Review
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Approaches, challenges, and recommendations for clinical practice in gestational syphilis: a scoping review

Abordagens, desafios e recomendações à prática clínica na sífilis gestacional: revisão de escopo

Enfoques, desafíos y recomendaciones para la práctica clínica en la sífilis gestacional: revisión de alcance

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ABSTRACT
Objective: to map the scientific evidence on the approach to gestational syphilis, the sociodemographic profile of pregnant women, and the challenges related to its management and follow-up.
Method: scoping review carried out in October 2024 in the following data sources: Virtual Health Library, Latin American and Caribbean Health Sciences Literature, National Library of Medicine, Scopus, Web of Science, and Google Scholar. Original articles in English, Portuguese, and Spanish, covering the period from 2019 to 2024 and addressing gestational syphilis as their main topic, were included. The snowballing technique, recommended by the JBI, was used as a strategy to achieve literature saturation. The studies were organized into three main themes, and content analysis of the data was performed.
Results: 39 studies were included. Late diagnosis of syphilis during prenatal care and the failure to address sexual partners stand out as persistent challenges. Sociodemographic factors such as Black or Brown race/skin color, low educational level, and difficulties in accessing health services contribute to the persistence of these scenarios.
Conclusion: the increase in the incidence of gestational syphilis cases and regional and socioeconomic inequities persists. Failures in the screening and management of the disease were identified, requiring actions in prenatal care and equitable policies.
Descriptors: Syphilis; Prenatal care; Pregnancy; Health strategies.

RESUMO
Objetivo: mapear as evidências científicas sobre a abordagem da sífilis gestacional, o perfil sociodemográfico das gestantes e os desafios relacionados ao seu manejo e acompanhamento.
Método: revisão de escopo nas fontes de dados Biblioteca Virtual em Saúde, Literatura Latino-americana e do Caribe em Ciências da Saúde, National Library of Medicine, Scopus, Web of Science e Google Acadêmico, realizada no mês de outubro de 2024. Foram incluídos artigos originais, em inglês, português e espanhol, com recorte entre 2019 e 2024, que tinham como temática principal a sífilis gestacional. A técnica de *snowballing*, recomendada pelo *JBI*, foi utilizada como estratégia para alcançar a saturação da literatura. Os estudos foram organizados em três temáticas principais e foi realizada a análise de conteúdo dos dados.
Resultados: foram incluídos 39 estudos. Destacam-se o diagnóstico tardio da sífilis no pré-natal e a não abordagem das parcerias sexuais como desafios persistentes. Fatores sociodemográficos como raça/cor preta ou parda, baixa escolaridade e dificuldades de acesso aos serviços de saúde contribuem para a manutenção desses cenários.
Conclusão: persiste o aumento da incidência de casos de sífilis gestacional e iniquidades regionais e socioeconômicas. Foram evidenciadas falhas no rastreamento e manejo da doença, exigindo ações no pré-natal e políticas equitativas.
Descritores: Sífilis; Cuidado pré-natal; Gravidez; Estratégias de saúde.

RESUMEN
Objetivo: mapear la evidencia científica sobre el abordaje de la sífilis gestacional, el perfil sociodemográfico de las gestantes y los desafíos relacionados con su manejo y seguimiento.
Método: revisión de alcance realizada en las siguientes bases de datos: Biblioteca Virtual en Salud, Literatura Latinoamericana y del Caribe en Ciencias de la Salud, National Library of Medicine, Scopus, Web of Science y Google Académico, llevada a cabo en octubre de 2024. Se incluyeron artículos originales en inglés, portugués y español, publicados entre 2019 y 2024, que abordaran la sífilis gestacional como tema principal. Se utilizó la técnica de snowballing,

recomendada por el JBI, como estrategia para alcanzar la saturación de la literatura. Los estudios se organizaron en tres temáticas principales y se realizó análisis de contenido de los datos.
Resultados: se incluyeron 39 estudios. El diagnóstico tardío de la sífilis en la atención prenatal y la falta de abordaje de las parejas sexuales se destacan como desafíos persistentes. Factores sociodemográficos como raza/color negra o parda, baja escolaridad y dificultades de acceso a los servicios de salud contribuyen al mantenimiento de estos escenarios.
Conclusión: persiste el aumento de la incidencia de casos de sífilis gestacional y las iniquidades regionales y socioeconómicas. Se evidenciaron fallas en el tamizaje y manejo de la condición, lo que exige acciones en el control prenatal y políticas públicas equitativas.
Descriptores: Sífilis; Cuidado prenatal; Gestación; Estrategias de salud.

INTRODUCTION

Syphilis represents a persistent threat to public health due to its social, behavioral, and educational aspects[1]. Caused by the bacterium *Treponema pallidum*, the infection is transmitted mainly through sexual and vertical routes. Despite the availability of effective diagnostic methods and follow-up guidelines in prenatal care, gestational syphilis continues to affect many women, resulting in congenital syphilis, which remains one of the relevant causes of neonatal mortality[2-4].

According to the 2024 Syphilis Epidemiological Bulletin, 86,111 cases of syphilis in pregnant women were reported in Brazil, corresponding to a rate of 34.0 cases per 1,000 live births[5]. In the same period, 25,002 cases of congenital syphilis were recorded, with an incidence rate of 9.9 cases per 1,000 live births, in addition to 196 infant deaths attributed to the infection. In a historical analysis, between 2012 and 2022, 537,401 cases of gestational syphilis were reported in the country[5]. These data show a trend of continuous growth over the past decade, reflecting persistent challenges in addressing syphilis[5].

In recent years, there has been a significant increase in cases, which may result in greater complications for the mother-infant dyad[6,7]. The high prevalence is related to low maternal educational level and deficient prenatal care[4,6]; in addition, underdeveloped countries have a higher incidence of the disease[6,7].

