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# Syphilis in women and men: an integrative review of scientific publications

*Sífilis na mulher e no homem: uma revisão integrativa das publicações científicas*

*Sífilis en la mujer y en el hombre: una revisión integrada de las publicaciones científicas*

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**ABSTRACT**

**Objective:** review scientific publications on syphilis in women and men and analyze them by level of scientific evidence. **Method:** for this integrative literature review conducted in April 2016, information was collected from the LILACS, MEDLINE, SciELO, Cochrane Library, Embase, CINAHL and Elsevier Scopus databases. **Result:** 23 articles, published between 1990 and 2016, were found to match the inclusion criteria. Brazil contributed 12 (52.1%) publications, 13 (56.52%) articles related to maternal and child health, and only 1 (4.3%) addressed men's health in care for syphilis. 21 (91.3%) of the studies were descriptive, and classified as at scientific evidence level 2C. **Conclusion:** the articles were classified as level 2C, which reflects moderate scientific evidence. Syphilis is widely explored in topics addressing maternal and child care, but a gap exists in syphilis-related scientific knowledge outside the pregnancy-puerperal cycle and in men.

**Descriptors:** Sexually transmitted diseases; syphilis; women's health; men's health.

**RESUMO**

**Objetivo:** revisar as publicações científicas sobre a sífilis na mulher e no homem e analisá-las de acordo com os níveis de evidência científica. **Método:** pesquisa bibliográfica, tipo revisão integrativa, realizada em abril de 2016. Coleta de informações nas bases de dados LILACS, MEDLINE, SciELO, *Cochrane Library*, *Embase*, CINAHL e na *Scopus,* da editora *Elsevier*. **Resultado:** encontraram-se 23 artigos, conforme os critérios de inclusão, publicados no período de 1990 a 2016. O Brasil contribuiu com 12(52,1%) publicações, 13(56,52%) artigos estão relacionados a saúde materno-infantil e somente 1(4,3%) produção explana a saúde do homem no cuidado com a sífilis. Verificou-se que 21(91,3%) estudos são descritivos, classificados no nível de evidência científica 2C. **Conclusão:** os artigos foram classificados no nível 2C, considerado evidência científica moderada. A sífilis é muito explorada em assuntos que abrangem área materno-infantil, provocando um hiato de conhecimentos científicos voltados para a temática sífilis fora do ciclo gravídico-puerperal e no homem.

**Descritores:** Doenças sexualmente transmissíveis; sífilis; saúde da mulher; saúde do homem.

**RESUMEN**

**Objetivo**: revisar las producciones científicas publicadas sobre la sífilis en mujeres y hombres y analizarlas de acuerdo con los niveles de evidencia científica. **Método:** investigación bibliográfica, tipo de revisión integradora, realizada en abril de 2016. Recolección de información en las bases de datos LILACS, MEDLINE, SciELO, *Cochrane Library*, *Embase*, CINAHL y *Scopus, editorial Elsevier.* **Resultado:** se encontraron 23 artículos según los criterios de inclusión publicados entre 1990 y 2016. Brasil contribuyó con 12(52,1%) publicaciones, 13(56.52%) artículos se relacionaron con la salud materna e infantil y apenas una (4.3%) producción explica la salud de los hombres en la atención respecto a la sífilis. Se encontró que 21(91.3%) estudios son descriptivos, clasificados dentro del nivel de evidencia científica 2C. **Conclusión:** se clasificaron los artículos en el nivel 2C, considerados evidencia científica moderada. La sífilis se explora ampliamente en temas que cubren el área materna e infantil, lo que causa una brecha de conocimiento científico volcado hacia el tema de la sífilis fuera del ciclo del embarazo/puerperio y el hombre.

**Descriptores:** Enfermedades de transmisión sexual; sífilis; salud de la mujer; salud del hombre.

## INTRODUCTION

The high incidence of sexually transmitted infections has become a major public health problem; hence, it is worth reflecting on the constant discoveries and advances in health care, and as regards the control of such infections, technological sophistication is not necessary for prevention or treatment actions, especially when addressing syphilis, a disease that historically causes strong social criticism[1,2]. From 2010 to June 2016, 227,663 cases of syphilis acquired in Brazil were reported[3].

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When acknowledging the signification of the gender role, which has been permanently restructured in relation to women and men, there is a need for reflection and intervention by health professionals, regarding the care provided to women and men with syphilis. Identifying the scientific production on syphilis related to women's and men's health is essential in order to provide visibility to research that has been carried out[4].

In this scenario the following question arises: what do the scientific publications on syphilis in women and men reflect?

