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Adaptation of prenatal care offered to indigenous women: maternal characteristics and health services

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Abstract *This study aimed to analyze the adaptation of prenatal care offered to Indigenous women and its association with maternal characteristics and health services. This is a cross-sectional study, conducted with 461 Indigenous women who gave birth and/or received immediate postpartum care in the municipalities of Mato Grosso do Sul, between 2021 and 2022. An indicator of minimum prenatal adequacy was developed, which was classified as adequate when the woman started prenatal care in the 1st trimester of pregnancy, had ≥7 consultations, and had routine exams recorded. Logistic regression models were used to estimate the adjusted odds ratios and factors associated with prenatal adequacy. It was found that 67.2% began prenatal care in the 1st trimester, 51.8% had ≥7 consultations, and 40.6% had exam results recorded. About 1 in 4 Indigenous women achieved the proposed adequacy; the associated maternal characteristics were ethnicity, region of residence, and place of residence. Prenatal care revealed health inequities, with low adequacy rates in prenatal care and worse rates among women living in villages and settlements in the southern region of the state.*

Key words *Health of Indigenous Peoples, Prenatal Care, Maternal Health, Health Services*

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Introduction

Despite the emphasis given to maternal and child health in the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs), as well as global efforts to achieve these goals, attention to ethnic and racial issues in this type of care has been limited[1-3]. A study conducted using data from 36 low- and middle-income countries provides evidence of the persistence of social inequalities that affect ethnic minorities differently and contribute to the health conditions of these populations[1]. Situations involving unfavorable health outcomes among Indigenous populations are ongoing, as are the persistence of worse indicators[3].

These situations are evident when investigating the maternal and child health of Indigenous peoples, characterized by difficulties in accessing and receiving adequate prenatal care, higher occurrences of maternal and infant mortality, as well as increased risks of adverse events during pregnancy[4].

In this context, prenatal care is an indispensable component of health care for women during the pregnancy-postpartum period. Quality prenatal care aims to provide support to women from the beginning of pregnancy, as well as diagnose, treat, and control maternal and fetal morbidities, ensuring, at the end of pregnancy, the birth of a healthy child and guaranteeing maternal and neonatal well-being, a fundamental factor in achieving a reduction in maternal and perinatal morbidity and mortality[5-8].

Data from the Birth in Brazil Survey show that, although the prenatal care coverage rate, established by the Ministry of Health as the percentage distribution of women with live births according to the number of prenatal consultations, is greater than 61.0% in all regions of the country, when evaluating the essential components of this care, such as the period in which prenatal care begins, performance and recording of routine exams, the adequacy rates are still considered low with significant regional differences[6]. These aspects were also observed in previous studies that pointed to the existence of flaws in prenatal care in different contexts, such as difficulties in access, late start of prenatal care, an inadequate number of consultations, and an incomplete performance of recommended procedures, thus compromising the quality and effectiveness of care[7-9].

In this scenario, the number of Indigenous women with difficulties in accessing quality prenatal care is significant, with significant differences in the supply and access to this care in several countries around the world, including Brazil[2,4,10,11].

These differences occur due to numerous factors, such as transportation difficulties for populations living in remote and rural areas, access to recommended tests during pregnancy, and communication difficulties[10,12,13].

An important national study on prenatal care for Indigenous women showed a coverage of 90.4%; however, this demonstrated gaps in care, characterized by a late start of prenatal care (only about 30% started in the 1st trimester), an inadequate number of consultations (only 16% had 7 or more prenatal consultations), and low requests and records of recommended tests (blood glucose 53.6%, urine 53%, blood count 56.9%, and oncotic cytology 12.9%), as well as prescriptions for supplements for this population[11].

Considering that the importance of prenatal care is decisive and strategic for the maternal and child health of the Indigenous population, and combined with the scenario of the state of Mato Grosso do Sul, which is the third state in the country with the largest number of Indigenous residents, represented by 116,346 Indigenous people according to data from the 2022 Census[14], this article contributes to the identification of actions aimed at pregnant Indigenous women, in an attempt to improve prenatal care provided by the Indigenous Health Subsystem (SasiSUS).

