported in Londrina, Paraná, where most high-risk pregnant women at a reference maternity hospital were primigravidas, hypertensive, and had unplanned pregnancies<sup>15</sup>. This context underscores the need to strengthen sexual and reproductive health services through health education initiatives and family planning, expanding contraceptive availability while respecting the health needs of women and their partners.

Regarding prenatal care, most participants in this study initiated follow-up in primary care services and were referred to high-risk prenatal services in the second trimester. It is important to note that prenatal care began in the first trimester and involved six or more consultations before delivery, which can be considered adequate<sup>9</sup>. Similar results have been reported in other Brazilian states<sup>2-3</sup>. The expansion of primary care coverage over recent decades appears to facilitate early prenatal access, as recommended by the Stork Network guidelines<sup>2,8</sup>. In this context, establishing a formal linkage to a reference maternity hospital is essential to reduce access barriers and ensure quality care during labor and delivery, considering proximity and, when possible, the woman's choice. In this study, the majority of high-risk pregnant women reported receiving information about when and under what circumstances to seek the maternity hospital..

However, the continuity of care for high-risk pregnant women within the Stork Network revealed vulnerabilities related to guaranteed access to childbirth services. A significant proportion of women were not admitted to the first maternity hospital they sought, undergoing only obstetric examination and being redirected due to lack of vacancies or because the facility was not designated for high-risk deliveries for women from the countryside of the state.

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A study in another Northeastern Brazilian capital showed that 35.8% of high-risk pregnant women experienced a “journey” in search of delivery care, with younger age and primigravidity being key factors, reflecting both inexperience regarding labor signs and inadequate knowledge of the healthcare network. In addition, formal mechanisms for referral were lacking, and the supply of obstetric and neonatal beds was insufficient. These findings indicate the need for a restructuring of delivery services, including organized referral flows and adequate bed availability to ensure safe mother-infant care<sup>9</sup>.

An Irish study identified that multiple factors, including type of delivery, can influence women’s risk perception and choice of delivery location, showing that primiparous women with lower educational levels are less likely to be offered choices by healthcare services<sup>16</sup>.

Despite the expansion of primary healthcare and increased prenatal access, barriers persist for high-risk pregnant women seeking care in reference maternity hospitals, even when linked to family health units. This challenge is particularly pronounced for women from rural areas without high-complexity maternity services.

The regulation of access to specialized care remains a bottleneck in the regionalization of health services, with fragile referral and counter-referral flows. A study with primary care physicians in Ceará highlighted the lack of clinical protocols, insufficient specialized services, and organizational challenges in health regulation centers, reducing the resolution capacity of healthcare<sup>12</sup>.

These findings demonstrate the need to implement integrated management mechanisms for healthcare networks, enhance municipal capacity to provide quality childbirth care, and invest in expanding maternity hospital beds to ensure adequate hospital support<sup>13, 9</sup>.

In this study, once admitted, participants perceived that they were welcomed and classified according to childbirth risk. The emergency obstetric unit implemented risk-classified reception according to the Stork Network guidelines, ensuring structured access to delivery care. All women were welcomed and classified, with the majority assigned the highest risk category (red), requiring immediate medical attention. Delays due to non-admission at the first maternity may have exacerbated these urgent situations. Risk classification directs the healthcare team to prioritize critical cases, potentially reducing maternal mortality by enabling timely intervention<sup>13</sup>.

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The cesarean delivery rate in this study exceeded WHO recommendations but appears justified due to maternal hypertension and associated complications, prioritizing the safety of the mother-infant dyad. Similar high cesarean rates (>50%) have been reported in reference obstetric maternity hospitals in Brazil<sup>14,15</sup>.

Another notable aspect of obstetric and neonatal care was the availability of rooming-in, aligning with childbirth humanization policies, promoting mother-infant bonding, and supporting breastfeeding. Studies indicate a positive association between immediate breastfeeding and rooming-in practices<sup>17</sup>. Despite high-risk pregnancies and cesarean deliveries, the care teams appear to implement effective interventions that prevent neonatal complications.

Nevertheless, barriers to obstetric humanization were observed, as most high-risk women were not allowed a companion of their choice during delivery. Although reasons for this were not identified, Stork Network guidelines recommend ensuring the presence of a companion to provide support, security, and comfort. Law 11,108/2005 similarly mandates that health services allow a companion of choice to promote humanized care and prevent obstetric violence, noncompliance with which may jeopardize maternal health<sup>18</sup>.

Globally, high-risk pregnancies often face challenges in achieving humanized care, with unplanned interventions generating anxiety and negative birth experiences. Evidence suggests these women expect individualized, attentive care as part of a humanized approach<sup>19</sup>.

Overall, Stork Network guidelines for prenatal and delivery care, while aiming to qualify care, remain aspirational, particularly regarding access and humanization. Even institutions adopting good obstetric practices still need to transform the care model, involving both managers and healthcare professionals.

This study has inherent limitations of cross-sectional designs, which preclude temporal analysis of variable relationships. Conducting the study in the maternity hospital may have introduced uncontrolled factors, as participants were still receiving care and interacting with staff, potentially influencing their responses. Nonetheless, the results contribute to understanding high-risk maternity care and provide insights for improving the quality of services, particularly regarding linkage and access within the Stork Network.



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### CONCLUSION

An association was observed between maternal age and parity, with the highest concentration of first pregnancies occurring in women under 35 years of age and with lower educational levels. Maternal age also influenced both the choice of maternity hospital and non-admission to the first maternity sought. Younger pregnant women, apparently due to inexperience, were less likely to be admitted to their preferred maternity, not only because of a lack of vacancies but also because the facility was not the one to which they had been referred.

The study highlights weaknesses in the high-risk pregnancy and childbirth care network, reflected in difficulties for women in accessing maternity services. Furthermore, humanization guidelines are not fully operationalized in the maternity hospitals. These findings underscore the need to strengthen the healthcare network, ensure formal linkage of pregnant women to maternity services, establish clear referral and counter-referral flows, and provide sufficient hospital beds to guarantee access to high-complexity obstetric care.

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