Saúde e Pesquisa
DOI: 10.17765/2176-9206.2024v17n3.e12357

Epidemiology of the gestational iron deficiency anemia in a municipality in southeast Brazil

Epidemiologia da anemia ferropriva gestacional em um município do sudeste do Brasil

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ABSTRACT
Iron deficiency anemia is a disease characterized by a reduction in hemoglobin production due to a lack of iron. To estimate the frequency of iron deficiency anemia in pregnant women living in a municipality in the southeast region of Brazil and investigate the associated factors. One hundred adult pregnant women answered a questionnaire to collect demographic, socioeconomic, obstetric, and food intake data. Data were processed, and descriptive analyses of frequency and association (chi-square test and Fisher's exact test) were applied. Statistical significance was considered when $p \leq 0.05$. Among the pregnant women, 96% were non-white, 58.5% were in a stable union, 40% were in the 2nd trimester of pregnancy, 52.8% were taking iron supplements, and 4.6% had iron deficiency anemia during the current pregnancy. Furthermore, there was no association of any variable with iron deficiency anemia, and it was not possible to identify its determinants. The prevalence of iron deficiency anemia in the studied group was low; however, the absence of iron supplementation by almost half of pregnant women can lead to a worsening of the condition, deserving attention from professionals and municipal health managers.

Keywords: Iron deficiency anemia. Nutritional supplements. Pregnant women. Prenatal care.

RESUMO
Anemia ferropriva é uma doença caracterizada pela redução na produção de hemoglobina, devido à carência de ferro. Estimar a frequência da anemia ferropriva em gestantes residentes em um município da região sudeste do Brasil e averiguar os fatores associados. Cem gestantes adultas responderam um questionário para obtenção de dados demográficos, socioeconômicos, obstétricos e de consumo alimentar. Os dados foram processados e análises descritivas de frequência e de associação (teste qui-quadrado e Exato de Fisher) foram realizadas. Considerou-se significância estatística quando $p \leq 0,05$. Dentre as gestantes, 96% não eram brancas, 58,5% viviam em união estável, 40% estavam no 2º trimestre gestacional, 52,8% suplementavam ferro e 4,6% apresentaram anemia ferropriva na gestação atual. Além disso, não houve associação de nenhuma variável com a anemia ferropriva, não sendo possível identificar seus determinantes. A prevalência de anemia ferropriva no grupo estudado foi baixa, entretanto a ausência de suplementação de ferro por quase metade das gestantes pode levar ao agravamento do quadro, merecendo atenção dos profissionais e gestores municipais de saúde.

Palavras-chave: Anemia ferropriva. Suplementos nutricionais.Gestantes. Pré-natal.

INTRODUCTION

Iron deficiency anemia is a disease caused by a reduction in hemoglobin production due to a lack of iron and characterized by a reduction in the blood's capacity to transport oxygen, which makes it impossible for the body to fulfill vital functions, and the maternal-infant group is the most vulnerable.[1] Estimates indicate that 32.8% of women of reproductive age and 38.2% of pregnant women have some level of anemia in the world.[2] However, international evidence indicates a drop in the prevalence of anemia in this specific group, from 4 to 5% between 1995 and 2011.[3] In Brazil, a recent study that covered all regions of the country identified a prevalence of anemia among pregnant women of 23%.[4]

Among the justifications for the appearance of this disease during pregnancy are not only the high need for iron for the development of the fetus and placenta and the increase in maternal blood volume but also the deficiency of iron in the daily diet and low maternal reserves of this nutrient. Therefore, it may be that women begin pregnancy with a deficiency or limited reserves of iron, as iron deficiency is common in adulthood.[4,5]

In Brazil, anemia screening is recommended when diagnosing pregnancy, and different parameters can be used, such as serum ferritin measurement, a marker of the depletion of iron stores in the body, and evaluation of the blood count, considering the levels of red blood cells, hemoglobin (Hb) and hematimetric indices, which reveal an already established anemic process, with pregnant women with Hb $<$ 11 g/dL considered anemic.[4,6,7]

Scientific evidence points to a higher occurrence of postpartum hemorrhage, hypertensive disorders, and late cardiovascular events in mothers after anemic pregnancy.[8,9] Severe cases are associated with a chance of maternal mortality 2.4 times higher than in non-anemic pregnant women.[10] For newborns, a correlation was detected between low Hb concentration and low birth weight and preterm birth.[11] Wiegersma and collaborators also refer to a higher predisposition to the development of neurodevelopmental disorders, such as autism spectrum diseases and attention deficit and hyperactivity, in children of mothers who had gestational anemia.[12]

