Cogitare Enfermagem

ORIGINAL ARTICLE

Toxoplasmosis in pregnant women in primary care: a cross-sectional study on seroprevalence and associated factors

HIGHLIGHTS

1. IgG seroprevalence for toxoplasmosis in 35.2% of pregnant women.
2. Older age and parity were associated with gestational toxoplasmosis.
3. Presence of rodents in the home was associated with the acquisition of toxoplasmosis.
4. Lack of knowledge was associated with a higher seroprevalence of toxoplasmosis.

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ABSTRACT

Objective: To estimate the seroprevalence of toxoplasmosis in pregnant women attending primary care and to investigate the sociodemographic, obstetric, and behavioral variables associated with seropositivity. **Method:** Cross-sectional study conducted with 145 healthy pregnant women at usual risk, residing in Juiz de Fora, Minas Gerais, using a structured questionnaire and data from serological test records. The analysis included descriptive and inferential statistics, with a significance level of 5% and multivariate analysis. **Results:** The seroprevalence of toxoplasmosis was 35.2%. Seropositive pregnant women had a higher mean age ($p < 0.001$) and a greater number of previous pregnancies ($p = 0.005$). There was an association with the presence of rodents in the home ($p < 0.001$) and lack of knowledge about the disease ($p = 0.008$). In the multivariate analysis, maternal age was identified as an associated factor ($p = 0.012$). **Conclusion:** Most pregnant women were susceptible to toxoplasmosis, reinforcing the importance of screening and educational actions during prenatal care.

DESCRIPTORS: Infectious Disease Transmission, Vertical; Risk Factors; Seroepidemiologic Studies; Prenatal Care; Prenatal Education.

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INTRODUCTION

Toxoplasmosis, caused by the protozoan Toxoplasma gondii, is a globally relevant infection, particularly in developing countries, due to its potential to cause gestational and congenital complications[1-2]. The main routes of transmission include ingestion of oocysts present in soil, water, poorly washed vegetables or fruits, excreted by infected felines. Infection can also occur through the consumption of raw or undercooked meat containing tissue cysts[1,3-5]. Blood transfusions and organ transplants represent rare forms of transmission[4].

The prevalence of toxoplasmosis varies according to geographic region, climate, socioeconomic conditions, dietary and hygiene habits of the population[1,6]. The infection is predominantly asymptomatic or associated with self-limiting symptoms in healthy adults[3-4,7]. However, it can pose a risk to fetal development when infection is acquired during pregnancy, due to the risk of vertical transmission via transplacental route[3-4].

Worldwide, the incidence of Congenital Toxoplasmosis (CT) is estimated to be 1.5 cases per 1,000 live births[8]. The incidence of CT in developing countries varies significantly, with a higher burden observed in South America and in some regions of the Middle East and low-income countries[8]. In Brazil, the incidence of congenital toxoplasmosis can reach 3.4 cases per 1,000 live births[9]. In the state of Minas Gerais, between 2023 and 2025, 2,802 cases of gestational toxoplasmosis were registered in the Notifiable Diseases Information System and 1,250 cases of CT in the same period[10]. It is estimated that there are 1.3 cases of CT per 1000 live births in Minas Gerais, with a higher incidence in regions of the state with a lower socioeconomic development index[11].

The consequences for the fetus vary depending on the gestational period, inoculum, and genetic factors of the parasite and the host[12]. Vertical transmission of toxoplasmosis occurs predominantly as a result of acquiring a primary infection during pregnancy[13]. In the absence of treatment, the risk of intrauterine transmission ranges from 17% to 25% in the first trimester, from 25% to 54% in the second, and from 60% to 90% in the third trimester of pregnancy[3,6].

CT clinical spectrum ranges from asymptomatic infections at birth to the manifestation of prematurity, intrauterine growth restriction, fetal death, and stillbirth[4,7,14]. Infection acquired during pregnancy can be transmitted vertically to the fetus, with a higher risk of serious complications when it occurs early in pregnancy, including intracranial calcifications, hydrocephalus, and retinochoroiditis, while late infections tend to have moderate effects[1,8-9].

