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Knowledge of pregnant women and health professionals on congenital toxoplasmosis

Conhecimentos de gestantes e profissionais de saúde sobre toxoplasmose congênita

Conocimiento de embarazadas y profesionales de la salud sobre toxoplasmosis congénita

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ABSTRACT

Introduction: Toxoplasmosis is a disease that affects a large part of the world population. The congenital form occurs due to the transplacental passage of the parasite during pregnancy. In primary prevention programs, an initial step is to assess the level of information about the disease of the target audience. The objective was to assess the knowledge of pregnant women attended at the reference School Hospital in Uberlândia, MG and the professionals who attend prenatal care on congenital toxoplasmosis. **Outline:** In this descriptive study, information was acquired through a questionnaire applied between August 2017 and August 2018, with a sample of 138 pregnant women and 33 professionals. **Results:** It was found that 87.7% of pregnant women heard about toxoplasmosis, however 62.6% were unaware of all forms of infection and 34.5% were unaware of the infection during pregnancy. For the professionals, 69.7% provided guidance on seroconversion during pregnancy, but 18.2% answered that seronegative pregnant women should undergo the test only twice. **Implications:** These data show the importance of primary prevention programs, through university extension actions to ensure continuing education on this subject for pregnant women, and to keep health professionals trained with regard to notification of cases of congenital toxoplasmosis.

DESCRIPTORS

Toxoplasmosis, Congenital; Primary Prevention; Prenatal Care.

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INTRODUCTION

Toxoplasmosis, a disease transmitted by the parasite *Toxoplasma gondii*, is one of the parasitic infections with worldwide distribution and is therefore considered a public health problem.[1-4] The prevalence of *T. gondii* infection in humans is high with estimates ranging from 10% to 90% depending on the geographic region and the eating habits of the population.[5-6] In Brazil, in general, the prevalence varies between 50% and 80%, with the majority of cases affecting children and pregnant women.[7-8]

The congenital form of toxoplasmosis occurs due to the transplacental passage of the parasite during pregnancy.[9-11] The frequency and severity of the disease depend on the gestational age. Maternal infection in the first trimester of pregnancy can cause severe congenital toxoplasmosis, resulting in death of the fetus in the uterus or spontaneous abortion. The most serious cases can cause irreversible injuries to the fetus such as Sabin's Tetrad.[12-16]

In contrast, infection during the third trimester usually results in apparently normal newborns, but they may have sequelae late.[17-18] Infections that go unnoticed or, if left untreated, cause severe eye disease (chorioretinitis) or developmental delay mental illness in the child's second or third decade of life.[18-19]

In developed countries, the disease affects 1 to 10 out of 10,000 newborns.[20] In Brazil, the occurrence of congenital toxoplasmosis affects 3 to 10 out of 10,000.[21] In Minas Gerais, the prevalence of infection is significant, with 13 cases detected for 10,000 newborns, which may be associated with regional social inequality.[22]

Several factors are related to the prevalence of congenital toxoplasmosis in Brazil[22-27] and, in Minas Gerais, some risk factors were identified as involved in the epidemiology of congenital toxoplasmosis: three were related to demographic and socioeconomic characteristics (age, education and income), five were related to the habits of pregnant women and the environmental conditions favorable to exposure to the parasite (ingestion of raw or undercooked meat, raw vegetables, untreated or unboiled water, direct or indirect contact with cats and contact with contaminated soil).[22]

Uberlândia is a Brazilian municipality that has a significant congenital infection rate when compared to other studies carried out in several countries such as the United States of America, Denmark, Sweden, United Kingdom and Poland.[28] However, the lack of more specific data on the disease in this municipality justifies the implementation of actions in health promotion, especially in the group of pregnant women, given its clinical and epidemiological importance.

The prevention of toxoplasmosis is based on three main strategies: prenatal, neonatal screening and health education. The educational approach is an important measure capable of preventing infection among pregnant women, however, it will only have a significant impact if the pregnant woman changes the habits that favor infection by the parasite.13 These aspects justify the importance of programs involving the promotion of health for this population group.[13]

Primary prevention is based on public health education programs, through which the pregnant woman is instructed to take preventive measures, identifying what are the risk factors involved with *T. gondii* infection and the development of toxoplasmosis during pregnancy. Thus, it is up to health professionals to educate and advise on the prevention of toxoplasmosis and the importance of prenatal care.[29]

Considering that the basis of a primary prevention program includes an initial stage which assesses the level of information of professionals, determines at-risk pregnant women through maternal serological screening and carries out health education strategies, through the extension project entitled “Primary prevention of toxoplasmosis - guidance for pregnant women and health professionals” in this study, the objective was to evaluate the knowledge

of pregnant women attended at the Hospital Escola de Uberlândia, MG and the professionals who attend prenatal care about congenital toxoplasmosis.