To promote pregnant women's health and prevent anemia, prophylactic supplementation actions with ferrous sulfate have been developed in Brazil since 2005 via the National Iron Supplementation Program.[13] Preventive supplementation reduces the frequency of anemia at the end of pregnancy by 73%, in addition to reducing the frequency of low birth weight and premature births, with medication supplementation with iron salts being mandatory from the beginning of pregnancy until 3 months postpartum.[6,11]

The high prevalence of gestational anemia and its implications for maternal and child health require preventive and combative measures, and it is up to public health managers to support and promote plans and actions related to health promotion, considering the epidemiological profile and needs of its territory. However, there is a lack of more recent studies in Brazil that evaluate the prevalence of anemia and women's adherence to the prescription of iron and folic acid, as well as the effectiveness of such measures in controlling gestational anemia.

Given the above, the objective of this study was to estimate the frequency of gestational iron deficiency anemia in pregnant women in a municipality in the southeast region of Brazil and to investigate the factors associated with anemic conditions during pregnancy.

METHODOLOGY

This was a cross-sectional, exploratory, descriptive, quantitative study carried out in the municipality of Ouro Preto, state of Minas Gerais, Brazil, from September 2021 to July 2022.

Ouro Preto is a municipality located approximately 100 km from the state capital,

inserted in the *Quadrilátero Ferrífero*, whose main source of income is mining and tourism. It has around 75 thousand inhabitants distributed across the headquarters and 12 districts, with a Municipal Human Development Index of 0.741.

For the study sample, the sample calculation considered the number of births per residence in the municipality in the year before data collection (809 births), the 95% confidence interval, and the sampling error of 5%, resulting in 189 pregnant women. However, the convenience sampling technique was adopted due to the difficulty of contacting pregnant women as prenatal care (PN) is provided by spontaneous demand, with no pre-determined days for this purpose. Thus, adult pregnant women (aged 20 years or over), residing in the urban and rural areas of the aforementioned municipality, in any gestational trimester, undergoing prenatal care within the scope of the SUS, were invited to participate, specifically, those who were in the waiting room for the ultrasound exam at the Municipal Polyclinic, carried out once a month.

The pregnant women were contacted on the day and location of the ultrasound exam and received all the information about the research. After clarification of doubts, those who wished to participate voluntarily gave their consent by signing the Informed Consent.

Data were collected in person, in a private room at the Municipal Polyclinic, from January to May 2022, using an interview, in which they answered a questionnaire divided into three parts: part 1: demographic and socioeconomic questions (age, color/ethnicity, marital status, education, paid work, monthly family income, and number of people in the household); part 2: obstetric issues, namely: gestational age, trimester in which prenatal care began, parity, number of previous pregnancies, interpregnancy interval (the period between the end of the last pregnancy and the beginning of the current pregnancy), a positive diagnosis of anemia before and during pregnancy, supplementation with iron salts and folic acid, and possible reasons for not supplementing; and part 3: questions about the intake of alcoholic beverages, foods that are sources of iron, such as meat, poultry, fish, beans and dark green leafy vegetables, in addition to being asked about the presence of intestinal parasites. Information was also obtained from records in the pregnant booklet, such as date of birth, date of last menstruation, hemoglobin value, and record of prescription of a therapeutic dose of ferrous sulfate.

Regarding age, the data were categorized into <35 years and ≥ 35 years since pregnant women aged 35 years or over are considered high-risk pregnancies.[6]

The diagnosis of iron deficiency anemia was made by analyzing the hemoglobin value recorded in the pregnant booklet (Hb $<$ 11 g/dL), accompanied by observation of the prescription of a therapeutic dose of iron salts (120 to 240 mg/day of elemental iron), as records of other diagnostic parameters were missing.

The collected data were processed in the Microsoft Office Excel program and exported to the SPSS software version 18 for descriptive analyses of event frequencies, with the results shown in absolute and relative numbers, and association analysis of independent variables (demographic, socioeconomic, obstetric and food consumption) with the dependent variable (presence of iron deficiency anemia in the current pregnancy), using Pearson's Chi-Square or Fisher's Exact tests. For statistical significance, a p-value ≤ 0.05 was considered.

This study was approved by the Research Ethics Committee of the Federal University of Ouro Preto (UFOP), under CAAE: 48215221.9.0000.5150, opinion: 5.182.932.