In view of the above, this study aimed to analyze the adequacy of prenatal care offered to Indigenous women in Mato Grosso do Sul and its association with maternal characteristics and the health service.

Methods

This is a cross-sectional epidemiological study, with a statewide scope and developed in ten (10) municipalities in the state of Mato Grosso do Sul, covering twelve (12) hospital units and one (1) normal birth center, in the period from November 21, 2021 to August 24, 2022.

Mato Grosso do Sul has the 3rd largest Indigenous population in the country, represented by 116,346 people, which corresponds to 4.22% of the total population of the state. The presence of Indigenous people was recorded in the 79 municipalities of the State, with the municipalities of Campo Grande, Dourados, Amambai, Aquidauana, and Miranda having the largest number of Indigenous people[14].

This study included Indigenous women who lived in Indigenous lands, settlements, or urban communities in Mato Grosso do Sul, who had given birth and/or received immediate postpartum care in one of the 12 (twelve) hospital units or 1 (one) birth center, with a live birth of any weight or gestational age (GA) and who had a pregnancy booklet or perinatal records during their hospital stay. Indigenous women who had a fetal death and women who suffered a spontaneous or induced abortion were excluded from the study.

This study was carried out in two stages: in the first, municipalities with a monthly average of four (4) live births registered by Indigenous women in the Live Birth Information System (*Sistema de Informação de Nascidos Vivos* - Sinasc) for the year 2018 and which had a SASI-SUS service (Base Center or DSEI) as their headquarters were selected.

Of the total of 79 municipalities, eleven (11) met these criteria. There was one (1) refusal by one municipality, totaling ten (10) municipalities investigated, with twelve (12) hospital units and one (1) normal birth center in Mato Grosso do Sul (MS).

To calculate the sample size, the simple random sample equation without replacement was used, with correction for population size, based on the number of births of Indigenous race/color (2,173) in Mato Grosso do Sul in 2018, registered in Sinasc, a prevalence of 58% of women who had at least seven prenatal consultations with a 95% confidence level (95%CI) and a maximum acceptable sampling error of 5%. It was estimated that, to meet the objectives of the study, it would be necessary to include 320 Indigenous women in the sample. In addition, anticipating the occurrence of possible losses, the sample size was increased by 20%, totaling a minimum of 384 interviews.

Data collection was carried out in two stages: initially, women were invited to participate in the study through an interview during their hospitalization, within 24 to 48 hours after delivery, to collect data on sociocultural characteristics. Information on prenatal care was then extracted from the pregnant woman's booklet or perinatal record, with the woman's authorization. The collection instruments were developed based on official documents and national studies on prenatal care[5,6,11,15,16], which had previously been tested before the onset of this study. Data were collected in printed format and later entered into the REDCap software, version 6.17, by previously trained researchers and systematically reviewed by specialists in the area of obstetric care.

The variables collected in the interview with the woman were: age, education, ethnicity, region and place of residence; and in the pregnant woman's booklet, data were collected regarding obstetric characteristics and current prenatal care: parity, date prenatal care began, number of consultations, performance and recording of the result of the rapid anti-syphilis test, rapid anti-HIV test, VDRL/Syphilis (Venereal Disease Research Laboratory) test, blood count, urine test (EAS), fasting blood glucose, obstetric ultrasound and prescription of folic acid and ferrous sulfate during pregnancy, type of health unit where prenatal care was provided and professionals involved in the prenatal consultation.

Regarding the region of residence, the municipalities were categorized into three regions of the state of Mato Grosso do Sul: North (Miranda, Aquidauana and Sidrolândia), South (Amambai, Antônio João, Tacuru, Dourados, Caarapó, Iguatemi), and the capital Campo Grande. Regarding the place of residence, they were separated into urban and rural areas.

The prenatal adequacy index was developed, considering indicators adapted from previous studies[6,11,16] and the criteria proposed by the World Health Organization (WHO) and the Ministry of Health[5,15], which meets the four proposed axes: *Axis 1*: start of prenatal care up to the first trimester of pregnancy; *Axis 2*: number of prenatal consultations recommended for gestational age at the time of delivery, considering the schedule of seven consultations proposed by the WHO[15]. GA was calculated from the date of the last menstrual period, and the number of consultations was considered adequate when the pregnant woman attended 100% of the minimum consultations expected for GA at the time of delivery; *Axis 3*: performance and recording of the results of 1 (one) rapid anti-syphilis test, 1 (one) rapid anti-HIV test, 1 (one) Venereal Disease Research Laboratory (VDRL/Syphilis), 1 (one) blood count, 1 (one) urine test (EAS), 1 (one) fasting blood glucose test, and 1 (one) obstetric ultrasound; *Axis 4*: prescription of folic acid and ferrous sulfate during pregnancy.

