SYPHILIS: A PEDAGOGICAL APPROACH FOR ADOLESCENTS IN THE 1ST YEAR OF HIGH SCHOOL IN A PRIVATE SCHOOL IN THE MUNICIPALITY OF SÃO LOURENÇO DA MATA – PE

https://doi.org/10.56238/sevened2025.001-031

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ABSTRACT

Syphilis, a predominantly sexually transmitted infection, is a significant public health problem in Brazil. When not diagnosed and treated early, it can evolve, leading to serious health complications. In view of this alarming reality, this research adopted a quantitative, descriptive and exploratory approach to deepen the understanding of this problem. The problem investigated was centered on the number of syphilis cases in the municipality of São Lourenço da Mata - PE, in parallel with the lack of educational and preventive campaigns. Thus, an educational intervention was proposed aimed at students in the 1st year of high school at the Centro Educacional Balão Mágico school, with the purpose of informing, preventing and raising awareness about syphilis, training them as multipliers of information in their communities. The methodology applied involved a lecture covering everything from the structure of the *Treponema pallidum bacterium* to the methods of diagnosis and treatment of syphilis, contextualizing the epidemiological situation of the disease in Brazil, Pernambuco and the municipality. The lecture was designed to stimulate post-event discussions among students, promoting critical reflection and fostering an informed approach to sexual health within the school environment. The results achieved highlighted the importance of the school in the role of informing, preventing and raising awareness among young people about public health issues. Concluding that more interventions and educational projects aimed at health are needed, aiming to mitigate problems such as syphilis, which are crucial for the quality of life of individuals, as well as the need for the school to integrate itself as a vehicle for communication, guidance and prevention of these problems.

Keywords: High school. *Treponema pallidum.* São Lourenço da Mata. Syphilis. School intervention.

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INTRODUCTION

According to the World Health Organization (WHO, 2016), it is estimated that syphilis affects more than 12 million people worldwide. Syphilis is a sexually transmitted infection, caused by the bacterium *Treponema pallidum*, it is transmitted through skin lesions or mucous membranes sexually, transplacentally or blood transfusion. When left untreated, the disease can last for many years, being divided into phases, primary, secondary, latent, and tertiary syphilis (Levinson, 2011).

Despite being a curable infection, it is a public health problem on a global scale, which has been increasing in recent decades, being considered one of the most reported STIs (Sexually Transmitted Infection) in the world (Ministry of Health, 2021). Between 2019 and 2023, 778,359 cases of acquired syphilis were recorded in Brazil, 73,869 of which were in adolescents aged 13 to 19 years, that is, about 10% of the cases in the country in the last 5 years (Ministry of Health, 2023).

Thus, during the realization of a research activity for the curricular component of microbiology, it was possible to observe that in the municipality of São Lourenço da Mata, located in the State of Pernambuco, there was a significant number of cases of syphilis. However, there was no information and preventive campaign for the disease.

Thus, it is necessary to participate in education and the role of the school in the formation of young people, aiming to prepare them adequately to face contemporary challenges. In view of the problem and wishing to interfere in a positive way in the fight against infection, a proposal for information, prevention and awareness was elaborated to be applied in a school community through lectures and discussions, with students in this context playing the role of multipliers of information in the community, among family members and friends.

Thus, this study aimed to provide adolescents and students of the 1st year of high school with a pedagogical approach to syphilis, to make them aware and sensitize them about the etiological agent, clinical manifestations, types of diagnoses, treatment, prevention and the epidemiological profile of infection in Brazil, in Pernambuco and in the municipality of São Lourenço da Mata.

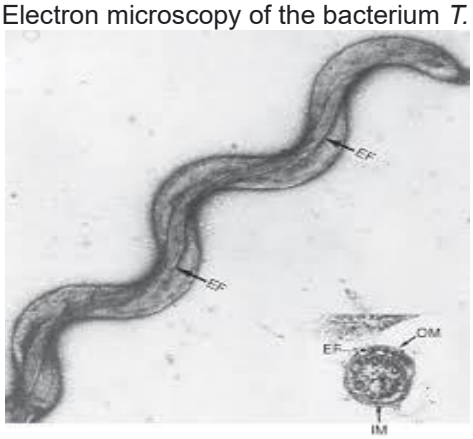
THEORETICAL FRAMEWORK

ETIOLOGICAL AGENT

Treponema pallidum, the etiological agent of syphilis, is a Gram-negative bacterium that has a spiral shape, a size of 6 to 15µm in length and 0.2µm in diameter, and has man as its only host. It consists of a cytoplasmic membrane, surrounded by an outer

membrane with 3 layers rich in molecules of N-acetyl muramic acid and N-acetyl glucosamine, which assumes the function of a protective barrier for the endoflagellum responsible for movement and undulating locomotion, as shown in figure 1 (Trabulsi, 2005).

Figure 1: Electron microscopy of the bacterium *T. Pallidum*.



Source: Google Images, 2024.

Like other microorganisms, *T. pallidum* performs vital functions, such as DNA replication, transcription, RNA translation, energy production, toxin secretion, among others. However, it has limited metabolic capacity for the synthesis of amino acids and carbohydrates, so it needs to remove numerous nutrients from its host (Weinstock, 1998). It is sensitive to variations in temperature, humidity and disinfectants. Its ability to survive in environments with low oxygen levels is related to the lack of genes responsible for encoding enzymes that offer protection against toxicity caused by oxygen (Silva, 2020).