RESULTS

This study involved the participation of 100 pregnant women, with an average age of 28.6 $\pm$ 6.0 years, living in the municipality of Ouro Preto, state of Minas Gerais, Brazil, undergoing prenatal care within the scope of the SUS. For

characterization, considering demographic and socioeconomic data (Table 1), the following variables were used: age, color/ethnicity, number of people in the household, marital status, education, paid work, and monthly family income. There is no information for some variables since participants were able to freely decide whether or not to answer each question.

Among the study participants, 83.0% were under 35 years of age, the majority declared themselves mixed race and lived in a household with a total of 3 to 4 people (55.7% and 46.9%, respectively). Regarding marital status, 59.1% were in a stable union or were married. Concerning schooling, 78% had completed high school or higher education. As for socioeconomic conditions, 52% had some type of paid work or source of income and most (91.8%) had a monthly family income of less than two minimum wages.

Table 1. Demographic and socioeconomic characterization of pregnant women in the study

Variable	N = 100	% of valid information
Idade (anos)		
< 35	82	82,0
≥ 35	18	18,0
Color/ Ethnicity		
White	7	7,0
Yellow	4	4,0
Brown	56	56,0
Black	32	32,0
Indigenous	1	1,0
Number of people in the household		
1 to 2	29	29,6
3 to 4	46	46,9
5 to 6	14	14,3
7 or more	9	9,2
No information	2	NA
Marital status		
Single + Widow	40	40,4
Married + Stable Union	55	55,5
Separated + Divorced	4	4,1
No information	1	NA
Education		
Illiterate + Elementary Education	22	22
Secondary + Higher Education	78	78
Paid Work		
Yes	52	52
No	48	48
Monthly Family Income (minimum wages)		
Half to 2	78	91,8
3 to 4	7	8,2
No information	15	NA

NA: not applicable

Table 2 lists pregnant women considering obstetric variables, such as current gestational trimester, start of prenatal care, first pregnancy, number of previous pregnancies, number of pregnancies and interpregnancy interval.

Among the pregnant women in the study, 28.3% and 40.4% were in the first and second trimesters of pregnancy, respectively; the majority (81.9%; n=77) started PN in the first trimester, with no record of PN starting in the third trimester. Furthermore, 28.6% were in their first pregnancy, 57.7% already had 1 to 2 children, and 11.3% had 3 to 4 children. Regarding the interpregnancy interval, 58% (n=47) had an interpregnancy interval greater than 2 years.

Table 2. Characterization of pregnant women in the study, considering obstetric data

Variable	N=100	% of valid information
Current gestational trimester		
1st Trimester	28	28,3
2nd Trimester	40	40,4
3rd Trimester	31	31,3
No information	1	NA
Start of prenatal care		
1st Trimester	77	81,9
2nd Trimester	17	18,1
3rd Trimestre	0	0
No information	6	NA
First pregnancy		
Yes	28	28,6
No	70	71,4
No information	2	NA
Number of previous pregnancy		
Zero	28	28,9
1 to 2	56	57,7
3 to 4	11	11,3
5 or more	2	2,1
No information	3	NA
Interpregnancy interval		
Not applicable (1st pregnancy)	28	34,6
Less than or equal to 1 year	1	1,2
>1 to ≤ 2 years	5	6,2
Greater than 2 years	47	58,0
No information	19	NA

NA: Not applicable

Table 3 presents the characteristics of pregnant women in the study related to anemia before the current pregnancy, anemia in a previous pregnancy, anemia in the current pregnancy, iron and folic acid supplementation, reasons for not supplementing, and characteristics of current food consumption, focusing on foods sources of heme and non-heme iron, in addition to the intake of alcoholic beverages, and the presence of intestinal parasites at the current time

Table 3. Frequencies of pregnant women in the study considering iron deficiency anemia, nutritional supplementation, current food consumption, and alcohol consumption

(Continue)

Variable	N=100	% of valid information
Anemia prior to current pregnancy		
Yes	12	12,6
No	83	87,4
No information	5	NA
Anemia in Previous Pregnancy		
Yes	11	15,1
No	62	84,9
No information	27	NA
Anemia in current pregnancy		
Yes (Hb < 11g/dL)	3	4,6
No (Hb ≥ 11g/dL)	62	95,4
No information	35	NA
Iron supplementation		
Yes	47	52,8
No	42	47,2
No information	11	NA
Folic acid supplementation		
Yes	71	72,4
No	27	27,6
No information	2	NA
Reason for not supplementing		
It was not prescribed	14	70,0
Unwanted signs and symptoms	1	5,0
Another undescribed reason	5	25,0
No information	20	NA
Current daily consumption of meat, fish and poultry		