Some difficulties reported by health professionals in identifying gestational syphilis are low adherence to prenatal care, limited participation of the sexual partner, reduced demand for rapid testing, manual completion of notification forms, the absence of a care plan, and the lack of protocols[8]. Studies indicate that syphilis testing and treatment should be widely available, accessible, and free of stigma, ensuring that the entire population has equitable and safe access to services[8,9].

It can be observed that syphilis, despite the scientific and technological advances achieved over the years, remains an important public health problem[1]. Although its eradication is not yet an achievable goal, studies indicate that its control is possible, provided that the available tools are used strategically and the recommended practices are followed[9].

In view of this scenario, several recent studies on gestational syphilis are available; however, the organization and systematization of this evidence remain limited. Thus, the need was identified to bring these findings together, promoting their organization and synthesis, as well as the identification of existing gaps, especially regarding the organizational dimensions of care. Although gestational syphilis is widely discussed in the literature, heterogeneity in the available evidence is still observed.

In this context, the need to investigate current research is reinforced, with a view to identifying gaps and highlighting opportunities for new studies. Accordingly, the objective of this study is to map the scientific evidence on the approach to gestational syphilis, the sociodemographic profile of pregnant women, and the challenges related to its management and follow-up.

METHOD

This is a scoping review based on the *Preferred Reporting Items for Systematic Review and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR)* checklist and on the model proposed by the *JBI - Methodology for JBI Scoping Review*, which seeks to explore and identify scientific production on a given topic[10]. It includes the analysis of relevant research that supports decision-making and improves clinical practice, allowing a synthesis of the state of knowledge on a given subject. In addition, it identifies gaps that need to be addressed through new studies[10].

The research protocol was registered in the *Open Science Framework* (https://osf.io/2mwrd). Since its publication, changes have been made to the study in relation to the information initially described in the protocol, in order to improve methodological rigor and the robustness of the data presented.

For a better research design, and as recommended by the *JBI*[10], the elements of the PCC acronym (Population, Concept, and Context) were used, as follows: *P-Population*: Women; *C-Concept:* Syphilis; *C-Context:* Pregnancy. Based on the search strategy, the following guiding question was formulated: What is the state of the art regarding the approach to gestational syphilis and the main identified challenges related to its management and follow-up?

Articles in Portuguese, English, and Spanish, free of charge, available in full, and published between 2019 and 2024 were included. The selected studies had as their main topic the approach to syphilis during pregnancy. Studies addressing other sexually transmitted infections (STIs) or discussing congenital and/or acquired syphilis were excluded, as well as other reviews, case reports, books, book chapters, and papers/abstracts published in conference proceedings.

Considering that syphilis is a condition that has been widely investigated over the years, the time frame was limited to a more recent period in order to include more up-to-date and methodologically current studies. This strategy sought to encompass contemporary challenges in addressing the disease, as well as to incorporate more current recommendations related to its prevention, diagnosis, and management, more faithfully reflecting the current epidemiological scenario.

The bibliographic search was conducted in October 2024 in the following data sources: Virtual Health Library (VHL), Latin American and Caribbean Health Sciences Literature (LILACS) indexed in the VHL, *National Library of Medicine* (PubMed), *Scopus*, and *Web of Science*. The gray literature search for non-indexed materials was conducted through Google Scholar.

Google Scholar, by including a wide range of scientific and gray literature, yields an extensive volume of results. Considering this characteristic and in order to make the search process more controlled and reproducible, screening was limited to the first five pages of the search strategy, comprising 10 studies per page, totaling 50 articles. This delimitation sought to reduce literature saturation and ensure greater methodological feasibility while maintaining the relevance and timeliness of the included studies.

The search strategies used a combination of keywords and controlled and uncontrolled Health Sciences Descriptors: Gravidez; Sífilis; Cuidado Pré-natal, and of the *Medical Subject Headings* (MeSH): *Pregnancy; Syphilis; Prenatal Care*, using the Boolean operators *AND* and *OR*. The searches were structured as follows (Table 1):

Table 1 - Search strategies according to data sources. Porto Alegre, RS, Brazil, 2024.

Data Sources	**Search Strategy**

LILACS	Search by "Title, Abstract and Subject": ti:((((gravidez OR gestação OR pregnancy OR pregnancies OR gestation OR embarazo OR gestación) AND (sífilis OR lues OR syphilis OR "Great Pox")) OR ("sífilis gestacional" OR "gestational syphilis")) AND ("Cuidado Pré-natal" OR "Assistência Antenatal" OR "Assistência Pré-Natal" OR "Consulta Pré-Natal" OR "Prenatal Care" OR "Antenatal Care" OR (care AND antenatal) OR (care AND prenatal) OR "Atención Prenatal" OR "Asistencia Prenatal" OR "Atención Antenatal")) OR mh:((((gravidez OR gestação OR pregnancy OR pregnancies OR gestation OR embarazo OR gestación) AND (sífilis OR lues OR syphilis OR "Great Pox")) OR ("sífilis gestacional" OR "gestational syphilis")) AND ("Cuidado Pré-natal" OR "Assistência Antenatal" OR "Assistência Pré-Natal" OR "Consulta Pré-Natal" OR "Prenatal Care" OR "Antenatal Care" OR (care AND antenatal) OR (care AND prenatal) OR "Atención Prenatal" OR "Asistencia Prenatal" OR "Atención Antenatal")) AND (fulltext:("1" OR "1") AND db:("LILACS") AND la:("pt") AND type:("article" OR "thesis")) AND (year_cluster:[2019 TO 2024])
VHL	Search by "Title, Abstract and Subject": (((gravidez OR gestação OR pregnancy OR pregnancies OR gestation OR embarazo OR gestación) AND (sífilis OR lues OR syphilis OR "Great Pox")) OR ("sífilis gestacional" OR "gestational syphilis")) AND ("Cuidado Pré-natal" OR "Assistência Antenatal" OR "Assistência Pré-Natal" OR "Consulta Pré-Natal" OR "Prenatal Care" OR "Antenatal Care" OR (care AND antenatal) OR (care AND prenatal) OR "Atención Prenatal" OR "Asistencia Prenatal" OR "Atención Antenatal") AND (fulltext:("1" OR "1" OR "1") AND la:("en" OR "pt" OR "es") AND type:("article" OR "thesis")) AND (year_cluster:[2019 TO 2024])
PubMed	Search by "All fields": ((((("pregnancy"[MeSH Terms] OR "pregnancy"[All Fields] OR "pregnancies"[All Fields] OR "pregnancy s"[All Fields] OR ("pregnancy"[MeSH Terms] OR "pregnancy"[All Fields] OR "pregnancies"[All Fields] OR "pregnancy s"[All Fields]) OR ("gestate"[All Fields] OR "gestated"[All Fields] OR "gestates"[All Fields] OR "gestating"[All Fields] OR "gestational"[All Fields] OR "gestations"[All Fields] OR "pregnancy"[MeSH Terms] OR "pregnancy"[All Fields] OR "gestation"[All Fields])) AND ("syphilis"[MeSH Terms] OR "syphilis"[All Fields] OR "Great Pox"[All Fields])) OR "gestational syphilis"[All Fields]) AND ("Prenatal Care"[All Fields] OR "Antenatal Care"[All Fields] OR ("Care"[All Fields] AND ("antenatal"[All Fields] OR "antenatally"[All Fields])) OR ("Care"[All Fields] AND ("prenatal"[All Fields] OR "prenatally"[All Fields] OR "prenatals"[All Fields])))) AND ((ffrft[Filter]) AND (fft[Filter]) AND (humans[Filter]) AND (english[Filter] OR portuguese[Filter] OR spanish[Filter]) AND (2019:2024[pdat]))
Scopus	In "Advanced Search", search by "Title" or "Keywords": (TITLE((((Pregnancy OR Pregnancies OR Gestation) AND (Syphilis OR "Great Pox")) OR "gestational syphilis") AND ("Prenatal Care" OR "Antenatal Care" OR (Care AND Antenatal) OR (Care AND Prenatal))) OR

