

CONGENITAL SYPHILIS AND ITS REPERCUSSIONS ON CHILD DEVELOPMENT: CONSTRUCTION AND VALIDATION OF A DIGITAL BOOKLET

SÍFILIS CONGÊNITA E AS REPERCUSSÕES NO DESENVOLVIMENTO INFANTIL: CONSTRUÇÃO E VALIDAÇÃO DE CARTILHA DIGITAL

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ABSTRACT

Objective: To create and validate a digital booklet on congenital syphilis (CS) and its repercussions on child development when treatment is not administered effectively. **Method:** The booklet development followed a methodological study, organized in three stages: literature review, creation of educational material, and validation with experts. **Results:** Validation was performed by 10 expert health professionals who assessed scientific accuracy, content, design, and clarity. The Content Validity Index was calculated, and all items achieved the maximum score of 1.00. The booklet received suggestions for improvements in design and content. **Conclusions:** The validated booklet is an effective tool for reducing CS cases, highlighting the importance of partnerships with government agencies for its widespread distribution and promotion.

Keywords: Congenital syphilis; Child development; Primary Prevention; Health education; Educational technology.

RESUMO

Objetivo: Criar e validar uma cartilha digital sobre sífilis congênita e seus impactos no desenvolvimento infantil quando o tratamento não é realizado de forma eficaz. **Método:** O desenvolvimento da cartilha seguiu um estudo metodológico em três etapas: levantamento bibliográfico, criação do material educativo e validação com especialistas. **Resultados:** A validação foi realizada por 10 profissionais de saúde especialistas, que avaliaram exatidão científica, conteúdo, design e clareza. O Índice de Validade de Conteúdo Global obteve 1,00, validando a cartilha com total concordância. **Conclusão:** A cartilha é uma ferramenta eficaz para reduzir os casos de SC, destacando a importância de parcerias com órgãos governamentais para sua ampla distribuição e promoção.

Palavras-chave: Sífilis congênita; Desenvolvimento infantil; Prevenção Primária; Educação em saúde; Tecnologia educativa.

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INTRODUCTION

Congenital syphilis (CS) is characterized by vertical transmission from mother to fetus, which usually occurs during childbirth, in mothers who have not received effective treatment during prenatal care, or who have not received prenatal care (Brasil, 2022a). CS remains a persistent public health challenge in Brazil and worldwide, even though it is preventable through timely prenatal screening and treatment, which underscores the relevance of investigating and addressing gaps in information about the disease.

CS can manifest early, up to 3 months of life, with characteristic symptoms such as vesiculobullous eruptions or coppery macular rash on the palms of the hands and soles of the feet, in addition to papular lesions around the nose, mouth, and diaper areas, and petechial lesions (Comarella; Fernandes; Elias, 2023).

Symptoms that may appear late, usually after the 2nd year of life, are gummatous ulcers, with a tendency to involve the nose, septum, and hard palate, periosteal lesions, and, in the most severe cases, may cause saber shin and bossing on the parietal and frontal bones (Brasil, 2016).

One study by Domingues *et al.* (2021) refers that CS treatment must begin immediately, still in the maternity ward, with hospital admission, as it is a disease that can evolve rapidly. If left untreated, it carries risks such as low birth weight, premature birth, stillbirth, and/or other clinical manifestations. If the parturient has syphilis, breastfeeding may be allowed, but an evaluation of the breasts is necessary, and in case of lesions on the nipples and areolas, breastfeeding must be suspended until the start of treatment and improvement of symptoms.

In recent years, the incidence of CS has shown increased rates in several regions, highlighting the urgent need for effective prevention and education strategies. The lack of adequate information about the disease, its forms of transmission, and its repercussions on child development contributes to the perception of this problem for public health (Nascimento *et al.*, 2021).