(Conclusion)

Variable	N=100	% of valid information
Yes	91	91,9
No	8	8,1
No information	1	NA
Current daily consumption of dark green leafy vegetable		
Yes	84	84,8
No	15	15,2
No information	1	NA
Current daily consumption of beans		
Yes	87	87,9
No	12	12,1
No information	1	NA
Current consumption of alcoholic beverages		
No	90	90,0
Occasionally	7	7,0
1 to 3 times/week	2	2,0
Every day	1	1,0
Current intestinal parasitosis		
Yes	0	
No	100	100,0

NA: not applicable

Among the participants, 87.4% (n=83) reported not having presented anemia before pregnancy (anemia outside the gestational period), 84.9% (n=62) did not present anemia in a previous pregnancy, and 4.6% (n=3) had iron deficiency anemia during the current pregnancy. Most pregnant women (47.2%; n=42.0) did not take iron supplements, and 72.4% reported taking folic acid. Among the justifications for not supplementing both nutrients, of the 20 responses obtained, 70% said the supplements were not prescribed, 5.0% stopped using them due to unwanted signs and symptoms, and 25.0% reported other reasons.

Regarding current food consumption, most pregnant women (91.9%) consume daily foods that are rich sources of heme iron, such as meat, poultry, fish, or offal, in addition to foods rich in non-heme iron, such as dark green leafy vegetables (84.8%) and beans (87.9%). Regarding current alcohol consumption, 2% reported a frequency of consumption of 1 to 3 days a week, and no pregnant woman reported having intestinal parasites on the day of the interview.

To investigate the possible determinants of iron deficiency anemia during pregnancy, associations were tested between all independent variables (demographic, socioeconomic, obstetric, current consumption of iron-rich foods, and alcohol consumption) with the dependent variable of iron deficiency anemia; no significant results were obtained, as $p > 0.05$ (data not shown).

DISCUSSION

The present study's sample consisted of 100 adult pregnant women who used the SUS in prenatal visits and exams. Among the 100 participants, only 65 recorded their serum hemoglobin value and prescription of a therapeutic dose of ferrous sulfate in the "pregnant booklet." Thus, in this subsample of 65 pregnant women, 4.6% (n=3) had iron deficiency anemia during the current pregnancy. This result was unexpected, as it was lower than those from other national studies, and the prevalence of iron deficiency anemia was observed in Brazil in 2023 (23%).

In a study with pregnant women living in Maceió, northeast region, the prevalence of anemia was 28.3%, higher in those who lived with more people in the household and in those who lived with food insecurity.[24] Two other studies carried out in northeastern states (Ceará and Bahia) showed iron deficiency anemia in 27% and 18.9% of pregnant women, respectively.[20,25] In Pelotas, a municipality in the southern region of Brazil, the prevalence of anemia in pregnant women was 35.9 %, a value higher than in the northeast region and the study conducted in Ouro Preto.[26]

In the present study, most participants (87.9%) declared themselves mixed-race and black, as in the study by Niquini and collaborators also carried out in a municipality in the southeast region of Brazil, where 74.9% of pregnant women were non-white.[15] In the study by Fernandes and collaborators in the three most populous regions of Brazil (south, southeast, and northeast), 55.8% of pregnant women also declared themselves non-white.[16]

Considering that the population of Ouro Preto, for the most part, is made up of brown and black people, it is relevant to highlight this phenotypic characteristic (skin color) since it is well documented in the scientific literature, the inequities in healthcare of the black population, resulting from the structural racism that plagues our country, and its serious consequences for the physical and mental health of black people.

Considering the marital status of the participants, 58.5% were married or in similar marital relationships. In the research by Oliveira and collaborators, 86.9% of pregnant women were married.[17] A lower proportion was found in a study that evaluated food insecurity among pregnant women in the municipality of Lavras, southeastern Brazil, in which 41.6% of pregnant women lived in a stable marital union.[14] The fact that pregnant women are single, divorced, or widowed is believed to imply a lower monthly income and, consequently, lower purchasing power to access adequate food in quantity and quality, leading to greater exposure to the situation of food insecurity and the impossibility of daily intake of foods that are sources of heme iron, the chemical form best absorbed in the body.