	KEY((((Pregnancy OR Pregnancies OR Gestation) AND (Syphilis OR "Great Pox")) OR "gestational syphilis") AND ("Prenatal Care" OR "Antenatal Care" OR (Care AND Antenatal) OR (Care AND Prenatal)))) AND PUBYEAR > 2018 AND PUBYEAR < 2025 AND (LIMIT-TO (DOCTYPE,"ar")) AND (LIMIT-TO (LANGUAGE,"English") OR LIMIT-TO (LANGUAGE,"Portuguese") OR LIMIT-TO (LANGUAGE,"Spanish")) AND (LIMIT-TO (SRCTYPE,"j"))
Web of Science	In "Advanced Search", search by "Topic": Filters: Publication Years; Document Types, Languages TS=(((((Pregnancy OR Pregnancies OR Gestation) AND (Syphilis OR "Great Pox")) OR "gestational syphilis") AND ("Prenatal Care" OR "Antenatal Care" OR (Care AND Antenatal) OR (Care AND Prenatal))))
Google Scholar	((“Cuidado pré-natal” OR “Assistência Pré-Natal” OR “Consulta Pré-Natal” OR "Prenatal Care" OR “Atención Prenatal”) **AND** (Gravidez OR gestação OR pregnancy OR Embarazo) **AND** (sífilis OR syphilis))

Source: research data, 2024.

Study selection began with a preliminary data search, with records imported into *Rayyan*® software. Study screening, aimed at reducing the risk of bias, was carried out independently and blindly by three researchers. In cases of disagreement between reviewers, a fourth evaluator was assigned to resolve the issue. Duplicates were counted only once, and an initial screening was performed based on titles and abstracts. The selected studies were read in full for a more detailed analysis. After identifying the eligible studies, the full text was reviewed.

As recommended by the *JBI*[10], the retrospective *snowballing* technique (*Backward Snowballing*) was applied independently by three researchers, aiming to achieve saturation of the available literature and to reduce the risk of selection bias. After identifying and selecting the articles to be included in the study, the reference lists of the selected studies were analyzed in order to identify additional potentially relevant publications.

After applying the eligibility criteria and reading the full text, the data were organized in a *Microsoft Office Excel*® spreadsheet, created by the first author, with data extraction performed by three authors in a standardized manner, in order to provide a structured view of the material. As recommended by the *JBI-Methodology for Scoping Reviews*, information regarding the country in which the study was conducted, objectives, methods, and main results of each included study was extracted for analysis. For a broader range of results, and because it is an optional item in scoping reviews[10], methodological quality assessment was not performed.

The information extracted from the articles, such as the country in which the study was conducted, objectives, and methodological design, was organized in a summary table. Considering the breadth of the topic of gestational syphilis and the heterogeneity of the findings, an analytical reading of the results and their contexts was carried out, with identification of the main themes and findings presented, and those with related content were grouped under the same thematic axis. This process enabled organization by similarity, favoring greater detail and systematization of the evidence.

