

## ORIGINAL ARTICLE

## VACCINATION IN PREGNANCY: CONSTRUCTION AND VALIDATION OF EDUCATIONAL TECHNOLOGY

### HIGHLIGHTS

1. Construction and validation of Educational Technology on vaccination during pregnancy.
2. Nurses' role in the immunization context.
3. Favoring prenatal health education.

Camilla Cristina Lisboa do Nascimento<sup>1</sup>   
Ivaneide Leal Ataíde Rodrigues<sup>1</sup>   
Laura Maria Vidal Nogueira<sup>1</sup>   
Heliana Helena de Moura Nunes<sup>1</sup>   
Gisele de Brito Brasil<sup>2</sup>   
Carlos Marcelo da Silva Moraes<sup>1</sup>   
Alexandre Aguiar Pereira<sup>1</sup> 

### ABSTRACT

**Objective:** to build and validate the content of an educational technology to guide pregnant women about immunization. **Method:** a methodological study carried out from December 2020 to October 2021 in Belém, Pará, Brazil. It consisted of two stages: Construction through an Integrative Literature Review and face and content validation with 16 judges using a *Likert* scale for data collection and the Content Validity Index for analysis. **Results:** a double-sided table flipbook was created on immunization, which was assessed by 100% of the judges as relevant, with a mean Content Validity Index per block greater than 0.86. **Conclusion:** the technology was built with technically correct information and validated by experts in the respective areas. It is understood that its use will ease the prenatal Nursing practice, considering it to be a tool capable of arousing interest and encouraging dialogue between professionals and pregnant women, solving doubts in the immunization context.

**DESCRIPTORS:** Immunization; Educational Technology; Education; Prenatal; Nursing.

### HOW TO REFERENCE THIS ARTICLE:

Nascimento CCL do, Rodrigues ILA, Nogueira LMV, Nunes HH de M, Brasil G de B, Moraes CM da S, et al. Vaccination in pregnancy: construction and validation of educational technology. *Cogitare Enferm.* [Internet]. 2023 [cited "insert year, month and day"]; 28. Available from: <https://dx.doi.org/10.1590/ce.v28i0.93165>

<sup>1</sup>Universidade do Estado do Pará, Centro de Ciências Biológicas e da Saúde, Belém, PA, Brasil.

<sup>2</sup>Universidade Federal de Santa Catarina, Trindade, Florianópolis, SC, Brasil.

## INTRODUCTION

The gestational period is a physiological process that generates physical, psychological and social changes in women, influenced by countless factors such as alterations in their biological, socioeconomic and cultural characteristics<sup>1</sup>.

Recognizing these characteristics, the Ministry of Health (*Ministério da Saúde*, MS) assumed as one of its commitments the promotion of safe motherhood throughout the entire pregnancy and puerperal process, such as prenatal care, considering health care humanization<sup>2</sup>. The perspective of humanized birth emphasizes the importance of women understanding their pregnancy so that they are aware of pertinent information and the care they need to receive focused on their particularities. This shows empowerment and their leading role during pregnancy<sup>3</sup>.

It is important to highlight the importance of pregnant women fully complying with the vaccination schedule. A number of studies have indicated that pregnant women produce IgG antibodies through immunization, which are transported via the placenta and may exert beneficial effects both on the fetus and on the mother<sup>4</sup>. However, despite highlighting vaccination efficacy during pregnancy, it is understood that not all immunobiologicals are routinely recommended due to concerns in relation to the risk/benefit ratio during this period<sup>5</sup>.

The gestational period is characterized by immunological and physiological changes in women, which favor alterations in the susceptibility of mothers and fetuses to infections, along with modifications in the immune response<sup>6</sup>. Therefore, the importance of vaccinating pregnant women to protect maternal and child health from vaccine-preventable diseases, such as diphtheria and tetanus, is ruled out with the double adult vaccine, the triple acellular bacterial vaccine (dTpa) against diphtheria, tetanus and pertussis, and the recombinant hepatitis B and influenza virus vaccines<sup>7</sup>.

In addition to that, vaccination coverage is lower than expected in certain population subgroups, particularly the obstetric one, as a result of persistently high social inequality in the country and of the sum of social inequalities and the gestational population<sup>7</sup>. In this particular context, the use of Educational Technologies (ETs) stands out as a significant means of fostering dialogue between patients and the health team, thereby easing comprehensive and informative communication among all parties involved, including these patients' families<sup>8</sup>. ETs can contribute and offer essential clarifications to pregnant women, contributing to teaching and learning activities and mediating the educational practices of those who use them. They stand out as tools that help people critically reflect on their own knowledge and explore possibilities for changing their practices<sup>9</sup>.