TRANSMISSION OF SYPHILIS

Syphilis is a Sexually Transmitted Infection (STI), considered a global and constant public health challenge. In most cases, the disease is transmitted through unprepared sexual contact, when one partner is infected. Another way is when an infected pregnant woman transmits the bacteria to her fetus, at childbirth or during breastfeeding. More rarely, syphilis can also be transmitted by blood transfusion or contact with contaminated materials (Silva, 2020). The propagation of the agent, *Treponema pallidum*, by sexual route, occurs when the bacterium associates with epithelial cells and elements of the extracellular matrix. The spirochetes of the bacterium penetrate the mucous membrane (eg, genitalia, oral cavity, and rectum). Upon penetrating the epithelium, the organisms reproduce and spread through the lymphatic vessels and bloodstream (Peeling et al., 2017).

Congenital syphilis happens when an infected pregnant woman transmits syphilis to the fetus during pregnancy in three ways, hematogenously, through direct contact and

breastfeeding. Hematogenous transmission occurs when *T. pallidum* crosses the transplacental barrier. In direct contact, it occurs when the baby passes through the vaginal canal during delivery or during breastfeeding, when the mother has local lesions, in both cases (Sonda, et al., 2013). Blood transmission occurs through blood transfusion or materials containing the blood of the contaminated person, spirochetes penetrate mucous membranes or superficial skin wounds and when they penetrate the epithelium, the bacteria multiply and spread through the lymphatic vessels and into the bloodstream (Peeling et al., 2017).

CLINICAL MANIFESTATIONS OF SYPHILIS

Acquired syphilis

Primary syphilis is characterized by the appearance of an ulcer, called hard chancre, usually single, painless and hardened, which appears in the place where sexual exposure occurred, such as in the vulva, penis, anus or oral cavity, in a period of 9-90 days after infection. The lesion may go unnoticed by the patient and disappears after 3 to 6 weeks, causing a false impression of healing (Health World Organization, 2016).

After the healing of the cancer, between 6 weeks and 6 months, in 90% of infected patients, mucocutaneous lesions appear on the skin, characteristically affecting the palms of the hands and soles of the feet, qualifying secondary syphilis. Subsequently, they progress to condylomas, similar to warts, in addition to lesions that can appear on the gums, lips, under the tongue, and on the palate, and fever, malaise, headache, and swelling throughout the body may occur (Brasil, 2022). According to the World Health Organization (WHO, 2016), it can also include grayish-white lesions on the mucous membranes. The rashes of secondary syphilis have a large number of manifestations and can vary and mimic other infectious or non-infectious diseases.

Latent syphilis presents itself as a phase after the primary and secondary manifestations, in which the patient is considered asymptomatic, but still tests positive for the infection, being differentiated into early latent and late latent, when the infection occurs in less than a year, with patients having a high risk of transmission, due to recent lesions and when it occurs for more than a year and is not considered infectious, respectively (Ghanem et al., 2020; Hicks, Clement 2020).

The late phase, or tertiary syphilis, can appear between 1 and 40 years after the onset of infection and usually presents more severe symptoms. Patients may manifest as plaques or nodules that are wavy in shape or like an arch. More serious manifestations include neurological (neurosyphilis) and cardiovascular diseases (Brasil, 2021).

Neurosyphilis can present with acute changes in mental status, meningitis, stroke, auditory, ophthalmic, and ocular abnormalities, locomotor ataxia, and general paralysis, which can lead to death (Health World Organization, 2016).

Congenital syphilis

Congenital syphilis is associated with miscarriage, premature birth, stillbirth, and malformations of the fetus. Most cases occur due to the absence or inadequate treatment of syphilis in pregnant women and failures in tests during prenatal care. Congenital syphilis is divided into precocious when it appears up to the second year of life and late when symptoms are observed after the second year of life (Albuquerque et al., 2021). The main features of early congenital syphilis are: Hepatomegaly (enlargement of the liver), splenomegaly (enlargement of the spleen), skeletal abnormalities (periostitis or osteochondritis), pseudoparalysis of the limbs, pneumonia, sero-bloody rhinitis, jaundice, anemia, and generalized lymphadenopathy. (Domingues et al., 2021).

Among the main symptoms of late congenital syphilis are the "Saber Blade" tibia, Clutton's joints, "Olympic" forehead, "saddle" nose, Hutchinson's teeth, mulberry molars, short jaw, elevated palatal arch, interstitial keratitis, and neurological deafness (Domingues et al., 2021).

DIAGNOSIS OF SYPHILIS

Diagnostic tests are divided into two categories: Direct examinations and immunological tests. In direct examinations, samples collected directly from primary or secondary lesions are used, the methodologies for the tests can vary between, darkfield microscopy, which despite being easier to implant and low cost, is necessary for analysis, microscope with darkfield condenser and experienced professionals in the handling of the slide. Microscopy with stained material and direct immunofluorescence is currently little used, because in addition to the dyes having low specificity for *Treponema pallidum*, the inputs for labeling are scarce. On the other hand, nucleic acid amplification test (NAAT) has a better result if used as a sample, exudate from lesions (Brazil, 2021). On the other hand, immunological tests help in the investigation of syphilis by detecting antibodies in whole blood, serum, or plasma samples. Among these, they are divided into two categories: Treponemal and non-treponemal tests. Treponemic drugs are those that detect antibodies produced by the infected individual, and they are the most suitable to start the investigation of syphilis, however, they should not be used in the monitoring of treatment, only for diagnosis. They can be fluorescent treponemal antibody absorption (FTA-Abs), *T. pallidum*

particle agglutination (TPPA), *T. pallidum* haemagglutination assay (TPHA), enzyme immunoassays and their modifications (Gaspar et al., 2021).