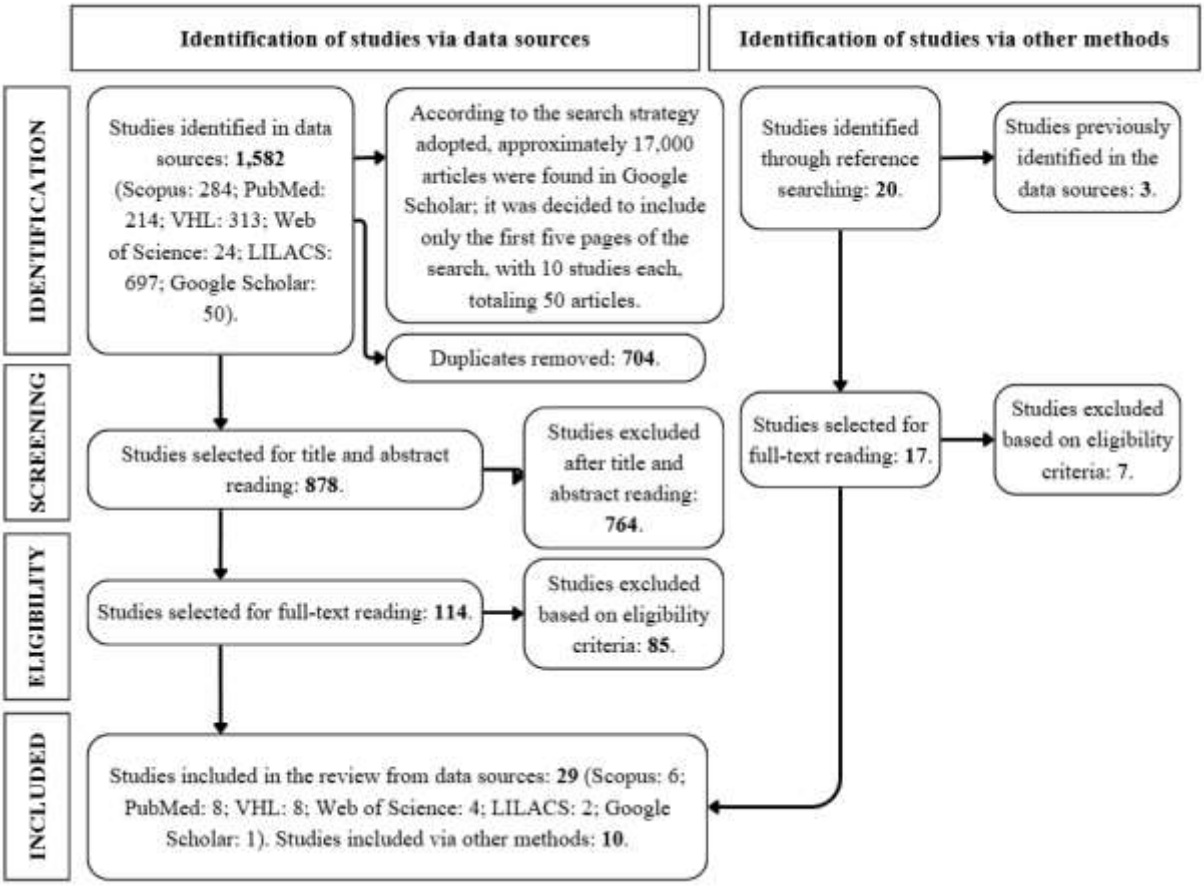
The studies were grouped according to their similarities. For example, those addressing the distribution of syphilis cases were organized under the same theme; those dealing specifically with epidemiological patterns were allocated to another; and those discussing prenatal care practices were placed under a distinct theme. When a study addressed prenatal care practices from the perspective of pregnant women, having a different characteristic from the others, it was kept in the corresponding theme but allocated to a specific subtheme, so as to organize and detail the different perspectives found in the literature. Thus, each theme and subtheme was named according to the specific subjects of each set of studies.

Because this is a literature review, submission to the Research Ethics Committee was not required. However, the research protocol was prepared with rigor to ensure the integrity and validity of the study. This study was funded by the authors themselves and did not entail costs for the institution or third parties.

RESULTS

A total of 18,532 studies were identified in the selected data sources. After applying the established criteria, 1,582 were included for screening. Of these, 704 were duplicates. Subsequently, after reading titles and abstracts, 764 were excluded, resulting in 114 texts for full-text reading. At this stage, 85 were removed, totaling 29 included. Afterwards, the *snowballing* process was applied, through which 10 additional articles were identified, resulting in a final sample of 39 included studies (Figure 1).

Figure 1 - Flowchart of study selection based on the *Preferred Reporting Items for Systematic Review and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR)* - Porto Alegre, RS, Brazil, 2025.



Source: research data, 2024.

Among the included studies, 26 (66.7%) were conducted in Brazil, eight (20.5%) in China, three (7.7%) in Ethiopia, one (2.6%) in the Democratic Republic of the Congo and Zambia, and one (2.6%) in the United States and Peru. Of the 39 included studies, 26 (66.7%) were classified as national and 13 (33.3%) as international. There was a predominance of quantitative studies, 36 (92.3%), based on observation and data analysis, and only one (2.6%) with a qualitative approach, one (2.6%) consisted of a randomized clinical trial, and one (2.6%) a quasi-experimental study (Chart 2).

Chart 2 - Characterization of the studies included in the research. Porto Alegre, RS, Brazil, 2025.

Study Identification	Country/ Year	Objectives	Methodology
Li et al[11]	China. 2020.	To describe the standardized treatment rate of pregnant women infected with syphilis in Hunan province and to explore the determinants of standardized treatment.	Retrospective observational study with multivariate quantitative analysis.
Swayze et	United	To evaluate factors, including non-	Cross-sectional

al[12]	States and Peru. 2021.	treponemal titers, associated with penicillin treatment in pregnant women diagnosed with syphilis in Brazil between 2010 and 2018.	observational study with statistical analysis using random-effects logistic regression.
Oliveira et al[13]	Brazil. 2023.	To estimate the level of underreporting and to correct the incidence rates of gestational syphilis in the 557 Brazilian microregions.	Cross-sectional ecological study with Bayesian statistical modeling to correct underreporting.
Dantas et al[14]	Brazil. 2022.	To describe the temporal trend of gestational syphilis and to associate its detection rate with socioeconomic and health indicators in all Brazilian regions between 2008 and 2018.	Ecological time-series study based on public secondary data.
Cerqueira, Silva, and Gama[15]	Brazil. 2021.	To analyze the effect of a multifaceted intervention on the care of pregnant women with syphilis in Primary Health Care.	Mixed quasi-experimental study with time-series analysis and pre- and post-intervention assessments.
Mélo et al[16]	Brazil. 2020.	To analyze the trend of gestational syphilis indicators from 2008 to 2015 according to sociodemographic and clinical characteristics in Northeast Brazil, a region composed of nine states.	Ecological time-series study with trend analysis using Joinpoint regression.
Tareke, Munshea, and Nibret[17]	Ethiopia. 2019.	To investigate the seroprevalence and associated risk factors for syphilis in pregnant women attending prenatal care at Felege Hiwot Referral Hospital, Ethiopia.	Cross-sectional study.
Althabe et al[18]	Democratic Republic of the Congo and Zambia. 2019.	To assess whether combining the provision of supplies with a behavioral intervention would be more effective than providing supplies alone in improving syphilis screening and treatment during prenatal care.	Cluster randomized clinical trial.
Alves, Lopes, and Silva[19]	Brazil. 2023.	To describe the epidemiological profile of gestational syphilis cases between 2010 and 2020 in the state of Paraíba.	Ecological, descriptive, and observational study with a quantitative approach.
Borba and Silva[20]	Brazil. 2023.	To assess the adequacy of gestational syphilis treatment and factors associated with inadequate treatment	Observational cohort study.