The highest rates of syphilis detection in pregnant women, among the capitals, were observed in Rio de Janeiro (74.7 pregnant women/1,000 live births (LB)), Porto Alegre (68.6 pregnant women/1,000 LB), and Rio Branco (63.7 pregnant women/1,000 LB). Ten capitals presented incidence rates of congenital syphilis higher than the national rate (27.1 cases/1,000 LB), the highest being in Porto Alegre (34.6 cases/1,000 LB), Recife (27.6 cases/1,000 LB), and Natal (23.6 cases/1,000 LB) (Brasil, 2022b).

Another study (Paniz *et al.*, 2024) contributed to the analysis of the high rate of congenital syphilis in the year 2020, evaluating the sociodemographic profile of pregnant women, the treatment prescribed to them, its efficacy, and the continuity of treatment in Basic Health Units.

Another study contributed to the analysis of the high rate of congenital syphilis in the year 2020, evaluating the sociodemographic profile of pregnant women, the treatment prescribed to them, its efficacy, and the continuity of treatment in Basic Health Units (Bender *et al.*, 2024; Rivera *et al.*, 2021).

Information and Communication Technologies (ICTs) are digital technologies that can be used in any scope for playful and didactic dissemination of information and knowledge in an accessible way and providing interaction with the public (Reberte; Hoga; Gomes, 2012). Given this potential, the following research question guided this study: Is a booklet on congenital syphilis and its repercussions on child development a valid intervention for the propagation of information and knowledge to health professionals and the general public?

It is believed that its use can favor actions to reduce cases of congenital syphilis, with emphasis on the repercussions in severe cases when there is no treatment or incomplete treatment. Therefore, the objective is to create and validate a digital booklet on congenital syphilis and its repercussions on child development in cases of ineffective treatment or lack thereof.

METHODS

The methodological study was developed in the following stages: (01) Literature Review, (02) preparation of the educational material, and (03) validation of the material by subject specialists.

In the first stage, Literature Review, a search was carried out between (INSERIR PERÍODO DA BUSCA) in the LILACS, PubMed and BDENF databases using the descriptors “congenital syphilis” and “consequences”, which returned X studies. It was evident that there were not many studies reporting what happened to the baby after the pregnant woman acquired syphilis and did not undergo treatment. Thus, research was carried out in manuals and protocols of the Ministry of Health (MoH) about the consequences that babies can acquire if the pregnant woman does not receive or incomplete syphilis treatment. Reflective readings were developed with the purpose of filtering the maximum of relevant and succinct information for the production of the booklet.

Next, the texts were prepared clearly and objectively, addressing a brief explanation about congenital syphilis, treatment, the diseases that babies can develop, where to seek care, and forms of prevention. The programs used for design production were Canva pro and Adobe Indesign for the booklet's layout and page configuration. Also in this stage, guidelines related to the language and presentation of the booklet were used, which the health professional needs to consider to create comprehensible materials with colors that attract the reader.

The first step in the construction of the booklet consisted of content gathering. Thus, a search was carried out in MoH publications that addressed the care mothers should have for the prevention of vertical transmission of syphilis. The content of the booklet was organized into nine domains with the following subtitles: Presentation Cover; Congenital Syphilis; Signs and symptoms that may appear in the pregnant woman; Diagnosis; Treatment for the pregnant woman and her follow-up; Consequences to the baby when the mother does not receive or complete the treatment; Treatment for the baby; What to do if the signs and symptoms appear? Forms of congenital syphilis prevention.

In the second step, the textual elaboration was carried out, followed by the production of illustrations and finalized with the layout. The aim was to combine content rich in information but objective, since very extensive materials can become tiresome, using language accessible to all social strata and levels of education.

The booklet was developed in a “calendar” format with A5 size sheets (148x210 mm) and consists of 12 pages. After the layout was finalized, the researcher forwarded the preliminary version of the booklet for printing and distributed it to the expert judges, with the objective of validating both the appearance and the content. The final version of the booklet was titled “Ex-pli-co para você sobre sífilis congênita e as consequências para o bebê” (I Explain to you about congenital syphilis and the consequences for the baby). Figures 1, 2, 3, and 4 represent the materials that will be made available in health services, such as Basic Health Units and specialized services.