Subsequently, an indicator of minimum adequacy of prenatal care was developed, which was classified as adequate when the woman started prenatal care in the first trimester of pregnancy, attended seven or more consultations, and had the results of routine exams recorded in the pregnancy record. Axis 4 was not included in the

analysis of adequacy of prenatal care due to the lack of data recorded for this item for 68 of the 461 women.

A descriptive analysis of maternal characteristics and health services was performed. To verify whether the occurrence occurred homogeneously according to maternal characteristics (age, education, ethnicity, region and place of residence) or the health service where the woman received prenatal care (type of health unit and professionals who performed the prenatal consultations), Fisher's exact test and the chi-square test with a 95%CI[17] were used.

To estimate the adjusted odds ratios and assess which of the variables studied are associated with the adequacy of prenatal care among Indigenous women in Mato Grosso do Sul, logistic regression models were estimated. In the multivariate analysis, models with all statistically significant variables ($p<0.05$) were evaluated as gross models.

The research was approved by the National Research Ethics Committee (CONEP), logged under number 5393.703/2020.

Results

A total of 461 Indigenous women participated in this study. Of these, the majority were between 20 and 34 years of age (65.7%), were of the Guarani ethnic group (65.5%), and had completed elementary school (51.8%). Regarding housing, 69.0% lived in the southern region of Mato Grosso do Sul and 86.6% in villages located in rural areas. Regarding parity, more than two-thirds were multiparous, 85.9% had their prenatal care provided at Indigenous Basic Health Units (UBSI) located in their territories, and 58.1% were attended to by a multidisciplinary team (doctor and nurse) (Table 1).

Table 2 shows the prenatal adequacy index, according to each axis of analysis. Regarding Axis 1, 67.2% of the women began prenatal care in the first trimester of pregnancy. Most of these women had completed high school (75.6%) ($p<0.05$), were of the Terena ethnic group (82.7%) ($p<0.05$), and lived in the northern region of Mato Grosso do Sul (89.8%) ($p<0.05$).

For Axis 2, a little over half (51.8%) of the women had seven or more consultations. It is important to note that 60.8% ($p<0.05$) of the pregnant women who received medical care from a multidisciplinary team had had the appropriate number of consultations (Table 2).

Table 1. Distribution of Indigenous women according to maternal characteristics and health service, Mato Grosso do Sul, 2021-2022.

Maternal characteristics and prenatal health service	Indigenous women	
	n	%
Total	461	n.a.
Age range (years)		
12 to 19	120	26.0
20 to 34	303	65.7
35 and over	38	8.2
Educational level		
None	48	10.4
Elementary	239	51.8
High School	174	37.7
Ethnicity		
Guarani	302	65.5
Terena	159	34.5
Region of residence		
South	318	69.0
North	120	26.0
Campo Grande	23	5.0
Place of residence		
Rural	399	86.6
Urban	62	13.4
Parity		
Primiparous	145	31.5
Multiparous	316	68.5
Type of health unit where prenatal care was carried out		
UBSI	396	85.9
FHU	60	13.0
Others	5	1.1
Professionals involved in the prenatal consultation		
Doctor	19	4.1
Nurse	174	37.7
Doctor and nurse	268	58.1

Notes: Indigenous Basic Health Unit (UBSI), Family Health Unit (FHU).

Source: Authors.

Regarding the recording of routine prenatal exam results (Axis 3), less than half (40.6%) of the women achieved the adequacy index. Among these, those of the Terena ethnic group had almost twice the adequacy in recording the results of routine prenatal exams (57.9%) ($p<0.05$) when compared to Guarani women (31.5%). Women who lived in the northern region of Mato Grosso do Sul (57.5%) or in the capital city of Campo Grande (56.5%) ($p<0.05$) managed to achieve an adequacy index for routine exams, which represents almost double that obtained for those

Table 2. Distribution of Indigenous women according to maternal and health service characteristics, and according to the adequacy of each prenatal assessment axis, Mato Grosso do Sul, 2021-2022.

