



## ORIGINALES

### Mobile application about syphilis for adolescents: appearance and content validation

Aplicativo móvel sobre sífilis para adolescentes: validação de aparência e conteúdo

Aplicación móvil sobre sífilis para adolescentes: validación de apariencia y contenido

Nathanael Souza Maciel<sup>1</sup>

Diego da Silva Ferreira<sup>2</sup>

Antônio Wendel Nogueira Oliveira<sup>1</sup>

Marks Passos Santos<sup>3</sup>

Camila Chaves da Costa<sup>1</sup>

Leilane Barbosa de Sousa<sup>1</sup>

<sup>1</sup> University of International Integration of Afro-Brazilian Lusofonia. Brazil.  
[nathanael.souza.inf@gmail.com](mailto:nathanael.souza.inf@gmail.com)

<sup>2</sup> Ceara state University. Brazil.

<sup>3</sup> Ages Faculty of Medicine. Bahia. Brazil.

<https://doi.org/10.6018/eglobal.529961>

Received: 30/06/2022

Accepted: 9/10/2022

#### ABSTRACT:

**Objective:** To validate the appearance and content of an application for the prevention and control of syphilis in adolescents.

**Method:** A methodological study was carried out from January to June 2020. Twenty-two judges with experience in syphilis control participated, with an emphasis on adolescent health promotion, educational technologies, and instrument validation. An instrument with variables related to content, structure, functionality, and relevance was used. The Content Validity Index, Cronbach's Alpha Test, and Flesch's Readability Index were used.

**Results:** In the three dimensions, the average Content Validity Index was greater than 0.80, which validates the contents of the application. The overall Content Validity Index of the application was 0.86, which is satisfactory and makes it possible to consider the application valid in terms of content and appearance. Concerning the total Cronbach's Alpha of the application, a value of 0.94 was obtained, demonstrating excellent homogeneity between the participants' responses. The readability test revealed that the technology is easy for the user to understand.

**Conclusion:** The mobile application proved valid in terms of content and appearance, demonstrating that this is a reliable technological tool that adolescents can use as a health education strategy for syphilis prevention and control.

**Keywords:** Sexually Transmitted Diseases; Disease Prevention; Syphilis; Information Technology; Adolescent.

## RESUMO:

**Objetivo:** Validar o conteúdo e a aparência de um aplicativo sobre prevenção e controle da sífilis para adolescentes.

**Método:** Estudo metodológico realizado de janeiro a junho de 2020. Participaram 22 juízes com experiência na área de sífilis, com ênfase em promoção da saúde do adolescente, tecnologias educativas e validação de instrumentos. Foi usado instrumento que possui variáveis relacionadas ao conteúdo, estrutura, funcionalidade e relevância. Utilizou-se o Índice de Validade de Conteúdo, Teste Alpha de Cronbach e Índice de Legibilidade de Flesch.

**Resultados:** Nas três dimensões, a média do Índice de Validade de Conteúdo foi superior a 0,80, o que valida os conteúdos do aplicativo. O Índice de Validade de Conteúdo global do aplicativo foi de 0,86, sendo satisfatório e possibilitando considerar aplicativo validado quanto ao conteúdo e aparência. Em relação ao Alfa de Cronbach total do aplicativo, obteve-se um valor de 0,94, demonstrando uma excelente homogeneidade entre as respostas dos participantes. O teste de legibilidade revelou que a tecnologia é considerada de fácil compreensão para o leitor.

**Conclusão:** O aplicativo móvel se apresentou válido quanto ao conteúdo e a aparência, demonstrando que é uma ferramenta tecnológica confiável para ser utilizada por adolescentes na educação em saúde acerca da prevenção e controle da sífilis.

**Palavras-chave:** Infecções Sexualmente Transmissíveis; Prevenção de Doenças; Sífilis; Tecnologias da Informação; Adolescentes.

## RESUMEN:

**Objetivo:** Validar el contenido y la apariencia de una aplicación para adolescentes sobre la prevención y el control de la sífilis.

**Método:** Estudio metodológico realizado de enero a junio de 2020. Participaron 22 jueces con experiencia en el área de la sífilis con énfasis en la promoción de la salud de los adolescentes, las tecnologías educativas y la validación de instrumentos. Se utilizó un instrumento que tiene variables relacionadas con el contenido, la estructura, la funcionalidad y la relevancia. Se utilizaron el Índice de Validez de Contenido, la Prueba Alfa de Cronbach y el Índice de Legibilidad de Flesch.