The educational process in health serves as a means of disseminating knowledge, promoting health and preventing diseases, particularly those that can be prevented through vaccination, as the knowledge of the population, especially pregnant women, in relation to the importance of vaccination can contribute to eradicating these diseases<sup>10</sup>. Among the health professionals engaged in educational initiatives, nurses are constantly challenged to seek alternatives that provide them with the necessary support to collaborate with people, groups and communities, with ETs as strong allies in this process<sup>11</sup>.

In addition to the importance of elaborating ETs, it is noted that, for their effective use, they must undergo a validation process that involves the analysis of various items, such as objectives, structure and relevance. This process must be carried out by experts in the focus area, in addition to other important aspects<sup>10</sup>. Thus, the validation of an ET presents itself as a way of qualifying a new intervention/instrument or improving an existing one through systematic use of available knowledge<sup>12</sup>.

The absence of scientific productions on the construction of ETs centered on the

study topic stands out, and including health education in the Pre-Natal Program practices appears to be a contemporary and necessary strategy, especially when it emerges from knowledge exchange, evolving into an act of creating and transforming thoughts and actions<sup>8</sup>.

In this scenario, it is understood that there is a need to expand educational actions with pregnant women carried out in a dialogical and comprehensive manner, as well as that ETs can assist in these actions and in unique assistance during prenatal care. Therefore, the objective of this study was to build and validate the content of an educational technology to guide pregnant women about immunization.

## METHOD

A methodological design study developed from December 2020 to October 2021 in the municipality of Belém, Pará, Brazil. The *Standards for Quality Improvement Reporting Excellence - SQUIRE* was followed<sup>13</sup>.

The participants were 16 judges, including 13 nurses, a graphic designer, a pedagogue and a Portuguese language teacher, to assess the content, face and form of the ET, in addition to the requirements necessary to inform with correctness, precision and accessible language for the technology's target audience.

The number of judges was based on the recommendation to work with a minimum number of nine judges in validation processes<sup>14</sup>. They chose the snowball technique, which is a form of non-probability sampling where the initial participants in the study nominate new ones who in turn indicate others and so on, until the necessary number of participants is reached<sup>15</sup>.

For inclusion, a score calculation adapted for this study was used, similarly to another validation study<sup>16</sup>. A minimum score of five points was considered and the experts' suitability to the selection criteria was verified through their CVs on the Lattes Platform. Those who did not meet the 30-day deadline for returning the validation instrument would be excluded; however, all of whom complied. The criteria and scores considered are presented in Table 1:

**Table 1** – Criteria and scores for selecting the expert judges to validate the Educational Technology on immunization in the gestational period. Belém, PA, Brazil, 2021

| Scoring criteria   | Score                |
|--|----------------------|
| thesis or dissertation in the area of interest*                    | 2 points/paper       |
| Monograph or specialization in the area of interest                | 1 point per paper    |
| Participation in groups/projects in the area of interest           | 1 point              |
| Teaching experience in the area of interest                        | 0.5 point/year       |
| Practical work in the area of interest                             | 0.5 point/year       |
| Papers' orientation in the area of interest                        | 0.5 point per paper  |
| Authorship of papers in the area of interest published in journals | 0.25 point per paper |
| Participation in paper evaluation boards in the area of interest   | 0.25 point per paper |

Note: \*The following were considered as areas of interest: immunization or women's health, especially prenatal care.

Source: Feitosa, Stelko-Pereira, Karla (2019)<sup>16</sup>

The study was developed in two stages: In the first one, an Integrative Literature Review (ILR) was carried out, processed in six stages: 1) Identification of the topic and selection of the research question; 2) Definition of inclusion and exclusion criteria for the studies; 3) Definition of the diverse information to be extracted from the studies selected; 4) Evaluation of the studies included; 5) Interpretation of the results; and 6) Presentation of the review/knowledge synthesis<sup>17</sup>.