Given this question, the objective was to review scientific publications on syphilis in women and men and analyze them according to the levels of scientific evidence.

## METHODOLOGY

Bibliographic, descriptive study, based on integrative review. This type of investigation makes it possible to synthesize the different studies available on a given subject and guides practice on the basis of scientific knowledge. An integrative review consists of six phases: establishment of the research question; literature search; categorization of studies; evaluation of the articles included; interpretation of results and synthesis of knowledge[5].

The investigations found in this integrative review were classified according to Evidence-Based Practice (EBP). This classification is in accordance with the Oxford Centre Evidence-Based Medicine (Figure 1), which classifies evidence according to methodological design[6]. See Figure 1.

| Level of evidence | Study type |
|---|---|
| 1A | Systematic reviews and meta-analyses of comparable clinical trials. Well-designed randomized controlled trials with relevant clinical outcomes. |
| 1B | Randomized controlled trials with a narrow confidence interval. |
| 1C | *All-or-nothing* results. Controlled case series study. |
| 2A | Homogeneous systematic review of cohort studies (with comparison groups and variable control). |
| 2B | Cohort study with poor-quality randomization, control or no long follow-up, cross-sectional cohort study. |
| 2C | Research results (observation of therapeutic results or clinical evolution). |
| 3A | Homogeneous systematic review of case studies with control groups. |
| 3B | Case studies with control groups. |
| 4 | Case and series reports without a control-case definition. |
| 5 | Opinions of respected authorities or experts. Non-systematic literature review. |

**FIGURE 1:** Classification of study types by level of evidence.

The evaluation of the scientific findings related to the proposed theme was performed by two independent researchers. The inclusion criteria were original national and international scientific articles, published in Portuguese, English or Spanish, regardless of the research method used. Studies retrieved from more than one database were considered only once. Records that did not include men or women as the object of care were excluded, as well as editorials, abstracts from proceedings, management reports and epidemiological bulletins.

As a search strategy for syphilis related to women's and men's health, certain Health Sciences Descriptors (DeCS) from the Virtual Health Library Portal (VHL) were used, based on the advanced search interface via an *iAH* form, applying the *or/and* Boolean operators. The descriptors selected were: syphilis; serodiagnosis of syphilis; comprehensive health care for women; men's Health.

The scientific production was obtained by a bibliographic search on the VHL databases: *Literatura Latino-Americana e do Caribe em Ciências da Saúde* (LILACS); Scientific Electronic Library Online (SciELO); The Cochrane Library and Medical Literature Analysis and Retrieval System Online (MEDLINE). Also, Elsevier's databases: Embase, Cumulative Index of Nursing and Allied Health (CINAHL) and Scopus were accessed in April 2016. The time interval was not predetermined in order to verify, on the databases, the beginning of scientific production and the dissemination of the theme in question.

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In order to extract and characterize the sample, a document analysis form was designed according to a model from two studies[7,8], including the following variables: year of publication, origin of production, area of knowledge, objective of the investigation, study participants, research design, level of evidence and journals.

Descriptive statistics was used to synthesize the data, and they were presented as absolute and relative frequency. The studies were divided into subgroups, according to the classification established in the document form. Categorization was based on the type of incidence and sample characteristics.

From the search, 148 studies were found, of which 30(20.2%) were published on LILACS, 11(7.4%) on SciELO, 49(33.1%) on MEDLINE, 6(4.05%) on the Cochrane Library, 16(10.8%) on Embase, 15(10.1%) on CINAHL and 21(14.1%) on Scopus.

The titles and abstracts of the 148 articles were thoroughly read. Of these, only 99 were original scientific articles, published in full in Portuguese, English or Spanish. Then, the 99 publications remaining were read, of which 27(27%) were on LILACS; 2(2%) on SciELO, 14(14%) on MEDLINE, 2(2%) on the Cochrane Library, 19(19%) on Embase, 20(20%) on CINAHL and 15(15%) on Scopus. Of all the articles, only 23 met all of the inclusion criteria. It is noteworthy that six LILACS publications were also on SciELO, and nine CINAHL publications were on Scopus and, due to duplicity, they were not considered.

## RESULTS

It is noted that the 23(100%) articles identified [9-31] were published from 1990 to 2016, and it is also noteworthy that 16(69.3%) investigations were produced by professional in the medical field[10-15,17,20-25,27,29,31].

As regards the variable origin of production, the worldwide distribution of studies on syphilis can be observed in Table 1.