**Resultados:** En las tres dimensiones, la media del Índice de Validez de Contenido fue superior a 0,80, lo que valida los contenidos de la aplicación. El Índice de Validez de Conocimiento global de la aplicación fue de 0,86, resultando satisfactorio y permitiendo considerar la aplicación como validada en cuanto a conocimiento y apariencia. En relación con el Alfa de Cronbach total de la aplicación, se obtuvo un valor de 0,94, lo que demuestra una excelente homogeneidad entre las respuestas de los participantes. La prueba de legibilidad reveló que la tecnología se considera de fácil comprensión para el lector.

**Conclusión:** La aplicación móvil se presenta válida en cuanto al contenido y la apariencia, demostrando que es una herramienta tecnológica fiable para ser utilizada por los adolescentes en la educación para la salud sobre la prevención y el control de la sífilis.

**Palabras clave:** Infecciones Sexuales Transmisibles; Prevención de Enfermedades; Sífilis; Tecnologías de la Información; Adolescentes.

## INTRODUCTION

Adolescence comprises the period between 10 and 19 years, marked as the transition from childhood to adulthood and characterized by changes related to culture and physical, mental, emotional, and social changes <sup>(1)</sup>. Faced with these changes, adolescents tend to adopt risky behaviors, such as sexual behaviors that contribute to unplanned pregnancies and sexually transmitted infections (STIs) <sup>(2)</sup>.

Among the STIs, syphilis continues to cause morbidity and mortality worldwide. Although this pathology is easily identifiable and treatable, syphilis infection rates continue to increase among vulnerable populations in high-income countries and remain at endemic levels in low- and middle-income settings <sup>(3)</sup>.

Based on prevalence data from 2009 to 2016, a total of 6.3 million cases of syphilis were estimated. The estimated global prevalence of syphilis in men and women is 0.5%, with regional values ranging from 0.1 in the European region to 1.6% in the African region <sup>(4)</sup>. Thus, the number of cases of syphilis infection is worrisome and raises the need to develop interventions that can control and prevent it. In addition, cases of syphilis in the age group of 13 to 19 years have represented considerable growth in recent years <sup>(5)</sup>.

The global STI strategy sets the goal of reducing the incidence of syphilis by 90% and reducing the incidence of congenital syphilis to <50 cases per 100,000 live births by 2030 <sup>(6)</sup>. To this end, technological innovations are relevant and can boost overcoming barriers, bringing the response to STIs closer. Furthermore, innovative methods are needed to address social and structural disease determinants to ensure that prevention efforts do not stall <sup>(7)</sup>.

Using technologies and applications for mobile platforms effectively modifies and provides opportunities for the health promotion of different groups, including adolescents. In a global scenario, the proportion of people between 15 and 24 engaged with the internet is estimated to be over 70% worldwide, compared to just 48% of the total population <sup>(8)</sup>. Therefore, using technological devices to promote youth discourses about sexuality brings a new discursive practice into everyday life <sup>(9)</sup>.

Mobile applications are an adequate, accessible, and interesting way to educate adolescents about their sexual and reproductive health and encourage their autonomy in sexual health practices, making them protagonists in preventing health problems and promoting and maintaining health <sup>(10)</sup>. In this way, the development and validation of mobile applications provide users with autonomy and present themselves as a new possibility to acquire knowledge, being, therefore, stimulated and disseminated.

In addition, the important role that nursing professionals play in health education in the most diversified care services is highlighted, considering that this is a category with a large number of professionals and that educational practices are innate to professional practice <sup>(11)</sup>. In this context, validation studies of nursing technologies for the prevention and control of syphilis are important as they improve these low-cost tools that can be implemented as health care interventions.

Given the above, considering that mobile applications are powerful health interventions <sup>(10)</sup>, in addition to the increasing use of these devices by adolescents and their vulnerability related to sexual health, the interest in validating a mobile application for disease prevention and control is justified, with a favorable impact on the promotion of knowledge, attitudes and adequate practices of adolescents concerning syphilis. Thus, the study's objective was to validate the appearance and content of an application for the prevention and control of syphilis in adolescents.