METHOD

This is a study of a descriptive nature, carried out at the Reference School Hospital of Uberlândia (HCU-UFU), in the municipality of Uberlândia, State of Minas Gerais, in the period between August 2017 and August 2018. This work was approved by the Human Research Ethics Committee (CEP / UFU) with CAAE registration: 68617417.5.0000.5152. Data collection was performed in the Obstetrics and Gynecology sector of HC-UFU, where pregnant women are attended during prenatal care. Both pregnant women and health professionals who signed a Free and Informed Consent Form (ICF) participated in the research.

The selection of participants was carried out using the systematic random sampling method, with a direct approach when the pregnant women arrived for a routine consultation and, in the case of professionals, the approach occurred in the Obstetrics and Gynecology sector itself. 138 pregnant women in prenatal care at HC-UFU and 33 health professionals participated in this study. The inclusion criteria included pregnant women (of any gestational age and with appointments scheduled throughout the gestation period) and health professionals (who worked or attended in the prenatal sector). Pregnant women and professionals who did not meet the inclusion criteria were excluded from the study.

Data were collected from semi-structured questionnaires, consisting of 11 questions for pregnant women, involving questions related to sociodemographic data and factors that may expose the pregnant woman to infection by *T. gondii*, being: Have you heard of toxoplasmosis? Do you have a habit of eating raw or rare meat? Can a pregnant woman have cats? Have you been tested for toxoplasmosis? Which animals are considered important transmitters of *T. gondii* to man? By what means can man acquire *T. gondii*? How can we prevent toxoplasmosis? The instrument of data collection was applied by members of the executing team, in order to facilitate the understanding of the participant, not exceeding the time limit of 5 minutes for response.

Then a brief explanation was made about toxoplasmosis (general aspects of the disease, ways of transmitting the parasite and its biological cycle, treatment and prophylaxis) and a folder containing the information was distributed with the aim of disseminating it to families. Explanatory posters with the theme, forms of transmission and prophylaxis of toxoplasmosis were attached in the corridors and rooms of the sector where the research was carried out.

To assess the perception and conduct of health professionals in relation to toxoplasmosis, a questionnaire was applied with 12 questions referring to sociodemographic data, in addition to items such as knowledge about toxoplasmosis, sources of infection and conduct towards pregnant women; which animals are considered important transmitters of *T. gondii* to man; A pregnant woman can have cats; By what means can man acquire *T. gondii*; How can we prevent toxoplasmosis; What are the main guidelines you give to pregnant women; You stay informed about diseases transmitted during pregnancy.

For analysis of the results, the data were processed in electronic spreadsheets prepared in Microsoft Excel® and then described in the form of graphs and tables. Descriptive statistics, expressed as a percentage, were used.

RESULTS

The age group of the 138 pregnant women participating in the study was between 14 and 43 years old, with an average of 27±6.8. Most pregnant women, 52.9%, had completed high school, 55.1% were in the third trimester of pregnancy and 87.7% had heard about toxoplasmosis (Table 1).

Table 1 – Education level, gestational period and knowledge of pregnant women treated at HCU-UFU, Uberlândia, MG, on toxoplasmosis.

Education level	Gestational period	Have you heard of the disease
Incomplete Elementary or Middle School 14/10.1%	First Quarter 19/13.8%	Yes 121/87.7%
Complete Elementary and Middle School 32/23.2%	Second Quarter 41/29.7%	No 17/12.3 %
Complete High School 73/52.9%	Third Quarter 76/55.1%	
Complete Higher Education 19/13.8%	Not Declared 2/1.4%	

Table 2 presents more details about the knowledge of pregnant women and health professionals in relation to animals that can become infected and transmit toxoplasmosis.