Maternal characteristics and prenatal health service	Axis [1] adequate		Axis [2] adequate		Axis [3] adequate		Axis [4] adequate	
Total	307	67.2	239	51.8	187	40.6	368	93.6
Age range (years)								
12 to 19	73	60.8	56	46.7	49	40.8	97	92.4
20 to 34	210	70.0	165	54.5	121	39.9	239	93.4
35 and over	24	64.9	18	47.4	17	44.7	32	100.0
Education level[1]								
None	26	54.2	21	43.8	17	35.4	38	95.0
Elementary	151	63.7	119	49.8	93	38.9	189	93.6
High school	130	75.6	99	56.9	77	44.3	141	93.4
Ethnicity[1,3,4]								
Guarani	178	59.1	155	51.3	95	31.5	248	95.8
Terena	129	82.7	84	52.8	92	57.9	120	89.6
Region of residence[1,3,4]								
South	185	58.5	165	51.9	105	33.0	265	96.4
North	106	89.8	63	52.5	69	57.5	87	88.8
Campo Grande	16	69.6	11	47.8	13	56.5	16	80.0
Place of residence[4]								
Rural	262	66.2	202	50.6	156	39.1	332	95.1
Urban	45	73.8	37	59.7	31	50.0	36	81.8
Parity								
Primiparous	95	65.5	77	53.1	65	44.8	116	92.8
Multiparous	212	68.0	162	51.3	122	38.6	252	94.0
Health unit where prenatal care was carried out[3,4]								
UBSI	263	66.9	203	51.3	156	39.4	327	95.6
FHU	41	69.5	33	55.0	26	43.3	37	78.7
Other	3	60.0	3	60.0	5	100.0	4	100.0
Professionals involved in the prenatal consultation[2]								
Doctor	14	77.8	8	42.1	3	15.8	12	92.3
Nurse	106	61.3	68	39.1	69	39.7	127	93.4
Doctor and Nurse	187	70.3	163	60.8	115	42.9	229	93.9

Notes: Axis 1) Beginning of prenatal care in the 1st trimester of pregnancy (n=457); Axis 2) Number of consultations appropriate for gestational age upon delivery (n=461); Axis 3) Recording of routine examination results and performance of obstetric ultrasound (n=461); Axis 4) Prescription of folic acid and ferrous sulfate during pregnancy (n=393). 1Statistically significant association on Axis 1 ($p<0.05$). 2Statistically significant association on Axis 2 ($p<0.05$). 3Statistically significant association on Axis 3 ($p<0.05$). 4Statistically significant association on Axis 4 ($p<0.05$).

Source: Authors.

who lived in the southern region of Mato Grosso do Sul (33%). Axis 4 achieved the highest proportion for the adequacy index (93.6%). Women of the Guarani ethnic group, who lived in the southern region of Mato Grosso do Sul, in rural areas, and who received care at UBSI, achieved more than 95.0% adequacy ($p<0.05$) (Table 2).

Regarding the minimum adequacy of prenatal care, it was observed that of the 461 women analyzed in this study, prenatal care was considered adequate for only 103 of them. Regarding ethnicity, less than 17.0% of the Guarani women managed to achieve it, and this percentage was more than double for the Terena women (34.0%) ($p<0.05$).

Approximately 35.0% ($p<0.05$) of women living in the northern region of Mato Grosso do Sul and one third (1/3) ($p<0.05$) of those living in urban areas were classified as having minimally adequate prenatal care. It was found that 27.1%

(p<0.05) of Indigenous women who received medical care from a multidisciplinary team received adequate prenatal care (Table 3).