## **MATERIAL AND METHOD**

This is a methodological study, defined as the one aiming to investigate methods for obtaining and organizing data and developing, validating, and evaluating research tools and methods <sup>(12)</sup>. This study was conducted from January to June 2020 online.

The mobile app, called "Syphilis? I'm out!" was previously developed by the research team and published in another article <sup>(13)</sup>. The application lists the following themes: definition of syphilis, stages of the disease, forms of transmission, forms of prevention, treatment, and specific guidelines for adolescents. The mobile application is divided into two parts: the first is similar to a booklet that adolescents can access to get information about Syphilis, and the second is a quiz game <sup>(13)</sup>.

Nurses (judges), researchers, or professors with experience in STIs with an emphasis on adolescents' health promotion, educational technologies, or instrument validation participated in the validation stage. The search for judges was carried out on the Lattes Platform, hosted on the website of the Brazilian National Council for Scientific and Technological Development (CNPq), and on the Theses and Dissertation Database of the National Coordination for the Improvement of Higher Education Personnel (CAPES) using the following keywords: "syphilis", "sexually transmitted infections", and "adolescence". Snowball sampling was also used, given the impossibility of estimating the quantity of the target population <sup>(14)</sup>.

Nurses who met two of the following criteria were included as content judges: having a master's or doctoral degree, having published a dissertation, thesis, or article on the theme of sexually transmitted infections in adolescents, and having prior clinical or teaching experience in the themes of "sexual and reproductive health" or "adolescent health" for at least one year, and expertise in sexual or reproductive health <sup>(15)</sup>.

The selected judges were contacted via e-mail and received an invitation letter explaining the research objectives and procedures and requesting a response about the judge's interest in participating in the research. Potential participants interested in participating received the following materials through the Google Forms platform: the informed consent form (ICF), the evaluation instrument, a link to access the application's screenshots in PDF format, and a link to a video simulating the use of the app for usability assessment. A period of 15 days was granted to return the assessment instruments. At the time, the suggestion of other professionals who met the inclusion criteria was also requested.

As for the ideal number of judges for the validation process, we used the recommendation of 22 expert judges <sup>(16)</sup>. Thus, the first 22 content judges who agreed to participate in the research and responded to the validation instrument made up the sample.

The content and appearance validation process was carried out with the participation of judges, using an instrument with variables related to the judge's characterization and variables related to the objectives, content, structure, functionality, and relevance of the application <sup>(17)</sup>. The variables were measured using a Likert scale with scores from one to four.

The collected data were organized in a Microsoft Office Excel 2016® spreadsheet and analyzed in the Statistical Package for the Social Sciences® version 20.0. Central tendency and dispersion measures were used to characterize the sample of judges. The Content Validity Index (CVI) was used for each item, domain, and the technology as a whole <sup>(18)</sup>. CVI values were adopted to measure the quality of each aspect or item, considering valid values equal to or greater than 0.80 <sup>(12,18)</sup>. Then, the exact binomial distribution test was used, being considered significant when  $p < 0.05$ .

Furthermore, Cronbach's Alpha coefficient test was applied individually and by grouping items relevant to each question, with a minimum acceptable value of 0.7<sup>(19)</sup>. Subsequently, a descriptive evaluation of the judges' suggestions was conducted, and the team met to decide whether they would be accepted or rejected. After making the relevant adjustments, the Flesch Readability Index (FRI) was applied using Microsoft Office Word 2016. In this study, an adapted version of the FRI questionnaire was used. The instrument stratifies the rating into four levels of reading difficulty: very easy (75 - 100 points), easy (50 - 75 points), difficult (25 - 50 points), and very difficult (0 - 25 points)<sup>(20)</sup>.

This study was reviewed and approved by the Research Ethics Committee of the University of International Integration of Afro-Brazilian Lusophony under opinion n° 3,805,400 and CAAE n° 23697219.8.0000.5576.

## RESULTS

Eighty nurse judges from all regions of Brazil were invited to participate in the content and appearance validation stage. Of these, 35 agreed to participate in the study, but only 22 responded to the formal request sent via e-mail. Table 1 presents the profile of the participating judges.