**TABLE 1:** Distribution of publications on syphilis by area of origin. Rio de Janeiro, Brazil, 2016

| Origin | No. | % |
|---|---|---|
| Brazil - Rio de Janeiro | 8 | 34.9 |
| Brazil - São Paulo | 2 | 8.9 |
| Brazil - Bahia | 1 | 4.3 |
| Brazil - Porto Alegre | 1 | 4.3 |
| Uruguay - Montevideo | 1 | 4.3 |
| Argentina | 1 | 4.3 |
| Venezuela | 1 | 4.3 |
| Dominican Republic - Haiti | 1 | 4.3 |
| Czech Republic - Prague | 1 | 4.3 |
| United States | 3 | 13.2 |
| China | 1 | 4.3 |
| Mozambique - Maputo | 1 | 4.3 |
| Peru - Lima | 1 | 4.3 |
| Total | 23 | 100.0 |

Most of the studies - 12(52.1%) - were from Brazil, followed by the United States, with 3(13.2%), and the other countries with only one study each. See Table 1.

The distribution of syphilis publications by knowledge area is specified in Table 2.

Most of the studies reviewed were produced by medical professionals, and nursing was represented in 3(13.2%) publications, according to Table 2.

As regards the objectives of the studies, 7(30.43%) addressed the syphilis diagnosis and treatment in mothers and newborns[9,11,16,18-21], and 6(26.08%) sought to evaluate the effectiveness of programs and campaigns for congenital syphilis eradication so as to contribute to the reorientation of interventions concerning the health of the population of pregnant women and their children[10-15].

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**Table 2**: Distribution of the number of publications on syphilis by area of knowledge. Rio de Janeiro, RJ, Brazil, 2016

| Professional area | No. | % |
|---|---|---|
| Medicine | 16 | 69.3 |
| Nursing | 3 | 13.2 |
| Biological Sciences | 3 | 13.2 |
| Anthropology | 1 | 4.3 |
| Total | 23 | 100.0 |

The correlation between the prevalence of sexually transmitted infections and epidemiological data, syphilis and vulnerable groups (those involved with illicit drugs and alcohol, deprived of freedom, sex workers and homeless) was found in 6(26.08%) studies[22-26,31.]

Relating syphilis to other sexually transmitted infections, such as gonorrhea, hepatitis B and the Human Immunodeficiency Virus (HIV), was the objective of 4(17.4%) articles[25-27,30]. Only one study was found whose the objective was to discuss male sexuality and syphilis, based on the counterpoint of homeless people[31].

Of the 23 studies, 11(47.82%) collected data by interviews or questionnaires[9,10,16-18,20-25]. Of these, 6(26.08%) involved women who had newborn children[9,10,16,18-20] and 6(26.08%) targeted a vulnerable population[22-26,31]. The 6(26.08%) studies whose participants were females and newborn children took into account the mothers' socioeconomic variables[9,10,16,18-20].

Regarding research design, it was found that 21(91.3%) studies were descriptive (non-experimental) with observation of therapeutic results and clinical evolution[9-18,20,22-31]. There was 1(4.3%) article based on the case-study method with the objective of documenting and interpreting one's falling ill with syphilis in a particular context[21]. The integrative literature review methodology was used in only 1(4.3%) publication[19].

Hence, it was observed that 21(91.3%) publications were classified according to level of evidence 2C[9-18,20,22-31]. The other articles were according to level of evidence 4[21] and 5[19].

Regarding the production focus, it was possible to observe aspects based on clinical practice and epidemiology - 11(47.82%)[10,20,22-29,31], followed by the perspective of service evaluation - 4(17.3%)[12-15], diagnosis and treatment - 4(17.3%)[9,11,19,30] and sociocultural and historical approach - 4(17.3%)[16-18,21]. In the latter, 2(8.9%) articles included the care provision view[16,18].

It was found that the journals publishing the largest number of articles associated with syphilis in women's and men's health were *Revista Brasileira de Epidemiologia* (Brazilian Journal of Epidemiology) - 3(13.2)[13,30,31]; *Revista de Saúde Pública* (Journal of Public Health) - 2(8.9%)[9,24] and *Cadernos de Saúde Pública* (Reports in Public Health), also with 2(8,9%)[12,15].

## DISCUSSION

When analyzing the variable year of publication, in order to clarify the beginning of scientific production and dissemination of the theme in question, a great alternation between the years 1990 and 2016 was found. It is noteworthy that the first full online publication, entitled: Positive serology for syphilis, toxoplasmosis, and Chagas disease in pregnant women during their first consultation at health care centers in metropolitan areas - Brazil, dated from 1990[9], two years before the Ministry of Health consolidated three important actions aiming at combating syphilis: assigning the compulsory notification of confirmed cases of sexually transmitted infections to *Sistema de Informação de Agravos de Notificação* - SINAN (System of Information on Notification Diseases); the publication of the document entitled: Technical bases for the elimination of congenital syphilis; and the signing of the International Agreement for Elimination of Congenital Syphilis in the Americas[3,32-34].