To build the ILR, the following databases were defined: *Literatura Latino Americana e do Caribe em Ciências da Saúde* (LILACS), Scientific Electronic Library Online (SciELO) and Medical Literature Analysis and Retrieval System Online (MEDLINE). To cover the 1<sup>st</sup> stage, the topic of "Practices on prenatal immunization" was chosen and the research questions were defined as follows: "Which content is important to inform pregnant women about immunization during pregnancy?" and "Which educational strategies have been used to inform pregnant women about immunization?"

For the 2<sup>nd</sup> stage, the inclusion criteria were established as follows: original articles published in Portuguese, English and Spanish, from January 2016 to December 2020, and available free of charge in full text. Secondary research studies such as literature reviews, whether integrative or systematic, were excluded. In the 3<sup>rd</sup> stage, selection of studies took place, carried out in accordance with the *Preferred Reporting Items for Systematic Review and Meta-Analyses* (PRISMA) methodology<sup>18</sup>. Studies repeated in more than one database were considered only once.

In the 4<sup>th</sup> stage, to evaluate the articles included, the data were compiled into a script adapted by the authors based on an instrument developed and validated<sup>19</sup>. In the 5<sup>th</sup> stage, the textual data analysis was conducted by using the *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires* (IRaMuTeQ) software, version 0.7 alpha 2, which is widely employed in the scientific literature and allows for the statistical analysis of a text corpus<sup>20</sup>.

In the 6<sup>th</sup> stage, the result obtained by the software was interpreted, ending with the construction of the ET in the form of a double-sided table flip album, created in CorelDRAW X7® 2015 by the authors, following the layout, color and typography choice stages.

For content validation, the judges were contacted by email with an invitation letter and, after confirming their interest in participating, they received the Free and Informed Consent Form (FICF) in their email addresses and a link to the online platform designed to access the ET elaborated and the validation form.

Upon accessing the link, they were directed to a free platform website developed by the researchers, where they were able to download the ET in PDF format and the validation form in DOCX format, which were to be sent along with the signed FICF to the email address of the researcher in charge.

The validation instrument was built based on a Likert scale<sup>21</sup> adapted for this study, with 29 items divided into five blocks (General Impression; Objectives; Structure and Presentation; Relevance; and Verbal Language) for the experts and 11 items divided into three blocks (General Impression, Aesthetic Quality and Portuguese Language) for the graphic designer, pedagogue and Portuguese language teacher. The items are presented with 4 options<sup>22</sup> and scored from 1 to 4, where 1-Totally adequate, 2-Adequate, 3-Partially adequate and 4-Inadequate.

The Content Validity Index (CVI) was used to assess the judges' agreement on the ET. The calculation was made by adding up the agreement corresponding to the items that were marked as Totally adequate and Adequate by the judges and divided by the total number of items in each block, considering a CVI cutoff point of 0.80<sup>23</sup>.

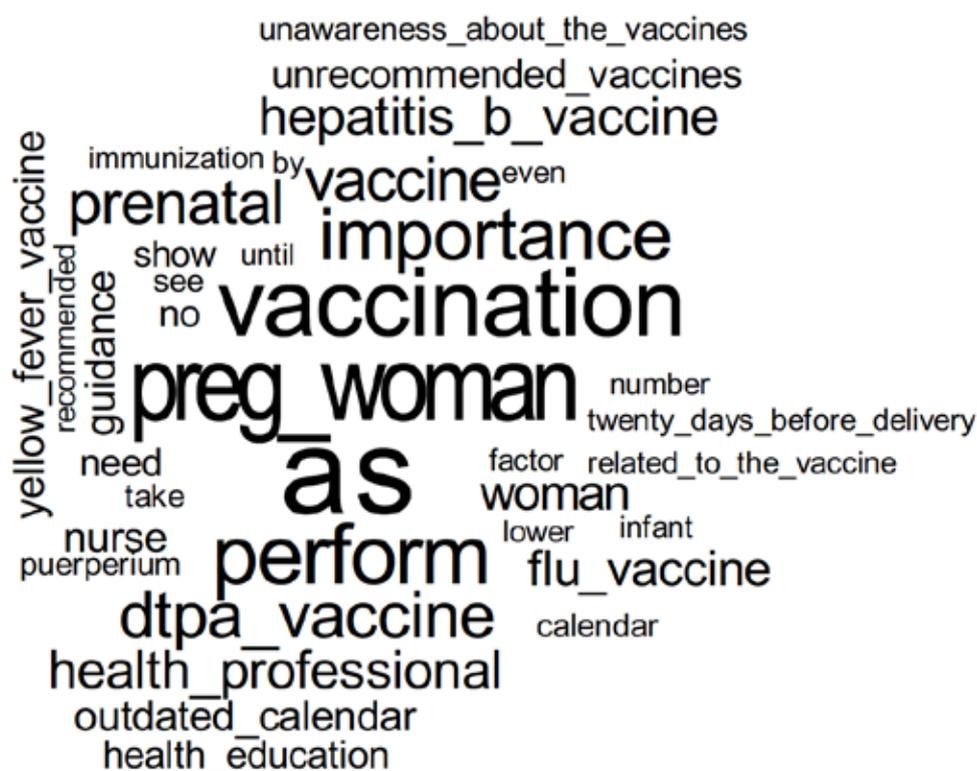
The research was approved by the Research Ethics Committee of a Public University with opinion No. 4,485,320. The participants were identified by means of an alphanumeric code, using the letter J (Judge) and the number of the instruments answered in ascending order.