Despite its clinical and epidemiological relevance, toxoplasmosis remains a neglected disease[14]. Prevention and monitoring during pregnancy depend on health surveillance, especially the qualified work of nurses in Primary Health Care (PHC), who provide low-risk prenatal care. Knowledge about seroprevalence and factors associated with infection is fundamental to supporting effective preventive actions.

From this perspective, this study aimed to estimate the seroprevalence of toxoplasmosis in pregnant women receiving primary care and to investigate the sociodemographic, obstetric, and behavioral variables associated with seropositivity.

METHOD

This is an observational, cross-sectional, analytical study conducted in four Primary Care units in the municipality of Juiz de Fora, Minas Gerais, Brazil, located in the Zona da Mata Mineira region. The study focused on evaluating aspects related to the prenatal care of pregnant women with habitual risk, understood as women without clinical or obstetric conditions that would classify them as high-risk. The units were chosen due to the high flow of pregnant women, including women in situations of social vulnerability. The manuscript was prepared according to the recommendations of Strengthening the Reporting of Observational Studies in Epidemiology (STROBE)[15].

The population consisted of pregnant women receiving prenatal care in the units. Pregnant women with usual risk pregnancies, at any gestational age, who had already had at least one prenatal visit at the unit, had serological records for toxoplasmosis in their medical records, and voluntarily agreed to participate in the research by signing the Free and Informed Consent Term (FICT), were included. For participants under 18 years of age, the FICT had to be signed by the legal guardian and the Free and Informed Assent Term (FIAT) by the adolescent herself. Pregnant women without serological data on toxoplasmosis and those who, after being approached, did not agree to participate in the study were not included.

The sample was obtained by convenience, characterizing a non-probabilistic selection. No prior calculation of the sample size was performed, as pregnant women were consecutively included during the data collection period, provided they met the eligibility criteria.

During the data collection period between August 2022 and September 2023, approximately 420 prenatal consultations were made available in the selected units, although a no-show rate of about 24.0% was observed. Pregnant women were informed about the research at the unit receptions, approached while waiting for their appointments, and invited to participate in a private room. No further approaches were made to pregnant women who had already been interviewed.

In total, 183 pregnant women agreed to participate, of whom 34 did not have serological test results for toxoplasmosis, and four were excluded because they presented results compatible with acute or recent infection during pregnancy (simultaneous presence of reactive IgG and IgM)[13]. Thus, 145 pregnant women were included in the final analysis. The study's dependent variable was maternal seropositivity for toxoplasmosis, defined by the presence of reactive IgG antibodies and negative IgM antibodies, considering previous exposure to Toxoplasma gondii[13], while pregnant women with non-reactive IgM and IgG results[13] for toxoplasmosis were considered susceptible.

Serological results were obtained from secondary records in the medical charts of pregnant women in PHC units. However, for the association analyses, the outcome variable considered was exclusively previous maternal seropositivity for toxoplasmosis (reactive IgG and non-reactive IgM: yes/no).

Data collection was carried out using an adapted questionnaire[16], covering sociodemographic, obstetric, environmental characteristics, eating habits, and behaviors related to toxoplasmosis transmission. The instrument was applied by previously trained interviewers, undergraduate nursing students from a public university, with no prior connection to the participants. An electronic form created on the Google Forms platform was used, completed by the interviewers themselves during individual face-to-face interviews, conducted in a private setting at the Primary Care services.

The independent variables analyzed included age, race/color, marital status, personal income, education level, housing conditions, number of previous pregnancies, food preparation, presence of rodents in the home, prior knowledge about toxoplasmosis, presence of cats in the home, direct contact with cat feces, milk consumption conditions, and consumption of raw vegetables or legumes.