Liu et al[21]	China. 2023.	To explore the factors associated with treatment among pregnant women with syphilis in Guangzhou, China.	Retrospective cohort study.
Sousa et al[22]	Brazil. 2022.	To analyze the epidemiological profile of syphilis in pregnancy from 2011 to June 2020 and to propose interventions to combat this infection.	Descriptive epidemiological study with a quantitative approach.
Paula et al[23]	Brazil. 2022.	To assess the conditions of Brazilian Primary Care services regarding the availability of rapid tests for early diagnosis and of benzylpenicillin for the treatment of pregnant women with syphilis.	Cross-sectional study.
Uchôa et al[24]	Brazil. 2022.	To determine the factors associated with gestational syphilis in postpartum women who participated in a prenatal care program in the Brazilian Amazon.	Unmatched case-control study.
Lendado et al[25]	Ethiopia. 2020.	To identify the determinants of syphilis infection in pregnant women attending prenatal care in hospitals in the Wolaita zone, southern Ethiopia, in 2020.	Unmatched case-control study.
Zhang et al[26]	China. 2023.	To identify risk factors for maternal syphilis in order to predict the risk of a person developing adverse pregnancy outcomes.	Retrospective cohort study.
Befekadu, Shuremu, and Zewdie[27]	Ethiopia. 2022.	To assess the prevalence of syphilis and associated factors in pregnant women receiving prenatal care.	Community-based cross-sectional study with a quantitative approach and multivariate statistical analysis.
Angonese and Guilherme[28]	Brazil. 2022.	To determine the epidemiological profile of gestational syphilis in a public-private hospital located in the municipality of Toledo, Paraná, from January 2017 to December 2019.	Retrospective observational study with a quantitative, descriptive, and indirect approach.
Gomes et al[29]	Brazil. 2021.	To analyze the knowledge of women who attended prenatal care consultations regarding syphilis and the guidance received on the prevention of gestational syphilis.	Descriptive study with a qualitative approach and thematic analysis.
Santos Filho et al[30]	Brazil. 2021.	To describe the clinical and epidemiological situation of gestational syphilis in Anápolis, Goiás, Brazil, between 2012 and 2018.	Epidemiological, descriptive, cross-sectional, quantitative study.
Costa, Aanholt, and	Brazil. 2021.	To learn about pregnant women with syphilis in the state of São Paulo over the	Epidemiological, descriptive, cross-

Ciosak[31]		last five years available.	sectional, quantitative study.
Silveira et al[32]	Brazil. 2021.	To assess the profile of syphilis cases reported in pregnant women in the state of Minas Gerais between 2013 and 2017.	Cross-sectional, descriptive study with a quantitative approach.
Macedo et al[33]	Brazil. 2020.	To assess barriers in prenatal care to controlling the vertical transmission of syphilis in pregnant women according to sociodemographic, reproductive, and care profiles in a metropolis in Northeast Brazil.	Descriptive study with a quantitative approach, based on data from a case-control study.
Pereira et al[34]	Brazil. 2020.	To analyze the relationship between low educational level and the incidence and prevalence of syphilis cases in pregnant women up to 24 years of age.	Retrospective, observational, descriptive, quantitative study.
Rosa et al[35]	Brazil. 2020.	To analyze the timely provision of syphilis screening during pregnancy, in the first and third trimesters.	Cross-sectional, descriptive, quantitative study.
Hayashida et al[36]	Brazil. 2020.	To describe the profile of gestational syphilis in the state, the incidence in regional units, the time of diagnosis, and the treatment.	Cross-sectional, descriptive, and observational study with a quantitative approach.
D'Oliveira[37]	Brazil. 2019.	To assess the quality of the information and outline an epidemiological profile of pregnant women with syphilis in the state of São Paulo regarding adequate treatment.	Cross-sectional, quantitative study.
Benzaken et al[38]	Brazil. 2020.	To assess the adequacy of prenatal care provided in Brazilian capitals and the diagnosis of gestational syphilis using public data from health information systems.	Ecological study with secondary data.
Benedetti et al[39]	Brazil. 2019.	To determine the prevalence of *Treponema pallidum* infection and associated factors in pregnant women in Dourados, Mato Grosso do Sul, Brazil.	Cross-sectional quantitative study.
Liu et al[40]	China. 2019.	To compare the frequency of adverse pregnancy outcomes among women seropositive for syphilis who received different treatment regimens at different times in Guangzhou, China.	Retrospective cohort study.
Hu et al[41]	China. 2020.	To compare the effect of the treatment regimens recommended by China and by the World Health Organization on adverse pregnancy outcomes and to examine the	Retrospective cohort study.