When asked which animals could be infected with *T. gondii*, most pregnant women replied that it could be the cat 70.3%. Regarding which animals could transmit T. gondii to humans, 69.5% answered that it could be the cat, 18.1% the dog and 16.6% the swine or cattle. As for the animals that could transmit *T. gondii* to humans, 96.9% of the professionals answered that they were the cat.

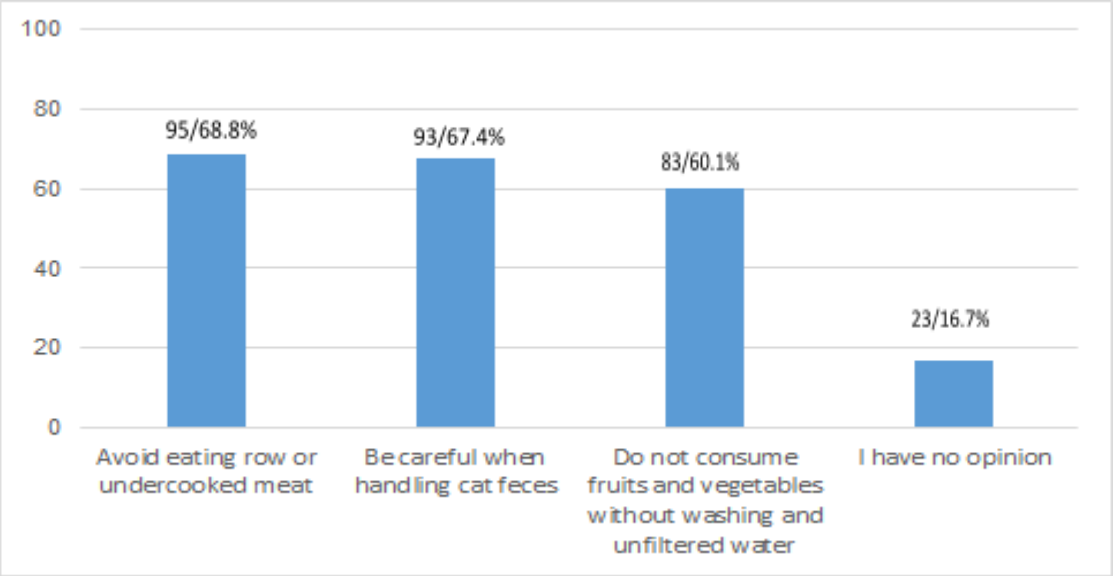
Table 2 – Knowledge of pregnant women and health professionals at HCU-UFU, Uberlândia, MG in relation to animals that can become infected and transmit toxoplasmosis to humans.

	Animals that can become infected with *Toxoplasma gondii* *	Animals that can transmit *Toxoplasma gondii* to humans *
	Pregnant	Pregnant/Professional
Cat	97/70.3%	96/69.5%/31 (96.9%)
Dog	40/28.9%	25/18.1%/13 (40.6%)
Swine	23/16.6%	23/16.6%/13 (40.6%)
Cattle	20/14.5%	23/16.6%/12 (37.5%)
Pigeon	20/14.4%	17/12.3%/3 (9.36%)
Rats	16/11.6%	14/10.1%/2 (6.24%)
Ovine	7/5.1%	2/1.4%/6 (18.75%)
Hamsters	5/3.6%	1/0.7%/2 (6.24%)
Bats	4/2.8%	5/3.6%/4 (12.5%)
All animals cited	3/2.2%	1/0.7%/1 (3.12%)
I have no opinion	34/24.6%	38/27.5%/1 (3.12%)

*Question in which you could check more than one answer option.

Most of the interviewed pregnant women, 84.1%, answered that they are not in the habit of eating raw or undercooked meat and 15.9% stated that they have the habit (data not shown). As for the ways to acquire toxoplasmosis, 62.6% of pregnant women did not know all forms of infection, 14.4% knew all forms of infection, 34.5% did not know that the infection could occur during pregnancy and 22, 3% answered that they had no opinion or did not know how to answer (data not shown). We also sought to know what the pregnant women know about the disease prophylaxis, since it is through this that pregnant women will know how to prevent infection by *T. gondii*. Most of them, 68.8%, answered to avoid eating raw or undercooked meat (Figure 1). In this question they could check more than one answer option.