The data were organized in Microsoft Excel software and analyzed in R software, version 4.3.2. In the descriptive analysis, categorical variables were presented in absolute and relative frequencies, and numerical variables in mean, median, standard deviation, minimum and maximum values, and quartiles. Normality of continuous variables was assessed using the Shapiro-Wilk test. For comparison between independent groups, Student's t-test was used for variables with normal distribution and the Mann-Whitney test for non-normal distributions. For categorical variables, the association with toxoplasmosis seropositivity was assessed using Pearson's chi-square test or, when necessary, Fisher's exact test.

A significance level of 5% ($p < 0.05$) was adopted. To control for potential confounding factors, multivariate analysis was performed using binary logistic regression, with toxoplasmosis seropositivity as the outcome. Epidemiological relevance variables and/or those with $p < 0.20$ in the univariate analysis were included in the model. Estimates were presented as Adjusted Odds Ratios (aOR), with respective 95% Confidence Intervals (CI). Model fit was assessed using pseudo-R^2 measures (McFadden, Cox-Snell, Nagelkerke, and Tjur) and the area under the ROC curve. Multivariate analyses were performed with complete cases, excluding 18 observations with missing data, resulting in n = 127 in the final model. Regarding ethical aspects, the study was approved by the Research Ethics Committee (REC) of the Universidade Federal de Juiz de Fora (UFJF), under Opinion No. 5,552,361, dated July 29, 2022, in accordance with Resolution No. 466/2012 of the Brazilian National Health Council (CNS). The data were previously anonymized by the technical team, ensuring privacy and confidentiality. The database was stored in digital format, password-protected, and with access restricted to the researchers involved. The research adhered to the ethical principles of confidentiality, exclusive use for scientific purposes, and protection of sensitive data, in accordance with the General Data Protection Law (*Lei Geral de Proteção de Dados* - LGPD) (Law No. 13,709/2018).

RESULTS

Of the 145 pregnant women included in the study, 51 (35.2%) tested positive for toxoplasmosis. The majority had completed High School Education (53.8%) and self-identified as mixed race (37.9%). Regarding housing, 65 (44.8%) lived in their own homes (Table 1).

Environmental and behavioral characteristics indicated that 131 (90.3%) pregnant women prepared their own food and 112 (77.2%) reported prior knowledge about toxoplasmosis. The presence of rodents in the home was reported by 53 (36.6%) participants, and 29 (20.0%) lived with cats in the home environment. Consumption of milk from farms or ranches was reported by 35 (24.1%) pregnant women. High consumption of fresh cheese (106; 73.1%), fruits (92; 63.4%), and raw vegetables (76; 52.4%) was observed. Regarding food preparation, 78 (53.8%) reported adopting a specific hygiene routine (Table 2).

Table 1. Distribution of toxoplasmosis serology according to the sociodemographic and housing characteristics of pregnant women participating in the study. Juiz de Fora, MG, Brazil, 2023

Variables	(n = 145)	%
Toxoplasmosis		
No	94	64.8
Yes	51	35.2
Education Level		
Elementary School	44	30.3
High School	78	53.8
Higher Education	23	15.9
Race/Color		
Mixed Race	55	37.9
Black	46	31.7
White	43	29.7
Yellow	1	0.7
Housing Status		
Owned	65	44.8
Rented	63	43.4
Provided Housing	17	11.8

Note: Data are presented as n (%).
Source: The authors (2023).

Table 2. Environmental and behavioral characteristics of pregnant women participating in the study. Juiz de Fora, MG, Brazil, 2023

(continue)

Variables	(n = 145)	%
Prepares food		
No	14	9.7
Yes	131	90.3
Rodents in the home		
No	92	63.4
Yes	53	36.6
Knows about toxoplasmosis		
No	33	22.8
Yes	112	77.2
Animals in the home		
No	57	39.3
Yes, without cats	59	40.7
Yes, including cats	29	20.0
Direct contact with cat feces[a]		
No	17	55.6
Yes, when changing/cleaning the litter box	10	44.4
Milk consumption directly from the farm		
No	110	75.9
Yes	35	24.1