The treponemal test of first choice is the Rapid Test (RT), as it does not require laboratory infrastructure, can be performed by any trained person, is performed and read quickly, in approximately 30 minutes. They are performed using blood samples collected by fingerstick or venipuncture and have the advantage of being performed at the time of the consultation, eliminating the risk of losing the patient due to non-return to care (Jacociunas et al., 2022). Non-treponemal tests, on the other hand, are widely used in laboratories and have a low cost. They are used to assist in diagnosis, for monitoring the response to treatment, and for cure control (Ministry of Health, 2020). These tests are reactive after three weeks of the appearance of hard cancer. In Brazil, the most popular test is the VDRL (Venereal Disease Research Laboratory), in which an adequate drop in titers is indicative of treatment success (Jacociunas et al., 2022).

TREATMENT AND PREVENTION OF THE DISEASE

Penicillin, a drug belonging to the group of beta-lactams, is the antimicrobial most prescribed by general practitioners. Brazil appears in first place in the consumption of this antibiotic in the "Region of the Americas" between the years 2016 and 2018, corresponding to 23.2% of prescriptions. Penicillin type *G benzathine* is the drug used in the treatment of primary, secondary and early latent syphilis with a single dose, for late latent syphilis or syphilis with unknown and tertiary duration, weekly treatment is done for three consecutive weeks with the drug, its administration should be intramuscular (IM), preferably in the ventrogluteal region (Alves et al., 2022). Regarding sexual partners diagnosed with syphilis, they should be clinically evaluated and start the treatment process. In addition, patients should be advised on the correct use of female and/or male condoms in all sexual relations, which is the effective method of preventing STIs (UFRGS, 2023).

ADOLESCENCE AND SYPHILIS

Adolescence is a phase of growth and development, characterized by physical, social and psychic transformations. In this stage of life between childhood and adulthood, the World Health Organization considers adolescence to be the second decade of life (from 10 to 19 years old), while the Statute of the Child and Adolescent considers that individuals between 12 and 18 years old are adolescents (Carneiro et al., 2015). There are indications that adolescence is marked by sexual maturation and puberty, considering physical growth, change in body composition, hormonal outbreak and the evolution of sexual maturation,

with puberty being something common for everyone, but adolescence is an individual phase influenced by social and cultural relations, that is, the reality of each citizen (Brasil, 2007).

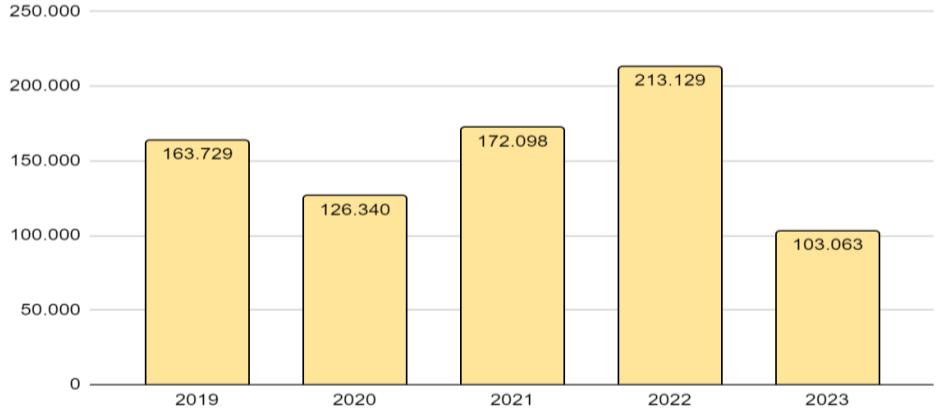
Under this bias, these adolescents accept early behaviors, such as sexual relationships, which in most cases are not prepared. Early sexuality increases vulnerability to sexually transmitted infections and other risks, which interferes with their futures. In the social sphere, low levels of education and socioeconomic are associated with these diseases (Taquette et al., 2004).

EPIDEMIOLOGICAL OVERVIEW OF ACQUIRED SYPHILIS IN BRAZIL AND PERNAMBUCO

In Brazil, scientific research on the subject has been increasing the understanding of the Brazilian population about infection prophylaxis. However, in the last decade, increasing increases in acquired syphilis have been recorded, this is attributed to unprepared sexual exposure, that is, without the use of condoms. Thus, it is understood that information about the disease has not been effectively reaching a part of the population. Despite being an infection with the possibility of cure, it faces a challenge for early diagnosis, along with the interruption of the transmission chain (Brasil, 2020).

According to the 2023 Syphilis Epidemiological Bulletin, in the last five years (2019 to June 30, 2023), a total of 778,359 cases of acquired syphilis were recorded in Brazil (Graph 1). It can be observed that there was a drop in the number of cases in 2020, the year of the covid-19 pandemic, two years after the pandemic there was a considerable increase in cases, proceeded by a decline in the last year.

Graph 1: Number of cases of acquired syphilis in Brazil between the years 2019 and June 30, 2023.