**Table 1** – Characterization of content and appearance judges.

Variable	n	%
<b>Gender</b>		
Female	18	81.8
Male	4	18.2
<b>Age</b> (35.7; SD: 7.6 years)		
25-29 years	5	22.7
30-39 years	12	54.5
≥ 40 years	5	22.7
<b>Time of bachelor's degree</b> (11.4; SD: 9.1 years)		
≤ 10 years	11	52.4
11 - 19 years	7	33.3
≥ 20 years	3	14.3
<b>Occupation</b>		
Assistance	4	18.2
Teaching	17	77.3
Assistance + Teaching	1	4.5
<b>Acquired degree</b>		
Doctorate	14	63.6
Master	22	100.0
Specialization	20	90.9
<b>Prior educational experience in syphilis control</b>		
Yes	16	72.7
No	6	27.3
<b>Themes approached in previous publications</b>		
Syphilis	7	31.8
STIs	20	90.9
Educational technologies	13	59.1
Validation	8	36.4
Adolescents' health	10	45.5

The age ranged between 27 and 55 years, with a mean of 35.7 years. Most participants were female (n=18; 81.8%). The professional experience ranged from 2 to 39 years, with an average of 11.4 years. Regarding the occupations, the majority (n=17; 77.3%) worked in teaching jobs and were doctors (n=14; 63.6%). Many judges (n=16; 72.7%) had educational experience in syphilis control and publications on sexually transmitted infections.

Table 2 presents CVI values, the binomial test results, and Cronbach's alpha coefficients for each domain.

**Table 2** – Distribution of content validity index (CVI) values, binomial test results, and Cronbach's alpha coefficients.

<b>Domain 1: Objectives and content</b>	<b>CVI</b>	<b>Binomial test</b>	<b>Cronbach's alpha</b>
a) The text is compatible with the target audience	0.91	0.000	
b) The information/content is adequate	0.91	0.000	
c) The content may promote behavior changes	0.86	0.001	
d) The content and image are motivating	0.82	0.004	
e) The content meets the needs of adolescents	0.82	0.004	
f) The content can circulate in the scientific environment	0.95	0.000	
<b>Total domain</b>	<b>0.88</b>		<b>0.848</b>
<b>Domain 2: Structure and functionality</b>			
a) The app is suitable for adolescent guidance	0.95	0.000	
b) The messages are presented in a clear and objective manner	0.91	0.001	
c) The information presented is scientifically correct	0.91	0.000	
d) The proposed content is presented using a logical sequence	0.91	0.000	
e) The material is suitable for the socio-cultural level of the target audience	0.82	0.004	
f) The information is well structured in concordance and spelling	0.73	0.052	
g) The writing style corresponds to the level of knowledge of the target audience	0.91	0.000	
h) The illustrations (images and GIFS) are expressive and sufficient	0.68	0.134	
i) The number of screens is adequate	0.86	0.001	
j) The title, subtitle, and topics' font sizes are adequate	0.95	0.000	
k) Text colors are relevant and easy to read	0.86	0.001	
<b>Total domain</b>	<b>0.86</b>		<b>0.881</b>
<b>Domain 3: Relevance</b>			
a) The themes portray the key aspects that should be reinforced	0.86	0.001	
b) The application proposes that adolescents acquire knowledge	0.91	0.000	
c) The application addresses necessary subjects	0.82	0.004	
d) The application is suitable for use by any adolescent	0.77	0.017	
<b>Total Domain</b>	<b>0.84</b>		<b>0.877</b>
<b>APPLICATION'S TOTAL</b>	<b>0.86</b>		<b>0.944</b>

The judges positively evaluated domain 1 – objectives and content – since a CVI of 0.88 was obtained. The binomial test was satisfactory for all items in this domain,

obtaining statistical significance. The Cronbach's Alpha of the domain was 0.848, which suggests a good internal consistency between the judges.

Concerning domain 2 – structure and functionality – we obtained a CVI of 0.86, above the acceptable cutoff. However, the items referring to the structuring in agreement and spelling of the information and the expression of the illustrations obtained a score lower than 0.80. The binomial test for this domain obtained statistical significance in most topics. However, the structuring agreement and spelling of the information and the expression of the illustrations did not obtain statistical significance. The Cronbach's alpha of the domain was 0.881, which suggests a good internal consistency between the judges. It should be noted that the screens were modified in terms of spelling and the inclusion of more representative images, as suggested by some judges.