Table 2. Environmental and behavioral characteristics of pregnant women participating in the study. Juiz de Fora, MG, Brazil, 2023

(conclusion)

Variables	(n = 145)	%
Milk consumption type[a]		
Pasteurized milk	96	75.6
Boiled milk	24	18.9
Raw milk	7	5.5
Fresh cheese consumption		
No	39	26.9
Yes	106	73.1
Fruit consumption		
Never	1	0.7
Rarely	16	11.1
Occasionally	36	24.8
Frequently	92	63.4
Raw vegetables and/or legumes consumption		
Never	6	4.1
Rarely	19	13.2
Occasionally	44	30.3
Frequently	76	52.4
Prepares vegetables and/or legumes to eat raw		
Washes with tap water	65	44.8
Does not wash	2	1.4
Has a specific routine	78	53.8

Note: Data are presented as n (%). [a]: Not all variables were computed.
Source: The authors (2023).

HIV-positive pregnant women had a higher average age compared to HIV-negative pregnant women (31.5 vs. 27.5 years; $p < 0.001$). Similarly, a higher number of previous pregnancies was observed among HIV-positive women (2.1 vs. 1.3; $p = 0.005$) (Table 3).

Table 3. Descriptive measures and hypothesis tests for numerical variables, according to toxoplasmosis serology. Juiz de Fora, MG, Brazil, 2023

Variables	Toxoplasmosis	N	Mean	SD	Median	Q1	Q3	p-value
Age	No	94	27.5	6.0	26.81	23.3	31.1	< 0.001[a]
	Yes	51	31.5	6.5	32.39	26.3	36.6	
Previous pregnancies	No	94	1.3	1.6	1	0	2	0.005[b]
	Yes	51	2.1	1.9	2	1	3	
Abortions	No	94	0.2	0.4	0	0	0	0.531[b]
	Yes	51	0.4	0.9	0	0	0.5	

Note: SD = standard deviation; Q1 = first quartile; Q3 = third quartile. [a]Student's t-test. [b]Mann-Whitney test.
Source: The authors (2023).

A statistically significant association was observed between the presence of rodents in the home and seropositivity for toxoplasmosis ($p < 0.001$), as well as between lack of knowledge about the disease and a higher occurrence of infection ($p = 0.008$). The other variables analyzed did not show a statistically significant association (Table 4).

Table 4. Association between sociodemographic variables, household characteristics, food consumption, and the presence of toxoplasmosis in pregnant women. Juiz de Fora, MG, Brazil, 2023

Variables	Toxoplasmosis				p-value
	No		Yes		
	n = 94	%	n = 51	%	
Education Level					0.218[a]
Elementary School	25	56.8	19	43.2	
High School	51	65.4	27	34.6	
Higher Education	18	78.3	5	21.7	
Race/Color					0.116[b]
Mixed Race	33	60.0	22	40.0	
Black	28	60.9	18	39.1	
White	33	76.7	10	23.3	
Yellow	0	0.0	1	100.0	
Housing Condition					0.091[a]
Owned	45	69.2	20	30.8	
Rented	42	66.7	21	33.3	
Provided Housing	7	41.2	10	58.8	
Prepares food					0.086[a]
No	12	85.7	2	14.3	
Yes	82	62.6	49	37.4	
Rodents in the home					<0.001[a]
No	69	75.0	23	25.0	
Yes	25	47.2	28	52.8	
Knows about toxoplasmosis					0.008[a]
No	15	45.5	18	54.5	
Yes	79	70.5	33	29.5	
Direct contact with cat feces					0.053[a]
No	9	52.9	8	47.1	
Yes, when changing/cleaning the litter box	9	90.0	1	10.0	
Milk consumption type					
Pasteurized milk	65	67.7	31	32.3	0.095[a]
Boiled milk	17	70.8	7	29.2	
Raw milk	2	28.57	5	71.5	
Consumes raw vegetables and/or legumes					0.114[b]
Never	6	100.0	0	0.0	
Rarely	12	63.1	7	36.9	
Occasionally	32	72.7	12	27.3	
Frequently	44	57.9	32	42.1	

Note: Data are presented as n (%); [a]: Pearson's chi-square test; [b]: Fisher's exact test; [c]: Not all variables were computed
Source: The authors (2023).