## RESULTS

When preparing the ILR to build the educational technology, 187 publications were initially identified, 30 of which were repeated among the databases. After reading the titles and abstracts, 66 primary studies were considered for full-reading. In this reading it was found that 20 of the materials answered the study guiding question, of which 10 (52.63%) were located in LILACS, seven (36.84%) in MEDLINE and three (10.52%) in SCIELO.

In relation to the topics covered in the publications, nine (47.36%) were focused on the vaccines that make up the vaccination calendar for pregnant women, six (31.57%) dealt with the importance of health professionals, especially nurses, in their work during prenatal consultations and five (26.31%) were about pregnant women's acceptance of vaccination.

The results of the studies were organized into a text *corpus* that enabled the formation of a word cloud using the IRaMuTeQ software (Figure 1). The *corpus* content consisted of 20 texts that resulted in 22 text segments, with identification of 656 words and 158 hapax (words with a frequency of one). The following words stood out: vaccination, pregnant woman, importance, perform, dTpa vaccine, hepatitis B vaccine, health professional and prenatal care, which are related to aspects about the importance of the work done by health professionals, especially nurses, in health education activities, vaccines to be offered and compliance with the vaccination schedule during the prenatal period.



**Figure 1** – Word cloud about vaccination during pregnancy. Belém, PA, Brazil, 2021

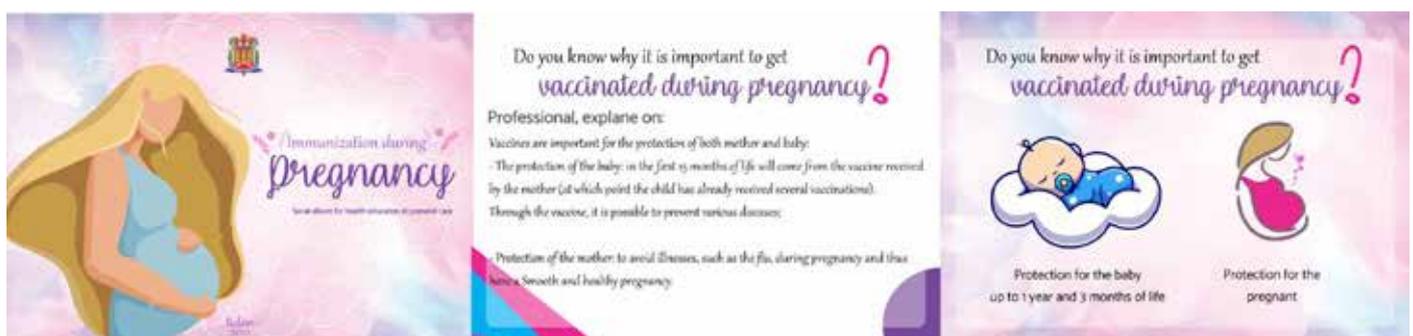
Source: The authors (2021).

Based on these highlighted topics, it was decided to build an educational technology in the form of a table flipchart with the purpose of assisting health professionals during the

prenatal consultations to inform/guide on immunization during the gestational period. The album was called "Flipchart on Immunization for pregnant women during prenatal care" (Figure 2), containing 18 double colored pages, size 210 mm x 297 mm and consisting of textual and illustrative content.