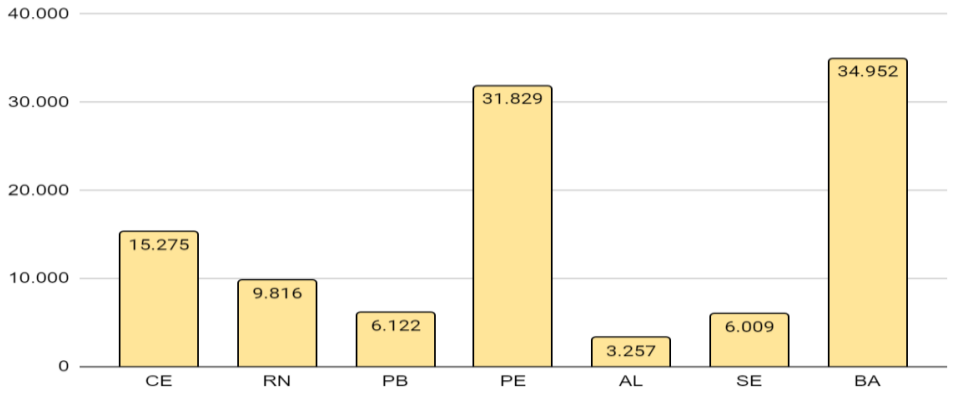
Source: Syphilis Epidemiological Bulletin, Ministry of Health, 2023 (Modified).

Also between the years 2019 and 2023, in the North region, the total number of cases in the last 5 years reached 57,990, presenting the lowest rate among the other regions, in the Northeast, the number of cases reached 120,810, while in the Southeast, there were 366,318 cases registered. In the South and Midwest of Brazil, 171,865 and 61,376 cases of acquired syphilis were registered, respectively.

When we stop to analyze the data recorded in relation to schooling, by year of diagnosis, in the last decade, between 2012 and June 2023, they were separated into the categories: Illiterate, incomplete 1st to 4th grade, complete 4th grade, incomplete 5th to 8th grade, Complete elementary school, Incomplete high school, Complete high school, Incomplete higher education, Complete higher education, Complete higher education, Not applicable, Subtotal and Ignored. It is possible to observe a higher prevalence of infection in individuals with complete high school with 268,041 and 120,575 for individuals with incomplete high school (Brasil, 2023).

In the age group of 13 to 19 years, the incidence was higher in females. Among males, 30,629 cases were reported, while females had 43,240 cases of acquired syphilis, totaling 73,869 cases in the country (Brasil, 2023). In the same document, Pernambuco recorded the second highest number of cases reported in the Northeast region between 2019 and June 2023, totaling 31,829 cases, as shown in graph 2.

Graph 2: Number of cases of acquired syphilis in the Northeast States between the years 2019 and June 30, 2023.

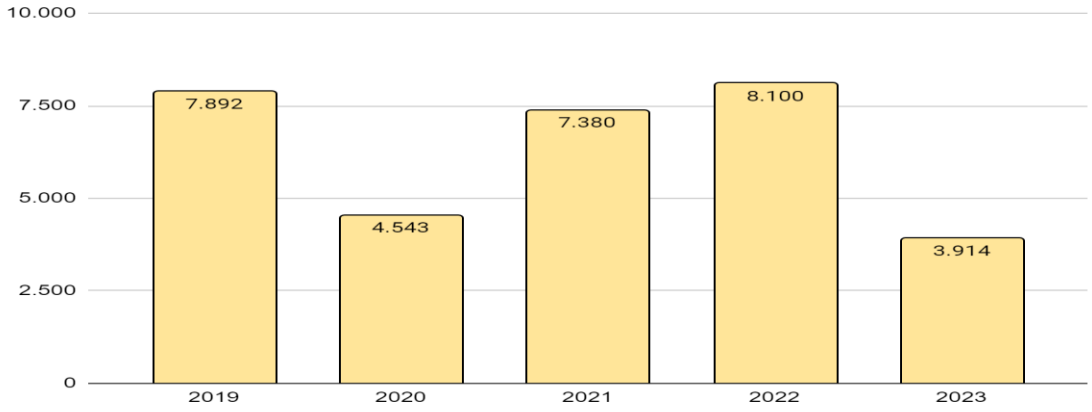


Source: Syphilis Epidemiological Bulletin, Ministry of Health, 2023 (Modified).

In the State of Pernambuco, in 2019, 7,892 cases were registered, while in the following year, due to the COVID-19 pandemic, there was a reduction to 4,543 reported cases. The number of cases increased again in 2021 with an amount of 7,380. The following year, there was a peak with 8,100 notifications of acquired syphilis, the highest number in five years. On the other hand, in 2023, considering the date of the last notification

made until the middle of the year, there was a significant drop, with only 3,914 cases registered (Graph 3).

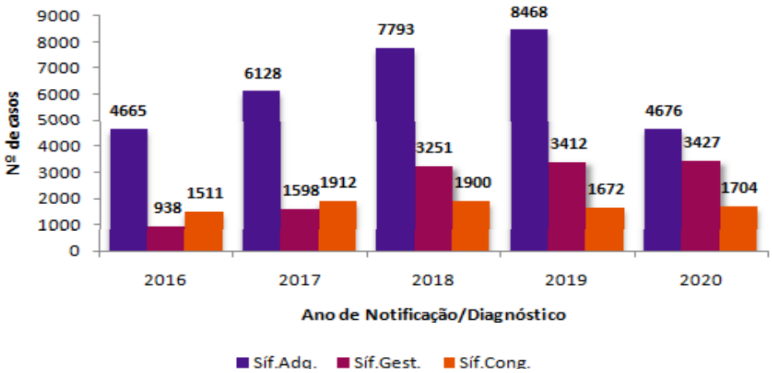
Graph 3: Number of cases of acquired syphilis in the State of Pernambuco between 2019 and June 30, 2023.



Source: Syphilis Epidemiological Bulletin, Ministry of Health, 2023 (Modified).

The data presented in the Epidemiological Report on syphilis in Pernambuco (2021), referring to the period from 2016 to 2020, show the highest rate of acquired syphilis in 2019, soon after, there was a sharp decrease in the number of cases in 2020, a year marked by the pandemic, as seen in figure 2.