From the same perspective, Garcia and collaborators, studying women living in Espírito Santo, southeast region, reported that, among the social variables that most contributed to gestational risk, insecure marital status remained in second place (19.9%), losing only for the use of alcohol and tobacco.[18] This evidence proved the social inequality related to the social role played by women, where pregnant women who headed their families had three times the chance of being classified as a high gestational risk when compared to those where other people were heads of the family.

Regarding schooling, in the present study, most pregnant women (78.0%) attended high school or higher education. In studies by Schafaschek and collaborators and Costa and collaborators, 74.2% and 78% of pregnant women, respectively, had completed high school or higher education.[14,19] Having a formal education is believed to help in understanding the causal factors of gestational anemia, its forms of prevention, as well as the importance of taking medication treatment appropriately, according to medical prescription.

Taking family income into account, Magalhães and collaborators observed that 85.3% of pregnant women had a family income equal to or greater than 1 minimum wage, similar to the present study, in which almost all pregnant women had a low family income.[20]

Considering the gestational trimester at the beginning of prenatal care, in the present study, the majority of pregnant women (81.9%) started in the first trimester, as well as in the study by Niquini and collaborators, also conducted in the southeast region, and Schafaschek and collaborators, conducted in the southern region, where 66.3% and 83.3%, respectively, started prenatal care early.[15,19] Contrary to this, Sato and collaborators in the central-western region observed that only 20.9% of pregnant women started prenatal care in the first trimester of pregnancy.[21] In this sense, the Ministry of Health recommends that entry into prenatal care be as early as possible, preferably up to the 14th gestational week, so that risk assessment and diagnoses of complications can be carried out, such as gestational iron deficiency anemia, are early, as well as the onset of treatment.

As for the number of pregnancies, in Niquini and collaborators, most pregnant women (55.2%) were multigravida, as were the pregnant women in the present study (71.4%).[15] Being multigravida may imply a lower iron reserve in the body before conception, favoring the appearance of iron deficiency anemia due to inadequate consumption of foods that are sources of this mineral and the absence of medicinal supplementation of iron salts.[22]

Concerning the interpregnancy interval, Barbosa and collaborators, based on data from a cohort of pregnant women in the northeast region of Brazil, stated that 82.9% of pregnant women had an interpregnancy interval ≥ 2 years.[23] These values are in line with the present study, where 58% of pregnant women had an interpregnancy interval of more than 2 years. Garcia and collaborators examined gestational risk and social inequalities and observed that the variables in the obstetric history group that most contributed to gestational risk were an interpregnancy interval of less than one year or greater than five years.[18] An interpregnancy interval equal to or greater than two years favors the replenishment of organic reserves of iron and other micronutrients before a new pregnancy begins, minimizing the risks of gestational anemia.

As for supplementation with iron salts, 52.8% of pregnant women in this study adhered to supplementation, a higher value than that obtained from pregnant women living in Pelotas, a municipality in the southern region of Brazil (43.2%), being the most frequent use among pregnant women with fewer years of education.[26]

In a study carried out in Rio de Janeiro, southeastern Brazil, among 1,407 pregnant women, 65% reported using ferrous sulfate. The variables of younger age, black ethnicity/color, higher number of births, not having received guidance on the use of the supplement, not having tried to obtain the supplement from the SUS, and not having been able to obtain it from the SUS, were significantly associated its non-use.[15] The Ministry of Health recommends that iron supplementation be universal for the group of pregnant women, either adults or adolescents and should begin during pregnancy and end in the third month postpartum.[6]

Regarding food consumption, Oliveira and collaborators reported different food

choices among the pregnant women in the present study, such as low consumption of leafy vegetables (21.3%) and meat (29.0%).[21] On the other hand, the pregnant women in the present study were largely adept at eating dark green vegetables (84.8%) and animal protein (91.9%), in addition to frequent consumption of beans, a legume typical of the Brazilian population's diet, consumed daily by 87.9% of pregnant women studied, a value close to the findings of Oliveira and collaborators of 87.2%. These results reinforce the importance of a balanced and healthy diet, the early prescription of iron salt supplements to prevent or treat anemia, and the need for continuous supervision of the use of the supplement to prevent and better manage the disease.