The titles are presented in the *Unicorn Calligraphy* and *Gabriola* fonts, ranging in size from 40 to 70, and the texts in *Catamaran* and *Gabriola*, from 20 to 28. It features a cover, presentation page, illustrative pages of guidance for pregnant women (front), guide pages for health professionals on the topics covered (back) and bibliographic reference. It consists of seven sessions related to doubts about immunization during pregnancy, such as: "Do you know why it is important to get vaccinated during pregnancy?", "Which vaccines do pregnant women need?", "Which vaccines are forbidden for pregnant women?", "Attention with special vaccines, such as yellow fever!", "What if the pregnant woman's calendar is up to date?", "If the pregnant woman does not know which vaccines she has already had, how can she find out?" and "A pregnant woman will be able to get the vaccines up to how many gestational weeks?"

It is noted that all content was organized in simple language in the text intended for pregnant women, with illustrations that allude to the diverse information presented and a guide text for professionals to provide guidelines on the sessions. Polychromy was used to highlight the information, as seen in Figure 2:



**Figure 2** – Cover, guidance page for pregnant women and guide page for health professionals that make up the table flip chart. Belém, PA, Brazil, 2021

Source: The authors (2021).

In the validation, the flipchart was evaluated by 16 judges: 13 (81.25%) nurses specialized in the subject matter, one (7.69%) graphic designer, one (7.69%) pedagogue and one (7.69%) Portuguese language teacher. Of the nurses, 10 (76.93%) had expertise in immunization and three (23.07%) in prenatal care.

Of the total number of judges, 12 (75%) were female and four (25%) were male, aged between 24 and 63 years old and with a mean of 35.25. A total of four (30.76%) had MSc degrees and 12 (96.23%) were specialists. In relation to working time, they had between three and nine years of service, with a mean of six years.

The CVI was calculated by blocks and in general, among the specialists (Table 2) and the graphic designer professional, pedagogue and Portuguese language teacher (Table 3), considered favorable as they presented indices by blocks greater than 0.86.

**Table 2** – Results of the Content Validity Indices, by blocks and in general, according to the evaluation by the expert judges. Belém, PA, Brazil, 2021

| Variables                  | Objectives   | CVI* | Overall CVI* |
|----------------------------|--|------|--------------|
| General impression         | Evaluate the judges' impression regarding the educational material, such as layout, diagramming and font size.                           | 0.91 | 0.92         |
| Objectives                 | Evaluate the desired objectives by using the ET.   | 0.92 |              |
| Structure and Presentation | Evaluate how to present the guidelines, which includes general organization, structure, presentation strategy, coherence and formatting. | 0.88 |              |
| Relevance                  | Evaluate the characteristics of the significance degree of the educational material presented.   | 0.90 |              |
| Verbal Language            | Assess whether the language used in the ET is easy to understand.  | 0.86 |              |

\* CVI = Content Validity Index

Source: The authors (2021).

**Table 3** – Results corresponding to the Content Validity Indices, by blocks and in general, according to the assessment by the professional judges: graphic designer, pedagogue and Portuguese language teacher. Belém, PA, Brazil, 2021

| Variables                | Objectives   | CVI* | Overall CVI* |
|--------------------------|--|------|--------------|
| Quality of the Interface | Evaluate the judges' impression regarding the educational material, such as layout, diagramming and font size. | 0.88 | 0.87         |
| Aesthetic Quality        | Evaluate the quality of the texts and images.  | 0.88 |              |
| Portuguese Language      | Evaluate adequacy to the educated standard.  | 0.86 |              |

\* CVI = Content Validity Index

Source: The authors (2021).

Based on the results, it can be asserted that the flipchart was validated, taking into account what was sought to be evaluated in it. The adjustments suggested by some judges were made, such as replacing figures and/or substituting and increasing the font size on the guidance pages intended for pregnant women.

## DISCUSSION

The flipchart was prepared based on diverse evidence from the literature that pointed out the necessary content in the immunization context to be addressed by health professionals during prenatal consultations. In this context, ET use presents itself as a strategy that assists in educational actions, contributing positively to health promotion and to preventing and eradicating vaccine-preventable diseases, such as its use in immunization during prenatal consultations. Sharing accurate and easy-to-understand information is crucial for pregnant women to understand the importance of keeping their vaccination schedule updated<sup>24</sup>.

The flipchart had its content validated by the judges given that the CVI values, both in the five blocks and in the overall calculation, were above 0.86, as recommended in the literature<sup>23,25</sup>. It is noted that the presentation, objectives proposed, relevance and clarity in sharing information were considered in this process. With this, it is reiterated that when assessing these aspects, the scientific rigor required in ET validation processes is met<sup>26</sup>.