As for domain 3 – relevance – all screens were validated with CVI 0.86. However, the item on suitability for use by any adolescent also scored greater than 0.8. The binomial test achieved statistical significance in all items with a  $p < 0.05$ . The Cronbach's alpha of 0.877 also indicates good internal consistency. The judges' suggestions were analyzed and accepted to improve the final version of the application.

In the three dimensions, the average of the CVI was above 0.80, which validates the contents of the application. The global CVI of the application was 0.86, which is satisfactory and makes it possible to consider the application valid in terms of content and appearance. Concerning the total Cronbach's alpha of the application, a value of 0.94 was obtained, demonstrating an excellent homogeneity between the judges' responses.

After the quantitative evaluation with the calculation of the CVI, binomial test, and Cronbach's alpha values, a qualitative evaluation was carried out, with all the expert judges' suggestions, criticisms, and praises being analyzed. The judges suggested 112 modifications, 79 of which were accepted, aiming to improve the application, and 33 were not.

Among the rejected suggestions is the inclusion of the possibility of oral treatment, improvements on the description of the route of administration of the treatment with the addition of the term "intramuscular", the inclusion of the name of the drug used for the treatment, the inclusion of themes such as sexual rights of adolescents, an explanation of how to use male and female condoms, the change of the term "symptoms" to the term "sign" – since the sign is the clinical manifestation perceived by another person –, and of the term "exam" to the term "test" – considered less invasive.

Suggestions for changes in the application were also made by the judges, such as: adding captions to the illustrations ( $n=1$ ), simplifying and re-elaborating sentences to make the language clearer ( $n=4$ ), and adding some information they deemed necessary ( $n=3$ ), among others.

The following suggestions given by the judges were accepted: strengthening the treatment of sexual partners, reinforcing breastfeeding even in case of reactive syphilis, inserting topics on the forms of transmission, removing the statement about local pain as an adverse reaction to the treatment, and emphasizing the importance of prenatal testing.

Regarding the application's readability assessment through the Flesch Readability Index, a value of 51.3 was obtained, classifying the material as easy to read.

## DISCUSSION

The adoption of digital technology promises many potential benefits for the healthcare system, including greater efficiency in healthcare, cost reduction, and improved healthcare system governance structures, thus extending healthcare delivery beyond its conventional limits <sup>(21)</sup>. The literature points out some examples of technologies developed for adolescents, addressing issues of contraception <sup>(22)</sup>, Human Immunodeficiency Virus <sup>(23-24)</sup>, and reduction of risky behaviors <sup>(25)</sup>.

It is noteworthy that, in addition to developing technologies, it is essential to ensure the quality of information. Given this, the method of validating an educational technology is based on the perspective that this step is essential to ensure the authenticity, validity, and credibility of the artifact before disseminating it to the target audience <sup>(26)</sup>. In this way, validating the "Syphilis? I'm out!" application was essential to assess the ideas and clarity of each technology component so that it is extensible to the target population.

According to the judges' evaluation, the "Syphilis? I'm out!" illustrations needed improvement to become more expressive. It is understood that reading and understanding health information is essential for individuals' decision-making and health behaviors. Therefore, non-verbal communication has been used as a resource for health education. This communication tool should be explored in the elaboration and validation of technologies, as incorporating this resource contributes to overcoming health inequities, poverty and intervening in public health problems <sup>(27)</sup>.

Some judges suggested simplifying sentences, making them easier to be understood by the adolescent audience. The potential of educational technologies in health can be potentiated if researchers acknowledge the importance of using an accessible and easy-to-understand language for potential users. A prior study that built and validated an application, with the participation of 23 specialists and ten caregivers of children, showed that the creation of educational materials requires an understanding of the scenario of the target population, combined with a participatory, communicative, and collective approach, leading to effective care plans <sup>(28)</sup>.

An example of suitability adjustment considering the target audience is the change of the term "catheter" to "probe", as the latter is more used and well-known <sup>(28)</sup>. Likewise, in our study, we kept the most popular words, such as "exam" instead of "test" and "symptoms" instead of "signs". We also declined the suggestion of adopting the term "intramuscular" as a Syphilis treatment administration route for being a technical term, not easily understood by adolescents.