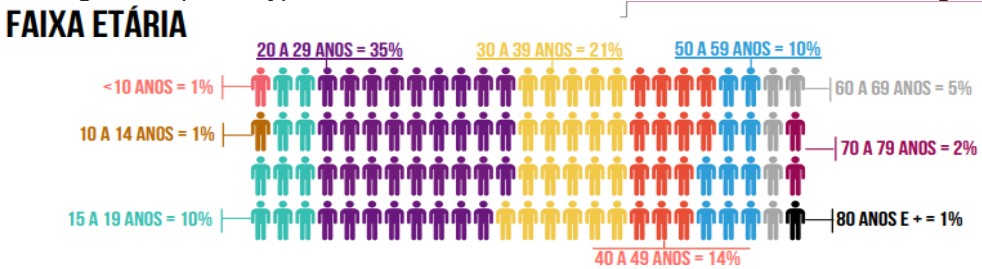
Figure 2: Cases of acquired, pregnant and congenital syphilis, according to the year of notification/diagnosis in the State of Pernambuco between 2016 and 2020.



Source: Pernambuco Epidemiological Report, 2021.

Regarding the age group (Figure 3), the prevalence of acquired syphilis was evidenced in individuals between 20 and 29 years, adding up to 35% of the cases, followed by the age group from 30 to 39 years, with 21% and 10% in the 50 to 59 and 15 to 19 age groups, respectively (Pernambuco Epidemiological Report, 2021).

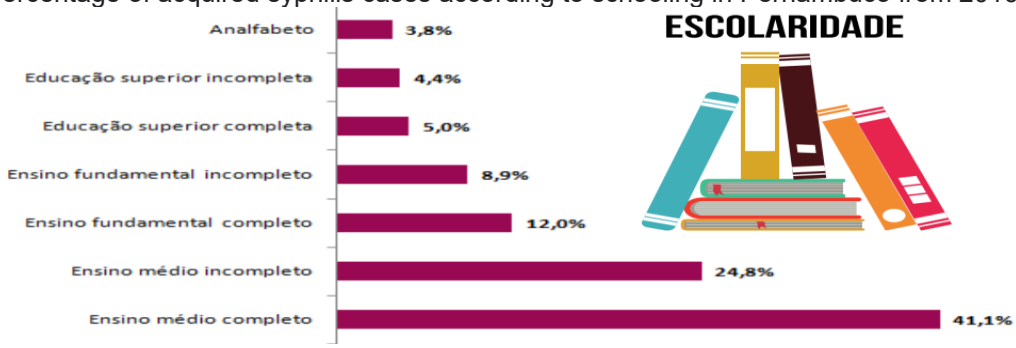
Figure 3: Percentage of acquired syphilis cases in Pernambuco from 2016 to 2020 according to age group.



Source: Pernambuco Epidemiological Report, 2021.

The prevalence of *Treponema pallidum* can be observed in individuals who have or have not completed basic education, with a higher percentage focused on complete and incomplete high school, as shown in Figure 4. Taking into account the age group and schooling, it is possible to evidence the vulnerability of adolescents in relation to *Treponema pallidum*. Thus, there is a need to constantly think about new significant strategies to combat, prevent and promote the health of individuals, promoting access to information and awareness.

Figure 4: Percentage of acquired syphilis cases according to schooling in Pernambuco from 2016 to 2020.

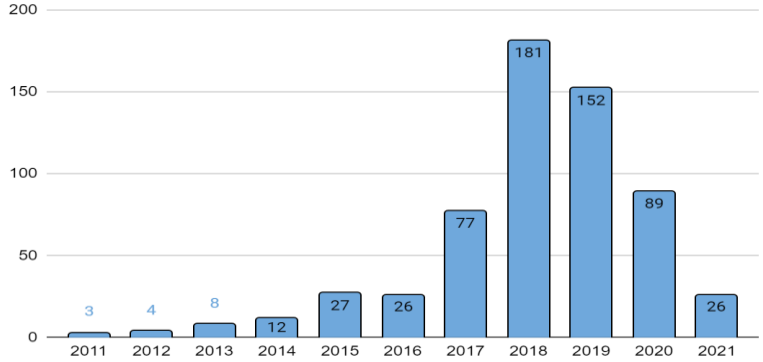


Source: Pernambuco Epidemiological Report, 2021.

EPIDEMIOLOGICAL OVERVIEW OF SYPHILIS IN THE MUNICIPALITY OF SÃO LOURENÇO DA MATA

Also in the Epidemiological Report on Syphilis in Pernambuco (2021), a mapping of cases of acquired syphilis in the municipalities of Pernambuco was carried out, among them, in the city of São Lourenço, it is possible to observe lower rates of the disease between the years 2011 and 2016. In 2017, there was an increase to 77 cases, and in the following year a sharp increase, characterizing the year with the highest incidence of infection. In later years, there was a drop, totaling 605 cases at the end of the period from 2011 to 2021.

Graph 3: Number of cases of acquired syphilis in the municipality of São Lourenço da Mata between the years 2011 and 2021, reported in the Pernambuco Epidemiological Report (2021).



Fonte: Pernambuco Epidemiological Report, 2021 (Modified).

THE ROLE OF EDUCATION IN THE CONTEXT OF SYPHILIS

In paragraph 2 of article 1 of the Law of Guidelines and Bases of Education, legislation that defines and regulates the Brazilian educational system, it is argued that the school must be linked to the world of work and social practice, and it is up to the Union to prepare the National Education Plan (PNE) and the State to prepare and execute educational plans, in accordance with the national education guidelines and plans. integrating the actions with their municipalities, so that each school system elaborates and executes its pedagogical proposal (Brasil, 1996).