Regarding enteroparasitosis, there was no report of their presence in the current pregnancy. However, it is worth mentioning that intestinal parasites can be associated with chronic blood loss, leading to the development of iron deficiency anemia during pregnancy, since the parasites feed on blood in different sites in the intestine, causing microhemorrhages with significant blood loss. In the study by Bini and collaborators, carried out in the municipality of Ponta Grossa, southern region of Brazil, of a group of 21 pregnant women who underwent parasitological examination of feces, only 23.8% obtained positive results for some type of enteroparasites; however, they were non-pathogenic protozoan species.[6,27]

When investigating the factors associated with gestational iron deficiency anemia, no association was detected between this complication and sociodemographic, economic, and obstetric variables and current consumption of iron-rich foods. In a cohort study conducted in Pernambuco (northeast region), there was also no association between skin color, income, and marital status with the occurrence of gestational anemia, but an association was found with maternal education. In this same research, a higher prevalence of the disease was observed in pregnant women undergoing fewer prenatal visits and in those who were closer to the upper or lower limits of the fertile period.[28]

In a cohort study conducted in the southern region of Brazil, anemia had a higher prevalence in mothers under twenty years of age (43.7%), self-declared black (47.7%), belonging to the poorest economic levels (43%), and with 5 to 8 years of study (42.3%).[26] Racial inequalities in health in Brazil have been revealed in the health of black women (black and brown) in terms of worse indicators of access to prenatal care and higher rates of mortality during pregnancy, childbirth, and the postpartum period.[16,29]

Still regarding the possible determinants of iron deficiency anemia, studies point to economic vulnerability, heavy menstrual flow, inadequate nutritional status, and the presence of intestinal parasites.[1] In a study carried out with pregnant women in a northeastern municipality, those who presented iron deficiency anemia had a lower socioeconomic standard, lower family income, and younger age group.[30]

Regarding obstetric variables, no association with gestational anemia was observed in the present study, contrary to the results of Magalhães and collaborators, who found a higher incidence of anemia in primigravidae and women who did not undergo prenatal care.[20] Miranda and collaborators detected an association between gestational anemia and the number of births, with the prevalence of anemia in 47.6% of women who reported four or more births.[26]

In this study, there was also no association between the use of alcoholic beverages and iron deficiency anemia during pregnancy, contradicting Pavesi and collaborators, who stated that alcohol consumption during pregnancy increases the chance of maternal anemia by 45%.[31]

The explanation for the lack of association between the independent variables and iron deficiency anemia in the present study probably involves the rather homogeneous sociodemographic, economic, and obstetric

profile in the studied group, in addition to the low frequency of the disease found among the pregnant women in the study.

The present study has competencies and some limitations that deserve to be mentioned. The comparison of data from several studies in the literature provides an overview of the panorama of gestational iron deficiency anemia in Brazil, highlighting important epidemiological data and possible determining factors. Furthermore, the results reinforce the importance of a balanced and healthy diet during pregnancy, rich in dietary sources of iron, as well as the early prescription of iron salt supplements to prevent or treat anemia, in addition to the need for continuous supervision of their use. of the supplement, for prevention and better management of the disease. As limitations, for the diagnosis of iron deficiency anemia, only hemoglobin values were available in the pregnant booklet; thus, it was necessary to use records of the prescription of therapeutic doses of iron salts. According to Silva and collaborators, a broader laboratory analysis, considering the red blood cell count and the ferritin value, combined with the hemoglobin measurement, could improve the specificity of the diagnosis[32]; however, these data were missing in the booklets of the participants in the present study. Other limitations were the small sample number, combined with non-probabilistic sampling, which makes it impossible to extrapolate the findings to the population of pregnant women in the municipality, and the lack of information for some variables, which was due to the absence of records in the pregnant booklet, absence of the booklet on the day of data collection, or also because the pregnant woman does not yet have the results of the laboratory tests in hand.

CONCLUSION

The prevalence of iron deficiency anemia was low in pregnant women in the present study; however, this pregnancy complication deserves attention from public health professionals and managers, as almost half of the participants reported not taking iron supplementation. On the other hand, most pregnant women consume foods rich in iron daily, which probably plays a protective role against iron deficiency anemia and should be encouraged during prenatal nutritional consultations.

Our findings are relevant in the field of maternal health care since the information generated can help improve professional clinical practice and support the planning of evaluation actions for public policies already implemented and future policies focused on maternal and child health promotion, besides disease prevention in the municipality. New studies, with larger samples and a longitudinal approach, could deepen the evaluation of the epidemiological characteristics and determinants of gestational iron deficiency anemia in the municipality.

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Received: 19 dec. 2023
Accepted: 10 mar. 2024