Validation by nurses working in the immunization or prenatal consultation sectors, was important because they are routinely in contact with the ET target audience, thus knowing the main questions and desires experienced by these pregnant women<sup>26</sup>. In addition to calculating the CVI, the suggestions proposed by the judges were valued, as they made it possible to adapt the flipchart to the target audience needs<sup>11</sup>.

As for the technology being a tool that enables understanding about immunization during the gestational period, content validation showed the importance of nurses duly trained in prenatal care, providing health education on the topic and enabling pregnant women to understand the guidelines provided, given that dissemination of information in technical language is notorious in the health sector, making it difficult for the target audience to understand it<sup>27</sup>. With this, Nursing leading role as a health educator stand out, using validated ETs capable of sharing safe and appropriate information with the target audience<sup>28</sup>.

Building ETs in different contexts and health scenarios makes it possible to standardize the guidelines provided regarding various topics, as in the case of this study, immunization during the gestational period, providing educational interventions based on technically correct information and targeted to the target audience needs<sup>14,29</sup>.

In the context of pregnant women, it is highlighted that guidelines on immunization during prenatal care are necessary so that they have greater adherence to updating the vaccination schedule appropriately and understand the importance of carrying out this practice, as it is commonplace to associate vaccination with fear, pain and uncertainty about their effectiveness<sup>24,28</sup>.

One of the study limitations is its construction based on a literature review, instead of shared with the pregnant women, which, in the authors' opinion, would be the ideal way. The restrictions imposed by the pandemic precluded this. The scientific rigor for carrying out the literature review and the researcher's experiences in the immunization area helped to contextualize the final product with the quality that would be legitimized by content validation.

## CONCLUSION

The study achieved its objectives by presenting a validated ET applicable in educational activities in prenatal care as an instrument capable of encouraging pregnant women to correctly and completely comply with the vaccination schedule.

Having completed construction and validation of the flipchart's content, the importance of carrying out its semantic validation is highlighted, giving voice to the target audience as well as allowing future updates on women's immunization and health.

It is understood that using this material will ease the Nursing practice during prenatal consultations, considering that it constitutes an illustrated technology capable of arousing interest and encouraging dialogue between professionals and pregnant women who have doubts about the importance of immunization to guarantee the health of women and infants alike.

## ACKNOWLEDGMENTS

Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES); Universidade Anhanguera of São Paulo, Pirituba, for the opportunity to do the Master's Degree, for the support through the 013/2021 public notice.