Next, the booklet was evaluated through the analysis of health professionals specialized on the subject, in order to validate the material regarding appearance, content, and legitimacy of the words. In this stage, ten specialized health professionals who have experience in the area of child assistance, teaching, or research in the area of study and health education were randomly selected, based on data from the National Council for Scientific and Technological Development (CNPq) Directory.

To validate the quality of the booklet, the Content Validity Index (CVI) was used. This method is related to scales that measure the quality of materials, in this case, the Thurstone scale was used. The Thurstone scale was readapted into a questionnaire through the Google Forms tool. In this scale, attitudes can be measured through the respondents’ answers, opinions, and evaluations that the subjects give for a certain situation (Thurstone, 1952).

The respondent addresses the predetermined hypothesis by indication their evaluation. The professionals attribute an importance value to each item, and only those with greater agreement (extreme agreement, 11 points) are retained, while items with extreme disagreement (1 point) are excluded and do not compose the final scale (Thurstone, 1952). Based on this scale, the general evaluation of the booklet was carried out through the Content Validation Index (CVI), calculated by dividing the sum of the individual CVIs by the total number of the items in the booklet. Considering that the validation was performed by 10 specialized health professionals, the literature indicates that a CVI of 0.78 is acceptable, meaning that at least 78% of the professionals agreed with the classification or relevance of the item (Souza; Moreira; Borges, 2020).

The study was approved by the Research Ethics Committee of the institution where the research was carried out, ensuring compliance with the recommendations of Resolution No. 466/12, under number 7,021,771. Furthermore, all participants signed the Free and Informed Consent Form (FICF).

RESULTS

The final product of the booklet is demonstrated in the following figures.

Figure 1 - Highlights the cover and layout of the booklet.

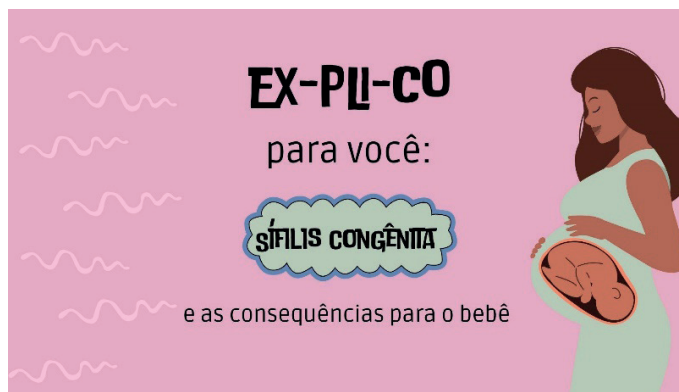


Figure 2 - Emphasizes the topic of possible early repercussions for the baby.



Figure 3 - Emphasizes the topic of possible late repercussions for the baby.



Figure 4 - Highlights the methods of congenital syphilis prevention.



Figure 5 - It shows the poster for scanning the QR code.



The booklet was submitted to analysis by the expert health professionals selected for validation. Ten health professionals were selected, all female nurses, aged between 23 and 45 years. Among the participants, 2 had a post-doctoral degree, 4 had a doctorate, 2 were masters, and 2 were specialists.

During the booklet validation process, the professionals evaluated aspects related to the items “scientific accuracy”, “content”, “design”, and “clear and objective writing”. The Content Validity Index per Item (CVI-I) was initially calculated using Formula 1:

$$CVI = \frac{\text{number of "agree" responses}}{\text{total number of responses}} \quad (1)$$

Subsequently, the Global Content Validity Index (GCVI) was calculated by Formula 2:

$$GCVI = \frac{\text{sum of CVI-I of all items}}{\text{total number of items}} \quad (2)$$

As all items obtained a unanimous classification with extreme agreement (maximum score of 11.00 divided by the number of specialists, resulting in 1.00), the individual CVI-I calculations were not highlighted separately. The GCVI calculation also presented a final result of 1.00, demonstrating the full validation of both the content and the appearance of the booklet.

At the end of the evaluation, the health professionals made some suggestions to collaborate with the quality of the content. For this, they were analyzed based on pertinent literature and the necessary corrections were made, such as changing colors, icons, and illustrations to arouse greater interest, in addition to adding information about seeking prevention and health care.