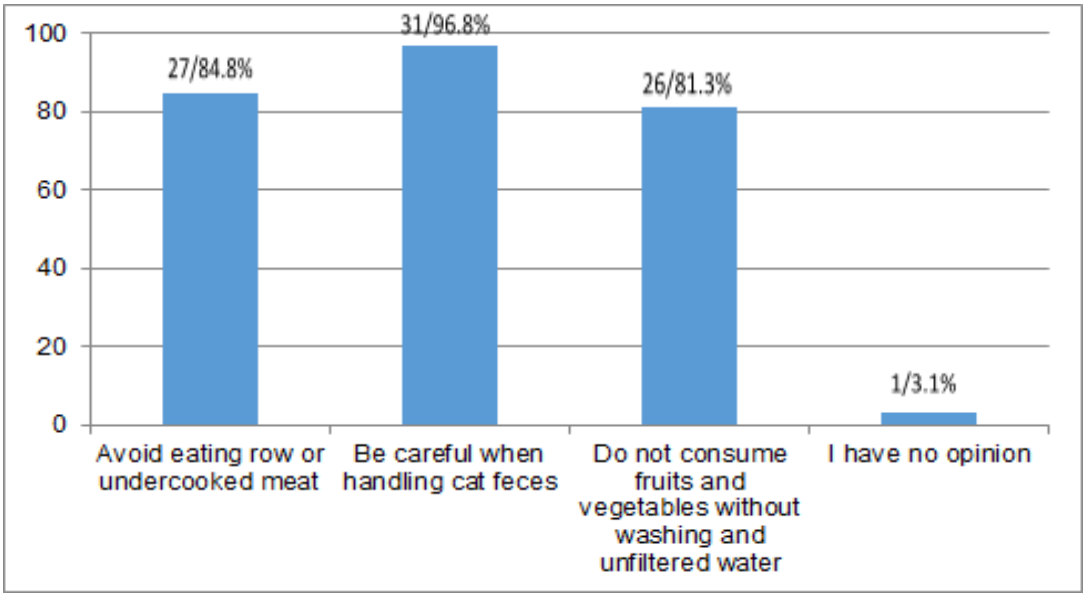
Figure 1 – Knowledge of pregnant women attended at HCU-UFU, Uberlândia, MG in relation to ways of preventing toxoplasmosis.



*Question in which you could check more than one answer option.

As for health professionals, 33 answered the questionnaire, among them: doctors, nurses, technicians and nursing assistants. The age group of the research participants ranged from 18 to 55 years, with an average of 30±11.6. As for the knowledge about the definitive host of *T. gondii*, 84.9% answered that it was the cat, 3.0% answered that it was the dog and 12.1% considered that besides the cat, other animals could be the definitive host of *T. gondii*. In this question, participants could not check more than one correct option. Regarding the ways to prevent toxoplasmosis, the majority answered to be careful when handling cat feces (96.8%) and avoid eating raw or undercooked meat (84.8%) (Figure 2). In this question they could check more than one answer option.

Figure 2 – Knowledge of health professionals at HCU-UFU, Uberlândia, MG in relation to ways to prevent toxoplasmosis.



*In this question, professionals could check more than one answer option.

In view of the importance of guidance by professionals on congenital toxoplasmosis, the conduct towards this disease was analyzed. Most health professionals, 84.8%, answered that they explain about the disease and the ways of prevention. For guidance on the test for toxoplasmosis, most professionals, 69.7%, responded that they advise pregnant women about seroconversion during pregnancy (Table 3).

Table 3 – Guidance given by HCU-UFU, Uberlândia, MG professionals to pregnant women about toxoplasmosis and the test.

Guidelines on toxoplasmosis	Test guidelines
I explain about the disease and the ways of prevention 28/84.8%	Yes and I advise pregnant women about seroconversion during pregnancy 23/69.7%
I explain about the disease, but not the ways of prevention 0/0%	No, I only request the mandatory tests for pregnant women 6/18.2%
I do not explain the disease, but I generally deal with diseases transmitted during pregnancy 2/6.1%	
Not applicable 3/9.1%	Not applicable 4/12.1%

Finally, when asked how often a seronegative pregnant woman for *T. gondii* should have a serologic test for the disease, the majority, 69.7%, answered three times, one test for each gestational trimester and 18.2% answered that it was necessary to perform the test twice, one test in the first trimester and the second test in the third gestational trimester (data not shown).