		risk factors associated with adverse pregnancy outcomes in women seropositive for syphilis.	
Silva and Andrade Júnior[42]	Brazil. 2021.	To identify the epidemiological profile of gestational syphilis in the municipality of Patos-PB from 2009 to 2019.	Descriptive, ecological, documentary, exploratory, and quantitative study.
Cavalcante, Brêda, and Fachin[43]	Brazil. 2021.	To analyze the epidemiological profile of patients affected by gestational syphilis in the Northeast region of Brazil from 2015 to 2020.	Descriptive epidemiological study.
Tenório et al[44]	Brazil. 2020.	To identify the factors that hinder the early diagnosis of gestational syphilis in a city in the interior of the Northeast.	Descriptive, documentary research with a quantitative approach.
Manola et al[45]	Brazil. 2020.	To measure the level of functional health literacy and the level of knowledge about syphilis in a group of pregnant women.	Cross-sectional and quantitative study.
Gong et al[46]	China. 2019.	To assess the effectiveness of preventing vertical transmission of syphilis in improving pregnancy outcomes	Retrospective observational study.
Wang et al[47]	China. 2023.	To assess progress toward the elimination of vertical (mother-to-child) transmission of syphilis in Zhejiang province.	Longitudinal observational study.
Yan et al[48]	China. 2020.	To analyze the current situation and factors related to contact tracing of pregnant women seropositive for syphilis and syphilis infection in their male partners.	Cross-sectional observational study.
Figueiredo et al[49]	Brazil. 2020.	To analyze the relationship between the provision of syphilis diagnosis and treatment in primary care and the incidence of gestational and congenital syphilis.	Ecological study.

Source: research data, 2024.

For a better analysis of the results, the studies were organized into three distinct thematic axes, grouped according to the presentation of the main results of each study. Within each category, specific subthemes were listed to deepen the discussion, and the studies were organized into those that best reflected their content, ensuring greater cohesion and clarity in the analysis (Chart 3).

Chart 3 - Organization of the studies according to thematic axes. Porto Alegre, RS, Brazil, 2025.

Thematic Axes	Subthemes
Epidemiological Trends and Patterns among Pregnant Women	a) Sociodemographic profile [11,16,17,19-22,24-26,28,30-32,34,36,37,42,43,46] b) Management of gestational syphilis in prenatal care [27,39] c) Knowledge of Pregnant Women[29,45]
Distribution of Gestational Syphilis	a) Underreporting[13] b) Evolution of gestational syphilis cases[14,49]
Protocols and Practices in the Management of Gestational Syphilis	a) Quality of prenatal care[12,15,18,38,40,41,44,47,48] b) Syphilis screening[23,33,35]

Source: research data, 2024.

One of the main gaps in the quality of care for gestational syphilis is the approach to pregnant women's sexual partners, in which difficulties persist in including this population in care, highlighting the need to propose improvements and to deepen discussions on the approach offered[15]. Based on gestational syphilis notification forms in Brazil, it was identified that, between 2010 and 2018, 18,783 cases (8.7%) were not adequately treated or were not even prescribed treatment[12]. Even so, although most pregnant women attend prenatal care and receive treatment, many partners do not, and inadequate treatments are frequently used[11,12,15,18,27,29,48].

Social factors such as low educational level, young maternal age, and race/skin color influence the quality of prenatal follow-up and the risk of infection[27,31,34,39,44]. The insufficient provision of rapid tests and essential medicines also compromises disease control[20,23,35,44]. A study conducted in Primary Health Care (PHC) identified that 47.7% of the services assessed did not have a sufficient quantity and/or continuous availability of rapid tests for syphilis, constituting inadequate conditions for the diagnosis and treatment of the infection in pregnant women[23].

Benzathine penicillin is the treatment of choice, and its effectiveness is directly related to early diagnosis, adequate prenatal follow-up, and treatment of sexual partners[11,24,31]. However, cases are still recorded in which the pregnant woman does not undergo treatment or in which penicillin is not used and is replaced by other medications, even in the absence of proven allergy[11].

The 39 studies included in this review were organized into thematic axes defined from the convergence between the main findings of the included works. This categorization made it possible to group the evidence in a way that favored the identification of patterns, gaps, and recurrences in the literature. The studies, organized by subthemes, mainly highlight, with 19 (48.8%) articles, the sociodemographic profile, evidencing challenges in the diagnosis, treatment, and control of gestational syphilis (Chart 4).

Chart 4 - Contributions of the articles by subtheme. Porto Alegre, RS, Brazil, 2025.

Subthemes	Contributions of the Studies
Sociodemographic profile	The number of syphilis cases has been increasing over the years, with a higher incidence in vulnerable groups, including young women and those with low educational levels[16,19,28,30-32,34,36,37,42,43,46]. Factors such as a previous history of syphilis, early initiation of prenatal care, and partner diagnosis positively influence treatment adherence[11,31]. Being married was identified as a protective factor against gestational syphilis[26], although other studies showed that most women with active syphilis during pregnancy were married[21,24]. Prenatal follow-up is essential to ensure adequate treatment, and adherence to it is an important factor for successful control of gestational syphilis[17,20,25,34,36,46]. Inadequate treatment, in turn, is related, among other factors, to late diagnosis[21,22].
Management of gestational syphilis in prenatal care	Factors associated with an increased risk of gestational syphilis were identified, including a history of multiple sexual partners, low educational level, less frequent prenatal consultations, and limited knowledge about the disease[27,39]. Although most pregnant women with syphilis received prenatal follow-up, early titration testing and effective treatment were insufficient[27,39].
Knowledge of Pregnant Women	The pregnant women participating in a study conducted in Brazil demonstrated limited knowledge about syphilis and its gestational form[29]. They were surprised by the complications for the baby, indicating a lack of knowledge about congenital syphilis[29]. In addition, they showed little understanding of rapid tests and syphilis treatment[29]. Possible failures in the guidance provided by health professionals were considered, as well as difficulties on the part of pregnant women in assimilating and understanding this information[29,45].
Underreporting	Underreporting of gestational syphilis cases in Brazil between 2007 and 2018 is estimated, showing that the quality of notifications may be associated with socioeconomic factors and access to health services[13]. A significant increase in gestational syphilis cases was observed in Brazil, with important variations among the different regions of the country[13]. This scenario highlights regional disparities both in the incidence rate of gestational syphilis and in the quality of prenatal care

