Original Article

doi: https://doi.org/10.1590/1983-1447.2022.20220108.en

☑ Knowledge translation and advances in health and nursing practices

Educational hypermedia on embracement and obstetric risk classification: content validation and usability

Hipermídia educativa em acolhimento e classificação de risco obstétrico: validação de conteúdo e usabilidade

Hipermedios educativos sobre la adopción y clasificación del riesgo obstétrico: validación del contenido y la usabilidad

Francisco Mayron Morais Soares[a,b]
Kirley Kethellen Batista Mesquita[c]
Igor Cordeiro Mendes[d]
Rodrigo da Silva Nunes[b]
João de Deus de Araújo Filho[a]
Luciana Mara Monti Fonseca[e]
Gilson Vasconcelos Torres[a]
Francisco Arnoldo Nunes de Miranda[a]

How to cite this article:
Soares FMM, Mesquita KKB, Nunes RS, Araújo Filho JD, Fonseca LMM, Torres GV, Miranda FAN. Educational hypermedia on embracement and obstetric risk classification: content validation and usability. Rev Gaúcha Enferm. 2022;43(spe):e20220108. doi: https://doi.org/10.1590/1983-1447.2022.20220108.en

ABSTRACT

Objective: To validate the content and usability of educational hypermedia about embracement and obstetric risk classification.

Methods: Methodological study, development by the basic instructional design model, conducted in five stages. Twenty-two judges participated to validate the content and usability. For the analysis, the Content Validity Index, the System Usability Scale, and the binomial test were used.

Results: In the content it was obtained a Content Validity Index of 0.96 and for and usability it was obtained 91.9. In the overall evaluation, all requirements obtained an index of 0.98.

Conclusion: The educational hypermedia developed presents evidence of validity and constitutes an innovative resource for the teaching and learning process in Nursing.

Keywords: Pregnancy complications. Education, nursing. Educational technology. Validation study.

RESUMO

Objetivo: Validar o conteúdo e usabilidade de hipermídia educativa sobre acolhimento e classificação de risco obstétrico.

Métodos: Estudo metodológico, desenvolvimento pelo modelo de design instrucional básico, realizado em cinco etapas. Participaram 22 juízes para validar conteúdo e usabilidade. Para a análise, foram utilizados o Índice de Validade de Conteúdo a *System Usability Scale* e o teste binomial.

Resultados: No conteúdo obtiveram um Índice de Validade de Conteúdo de 0,96 e para e usabilidade obteve-se 91,9. Na avaliação global, todos os requisitos obtiveram 0,98 de índice. Conclusão: A hipermídia educativa desenvolvida apresenta evidência de validade e se constitui como recurso inovador para o processo de ensino e aprendizagem em Enfermagem.

Palavras-chave: Complicações na gravidez. Educação em enfermagem. Tecnologia educacional. Estudo de validação.

RESUMEN

Objetivo: Validar el contenido y la utilidad de la hipermedia educativa sobre el acolchado y la clasificación del riesgo obstétrico.

Métodos: Estudio metodológico, desarrollo del modelo de diseño instruccional básico, realizado en cinco etapas. Participaron 22 jueces para validar el contenido y la usabilidad. Para el análisis se utilizó el Índice de Validez de Contenido, la Escala de Usabilidad del Sistema y la prueba binomial.

Resultados: En el contenido se obtuvo un Índice de Validez de Contenido de 0,96 y para la usabilidad se obtuvo un 91,9. En la evaluación global, todos los requisitos obtuvieron un 0,98 de índice.

Conclusión: La hipermedia educativa desarrollada presenta evidencia de validez y se constituye como recurso innovador para el proceso de enseñanza y aprendizaje en Enfermería.

Palabras clave: Complicaciones del embarazo. Educación en enfermería. Tecnología educacional. Estudio de validación.

[a] Universidade Federal do Rio Grande do Norte (UFRN), Departamento de Enfermagem. Natal, Rio Grande do Norte, Brasil.

[b] Faculdade Uninta Itapipoca, Departamento de Enfermagem. Itapipoca, Ceará, Brasil.