The crude logistic regression models show that among the maternal characteristics associated with minimally adequate prenatal care are ethnicity, region and place of residence, and having received medical care from a multidisciplinary team. Terena women are approximately 2.6-fold more likely (95%CI: 1.6-4.0) when compared to Guarani women. Women living in the northern region of the state of Mato Grosso do Sul were 2.5-fold more likely (95%CI: 1.6-4.1) than those living in the southern region of Mato Grosso do Sul, and those living in urban areas had their chances increased by 1.8-fold (95%CI: 1.0-3.3) when compared to those in rural areas. It was identified that receiving medical care from a multidisciplinary team nearly doubled the chances of minimum adequacy of prenatal care (95%CI: 1.2-3.1) (Table 3).

The results of the odds ratios, obtained through the adjusted model, indicated that Indigenous women who lived in the northern region of Mato Grosso do Sul were approximately five-fold (95%CI: 2.6-8.4) more likely to have mini-

Table 3. Distribution of Indigenous women according to maternal and health service characteristics, according to minimum adequacy of prenatal care and crude odds ratios, Mato Grosso do Sul, 2021-2022.

Maternal characteristics and prenatal health service	Minimum adequacy of prenatal care[a]			Crude model		
	n	%	95%CI	OR	95%CI	p-value
Total	103	22.5	(18.9-26.6)	n.a.	n.a.	n.a.
Age range (years)						
12 to 19	21	17.5	(11.7-25.4)	1.0		
20 to 34	73	24.3	(19.8-29.5)	1.5	(0.9-2.6)	0.131
35 and over	9	24.3	(13.1-41.0)	1.5	(0.6-3.7)	0.358
Educational level						
None	11	22.9	(13.1-36.9)	1.0		
Elementary	44	18.6	(14.1-24.0)	0.8	(0.4-1.6)	0.487
High School	48	27.9	(21.7-35.1)	1.3	(0.6-2.8)	0.491
Ethnicity[b]						
Guarani	50	16.6	(12.8-21.3)	1.0		
Terena	53	34.0	(27.0-41.8)	2.6	(1.6-4.0)	<0.001
Region of residence[b]						
South	55	17.4	(13.6-22.0)	1.0		
North	41	34.7	(26.7-43.8)	2.5	(1.6-4.1)	<0.001
Campo Grande	7	30.4	(15.2-51.6)	2.1	(0.8-5.3)	0.126
Place of residence[b]						
Rural	83	21.0	(17.2-25.3)	1.0		
Urban	20	32.8	(22.2-45.5)	1.8	(1.0-3.3)	0.042
Parity						
Primiparous	33	22.8	(16.6-30.3)	1.0		
Multiparous	70	22.4	(18.1-27.4)	1.0	(0.6-1.57)	0.939
Type of health unit where prenatal care was carried out						
UBSI	85	21.6	(17.8-26.0)	1.0		
FHU	16	27.1	(17.3-39.8)	1.3	(0.7-2.5)	0.346
Other	2	40.0	(1.0-80.0)	2.4	(0.4-14.7)	0.338
Professionals involved in prenatal consultation[b]						
Unidisciplinary	31	16.2	(11.6-22.2)	1.0		
Multidisciplinary	72	27.1	(22.1-32.7)	1.9	(1.2-3.1)	0.007

Notes: [a]Minimum overall adequacy of prenatal care = having begun prenatal care in the 1st trimester of pregnancy; and having attended the appropriate number of prenatal consultations for the gestational age upon birth; and having recorded results of routine exams (n=457). bChi-square test p-value <0.05. n.a. = Not applicable.

Source: Authors.

mally adequate prenatal care, when compared to women who lived in the southern region. Likewise, women who received medical care from a multidisciplinary team were approximately fourfold more likely to have adequate prenatal care when compared to those who received medical care from a single professional (doctor or nurse) (Table 4).

Discussion

This study demonstrated health inequities in the adequacy index of prenatal care offered to Indigenous women in Mato Grosso do Sul, since only 1 (one) in 4 (four) Indigenous women (25% of the total population studied) had their prenatal care considered adequate.

Similar studies, conducted using data from the Birth in Brazil survey, evaluated the adequacy of prenatal care from the gestational trimester when prenatal care was begun, the total number of consultations performed, and recommended tests (the same indicators used in this study), and showed adequacy values above 60%[6,8]. Results which proved to be much higher than those found here.

In the present study, the best rates were observed in the northern region of Mato Grosso do Sul, in the urban area and for women of the Terena ethnic group and those treated by a multidisciplinary team. Although the start of prenatal care and the number of consultations showed an adequacy index above 50%, their percentages were below that recommended by national and international institutions[5,15].