In the multivariate analysis, only age maintained a statistically significant association with seropositivity for toxoplasmosis (OR = 1.11; 95% CI: 1.02-1.20; p = 0.012), indicating an increased chance of infection with each additional year of age. The other variables did not show an association after adjustment, although the presence of rodents in the home (OR = 2.11; p = 0.134) and the raw milk consumption (without boiling) (OR = 4.25; p = 0.156) showed high effect sizes, but with wide variability and lack of statistical significance (Table 5).

Table 5. Multivariate analysis of factors associated with toxoplasmosis seropositivity in pregnant women. Juiz de Fora, MG, Brazil, 2023

Variables	Adjusted OR	95% CI	p-value
Age, in years	1.11	1.02 – 1.20	0.012
Color			
Black	1.34	0.46 – 3.89	0.596
White	0.54	0.17 – 1.71	0.293
Yellow	6.44	0.05 – 812.84	0.451
Marital status			
Married/common-law marriage	1.65	0.66 – 4.11	0.284
Divorced	0.29	0.01 – 15.05	0.537
Personal income in minimum wages			
1 to 2	0.83	0.27 – 2.55	0.740
2 to 3	2.00	0.25 – 15.81	0.512
> 3	1.49	0.06 – 35.39	0.804
Housing condition			
Rented	1.77	0.65 – 4.86	0.266
Provided housing	1.63	0.34 – 7.76	0.541
Prepares food			
Yes	0.96	0.19 – 4.94	0.957
Rodents in the home			
Yes	2.11	0.80 – 5.57	0.134
Previous pregnancies	1.07	0.80 – 1.43	0.662
Knows about toxoplasmosis			
Yes	0.51	0.17 – 1.55	0.236
Cat goes outside			
Yes	1.39	0.27 – 7.24	0.693
Contact with cat feces			
Yes	0.72	0.09 – 5.59	0.755
Milk consumption			
Boiled	1.01	0.32 – 3.24	0.983
Raw	4.25	0.58 – 31.36	0.156
Consumption of raw vegetables/greens			
Rare	5.07	0.16 – 163.39	0.360
Occasional	4.21	0.15 – 117.70	0.398
Frequent	5.23	0.19 – 147.81	0.332

Note: OR = odds ratio; 95% CI = 95% confidence interval. Model adjusted for all included variables. The reference categories were: mixed-race (parda); single marital status; personal income up to 1 minimum wage; owner-occupied housing; does not prepare food; absence of rodents in the household; unaware of toxoplasmosis; indoor-only cat; no direct contact with cat feces; consumption of pasteurized milk; and never consumes raw vegetables. n = 127 (18 observations excluded due to missing data). Pseudo - R^2: McFadden = 0.256; Cox-Snell = 0.279; Nagelkerke = 0.387; Tjur = 0.273. Area under the ROC curve = 0.829 (95% CI: 0.751–0.907).

Source: The authors (2023).

DISCUSSION

This study identified a seroprevalence of IgG for toxoplasmosis of 35.2% among pregnant women followed in PHC in the Zona da Mata region of Minas Gerais, corroborating the global estimate of 32.9%[1], and approaching the prevalence observed in the Americas region, where the prevalence is 45.2%[1]. The Brazilian context is more concerning, potentially reaching up to 91%[6]. However, in the Southeast region of Brazil, the prevalence of gestational toxoplasmosis varies from 40% to 54%[17-18]. There is evidence of greater exposure to toxoplasmosis in pregnant women residing in rural or peri-urban areas[18-19]. These significant differences result from the influence of environmental, socioeconomic, and cultural factors, dietary habits, hygiene habits, the population's level of knowledge, and access to health services[6-7].