DISCUSSION

This study explored the knowledge of pregnant women and health professionals about toxoplasmosis. Most pregnant women were in the third trimester and had partial knowledge about toxoplasmosis, since many of them were unaware of the vertical transmission of *T. gondii*.

Age is considered an important epidemiological factor in the identification of susceptible women. A study conducted in Goiânia, in the state of Goiás, showed that acute infections with detection of IgM antibodies frequently occurred in younger pregnant women, especially in adolescents.[30] On the other hand, a study carried out in Rolândia, in the state of Paraná, showed that pregnant women of a higher age group had a higher prevalence of toxoplasmosis.[24]

The divergence between the data represents the extent to which the transmission of *T. gondii* can be variable depending on the geographic region studied. This can be attributed to the increased exposure to risk factors associated with transmission over the years and it is expected that young women do not have sufficient knowledge about the disease, which increases the risk of infection during pregnancy. It should be noted that the average number of pregnant women in the present study was 27±6.8 years, being considered young.

Another factor associated with the transmission of *T. gondii* is the level of education. In this study, most pregnant women had completed high school (52.9%) and previous studies have shown that a higher level of education is a protective factor against infection.[22,31-32] The population with higher education has a greater understanding of good hygienic habits, which reduces the possibility of infection. Thus, we can conclude that the degree of knowledge of the pregnant women who participated in this research may have interfered with the lack of knowledge about the disease and the risks to the health of the fetus.

Toxoplasma gondii can be contracted through the consumption of raw and undercooked meat from animals containing tissue cysts or by ingestion of oocysts, which are present in cat feces, found in soil, water and food.[33] A study carried out in the municipality of Maringá, Paraná, showed that of 499 pregnant women interviewed, 210 (42.1%) had the

habit of consuming raw or undercooked meat.[34] Another study carried out in Caxias, Maranhão, showed that the consumption of raw meat by pregnant women had a significant association with seropositivity *for T. gondii*.[35]

Studies carried out in Minas Gerais, England and China pointed out that this eating habit is an important risk factor for the acquisition of toxoplasmosis.[36-38] In the present study, most pregnant women said they did not have the habit of eating raw or undercooked meat, however the ignorance of other ways of contracting the disease contribute to an increased risk of congenital infection.

Cases of toxoplasmosis outbreaks have been reported in Brazil. In 2002, in the municipality of Santa Isabel do Ivaí in the state of Paraná, 426 seroconverted to anti-*T* IgM. *gondii*, with seven pregnant women. Of these, six had infected children, one with severe congenital anomaly, resulting in death and a miscarriage. The probable cause of this outbreak was the contamination of one of the city's water reservoirs by *T. gondii* oocysts.[39]

Recently, in Santa Maria, Rio Grande do Sul, 792 cases were reported, and of these, 617 met the definition of a suspected case. Therefore, 218 (35.4%) were laboratory confirmed, 70 (11.3%) discarded and 329 (53.3%) are still under investigation. Of the confirmed cases, 20 (11.3%) were pregnant and another 103 are under investigation, as well as 02 fetal deaths that occurred at 28 and 36 weeks of gestation and an abortion in the 15th week of gestation. The source of the infection has not yet been discovered and the authorities are trying to complete the investigation of the outbreak and structure the network of laboratory diagnosis and patient care, with special attention to pregnant women.[40]

Thus, it is clear that health education, as well as personal hygiene, are still important preventive measures against the various parasitic diseases.[41-43] The primary prevention of congenital toxoplasmosis involves the promotion of knowledge, emphasizing the means to avoid infection by *T. gondii* and this information can be more effective when provided by the doctor himself or other health professionals and remembered during prenatal care.[44-45]

Regarding the knowledge of health professionals, it was found that, although most professionals show knowledge about the disease, more accurate information about the definitive host, the transmission routes and periodicity in the performance of tests during prenatal care are not fully known. It is up to them, mainly doctors and nurses, to participate in health promotion actions in order to train and become able to guide pregnant women on preventive measures on congenital toxoplasmosis throughout pregnancy.[46-48]

It is known that, in general, pregnant women follow medical recommendations when the information is provided, because they are concerned with the baby's health. Therefore, not only specific guidance must be provided by professionals, but also written recommendations must be made available to all pregnant women during the prenatal period or, preferably, in the preconception consultation.[49]