Each proposal takes into account the National Common Curriculum Base (BNCC), a mandatory reference document for the elaboration of school curricula and pedagogical proposals for basic education in public and private education networks in Brazil. The document brings as one of its skills (EM13CNT207) for students, the identification and analysis of vulnerabilities associated with contemporary challenges to which youth is exposed, in order to develop and disseminate preventive actions. Taking into account the changes and needs of society, it is essential to seek to promote more meaningful learning so that it makes sense to students (Brasil, 2018).

In High School, in the area of natural sciences, the biology component has the ability to evaluate social and health problems, for discussion, development of solutions, promotion of health and individual and collective well-being. Having as one of the objects of knowledge, Sexually Transmitted Infections (Brazil, 2018). In the first year of High School, the 2021 Pernambuco Educational Curriculum addresses topics of knowledge of extreme relevance for this school phase, such as Sexually Transmitted Infections. This theme should be addressed with the objective of developing skills (EM13CNT207) that allow the identification, analysis and discussion of the vulnerability associated with the experiences and challenges faced by young people. This vulnerability is considered in its

physical, psychological, and social aspects, encompassing the manifestations of the disease and its effects on the body, the need for emotional and community support, and the infectious spread of these conditions.

In the second year, the focus of the curriculum turns to the study of the infectious and contagious process of microorganisms, including their forms of contagion, transmission and treatment. This content can be taught through a variety of teaching resources, such as tables, texts, and graphs, in order to engage students in a comprehensive way. In addition, debates on socio-scientific themes are promoted, aiming at the analysis and problematization of the local, regional and global context. Such an approach aims not only to transmit theoretical knowledge, but also to develop analytical and critical skills in students, preparing them to understand and face complex issues related to health and science (Pernambuco, 2021). While, in the last year, the focus of knowledge is directed to ethnic and orientation issues, centering on attitudes that promote prevention and awareness of students, aiming to cultivate mutual respect. This approach integrates organically with previous themes, broadening students' understanding of the complexities of ethnic and orientation diversity and encouraging reflection on how these issues interact with previously covered topics. By connecting these elements, the goal is to provide a comprehensive education that prepares students for active and inclusive participation in society (Pernambuco, 2021).

Regarding the syllabus on Sexually Transmitted Infections, such as syphilis, a disease that causes about one million new cases reported daily and of these cases, a significant portion occurs among adolescents who have or have not completed high school (Carneiro et al., 2023). The data can lead to questions about the role of the school as a vehicle for transmitting information and awareness in favor of health, in view of all the norms and proposals of the reference documents for the teaching-learning process. According to Venturi (2013), in public schools these themes are associated with science/biology teachers. However, studies on effective educational practices in health are still little explored in Brazil, even in the teaching of natural sciences. However, Araújo et al (2021), in a search using VHL (Virtual Health Library), PubMED (US National Library of Medicine National Institutes of Health), Science Direct and Web of Science databases, to analyze articles that described educational actions in terms of prevention of syphilis in adolescents, the researchers described that educational interventions, conversation circles, Games and workshops proved to be effective in expanding knowledge on the subject, also demonstrating failures in knowledge related to the means of contamination

and correct use of contraceptive methods, in addition to evidencing the doubts and experiences shared by the students.

Thus, the non-approach or non-compliance with the syllabus established in the teaching plan and the school curriculum should be considered as one of the factors in the failure of the school's role, taking into account time limitations and prioritization of content as premises. The time available to teach may be insufficient to cover all planned topics, especially if there are disruptions in the school calendar such as holidays, behavior problems, school events, and students' learning difficulties, which may require more time to comprehend certain content, which can delay planned progress in the curriculum. In some cases, the school may choose to prioritize certain content or skills over others, due to external pressures (such as standardized exams) or local priorities.

METHODOLOGY

TYPE OF RESEARCH

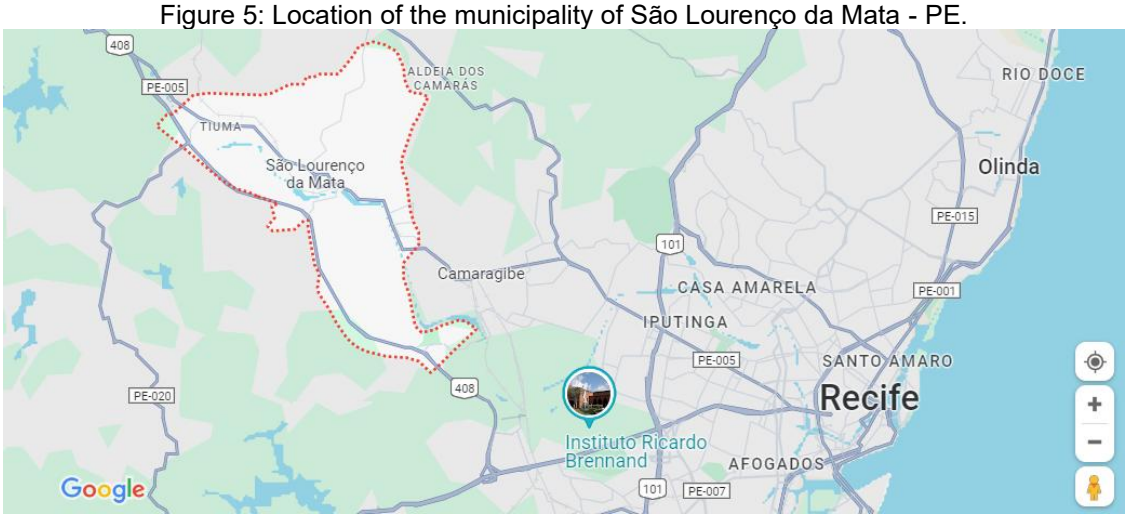
After defining the theme to be worked on, in view of its broad approach, a preliminary bibliographic survey was carried out to establish theoretical limits on the theme. The materials searched included books, articles, review articles, dissertations and theses, preferably from the last 10 and 5 years. The search was carried out on the following platforms: Google Scholar, Virtual Health Library - Ministry of Health (VHL MS), virtual libraries of universities, Scielo (Scientific Electronic Library Online), BDTD (Brazilian Digital Library of Theses and Dissertations), Pubmed (National Library of Medicine).