	in the Brazilian context[13].
Evolution of gestational syphilis cases	The gestational syphilis detection rate showed a negative correlation with the proportion of PHC coverage, indicating a higher number of cases in cities with lower coverage[14]. Municipalities with a lower proportion of PHC professionals per inhabitant and a smaller number of primary health care units had more cases of gestational syphilis, evidencing the relevance of human resources and infrastructure to the effectiveness of syphilis control actions[14]. In municipalities where there was a greater reduction in vertical transmission of syphilis, greater use of rapid tests and administration of benzathine penicillin were also observed[49].
Quality of prenatal care	Treatment of the sexual partner of pregnant women with syphilis remains a challenge and has proved unsatisfactory in many cases[15,47,48]. Despite prenatal follow-up, some women still presented active infection, evidencing failures in disease control[18]. The quality of prenatal care varied according to social factors such as age, educational level, and race/skin color, particularly affecting vulnerable groups[38,44]. The non-use of benzathine penicillin as the treatment of choice may be related to the perception, on the part of health professionals, of the low severity of syphilis, the possibility of false positives, or the interpretation of a previous infection already treated, which may compromise adequate management of the disease[12,40,41].
Syphilis screening	The diagnosis and treatment of syphilis still face relevant obstacles, especially due to the shortage of rapid tests in PHC services in the locations studied[23] or their insufficient provision[33]. Although most pregnant women attended prenatal care, the recording of *Venereal Disease Research Laboratory* (VDRL) results was low, and a few did not complete the appropriate regimen[33,35].

Source: research data, 2024.

DISCUSSION

When analyzing the findings of this study, it was found that, despite the existence of well-established protocols, failures in the management and screening of gestational syphilis are still identified. The following are observed: low recording of VDRL results[33], untimely provision of tests[35,44], and difficulties in access even when tests are available[15,33]. In addition, inadequate treatment of pregnant women[33] and the failure to treat sexual partners stand out[15,48]. When the complications and manifestations of congenital syphilis were assessed, as well as aspects relevant to prevention, the lack of treatment during prenatal care was identified as the main factor related to the occurrence of complications, such as vertical transmission[50,51].

An investigation conducted in southern Brazil showed a reduction in the risk of congenital syphilis when sexual partners were treated; however, only about 30% of the sample received treatment[52]. In the same context, it was shown that municipalities that used benzathine penicillin in the treatment of syphilis and offered a greater number of rapid tests showed a reduction in vertical transmission rates[49]. The persistence of these failures may contribute to maintaining the high incidence of congenital syphilis in Brazil, reinforcing the need to strengthen public policies for surveillance and comprehensive care.

Adequate prenatal follow-up plays a crucial role in reducing neonatal complications such as low birth weight, prematurity, congenital infections, and perinatal death[4,40,41]. For this follow-up to be effective, it is not enough to merely meet the minimum number of recommended consultations or to start gestational follow-up early[6]. It is essential to ensure quality of care with evidence-based clinical practices, including early screening and timely treatment. In this context, the importance of a comprehensive approach to the pregnant woman's sexual partners is also highlighted[4,9,48]. Although sexual partners do not define the diagnosis of congenital syphilis, they should be tested and treated together with the pregnant woman to avoid reinfection and ensure the effectiveness of treatment, preventing negative perinatal outcomes[4].

Social inequalities were also identified as a central factor influencing access to prenatal care among women with gestational syphilis. A higher risk of infection and lower access to health services were observed among young, non-White women with low educational levels[38,42-44,46], as well as migrant women[21,46]. In addition, it was shown that migrant and non-White women were more likely to receive inadequate treatment when compared with local residents and White women, respectively[21,38,46].

Furthermore, time-series analysis between 2008 and 2018 in Brazil showed clusters of gestational syphilis in areas with low income, low educational level, and limited access to health care[14]. Also in Brazil, ethnoracial inequalities in gestational syphilis were assessed, and it was highlighted that, if all groups had the same risk as White women with more than 12 years of schooling, approximately 90% of gestational syphilis cases would be prevented[53]. Corroborating this scenario, a systematic review with meta-analysis identified factors associated with gestational syphilis in Brazil, among them Brown skin color and low educational level[54]. These findings reveal how social vulnerabilities intertwine with barriers to care, demonstrating the importance of considering sociodemographic factors for syphilis control[53].

Even with guidance on the importance of broad prenatal coverage, operational weaknesses may compromise the control of gestational syphilis, such as late diagnosis and the consequent reduction in treatment effectiveness[21,40,41] and the inconsistent application of protocols for disease screening[35]. Among the solutions to these gaps, interventions combining supplies, continuous training, record auditing, and immediate *feedback*[18] and greater integration between syphilis and HIV screening[55] may increase the percentage of screening and treatment for gestational syphilis compared with providing supplies alone[18].

Moreover, counseling pregnant women during prenatal care is essential for the prevention and management of syphilis. Pregnant women's understanding of the disease, especially transmission, diagnosis, and risks, is often limited, as pointed out by an exploratory study that identified gaps in pregnant women's knowledge about the disease and its adverse outcomes[3]. This scenario converges with the results of a study conducted in Ethiopia, in which a low level of information about syphilis was associated with a higher occurrence of the infection[27]. In parallel, a cross-sectional study conducted with postpartum women reinforced the importance of health literacy, showing that when the pregnant woman masters information about the condition, there is an association with greater adherence to adequate treatment[56].

Regarding the temporal trend of gestational syphilis, the articles highlight an increase in the number of cases in different regions of Brazil, such as the Northeast[16,19,43], Southeast[31,32], and South[36]. Time-series analysis from 2008 to 2018 in Brazil showed an increasing temporal trend in the period, with the South region showing the greatest trend and the Central-West the smallest[14]. Among the variables associated with these increases, the study identified the Municipal Human Development Index (MHDI), the illiteracy rate, the percentage of PHC coverage, and the proportion of physicians, nurses, and primary health care units per inhabitant. In addition, an ecological analysis examined gestational syphilis rates in Brazil from 2011 to 2020 and identified, in contrast, an increasing trend in the number of cases in all Brazilian states except Espírito Santo[57]. These findings reinforce that the increase in gestational syphilis cases in Brazil may be related to regional and structural inequalities, indicating the need for and importance of territorialized public policies specific to each region[58,59], evidencing the demand to understand care behaviors in different health regions[59].