Studies carried out with health professionals state that nurses and doctors have little information on preventive measures for toxoplasmosis, and that nurses are unaware of information about diagnosis and clinical issues.[50-51] Another study carried out in Maringá, Paraná, showed that 88.7% of the professionals had doubts about the evolutionary forms of the parasite responsible for the infection of man. Among the physicians, 69.7% did not know what the best approach was for a pregnant woman with IgM and IgG anti-*T.gondii* reagent, 39.4% did not know how to answer during which period of pregnancy it was possible to acquire toxoplasmosis and 15.1% did not know what prevention guidelines should be given to pregnant women.[34]

In the present study, the professionals showed little knowledge about the animals that can transmit *T. gondii* to man, with less than half of them

responding to swine and cattle as transmitters of parasitosis. The lack of knowledge of this mode of infection is worrying, since the consumption of raw or undercooked meat from these hosts is one of the main causes of transmission of *T. gondii*.[22,24,52-53]

Serology for toxoplasmosis at the beginning of pregnancy is essential for an effective diagnosis and allows the adoption of prophylactic and therapeutic measures, making it possible to decrease the rate of congenital transmission and damage to the formation of the fetus.[54-55] Although congenital transmission occurs, most of the time, when the mother contracts the disease for the first time in pregnancy, reinfection with strains other than the primary infection can occur.[56]

In this study it was possible to observe that some professionals did not correctly guide pregnant women in relation to tests for toxoplasmosis, since 18.2% answered that they only requested mandatory tests and 6.1% did not explain about the disease, but approached it in a way general diseases transmitted during pregnancy. Thus, health promotion involving primary prevention should be considered for all pregnant women, whether or not they are susceptible to toxoplasmosis.[40]

Research conducted in various parts of the world has shown that the most effective, simple and economical way to prevent congenital toxoplasmosis is through primary or educational care for pregnant women on the risks of infection.[55] A study carried out in a city in Rio Grande do Sul followed 31 seronegative pregnant women through clinical and serologic tests in order to assess whether the early diagnosis of maternal infection, in seroconversion, could prevent fetal infection or reduce the consequences using therapeutic tools. In this group of pregnant women, there was no seroconversion during clinical and serological follow-up, both in mothers and their babies. The researchers attributed this result to the primary protective measures employed in the Women's Health Program, in which, at each action, the pregnant women were reminded of the preventions regarding the infection.[57]

The lack of knowledge about toxoplasmosis directly interferes with primary prevention measures. A study carried out in a Basic Health Unit (UBS) in the municipality of Satuba showed that of the 40 pregnant women, 22 of them had never heard of toxoplasmosis, only 9 said yes, another 9 said they had little knowledge.

As for medical guidance on the disease and information during prenatal consultations, 85% of the interviewees stated that they did not receive any type of guidance or information about this parasitosis. In addition, 22 pregnant women reported not having performed the serologic test for toxoplasmosis.[58] In view of this, the importance of health education is emphasized as a need for the involvement of health professionals.

Several studies highlight the difficulties that health professionals encounter during the first visit to pregnant women, including the effectiveness of the tests, as well as divergences in the diagnostic and therapeutic approaches to gestational toxoplasmosis.[59-60] Many patients are referred to high-risk care without presenting anti-IgM antibodies to *T. gondii*, representing a certain incompatibility in the diagnosis of toxoplasmosis.[61]

Therefore, the continuing education of health professionals working in prenatal care is extremely relevant, avoiding diagnostic errors and overloading the system. In addition to health promotion actions, notification of cases of toxoplasmosis acquired during pregnancy is essential for the implementation of primary prevention programs, as it allows the obtainment of epidemiological, clinical and diagnostic data that contribute to the evaluation of the clinical evolution of children exposed to *T. gondii*.[40,62]

The present study involved a large number of pregnant women attended in the region, which encourages the application of public policies directed at this group of people. However, the difficulty in

approaching all pregnant women with different gestational periods is highlighted, so that the guidelines are more specific, especially for those who are at the beginning of pregnancy.

Although the study was limited only to the reference Hospital School in Uberlândia, the data reinforce the importance of primary prevention in the context of congenital toxoplasmosis, since important aspects about the disease are unknown to most pregnant women and health professionals who participated in the research. In this sense, actions related to university extension represent an extremely important tool, whether it is performing actions to provide services to the university community and population groups that are indirectly involved or offering service to the community and taking their knowledge through courses, workshops, lectures, collaborating to improve the population's quality of life.