Regarding origin, the Brazilian state that published the largest number of studies was Rio de Janeiro - 8(34.9%)[10-15,18,21], followed by São Paulo - 2(8.9%)[23,31], as shown in Table 1. These figures result from the concentration of research and post-graduation centers in the Southeast Region, since, of the 1,420 existing post-graduation programs and courses, 844(53.4%) are in this region, which is considered the center of knowledge production in the country[32,34].

It is important to point out that, among all countries that published studies on syphilis in the female and male population, Brazil contributed with the largest production - 12(52.1%)[9-16,21,23,30,31]. It is noteworthy that, in addition to publications from the states of Rio de Janeiro[10-15,18,21] and São Paulo[23,31], studies also came from Bahia[16] and Porto

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Alegre[30], thus collaborating with the dissemination and expansion of the knowledge necessary to support the elimination of syphilis. Then, 3(13.2%)[22,27,29] studies conducted in the United States are worth of note, as shown in Table 1.

Regarding the areas of knowledge, it was observed that 16(69.3%) studies published on syphilis in women's and men's health came from Medicine[10-15,20-25,27,29-31], as shown in Table 2. This result can be explained by the fact that medical research groups have the largest financial incentives for knowledge production, especially in the clinical and epidemiological aspects.

The others were distributed in nursing - 3(13.2%)[9,16,18] and biological sciences - 3(13.2%)[19,26,28], followed by anthropology - 1(4.3%)[17], according to Table 2.

It should be noted that the partnership between health professionals and those in other fields is relevant as it enables an exchange of experience and collaboration for scientific production in order to contribute to the quality of care for women and men with syphilis. It is known that understanding health problems requires an ecological approach to the problems for the formulation of public policies[32,34].

Based on the variable objectives of the study, it was observed that 13(56.52%) studies addressed the gaps in maternal and child health, including the concern about the effects of health actions and practices implemented by programs to combat congenital and neonatal syphilis[9-16,18-21,30].

The results encourage discussions on care provision with notes on the need for prenatal qualification and continuing training of health professionals. They also stimulate operational aspects of the diagnostic system that should be efficient, since the cost of laboratory testing for detecting the infection is low and the technology is simple. In addition, they exhort demands for actions by epidemiological surveillance with the purpose to scale up a global view of the needs for effective action by the health programs that involve syphilis elimination[9-16,18-21,30].

Providing visibility to syphilis in the area of maternal and child health, as observed through the expressiveness of this theme in the objectives of the studies, means reflecting on the importance of the necessary and timely intervention for its eradication, since the period determined for the elimination of this infection expired in 2015[2,9-16,18-21,30,33].

As regard the other studies, 6(26.08%) aimed at the epidemiological analysis of syphilis in vulnerable groups related to the trafficking and use of illicit drugs, alcohol, prostitution or freedom deprivation[22-26,31]. This design contributes to the evaluation of health issues related to the prison system, sex workers as well as individuals involved with illicit drugs and alcohol. Contributing to the knowledge on syphilis seroprevalence in vulnerable groups in national and international regions, favors the establishment of flowcharts and indicators for the evaluation and control of strategies for monitoring infection in a population beyond health institutions[27,28,33].

Studies aiming at relating syphilis to other sexually transmitted infections, such as HIV, hepatitis C and gonorrhea, totaled 4(17.3%)[25-27,30]. It must be considered that the high prevalence of sexually transmitted infections among women in developing countries has raised concern and required the expansion of prevention and detection methods for health maintenance, concurrently with the control of opportunistic infections, not only in national level, but internationally.

It is worth noting that reflections concerning males were identified in only one article, pointing out sexual health as a portal to men's health[31]. The lack of research on male health and syphilis draws attention, mainly due to the expansion of this infection, expressing the need to promote health initiatives to assist this clientele[31,35,36].

Regarding the participants in the studies reviewed, 11(47.82%) studied human beings and contextualized the dimensions of the female being, either in the puerperal pregnancy period, in the situation of vulnerability or in childbearing age[9,10,16-18,20-25]. However, when reflecting on the socioeconomic profile, it was possible to observe young women with poor education and low socioeconomic status who experienced unequal gender relations. It is believed that the historical inequalities of power between men and women should be considered as one of the determinants of health in the formulation of public policies, especially in the eradication of infections such as syphilis[35].