The study's findings were higher than those identified in the First National Survey on the Health and Nutrition of Indigenous Peoples, in which the percentage of Indigenous women who began their prenatal care in the first trimester was only 33.0%, and approximately 21% of them had ≥7 consultations[11]. The study showed that among non-Indigenous women, the percentage of adequate consultations throughout the national territory was 73%[18].

The findings highlighted situations of health inequalities, characterized by greater adequacy in the beginning of prenatal care in the first trimester among Indigenous women with higher levels of education and who belonged to the Terena ethnic group. The greatest adequacy of consultations occurred among Indigenous women who received prenatal care from doctors and nurses. It is important to note that inequalities are closely related to the poor conditions of access to prenatal care[9], and are frequent in developing countries and among younger women with low levels of education[4,18].

The importance of starting prenatal care in the first trimester and of an adequate number of consultations is recognized for the development of a healthy and safe pregnancy for both mother and fetus, and for ensuring access to diagnosis and interventions in a timely manner so as to prevent possible complications during pregnancy[6,10,11,15].

The adequacy of the recording of routine exam results showed gaps in the quality of care, since less than 50% of Indigenous women presented adequate exam records, which may indicate that the exams were not performed or were not recorded by the health professional in the pregnant woman's booklet. The incompleteness of exam records in the Indigenous pregnant woman's booklet may also have negative implications for prenatal care, especially due to the importance of women's right to information to guide appropriate care during pregnancy and to reduce maternal and infant morbidity and mortality[11,19].

This index of minimum adequacy of prenatal care was worse for Indigenous women of the Guarani ethnic group, who lived in the southern region of Mato Grosso do Sul and were treated at UBSI. This may have resulted in difficulties

Table 4. Results of the adjusted logistic regression model on the minimum adequacy of prenatal care among Indigenous women, Mato Grosso do Sul, 2021-2022.

	Adjusted model		
	OR	**95% CI**	**p-value**
Region of residence			
South	1.0		
North	4.7	(2.6-8.4)	<0.001
Campo Grande	1.7	(0.7-4.5)	0.250
Professionals involved in prenatal consultation			
Unidisciplinary	1.0		
Multidisciplinary	3.6	(2.0-6.5)	<0.001

Notes: Results of the adjusted model with the variables of region of residence and professionals involved in the prenatal consultation. The interaction terms showed no statistical significance (North* Multidisciplinary, p=0.072; Campo Grande* Multidisciplinary, p=0.126).

Source: Authors.

in accessing laboratory services due to difficulties in integrating the Indigenous Health Care Subsystem (*Subsistema Atenção à Saúde Indígena* - SASI) with municipal health managers, in agreeing on the quantity of prenatal exams needed to serve the Indigenous population, as well as in logistic problems in transporting Indigenous pregnant women from the villages to the reference municipalities to undergo the exams.

When it comes to evaluating the quality of prenatal care in Brazil, there are numerous studies that reinforce the importance of performing laboratory tests in monitoring pregnancy and in preventing possible complications and/or reducing risks for the mother and fetus[6,11,16].

The fourth axis analyzed was the prescription of medications during pregnancy (folic acid and ferrous sulfate), which achieved high levels of adequacy, similar to those found among non-Indigenous pregnant women[10,20], and more than double that found in the First National Survey on the Health and Nutrition of Indigenous Peoples[11]. Prescriptions follow international guidelines and are considered extremely important in the pregnancy-postpartum cycle[15,21].

For the indicator of minimum adequacy of prenatal care, approximately 1 (one) in every 4 (four) Indigenous women managed to achieve adequacy. The maternal characteristics associated with the index were: ethnicity, region of residence, and place of residence, which suggests health inequity characterized by the record of worse adequacy rates among women who lived in villages and settlements in the South region, where the Guarani women lived.

Although the classification of the minimum adequacy index of prenatal care adopted a set of criteria and not individual variables, the results of this study are similar to the results of the First National Survey on the Health and Nutrition of Indigenous Peoples[11], and other international studies that pointed out gaps in the prenatal care offered to Indigenous populations[2,3].