CONCLUSION

Toxoplasmosis is a worldwide distributed zoonosis and one of the most serious infections during pregnancy due to abortion and the risk of fetal involvement. The knowledge of pregnant women and health professionals about the disease, such as a maternal-fetal infection, directly intervenes in the means of prevention, reducing the chances of vertical transmission of *T. gondii*.

In this study it was found that, although most pregnant women and health professionals report knowledge about the disease, complementary information such as transmission, prophylaxis and periodicity in the performance of tests during prenatal care are unknown. Thus, the need for continuous reinforcement of primary prevention programs is highlighted, as well as the notification of cases of toxoplasmosis acquired during pregnancy through university extension projects in the area. For that, it is of great importance the continuous training of health professionals for the implementation of primary prevention programs, mainly due to the challenge that this presents itself, as care involves changing the daily habits of pregnant women.

Actions related to university extension represent an extremely important tool for the institution, whether by carrying out actions to provide services to the university community and population groups that are indirectly involved or offering services to the community and bringing their knowledge through courses, workshops, lectures, thus contributing to improving the quality of life of the population.

RESUMO

Introdução: A toxoplasmose é uma doença que acomete grande parte da população mundial. A forma congênita ocorre devido à passagem transplacentária do parasito durante a gestação. Nos programas de prevenção primária, uma etapa inicial é a avaliação do nível de informação sobre a doença do público-alvo. O objetivo foi avaliar os conhecimentos de gestantes atendidas no Hospital Escola de referência de Uberlândia, MG e dos profissionais que atendem no pré-natal sobre toxoplasmose congênita. **Delineamento**: Neste estudo descritivo, as informações foram adquiridas por meio de questionário aplicado entre agosto de 2017 e agosto de 2018, com amostra de 138 gestantes e 33 profissionais. **Resultados**: Verificou-se que 87,7% das gestantes ouviram falar sobre toxoplasmose, porém 62,6% desconheciam todas as formas de infecção e 34,5% não sabiam da infecção durante a gestação. Para os profissionais, 69,7% realizavam orientação sobre a soroconversão durante a gestação, mas 18,2% responderam que gestantes soronegativas deveriam realizar o exame apenas duas vezes. **Implicações**: Estes dados mostram a importância dos programas de prevenção primária, por meio de ações de extensão universitária para garantir a educação continuada sobre este assunto para gestantes, e manter os profissionais de saúde capacitados no que diz respeito a notificação dos casos de toxoplasmose congênita.

DESCRITORES

Toxoplasmose Congênita; Prevenção Primária; Cuidado Pré-Natal.

RESUMEN

Introducción: La toxoplasmosis es una enfermedad que afecta a gran parte de la población mundial. La forma congénita se produce debido al paso transplacentario del parásito durante el embarazo. En los programas de prevención primaria, un paso inicial es evaluar el nivel de información de la audiencia objetivo sobre la enfermedad. El objetivo fue evaluar el conocimiento de las gestantes atendidas en el Hospital Escolar de referencia de Uberlândia, MG y de los profesionales que asisten a la atención prenatal sobre toxoplasmosis congénita. **Delineación:** En este estudio descriptivo, la información se adquirió mediante un cuestionario aplicado entre agosto de 2017 y agosto de 2018, con una muestra de 138 gestantes y 33 profesionales. **Resultados:** Se encontró que el 87,7% de las embarazadas se enteró de la toxoplasmosis, sin embargo, el 62,6% desconocía todas las formas de infección y el 34,5% desconocía la infección durante el embarazo. Para los profesionales, el 69,7% brindó orientación sobre la seroconversión durante el embarazo, pero el 18,2% respondió que las embarazadas seronegativas deben realizar el examen solo dos veces. **Implicaciones:** Estos datos evidencian la importancia de los programas de prevención primaria, a través de acciones de extensión universitaria para asegurar la educación continua en este tema a las mujeres embarazadas, y mantener capacitados a los profesionales de la salud en la notificación de casos de toxoplasmosis congénita.

DESCRIPTORES

Toxoplasmosis Congénita; Prevención Primaria; Atención Prenatal.

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AVAILABILITY OF DATA

The original data are under the responsibility of the corresponding author and are available in spreadsheets.

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CONFLICTS OF INTEREST

There are no conflicts of interest to declare.