Thus, taking into account the theme and the objective of the work, the research was characterized by a quantitative approach focusing on concrete information presented through numbers and objective data. As for the nature, being applied, it carries the intention of applying the knowledge and knowledge acquired to the target audience, in order to solve the problem. In addition, the research has a descriptive and exploratory nature, because in succession to the research, the study, the observation and the interpretation of the information, there was the characterization of the problem and the expansion of the scientific theoretical foundations on the subject.

PLACE OF INTERVENTION

The work was developed in a private school in the municipality of São Lourenço da Mata, a region located in the northern forest zone of the State of Pernambuco (Figure 5). According to the Brazilian Institute of Geography and Statistics (IBGE, 2024), the city has a territorial area of 263,687 km² and a resident population of 111,249 inhabitants.

Figure 5: Location of the municipality of São Lourenço da Mata - PE.



Source: Google Maps, 2024.

In the municipality, the work was developed at the private school, Centro Educacional Balão Mágico, located at R. Manoel Corrêa, 145 - Centro, São Lourenço da Mata - PE, 54.725-020, where the supervised internship experience of the Degree in Biological Sciences at the University of Pernambuco (UPE) was also carried out. The school has a sports court, air-conditioned rooms, secretariat, teachers' room, library, robotics classes and provides kindergarten, elementary and high school.

CHARACTERIZATION OF THE TARGET AUDIENCE

In the school, where in addition to the development of the project, the supervised internship experience was also experienced, it was possible to perceive its availability and interest in offering opportunities for the application of projects, as well as contributing to the participation, engagement and development of the intern in the school environment, contributing to an experience in teaching practice. Thus, the interest in planning and carrying out a pedagogical intervention in the institution arises, in order to collaborate with the teaching-learning process of the students, Therefore, the project was developed for students in the 1st year (A, B and C) of high school.

Organization of the intervention

At first, an interview was conducted in person, in a school environment, with the school's science and biology teacher and also responsible for supervising the internship, with the objective of discussing the implementation of a pedagogical project aimed at teaching and guidance about syphilis, aimed at high school. During the conversation, the importance of dealing with topics related to sexual health in the school context was addressed, especially considering the age group of high school students, as well as the

need to guide and provide information about such an urgent and predominant topic in society.

The teacher provided valuable points in relation to the profile of the dynamics carried out in the school, and of the students. Thus, after the discussion of the pedagogical objectives and the contents to be addressed, it was agreed that the pedagogical intervention would take place in the format of a lecture and discussion, since this approach would allow a greater dissemination of information in a clear and direct way, facilitating the participation and engagement of students. A date was then set for the lecture, with sufficient advance notice to allow adequate preparation of the materials.

APPLICATION OF THE LECTURE

The lecture was given to students of the 1st year of high school in classes A, B and C. The work involved the elaboration of the didactic material used for the expository part of the lecture (Figure 6), the data show resource was used to project informative and visual slides that facilitated the understanding and engagement of the students. The content of the slides was structured to address in a comprehensive and didactic way various aspects related to syphilis. The development of the exhibition material was based on reliable and up-to-date scientific sources, ensuring the accuracy and relevance of the information presented, based on the 2023 epidemiological bulletin and the 2021 epidemiological report of Pernambuco. In addition to using, graphic resources to facilitate understanding and maintain the interest of students.

Initially, a brief presentation was made to the students about the university, the course, and highlighting their personal interest in the topic of syphilis due to its epidemiological relevance and impact on public health (Figure 7). After that, the structure of the bacterium *Treponema pallidum, the* causative agent of syphilis, was addressed, with emphasis on its structural characteristics and its ability to infect humans, through microscopic images of the bacterium. The details of the clinical manifestations of syphilis in its different phases (primary, secondary, latent and tertiary), as well as the symptoms associated with each phase, aiming at a comprehensive understanding of the clinical aspects of the disease, using clinical images to illustrate the symptoms, providing a concrete visualization of the impacts of the disease.

With regard to epidemiology, images of graphs and statistical data corresponding to the last Epidemiological Bulletin of Syphilis by the Ministry of Health (2023) and the Epidemiological Report of Syphilis in Pernambuco (2021) were used, which showed the prevalence of the disease in the last five years and the most affected population groups,

as well as the analysis of the incidence in the Northeast region of Brazil, highlighting the State of Pernambuco, with a focus on the municipality of São Lourenço da Mata. These data were observed, taking into account age group and education, identifying population groups with greater vulnerability to syphilis.

Regarding diagnosis, the methods used were exemplified, with emphasis on the rapid test available at health centers. At the moment, the importance of early detection of the infection was reported, as well as the available treatments, focusing on the effectiveness of the use of penicillin and the need for adherence to the therapeutic regimen and preventive measures to avoid reinfection.

Figure 6: Slides referring to the expository material of the lecture applied.