When analyzing the set of axes, it is possible to verify that the care provided to Indigenous women during prenatal care is far below what is recommended and necessary, evidencing the persistence of health inequities in the care provided to this population, as widely described in the literature[2,3,4,11].

It is important to note that understanding the worst rates of minimum adequacy of prenatal care among the Guarani people, who live in villages and settlements in the southern region, must be supported by issues related to the violation of rights to land, sustainability, and health. The Guarani people of Mato Grosso do Sul live on Indigenous lands and in areas of reoccupation in the southern region of the state, facing situations of territorial conflict and constant threats of violence against their lives[22,23]. These challenges reinforce the hypothesis that in villages in the southern region, regional disparities are evident, especially when looking at the context of life and organization of assistance to Indigenous women to ensure adequate prenatal care[13].

The Terena people represent, in quantitative terms, the second largest Indigenous population in the state, and are concentrated for the most part in the northern region of the state. In this study, they were approximately three-fold more likely to have adequate prenatal care, which may be related to better access to municipalities with greater availability of health services.

Living in an urban area proved to be a contributing factor to minimal adequacy of prenatal care. One study conducted with Indigenous women in Panama concluded that the distance between their place of residence and the location where health services are offered constitutes a significant barrier to access and effective provision of prenatal care, and it was found that the greater the distance, the lower the number of consultations actually attended by these women[13]. This scenario is reaffirmed in the results of the First National Survey on the Health and Nutrition of Indigenous Peoples, in which the care offered to Indigenous pregnant women in Brazil was related to their place of residence and the difficulties in accessing health services[11].

In the analysis of the adjusted logistic regression model, women who lived in the northern region of Mato Grosso do Sul and who received prenatal care from a doctor and nurse increased the chances of prenatal care being carried out adequately, which suggests that there is an insufficient number of medical and nursing professionals at EMSI, especially to provide care to women in villages and areas of reoccupation in the southern region of Mato Grosso do Sul. This possible insufficiency may penalize these women who face long waiting times at UBSIs for care, due to the lack of actions aimed at meeting the needs of pregnant women in the different contexts of Indigenous territories.

The importance of research investigating how health inequities have a significant impact on maternal health in vulnerable populations is highlighted, and reveals the lack or ineffectiveness of care provided to them[1,3,10,11].

In this context, it is urgent to provide more assertive health care to Indigenous people, prioritizing issues involving the perinatal health of these populations, especially in developing countries where pregnant women, babies, and children make up a large part of Indigenous populations and tend to have higher rates of risk factors[2,11,13].

The limitations of this study include the small number of procedures analyzed, only four (4) axes of this assistance, the challenges in communication related to the command of the Portuguese language, which for some pregnant women was limited, making the interview more time-consuming and requiring the help of a translator. Another limitation refers to the interview having been conducted by a nurse from the hospital where the woman gave birth, who were trained to act as interviewers, due to the context of COVID-19 and respecting biosafety standards to mitigate the spread of the disease. Another limiting aspect of the study refers to Axis 4: prescription of folic acid and ferrous sulfate during pregnancy, having been excluded from the index of minimum adequacy of prenatal care due to its low completion, as it brings evidence of anemia in Indigenous women who should be receiving this supplement during prenatal care. In the considerations of the final impact of adequacy of prenatal care, as it indicates the non-implementation of this important measure.

It is concluded that prenatal care for Indigenous women in Mato Grosso do Sul showed health inequities, with low rates of adequacy in prenatal care, reduced coverage of routine consultations and exams, and worse rates among Indigenous women who lived in the southern region of the state and who received prenatal care from only one professional (doctor or nurse).

Improving prenatal care for this population involves the need for advances in the provision of care by primary care teams, whether within the scope of the DSEIs and/or in health units in the municipalities where Indigenous women live, in order to expand access to and quality of prenatal care, regardless of the regions and places where Indigenous women live.

Collaborations

GR Abreu collaborated with the conception and design of the study, analysis and interpretation of data, write-up and review, and approved the final version. RP Picoli collaborated with the conception and design of the study, write-up and review; and approved the final version. JR Welch and CEA Coimbra Jr. collaborated with the conception and design of the study, and review, and approved the final version.

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