Older maternal age was an independently associated factor with toxoplasmosis seropositivity, a result consistent with previous findings in different national and international contexts[5,7,18,20-21]. The literature indicates a higher prevalence of toxoplasmosis in people between 20 and 45 years of age[4,7,18,20-21], an age range that encompasses the reproductive period. However, a study conducted in Cameroon detected a higher incidence of toxoplasmosis in younger pregnant women, between 15 and 24 years of age[22]. Higher parity was associated with seroprevalence, in agreement with other case studies[17,20-21]. Supposedly, these associations refer to the greater chances of the woman's exposure to the parasite over time, concomitantly with the acquisition of new pregnancies throughout her reproductive life.

In this study, the presence of rodents in the home represented a risk factor for toxoplasmosis in pregnant women. Rodents are intermediate hosts of Toxoplasma gondii. In urban environments, domestic animals hunt rodents, birds, and other animals, promoting the spread of zoonoses[23]. This situation may represent an indicator of sanitary conditions, and the presence of rodents in the home possibly contributes to the perpetuation of the parasite's cycle and to greater chances of exposure to toxoplasmosis. Although these associations were not observed in this study, the ingestion of raw or undercooked meat, contact with cats and soil, lack of water treatment, inadequate food hygiene, consumption of unpasteurized milk, and low socioeconomic status are recognized risk factors for the acquisition of toxoplasmosis in pregnant women[5,7,18-19].

Although toxoplasmosis is a preventable condition, barriers to its elimination and control persist, such as late initiation of prenatal care, fewer consultations than recommended, failure to perform serological tests during pregnancy, lack of guidance from professionals on preventive measures, absence or delay in treatment of pregnant women, errors in medication prescription, delays in referring pregnant women to specialized health services, and difficulties in screening newborns[6-7,14].

In this study, lack of knowledge about toxoplasmosis was associated with a higher rate of infection acquisition among pregnant women. An association of seroprevalence is observed in pregnant women with low education, primary education, or illiteracy[7,17,22]. A significant proportion of Brazilian pregnant women (66%), as well as in the global context (72%), have insufficient knowledge about toxoplasmosis[2]. In the community, a representative portion of pregnant women (32.4% to 85.2%) had never heard of toxoplasmosis[5,17], and many (69.5%) only discover the existence of toxoplasmosis when they acquire it during pregnancy[14]. Knowledge about the possibility of disease vertical transmission is extremely low among Brazilian pregnant women (0.9%)[17].

The importance of educational activities to reduce the risks of exposure to Toxoplasma gondii is highlighted[5,7]. In regions of high seroprevalence, the integration of health education in the prenatal period has the potential to encourage women to adopt preventive measures to reduce the transmission of CT[7]. Such guidelines

should incorporate primary prevention measures to avoid exposure to infectious forms of *Toxoplasma gondii* resulting from the consumption of raw or undercooked meat, unfiltered water, and inappropriate hygiene of vegetables and fruits, as well as avoiding contact with contaminated water, soil, or cat feces[2]. Additionally, guidance on hand hygiene and food preparation techniques can contribute to reducing the risk of transmission[2]. These measures are fundamental for the entire population; however, for seronegative pregnant women, even greater precautions should be taken[6].

It is considered a challenge to articulate scientific production with care practices in the territories, understanding that the contexts and behaviors that lead to the risk of transmission do not stem solely from individual choices, but from material living conditions, access to information, and the organization of services[24-25]. Thus, understanding toxoplasmosis as a socially determined phenomenon allows us to overcome individualistic views and strengthen preventive actions contextualized to local realities. The nurse's role in prenatal care, especially through health education, strengthening the bond with pregnant women, and monitoring for complications, can favor the adoption of protective measures against infection[2,5,26].