A sociodemographic profile of pregnant women at higher risk of syphilis was identified, frequently including young women[16,19,22,28,31,32,34,36,37,42-44,60], especially between 15 and 29 years of age, with low educational levels[19,21,22,27,30-32,34,37,42-44,60], and Black and Brown women[19,22,30,32,37,44]. Furthermore, the evidence analyzed also showed the relevance of behavioral and sociodemographic factors and clinical history in relation to gestational syphilis.

A history of multiple sexual partners was shown to increase the risk of infection[17,25,43], as did a previous history of STIs[24,25], abortion, and substance use, including illicit drugs[25,27,39]. International evidence reinforces these results by showing that gestational and congenital syphilis are associated with social determinants.

The low educational level observed among pregnant women with syphilis evidences a context of social vulnerability frequently described in the literature[19,22,27,30-32,34,37,42-44,60]. Syphilis is a condition determined by multiple factors, in which social determinants directly influence the management and follow-up of the disease[34,39,60]. In this context, the conditions of vulnerability experienced by these users compromise adherence to treatment and adequate follow-up, increasing the risk of vertical transmission and, consequently, of congenital syphilis.

In California, it was identified that people experiencing homelessness and methamphetamine users were at higher risk of having children with congenital syphilis, but this risk was reduced with early access to prenatal care[61]. In a study conducted in China, a higher risk of syphilis and HIV was identified in pregnant women with a history of other STIs[62]. Similarly, in Colombia, a higher prevalence of gestational syphilis was observed in women in situations of social vulnerability, along with a low proportion of treatment of sexual partners[63]. These findings converge with the studies found, which reinforce the importance of early diagnosis, correct and timely treatment, as well as a comprehensive approach sensitive to vulnerable populations[60-64].

Prenatal care was identified as crucial for timely diagnosis and treatment[11,20,24,26,39]. However, the quality of prenatal care[31,39] and late diagnosis[21,22] remain challenges. The lack of treatment of the sexual partner[28,30,37,60] was also considered an obstacle to preventing reinfection, with a high rate of non-treatment[30]. Another relevant point highlighted was pregnant women's limited knowledge about syphilis and its prevention, which may contribute to the prevalence of the disease[27,29,45].

It was shown that pregnant women diagnosed with syphilis during prenatal care nevertheless had children born with congenital syphilis[60]. This finding demonstrates the persistence of inadequate outcomes even in the face of identification of the condition and follow-up of the infection, evidencing the complexity of addressing gestational syphilis and the need for investments in public policies and effective strategies for syphilis control and prevention.

Research conducted in China investigated the determinants of adverse pregnancy outcomes in women with syphilis and identified late diagnosis as an independent risk factor for adverse outcomes[40,41]. Regarding the pregnant woman's sexual partner, a lack of studies on

the sociodemographic profile of this population was demonstrated, as well as of information on the testing and treatment performed[65,66]. The results highlight the need for comprehensive and integrated strategies, articulating health education, qualification of perinatal care, and actions directed at sexual partners[55,60], in addition to improvements in the systems for notification and monitoring of gestational syphilis[67].

The evidence analyzed shows that outcomes related to gestational syphilis are associated with multiple factors, involving sociocultural, individual, and care-related aspects. Among the main ones, late diagnosis of syphilis during prenatal care and the failure to address sexual partners stand out; although the latter is not used as a diagnostic criterion for congenital syphilis, it favors maternal reinfection and, consequently, vertical transmission. Such occurrences persist in clinical practice despite recent studies and established protocols. In addition, sociodemographic aspects, Black or Brown race/skin color, low educational level, and the resulting difficulties in accessing health services contribute to the maintenance of these unfavorable outcomes.

These results, in line with the scientific literature, show that failures in prenatal care and social inequalities remain important determinants of the persistence of gestational syphilis, despite the availability of diagnostic methods and care protocols. These results have direct implications for the study, reinforcing the need to improve prenatal care, with timely diagnosis, adequate treatment, and an approach to sexual partners, in order to avoid reinfection and reduce vertical transmission.

Despite the breadth that characterizes the method of the present review, in which studies from different nationalities were included, the predominance of research developed in Brazil is recognized as a limitation. Another limitation refers to the time frame adopted, which may have resulted in the exclusion of relevant references on the topic, constituting a potential bias of the research. Even so, the study was able to describe the approach to gestational syphilis, the sociodemographic profile of pregnant women, and the challenges related to its management and follow-up from a current perspective, evidencing gestational syphilis as a challenge for global health.

CONCLUSION

The analysis of the approaches to and challenges of gestational syphilis demonstrates a persistent increase in the incidence of cases and in regional and socioeconomic inequities, mainly in Brazil. In addition, failures in the screening and management of the disease were evidenced, such as inadequate treatments, failure to treat sexual partners, and late diagnosis.

Added to this are the social determinants of health, with a higher number of cases in women in vulnerable situations, Black and Brown women, young women, and those with low educational levels. In this context, in order to improve the indicators, the need is emphasized to implement strategies that qualify case follow-up, improve the problem-solving capacity of care, and expand access to health services, with special attention to women in situations of social vulnerability and with intersectional characteristics, ensuring timely diagnosis and continuity of follow-up throughout pregnancy.

In view of the gaps identified, direct implications for nursing practice in prenatal care are reinforced, especially in strengthening syphilis screening protocols, with timely testing during pregnancy, as well as in qualifying health education actions directed at pregnant women and their partners. The role of the nurse in the active approach to sexual partners, in coordination with health surveillance services for the monitoring and notification of cases, and in the continuous monitoring of indicators related to gestational and congenital syphilis is also highlighted. Added to this is the need for continuing education of nursing teams, aimed at qualifying care, strengthening the line of care, and interrupting the chain of vertical transmission of the infection.

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