Source: The author, 2024.

Figure 7: Photos of the application of the lecture in classes A, B and C of the 1st year of high school at the Centro Educacional Balão Mágico school, in São Lourenço da Mata - PE.

Source: The author, 2024.

DISCUSSION FOR KNOWLEDGE ANALYSIS AFTER THE LECTURE

After the lecture, the pedagogical process continued with discussions on the subject. In search of a debate and sharing of opinions, the following questions were brought to the students:

1. Does the understanding of the etiological agent of the disease bring more contextualization on the subject?
2. Why is syphilis often confused with other infections or its symptoms go unnoticed?
3. What interferes in the search for early diagnosis?
4. What are the factors that contribute to the prevalence of syphilis in society?
5. Were you already aware of the number of cases in Brazil, the Northeast, Pernambuco or in the municipality (São Lourenço da Mata)?
6. Has this subject ever been addressed at school or in another environment of your life?

RESULTS AND DISCUSSION

In view of the applied project, significant perceptions were revealed, which opened space for fundamental discussions about the school and its role in this context. With the questions raised, it was possible to establish a moment of reflection, sharing of opinions, prior knowledge and evaluation of the effectiveness of the information transmitted in the lecture.

Thus, taking into account the first question: "Does understanding the etiological agent of the disease bring more contextualization about the theme?", the students revealed that they did not know the causative agent of syphilis, and therefore were not aware of its biological properties. However, they stated that they had already studied the structures mentioned in the composition of the body of the bacterium, a fact that was also confirmed by the professor.

This information leads to the thought that the approach to the cause of the disease can facilitate the understanding of its manifestation, as the functioning of the microorganism contextualizes its behavior within the human organism. In addition, the information about the elements that make up the syphilis bacterium served to remind them about previous classes.

Regarding the second question: "Why is syphilis often confused with other infections and its symptoms go unnoticed?", some students answered that this occurs due to the characteristics of the primary lesions, which resemble boils or other common dermatological

conditions. In addition, some have associated the confusion with the fact that syphilis sores often disappear after a period, leading to the false impression of healing.

These observations highlight the importance of understanding the different stages and symptoms of syphilis for a correct diagnosis and appropriate treatment. Awareness of how the disease manifests itself over time is crucial to avoid misconceptions and ensure that people seek medical assistance when needed.

Regarding the question: "What interferes in the search for early diagnosis?", in addition to mentioning the lack of attention to symptoms, it was agreed by the majority that one of the causes could also be related to the shame of going to a health center and asking for an STI test.

Most agreed that this hesitation is also motivated by the fear that other people will find out about their situation. These observations show that, despite being an infection with a high global incidence, syphilis is still a topic that causes embarrassment due to its direct association with sexuality issues. This embarrassment can lead to procrastination in seeking medical care, which can result in late diagnoses and potentially serious health consequences.

Regarding the question: "What are the factors that contribute to the prevalence of syphilis in society?", the students highlighted several aspects in addition to education and age group. Among them, adolescence has emerged as a critical period, where many young people are exploring their sexuality without adequate knowledge about sexually transmitted infections. In addition, the students mentioned that the school had not yet addressed the topic, leaving them with gaps in information that they tried to fill on their own, through the internet and social networks, exposing the need to address the topic in schools.

In the fifth question, the epidemiological data in Brazil, in Pernambuco and in the municipality of São Lourenço da Mata, reflect a significant gap between official disclosure and public perception. Although the Ministry of Health and the state government regularly disseminate this information, its effectiveness in reaching the population is questionable. This scenario shows a disconnect between the availability of data and its understanding and use by citizens. This lack of reach can be attributed to a number of factors, including difficulties in accessing detailed data and the complexity of technical information for the general public. Thus, the need to improve the communication and accessibility of this data is urgent to strengthen community awareness and participation in local and national public health issues.

Finally, with regard to the exploration of the theme in another context, it was evidenced that students do not have the habit of talking to their parents about the subject,

due to the lack of family openness to discuss issues related to sexual health, as well as the embarrassment of being reprimanded by them.

FINAL CONSIDERATIONS

The present study sought to gather quantitative information on syphilis, from its cause to epidemiological data, to contribute to the education of students in the 1st year of high school with a pedagogical intervention. The proposal made it possible to add knowledge to students about the disease, contributing with clear and objective references.

According to the objective results of the lecture, the importance of adopting preventive and awareness measures is highlighted, aiming not only at the dissemination of correct information about syphilis, but also at reducing the incidence of this disease in the general population. In addition, the relevance of continuous educational programs adapted to different age groups is highlighted, as a fundamental strategy for the effective control and combat of sexually transmitted diseases.

Therefore, it is noted that the methodology used allowed the debate and evaluation of students in a critical and reflective way about the impacts of syphilis on public and individual health. In addition, it enabled the construction of a space for open dialogue, where students could share experiences, clarify doubts and develop a sense of social responsibility in the prevention of sexually transmitted diseases. This process not only strengthened students' understanding of syphilis, but also encouraged the adoption of healthy behaviors and the search for accurate information about their own health.

In view of the analyses and reflections provided by this study, it is clear that education about syphilis and other sexually transmitted infections still faces significant challenges, especially with regard to open and accessible communication. The students' perceptions revealed knowledge gaps and emotional obstacles that directly affect the search for early diagnosis and appropriate treatment.

The importance of integrating these sexual health topics comprehensively into the school curriculum is essential to promote a deeper understanding and a conscious approach to these public health issues. In addition, the need to improve the dissemination of clear and accessible information is emphasized, in order to encourage a more proactive participation of the community in health promotion.

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