## REFERENCES

1. Thuler ACMC, Wall ML, Souza MAR. Characterizing women in the pregnancy-puerperal cycle and encouraging early breastfeeding. *Rev enferm UERJ*. [Internet]. 2018 [cited 2020 Dec 02]; 26(1):e16936. Available from: <https://doi.org/10.12957/reuerj.2018.16936>
2. Serrão JRM, Peixoto IVP, Nascimento CCL, Serrão AM, Pamplona MCA. Practices of HIV seropositive pregnant women on self-care: construction of educational healthtechnology. *REAS* [Internet]. 2020 [cited 2021 Feb 03]; 38(1):e1562. Available from: <https://doi.org/10.25248/reas.e1562.2020>
3. Ministry of Health (BR). National guidelines for care in normal childbirth: abridged version. Brasília: Ministry of Health; 2017.
4. Ballalai I, Domingues C, Maranhã AG, Montenegro El. Brazilian Society of Immunizations. Pregnancy vaccination: successful protection for mother and child [Internet]. 2018 [cited 2020 Dec 02]. Available from: <https://vacinasparagravidas.com.br/public/docs/guia-da-vacinacao.pdf>
5. Ballalai I, Bravo F. Immunization: everything you ever wanted to know. RMCOM. [Internet]. 2016 [cited 2020 Dec 02]. Available from: <https://sbim.org.br/images/books/imunizacao-tudo-o-quevoce- sempre-quis-saber.pdf>
6. Alvarez AMR, Jauregui B, El Omeiri N. Progress towards a comprehensive approach to maternal and neonatal immunization in the Americas. *Rev Panam Salud Publica* [Internet]. 2017 [cited 2023 Aug 15]; 41:e159. Available from: <https://doi.org/10.26633/RPSP.2017.159>
7. Oliveira SC, Silva TPR, Velásquez-Melendez G, Mendes LL, Martins EF, Rezende EM, *et al*. Social and obstetric inequalities and vaccination in pregnant women. *Rev Bras Enferm*. [Internet]. 2020 [cited 2023 Aug 15]; 73(Suppl 4):e20190099. Available from: <http://dx.doi.org/10.1590/0034-7167-2019-0099>
8. Araújo EF, Ribeiro ALT, Pinho IVOS, Melo MC, Abreu VJ, Nascimento ETS, *et al*. Development of educational technology about health education for children with type i diabetes mellitus. *Nurs. focus*. [Internet]. 2020 [cited 2020 Dec 02]; 11(6). Available from: <https://doi.org/10.21675/2357-707X.2020.v11.n6.3915>
9. Wild CFW, Nietzsche E, Salbego C, Teixeira E, Favero NB. Validation of educational booklet: an educational technology in dengue prevention. *Rev Bras Enferm*. [Internet]. 2019 [cited 2020 Dec 07]; 72(1):1318-25. Available from: <http://dx.doi.org/10.1590/0034-7167-2018-0771>
10. Saldan GG, Figueiredo FSF, Misawa F, Rêgo A da S, Salci MA, Radovanovic CAT. Construction of educational technology for home care after encephalic vascular accident: case report. *Rev enferm UFPE online*. [Internet]. 2017 [cited 2020 Dec 02]; 11(4):1784-93. Available from: <http://dx.doi.org/10.5205/ reuol.9763-85423-1-SM.1104201729>
11. Benevides JL, Coutinho JFV, Pascoal LC, Joventino ES, Martins MC, Gubert F do A, *et al*. Development and validation of educational technology for venous ulcer care. *Rev Esc Enferm USP*. [Internet]. 2016 [cited 2020 Dec 15]; 50(2):306-12. Available from: <http://dx.doi.org/10.1590/S0080-623420160000200018>
12. Teixeira E, Mota VMSS. Educational Technologies in Focus. São Caetano do Sul: Publishing Diffusion; 2011.