According to the variable research design, 21(91.3%) studies were descriptive (non-experimental) with the observation of therapeutic results and clinical evolution[9-18,20,22-31]. Of these, 3(13.2%) corresponded to publications with a socio-historical-cultural aspect[16-18]. One(4.3%) article whose methodology was based on the case study[21] was found, as well as 1(4.3%) publication that used integrative literature review as a research method[19]. However, only 3(13.2%) mentioned the ethical precepts[16,18,30], with approval registration by a research ethics committee. It was found that 7(30.4%) studies came from other countries or were performed before the standardization by the National Research Ethics Commission[17,20-22,24,26,27].

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Descriptive study designs (non-experimental studies) are not considered strong evidence for clinical application. This encourages the contribution to strengthen the Cochrane collaboration groups, with centers in different countries providing high-quality current information and aiming to develop and disseminate systematic reviews that portray the effectiveness of health interventions[37].

It is imperative to point out that of the 21(91.3%) descriptive studies (non-experimental)[9-18,20,22-31], only 2(8.9%) addressed nursing care by valuing the voice of women with syphilis, understanding that human beings need to perceive themselves as potential agents and capable of responsible choices when stimulated to adopt safe and healthy lifestyle habits[16,18].

Based on these data, the importance of developing socio-cultural research can be emphasized. Vulnerability in illness, especially from sexually transmitted infection, can be increased or minimized in circumstances of individual lives, where each partner reaches a certain proportion according to their social, cultural and economic context[38,39].

Regarding the variable level of evidence, the results indicated that most of the publications in this integrative review had a level of scientific evidence 2C - 21(91.3%)[9-18,20,22-31]; 1(4.3%) had level of scientific evidence 4[21]; and 1(4.3%) showed level of scientific evidence 5[19]. Level 2C, available in most of the articles reviewed, indicates moderate scientific evidence, but it does not allow for recommendations to be made for or against preventive clinical intervention, and it is necessary to explore individual criteria such as population, etiology and prognosis for the best interventional decision. Articles with levels 4 and 5 are analyzed as insufficient scientific evidence, and there are no satisfactory criteria to make a health recommendation.

Thus, it is wise to acknowledge that the studies in question did not apply methods that lead to the synthesis of the best scientific evidence, and there is no justification for the generalization of the recommendations outlined. However, the reflections and proposals seem to have been relevant to studies involving syphilis in women and in men. It is assumed that the knowledge of the scientific evidence classification of the articles retrieved in this integrative review provides a base to help health professionals perform a critical evaluation of research results and, consequently, contributes to decision-making about the incorporation of evidence to syphilis-related clinical practice[6, 9-31].

Regarding the variable journals, 12(52.1%) articles were published in journals classified as *Qualis* A2[9,10,12-15,18,19,22,24,30,31]; 4(17.3%) in journals evaluated with *Qualis* B1[11,17,25,27]. The others were published in journals with *Qualis* B2, B3 and B4[16,20,21,23,26,28,29]. By taking into account the *Qualis* classification, relevant aspects are considered, such as: the quality of articles, editorial board and consultants, criteria for text reviewing, nature of the publishing institution and the strategies that aim to ensure the excellence of the published scientific production.

As regards the indexation of the journals, 16(69.3%) were indexed in national and international databases[9-15,17-19,22,24,25,27,30,31]. Information such as this is necessary since the larger the number of indexed databases, the higher the productivity standard and the indirect diffusion of the journal and its content[32,34].

No references to financial support were found in the publications. This may be a reflection of the rapid changes in the scenario of research funding. It is important to analyze these changes in the distribution of research resources critically, mainly due to the traditional funding mechanisms of small-scale projects.

## CONCLUSION

Most of the articles were classified at level 2C, which is considered moderate scientific evidence.Thus, the generalization of recommendations is not justified; however, it is considered that the reflections and proposals seem to have been relevant to the 23 studies involving syphilis in women and men.

The scarcity of research on male health and syphilis calls attention to the spread of this sexually transmitted infection whose cure has been well-known since the discovery of penicillin in the 1940s, thus expressing the need to promote health education initiatives to assist this clientele by clarifying the forms of transmission, diagnosis, concomitant treatment with self-knowledge, such as the use of condoms for the practice of vaginal, anal and oral sex.

It was also found that syphilis is a widely explored topic in subjects that include the prenatal period, obstetrics or vertical transmission, but there is a gap in scientific knowledge regarding such topic out of the pregnancy-puerperal cycle.

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This article does not exhaust itself with these considerations; however, it brings out the myriad possibilities of multicenter studies in different regions of Brazil and the world, pointing to the need for further research on the advancement in syphilis prevention.

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