The inclusion of information about the oral treatment option was suggested. This proposal was rejected since benzathine benzylpenicillin, administered intramuscularly, is the drug of choice for the treatment of syphilis, being the only drug with documented efficacy during pregnancy, and there is no evidence of resistance of *T. pallidum* to penicillin in Brazil and the world <sup>(29)</sup>.



The app evaluated in this study was considered valid regarding its content and appearance. Indeed, developing and validating applications for syphilis is an important strategy to mitigate this public health problem affecting thousands of people worldwide. However, for these technologies to be used efficiently and properly, it is necessary to encourage the development of skills and abilities in health professionals to handle these tools with the same intensity as disseminating information in a globalized world <sup>(27)</sup>.

There are many difficulties in coping with syphilis, especially concerning cooperation and adherence of health professionals and civil society to organize a support network for the establishment of educational and preventive actions that may encompass different audiences (pregnant women, sexual partners, and others) regarding the risks of infection and its complications, as well as the lack of knowledge about the magnitude of this problem and the repercussions it can cause <sup>(30)</sup>. This way, the existence of a valid application with content that is easy to understand is a means of disseminating information about syphilis, contributing to the construction of knowledge and bringing adolescents closer to healthcare settings.

In this way, the application validated in our study is a resource that can be implemented in care practice to prevent syphilis. It is believed that its use can be disseminated within the scope of the Brazilian Family Health Strategy by nurses, community health agents, and other professionals who assist adolescents, aiming to bring this public closer to health services.

Among the study's limitations, the non-participation of information technology and communication professionals stand out since these professionals participated in another validation stage. In addition, there is a lack of semantic validation with the target audience. It is suggested that new studies approach other types of validation multi-professionally.

## CONCLUSION

The mobile application was evaluated as valid in content and appearance, demonstrating its reliability as a technology that adolescents can use to obtain health education to prevent and control syphilis. Finally, the readability test proved that the application's content is easy to understand.

## REFERENCES

1. World Health Organization. Young People's Health - a Challenge for Society [Internet]. Geneva: World Health Organization; 1986 [cited 2019 Apr 20]. Available from: [http://apps.who.int/iris/bitstream/handle/10665/41720/WHO\\_TRS\\_731.pdf?sequence=1&isAllowed=y](http://apps.who.int/iris/bitstream/handle/10665/41720/WHO_TRS_731.pdf?sequence=1&isAllowed=y)
2. Moura LR, Torres LM, Cadete MMM, Cunha CF, Moura LR, Torres LM, et al. Factors associated with health risk behaviors among Brazilian adolescents: an integrative review. Rev Esc Enferm USP [Internet]. 2018 [cited 2019 Apr 20];52. Available from: <http://dx.doi.org/10.1590/s1980-220x2017020403304>