13. Rosa BVC, Girardon-Perlini NMO, Guerrero NSG, Nietzsche EA, Beuter M, Dalmolin A. Development and validation of audiovisual educational technology for families and people with colostomy by cancer. *Texto Contexto Enferm.* [Internet]. 2019 [cited 2021 Feb 16]; 28(1):e20180053. Available from: <http://dx.doi.org/10.1590/1980-265X-TCE-2018-0053>
14. Ogrinc G, Davies L, Goodman D, Batalden P, Davidoff F, Stevens D. SQUIRE 2.0 (Standards for Quality Improvement Reporting Excellence): revised publication guidelines from a detailed consensus process. *J Am Coll Surg.* [Internet]. 2016 [cited 2021 Feb 16]; 222(3):317-23. Available from: <https://www.equator-network.org/reporting-guidelines/squire/>
15. Nietzsche EA, Texeira E, Medeiros HP. Educational care technologies: a possibility for empowering nurses? Porto Alegre: Moriá; 2014.
16. Baldin N, Munhoz EMB. Snowball: a methodological technique for research in community environmental education. In: X National Congress of Education–EDUCRE [Internet]. 2011 [cited 2021 Feb 16]; p. 329-41. Available from: [https://educere.bruc.com.br/CD2011/pdf/4398\\_2342.pdf](https://educere.bruc.com.br/CD2011/pdf/4398_2342.pdf)
17. Feitosa MCR, Stelko-Pereira ACM, Karla JN. Validation of Brazilian educational technology for disseminating knowledge on leprosy to adolescents. *Braz J Nurs* [Internet]. 2019 [cited 2021 Feb 16]; 72(5):1333-40. Available from: <https://doi.org/10.1590/0034-7167-2018-0610>
18. Koopmans FF, Daher DV, Acioli S, Sabóia VM, Ribeiro CRB, Silva CSSL da. Living on the streets: na integrative review about the care for homeless people. *Rev Bras Enferm.* [Internet]. 2018 [cited 2021 Feb 08]; 72(1):211-20. Available from: <https://doi.org/10.1590/0034-7167-2017-0653>
19. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) statement. *Syst. Rev.* [Internet]. 2015 [cited 2021 Feb. 08]; 4(1):1-9. Available from: <https://systematicreviewsjournal.biomedcentral.com/articles/10.1186/2046-4053-4-1>
20. Ursi ES, Galvão CM. Prevention of perioperative skin lesions: integrative literature review [Dissertation]. Ribeirão Preto (SP): University of São Paulo; 2005.
21. Camargo BV, Justo AM. Iramuteq: Iramuteq: a free software for textual data analysis. *Topics in Psychology.* [Internet]. 2013 [cited 2021 Mar 03]; 21(2):513-18. Available from: <http://dx.doi.org/10.9788/TP2013.2-16>
22. Ferreira DS, Teixeira E, Brown DO, Koch R, Monteiro WF, Santos ER dos, et al. Content validation of an educational technology about men's health. *Bahia J. Nurs.* [Internet]. 2020 [cited 2021 Mar 03]; 4(1):e36344. Available from: <https://doi.org/10.18471/rbe.v34.36344>
23. Souza AC de, Alexandre NMC, Guirardello E de B. Propriedades psicométricas na avaliação de instrumentos: avaliação da confiabilidade e da validade. *Epidemiol. Serv. Saude.* [Internet]. 2017 [cited 2023 Aug 15]; 26(3). Available from: <https://doi.org/10.5123/S1679-49742017000300022>
24. Rodrigues ILA, Nogueira LMV, Pereira AG, Abreu PD, Nascimento LC, Vasconcelos EMR de, et al. Learning by playing: semantic validation of educational technology on tuberculosis for schoolchildren. *Esc. Anna Nery Rev. de Enferm* [Internet]. 2021 [cited 2021 Mar 03]; 25(4):e20200492. Available from: <https://doi.org/10.1590/2177-9465-EAN-2020-0492>
25. Oliveira SC, Silva TPR, Velásquez-Melendez G, Mendes LL, Martins EF, Rezende EM, et al. Social and obstetric inequalities and vaccination in pregnant women. *Rev Bras Enferm.* [Internet]. 2020 [cited 2021 Mar 03]; 73(Suppl 4):e20190099. Available from: <http://dx.doi.org/10.1590/0034-7167-2019-0099>
26. Jesus EB, Esteves AVF, Teixeira E, Medeiros HP, Nascimento MH, Saboia VM. Validation of educational technology on phototherapy to guide families of jaundiced newborns. *Uerj Nursing Journal.* [Internet]. 2018 [cited 2021 Mar 03]; 26:e21789. Available from: <http://dx.doi.org/10.12957/reuerj.2018.21789>
27. Siqueira JP, Guimarães EAA, Oliveira VJ, Gontijo TL, Quites HFO, Amaral GG, et al. Knowledge of health professionals about vaccination in pregnant women: construction and content validation of an instrument. *Cuidarte magazine.* [Internet]. 2020 [cited 2021 Mar 14]; 11(1):e872. Available from: <http://>

[dx.doi.org/10.15649/cuidarte.872](https://doi.org/10.15649/cuidarte.872)

28. Barbosa EMG, Sousa AAS, Vasconcelos MGF, Carvalho REFL, Oriá MOB, Rodrigues DP. Educational technologies to encourage (self) care in postpartum women. Rev. Bras. Enferm. [Internet]. 2016 [cited 2021 Mar. 14]; 69(3):545-53. Available from: <https://doi.org/10.1590/0034-7167.2016690323i>

29. Nascimento CCL, Monteiro DS, Rodrigues ILA, Nogueira LMV, Santos FV dos, Pereira AA. Nurses' practices on immunization: shared construction of educational technology. Nurs Focus Magazine. [Internet]. 2021 [cited 2021 Mar 14]; 12(2):305-11. Available from: <https://doi.org/10.21675/2357-707X.2021.v12.n2.4065>

**Received:** 28/02/2023

**Approved:** 21/08/2023

**Associate editor:** Dra. Tatiane Trigueiro

**Corresponding author:**

Camilla Cristina Lisboa do Nascimento  
Universidade do Estado do Pará  
Av. José Bonifácio, 1289 - Guamá  
E-mail: camilla.nasc@gmail.com

**Role of Authors:**

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - **Nascimento CCL do**. Drafting the work or revising it critically for important intellectual content - **Nascimento CCL do, Rodrigues ILA**. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - **Nascimento CCL do, Rodrigues ILA, Nogueira LMV**. All authors approved the final version of the text.

ISSN 2176-9133



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).