Therefore, nursing team continuous training is essential, with emphasis on the role of the nurse as a health educator, capable of promoting health literacy and supporting women in self-care during pregnancy[27]. In this sense, there is a lack of knowledge about toxoplasmosis in pregnancy among doctors and nurses working in prenatal care in PHC[27]. In a study conducted with PHC professionals in Germany, it was identified that, although toxoplasmosis is recognized as a relevant zoonosis in clinical practice, professionals have less technical confidence in diagnosis and therapy compared to their knowledge about its transmission[28]. This is, in fact, a challenge: to expand knowledge about the problem.

It is emphasized that the effectiveness of actions to prevent gestational toxoplasmosis in PHC depends not only on professionals' technical qualification, but also on the structural and organizational conditions that support quality prenatal care, with the nurse as a central worker in care and health education.

It is considered that, for the effective implementation of actions to prevent gestational toxoplasmosis in PHC, it is essential to recognize that such actions depend not only on the professionals' technical qualification, but also on the concrete working conditions that enable the provision of quality prenatal care. The literature indicates that the performance of educational and surveillance practices is directly related to the organization of the health work process, the availability of material and human resources, and the care workload of nurses[29-30].

In many services, the reduced number of professionals, the overload of administrative activities, and the scarcity of laboratory supplies hinder the comprehensiveness of care and the execution of more personalized preventive actions. These structural limitations produce a scenario in which the prevention of gestational toxoplasmosis tends to be restricted to the request for serological tests, without space for educational dialogue, qualified listening, and continuous monitoring of the pregnant woman - central elements of nursing care in public health[30].

Investments in infrastructure, protected time for educational activities, expansion of multidisciplinary teams, and recognition of nurses' work, as professionals who articulate Clinical Practice, Epidemiology, and Social Sciences, are indispensable. More than a technical issue, the prevention of gestational toxoplasmosis represents an ethical and political challenge, requiring recognition of the nurse's work as an essential part of the social determinants of health and the right to comprehensive, safe, and quality care.

This study has limitations, as it is based on a convenience sample of pregnant women from the urban area, without considering women from rural and peri-urban areas. However, it has potential in identifying the profile of pregnant women previously exposed to toxoplasmosis and the risks of transmission, which can contribute to the design of strategic actions for this population profile, aiming at preventing the acquisition of the infection during pregnancy.

The study opens new possibilities for investigation. There is a scarcity of intervention studies that evaluate the impact of educational strategies conducted by nurses on the knowledge, attitudes, and practices of pregnant women, as well as their effects on reducing seroconversion during pregnancy. Furthermore, studies analyzing the nurse's role in toxoplasmosis surveillance and the social barriers to prevention can contribute to the consolidation of more comprehensive and effective practices in prenatal care; for example, investigations in rural and peri-urban areas may reveal specific inequalities and barriers that demand differentiated care approaches.

CONCLUSION

Older maternal age was an independently associated factor with exposure to toxoplasmosis. Furthermore, other factors associated with infection were a higher number of previous pregnancies, the presence of rodents in the home, and a lack of knowledge about the disease. It was evident that most pregnant women were susceptible to toxoplasmosis. The findings highlighted the need to strengthen prenatal care in Primary Care through health education and screening, focusing on the identified risk factors.

As an implication for Nursing, the importance of clinical and epidemiological assessment of the infection is highlighted, especially in assessing the risk of infection, guiding pregnant women, and monitoring environmental and behavioral conditions, directly contributing to the reduction and prevention of congenital transmission.

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Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - **Gargiullo SMLBA, Silva LC, Gomes-Sponholz FA.** Drafting the work or revising it critically for important intellectual content - **Gargiullo SMLBA, Silva LC, Silva MMS, Motta SRM, Nichiata LYI, Gomes-Sponholz FA.** Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - **Gargiullo SMLBA, Silva LC, Silva MMS, Motta SRM, Nichiata LYI, Gomes-Sponholz FA.** All authors approved the final version of the text.

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