3. Kojima N, Klausner JD. An Update on the Global Epidemiology of Syphilis. *Curr Epidemiol Rep* [Internet]. 2018 Mar [cited 2021 Nov 25];5(1):24–38. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6089383/>
4. Rowley J, Vander Hoorn S, Korenromp E, Low N, Unemo M, Abu-Raddad LJ, et al. Chlamydia, gonorrhoea, trichomoniasis and syphilis: global prevalence and incidence estimates, 2016. *Bull World Health Organ*. 2019 Aug 1;97(8):548-562P.
5. Brasil. Boletim Epidemiológico Sífilis 2021 [Internet]. Brasília: Ministério da Saúde; 2021 [cited 2020 Mar 26]. Available from: <http://www.aids.gov.br/pt-br/pub/2019/boletim-epidemiologico-sifilis-2019>
6. World Health Organization. Global Health Sector Strategy on Sexually Transmitted Infections 2016–2021 [Internet]. Geneva: WHO; 2016 [cited 2019 Apr 21]. Available from: <https://www.who.int/reproductivehealth/publications/rtis/ghss-stis/en/>
7. World Health Organization. Global progress report on HIV, viral hepatitis and sexually transmitted infections, 2021 [Internet]. Geneva: WHO; 2021 [cited 2021 Nov 26]. Available from: <https://www.who.int/publications/i/item/9789240027077>
8. World Health Organization. Global Diffusion of eHealth: making universal health coverage achievable. [Internet]. Geneva: World Health Organization; 2016 [cited 2019 Apr 20]. Available from: <http://apps.who.int/iris/bitstream/handle/10665/252529/9789241511780-eng.pdf;jsessionid=AB0098E08F0BFE19D1B4174BB7567D83?sequence=1>
9. Abreu LDP, Mendonça GMM, Araújo AF, Torres RAM, Silva MRF, Fialho AVM. Cuidado de enfermagem na relação saber/poder e sexualidade junto a juventude escolar via " web "rádio. *Rev Enferm UFSM* [Internet]. 2019 Oct 25 [cited 2021 Nov 26];9(0):54. Available from: <https://periodicos.ufsm.br/reufsm/article/view/33663>
10. Timmons SE, Shakibnia EB, Gold MA, Garbers S. MyLARC: A Theory-Based Interactive Smartphone App to Support Adolescents' Use of Long-Acting Reversible Contraception. *J Pediatr Adolesc Gynecol* [Internet]. 2018 Jun [cited 2019 May 6];31(3):285–90. Available from: <https://doi.org/10.1016/j.jpag.2017.11.005>
11. Galindo-Neto NM, Alexandre ACS, Barros LM, Sá GGM, Carvalho KM, Caetano JÁ. Construção e validação de vídeo educativo para surdos acerca da ressuscitação cardiopulmonar. *Rev Lat Am Enfermagem* [Internet]. 2019 Mar 18 [cited 2021 Nov 26];27. Available from: <http://www.scielo.br/j/rlae/a/xKdKQQFTDMXSPnHhsWkhdkm/?lang=pt>
12. Polit DF, Beck CT. Fundamentos de pesquisa em enfermagem: Avaliação de evidências para prática de enfermagem. 9th ed. Porto Alegre: Artmed; 2018.
13. Maciel NS, Ferreira DS, Costa EC, Sousa LB de, Costa CC. Desenvolvimento de um aplicativo móvel para adolescentes sobre prevenção e controle da sífilis. *Rev Saúde Digit E Tecnol Educ* [Internet]. 2022 Mar 22 [cited 2022 May 26];7(1):52–64. Available from: <http://periodicos.ufc.br/resdite/article/view/61426>
14. Valerio MA, Rodriguez N, Winkler P, Lopez J, Dennison M, Liang Y, et al. Comparing two sampling methods to engage hard-to-reach communities in research priority setting. *BMC Med Res Methodol*. 2016 Oct 28;16(1):146.
15. Fehring R. The Fehring Model. In CarrolJohnson R, Paquete M, editores. Classification of nursing diagnoses: proceedings of the tenth conference of North American Nursing Diagnosis Association. Philadelphia: Lippincott; 1994. p. 55-62.
16. Lopes MVO, Silva VM, Araujo TL. Methods for Establishing the Accuracy of Clinical Indicators in Predicting Nursing Diagnoses. *Int J Nurs Knowl* [Internet]. 2012 [cited 2020 Apr 23];23(3):134–9. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.2047-3095.2012.01213.x>