DISCUSSION

In the validation of the booklet's content and appearance, the contributions of the expert judges were considered. Although the global CVI proved to be satisfactory in the study (1.00), significant changes were suggested to improve the material. Some studies indicate that educational materials that use the CVI to validate their content generally require adjustments until the final validated version is reached, which highlights the importance of this stage for creating a quality material (Costa *et al.*, 2020).

This process of adapting the educational material to the health professionals suggestions is fundamental to making the technology more robust, with greater scientific rigor and effectiveness during health education activities. This phase is equally highlighted in other studies as crucial for the improvement of the material to be validated, in which the reformulation and exclusion of information, the substitution of terms, in addition to the review of illustrations were suggested (Costa *et al.*, 2020).

When developing quality educational materials, it is possible to carry out educational interventions based on structured knowledge and information directed at the target audience (Rocha *et al.*, 2024). In the context of congenital syphilis, these interventions are essential to promote positive behaviors and increase adherence to treatment, in addition to emphasizing the need for greater involvement of professionals with health education and the public (Simões *et al.*, 2024).

The educational material is essential in the context of health education, as it aims to collaborate in improving the knowledge of the health professional, in the more visual and objective explanation, and mainly for the propagation of information and knowledge to the public (Bender *et al.*, 2024). Regarding the booklet on congenital syphilis, the health professional needs to understand the practices related to reducing the vertical transmission of syphilis comprehensively, enabling the

understanding of the pathology in a clear and succinct way for the entire general population (World Health Organization, 2024).

Likewise, during the dialogue, issues of gender, sexuality, and reproductive health may arise, which need to be clarified and known by the health professional, without losing sight of the ethical, social, and cultural dimensions that regulate the lives of women with syphilis. Thus, the decisions and desires of these women must be discussed during care, aiming to provide adequate information about the safest recommendations for family planning, care during pregnancy, childbirth, and the puerperium (Nascimento *et al.*, 2021).

The health professionals suggestions, regarding the clarification of the importance of adopting certain care, were fundamental to strengthening the autonomy of women through the acquisition of more solid knowledge. The objective is to adequately guide mothers living with syphilis, enabling them to become protagonists in the care of their children exposed to the disease (World Health Organization, 2024).

This guidance allows these women to assume an active role in their own lives, with greater autonomy to offer safe care to their children and themselves, thus promoting a better quality of life (Simões *et al.*, 2024).

The importance of support from government agencies for the reproduction, dissemination, and wide distribution of this material in health services is highlighted, through various media, using digital technology for this benefit. Therefore, the digital booklet will be made available in health services through a QR CODE, as shown in Figure 5, to reduce printing costs and facilitate access for everyone.

CONCLUSION

The methodological study developed to create and validate an educational booklet on congenital syphilis and its consequences for the baby was successful in all its stages. The initial phase, dedicated to the literature review, evidenced the scarcity of specific studies on the consequences of untreated syphilis during pregnancy, which reinforces the importance of complementing the research with protocols and manuals from the Ministry of Health. This approach guaranteed the inclusion of updated, relevant, and evidence-based information, strengthening the quality and applicability of the educational material produced.

The limitations of this study were the absence of validation by specialists in the communication area and the lack of selection of professionals from different areas. Although the construction and validation of the booklet have been completed, the study does not end here. It is highlighted that the booklet will be constantly updated according to scientific progress, and there is the intention to make the validated material available for use in specialized services, in addition to carrying out future research to assess its effectiveness in implementing measures to reduce vertical transmission of syphilis.

Thus, the validated booklet emerges as an effective educational tool, with great potential to expand the knowledge of both pregnant women and health professionals about congenital syphilis and its implications. By promoting awareness, the booklet contributes to the prevention and reduction of the impacts of this condition on babies. Furthermore, the study was conducted in compliance with ethical standards, reinforcing the relevance of developing educational materials validated by experts, which ensures greater effectiveness in health communication and in addressing challenges in the context of maternal and child health care.

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