17. Marques ADB. Aplicativo multimídia em plataforma móvel para promoção do cuidado com os pés de pessoas com diabetes: ensaio clínico controlado randomizado [Internet] [Tese (Doutorado)]. [Fortaleza]: Universidade Estadual do Ceará, Centro de Ciências da Saúde; 2018 [cited 2020 Jul 25]. Available from: <https://siduece.uece.br/siduece/trabalhoAcademicoPublico.jsf?id=84305>
18. Alexandre NMC, Coluci MZO. Validade de conteúdo nos processos de construção e adaptação de instrumentos de medidas. Ciênc Saúde Coletiva [Internet]. 2011 Jul [cited 2021 Aug 31];16:3061–8. Available from: <http://www.scielo.br/j/csc/a/5vBh8PmW5g4Nqxz3r999vrm/?lang=pt>
19. LOBIONDO-WOOD G, HABER J. Pesquisa em enfermagem: métodos, avaliação crítica e utilização. 8th ed. Rio de Janeiro: Guanabara Koogan; 2014.
20. Nunes MG, Oliveira Júnior ON. O processo de desenvolvimento do Revisor Gramatical ReGra. In Curitiba,PR: PUC-PR; 2000 [cited 2020 Jul 25]. Available from: <http://www.niee.ufrgs.br/eventos/SBC/2000/pdf/semish/semi001.pdf>
21. Njoroge M, Zurovac D, Ogara EAA, Chuma J, Kirigia D. Assessing the feasibility of eHealth and mHealth: a systematic review and analysis of initiatives implemented in Kenya. BMC Res Notes [Internet]. 2017 Feb 10 [cited 2021 Nov 28];10:90. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5301342/>
22. Brayboy LM, Sepolen A, Mezoian T, Schultz L, Landgren-Mills BS, Spencer N, et al. Girl Talk: A Smartphone Application to Teach Sexual Health Education to Adolescent Girls. J Pediatr Adolesc Gynecol [Internet]. 2017 Feb [cited 2019 Apr 20];30(1):23–8. Available from: <https://dx.doi.org/10.1016%2Fj.jpag.2016.06.011>
23. Cordova D, Alers-Rojas F, Lua FM, Bauermeister J, Nurenberg R, Ovadje L, et al. The Usability and Acceptability of an Adolescent mHealth HIV/STI and Drug Abuse Preventive Intervention in Primary Care. Behav Med Wash DC [Internet]. 2018 Mar [cited 2019 Aug 24];44(1):36–47. Available from: <https://dx.doi.org/10.1080%2F08964289.2016.1189396>
24. Lelutiu-Weinberger C, Klein C, Muessig KE, Golinkoff JM, Hightow-Weidman LB, Rochelle AE, et al. Increasing HIV Testing and Viral Suppression via Stigma Reduction in a Social Networking Mobile Health Intervention Among Black and Latinx Young Men and Transgender Women Who Have Sex With Men (HealthMpowerment): Protocol for a Randomized Controlled Trial. JMIR Res Protoc. 2020 Dec;9(12).
25. Winskell K, Sabben G, Akelo V, Ondeng'e K, Obong'o C, Stephenson R, et al. A Smartphone Game-Based Intervention (Tumaini) to Prevent HIV Among Young Africans: Pilot Randomized Controlled Trial. JMIR MHealth UHealth [Internet]. 2018 Aug 1 [cited 2019 Apr 20];6(8). Available from: <https://dx.doi.org/10.2196%2F10482>
26. Gigante VCG, Oliveira RC, Ferreira DS, Teixeira E, Monteiro WF, Martins ALO, et al. Construção e validação de tecnologia educacional sobre consumo de álcool entre universitários. Cogitare Enferm [Internet]. 2021 Oct 29 [cited 2021 Nov 26];26. Available from: <http://www.scielo.br/j/cenf/a/LmxcRMvw9KHrpvWCjk4ByzF/>
27. Mota DN, Torres RAM, Guimarães JMX, Marinho MNASB, Araújo AF. Tecnologias da informação e comunicação: influências no trabalho da estratégia Saúde da Família. J Health Inform [Internet]. 2018 May 11 [cited 2021 Nov 26];10(2). Available from: <http://www.jhi-sbis.saude.ws/ojs-jhi/index.php/jhi-sbis/article/view/563>
28. Rodrigues LN, Santos AS, Gomes PPS, Silva WCP, Chaves EMC. Construção e validação de cartilha educativa sobre cuidados para crianças com gastrostomia.

- Rev Bras Enferm [Internet]. 2020 Apr 22 [cited 2021 Nov 26];73. Available from: <http://www.scielo.br/j/reben/a/hbbFTwjqwWhVJXVqmpvcyGk/?lang=pt>
29. Brasil. Protocolo Clínico e Diretrizes Terapêuticas para Atenção Integral às Pessoas com Infecções Sexualmente Transmissíveis (IST) [Internet]. Brasília: Ministério da Saúde; 2020 [cited 2021 Oct 20]. Available from: <http://www.aids.gov.br/pt-br/pub/2015/protocolo-clinico-e-diretrizes-terapeuticas-para-atencao-integral-pessoas-com-infecoes>
  30. Dias MS, Gaiotto EM, Cunha MR, Nichiata LIY. Síntese de evidências para políticas públicas de saúde: enfrentamento da sífilis congênita no âmbito da atenção primária à saúde. BIS Bol Inst Saúde Impr [Internet]. 2019 [cited 2021 Nov 26];89–95. Available from: <http://fi-admin.bvsalud.org/document/view/vv5tv>

ISSN 1695-6141

© [COPYRIGHT](#) Servicio de Publicaciones - Universidad de Murcia