[c] Universidade Federal do Ceará (UFC), Departamento de Enfermagem. Fortaleza, Ceará, Brasil.

[d] Universidade Federal do Maranhão (UFMA), Departamento de Enfermagem. Pinheiro, Maranhão, Brasil.

[e] Universidade de São Paulo (USP), Escola de Enfermagem de Ribeirão Preto. Ribeiro Preto, São Paulo, Brasil.

INTRODUCTION

During pregnancy, the woman undergoes several changes and adaptations inherent to the pregnancy state. This peculiar event can result in unfavorable conditions resulting from pre-existing clinical/obstetric conditions and require emergency care[1]. In scenarios of health complications related to pregnancy, it is important that clinical management is conducted to avoid obstetric complications and improve the quality of care[1,2].

The coming of clinical/obstetric changes requires that the nursing professional use risk stratification based on severity criteria, with additional tests and services[2]. Studies demonstrate barriers, such as lack of specific knowledge, which makes it difficult to implement this process and directly imply the embracement and obstetric risk classification[3,4].

In Brazil, despite the decline in maternal mortality in recent decades, rates remain at high levels, with an average of 107 deaths per 100,000 live births in 2021[5]. In this regard, the Ministry of Health, from Stork Network (*Rede Cegonha*), released the Manual for Embracement and Obstetric Risk Classification (*Manual de Acolhimento e Classificação de Risco Obstétrico* – ACRO), implemented in 2014 and updated in 2017, with the instrumentalization of access to the obstetric emergency service, with improvement of indicators of maternal and perinatal morbidity and mortality[6].

The ACRO protocol is a tool that supports clinical decisions in universal language for obstetric emergencies. Its purpose is the prompt identification of critical cases and enabling fast and safety care according to the potential risk, supported by scientific evidence, besides to establishing a simple and systematic analysis of life-threatening situations[1].

In this new epidemiological scenario, there is a need for qualified professionals to apply the ACRO in obstetric emergency services in the light of the best scientific evidence. Nurses are one of them, as, according to Decree/Law 94,046 of 1987, they can provide nursing care to pregnant women with emergencies and delivery without dystocia[7].

Thus, it is important to provide nurses with education that fosters an accurate clinical vision for comprehensive care for pregnant women, in addition to emphasize the importance of periodic and updated training. Therefore, Nursing education must have quality in the teaching and learning process and in Nursing care in the global era.

Therefore, it is necessary to structure forms of education supported by the results of scientific research together with Information and Communication Technologies (ICT), from the perspective of use of resources capable of assisting in the educational and innovative scenario for the apprehension of content and motivation in learning, as the example of hypermedia[8].

Hypermedia is an educational resource that allows interactive learning with the use of multiple media, dynamic and/or static, with the example of hypertexts, images, figures, videos, clinical cases and links, presenting itself as an enriching didactic strategy in the teaching-learning process, which connect during learning[9]. Among the hypermedia, it stands out the virtual learning environment (VLE), a teaching modality mediated by digital technology in the health area, evidenced as an effective approach and adding value to student performance, as well as in perceptions of the learning experience.

With the advance and use of ICT in nursing education, the development and evidence of validity of educational technologies for nursing education becomes inexorable as an additional resource to assist in skills and competences with the training of students and professionals to provide effective and safe care[8].

Nevertheless, professors and students in Brazil had a more active participation in the teaching of digital nursing, which made more active the participation and use of technologies that interact virtually in the activities proposed in the curricular subjects. Nursing schools have been using digital education for years both for courses and for undergraduate subjects[10,11,12].

Associating care with educational actions aims to share practices and knowledge in a horizontal relationship. Although relevant, when verifying the literature, there was a reduced number of studies about educational technologies in obstetrics. Similar studies validated educational hypermedia for teaching labor[13], a booklet to guide professionals in conducting prenatal care and delivery[14], and validation of an educational manual for birth companions[15] and a video case study for safe delivery[16].

Thus, to fill gaps in the literature on educational technologies in embracement and obstetric risk classification, this study contributes to the advancement of knowledge by providing hypermedia with focusing on teaching students and nursing professionals.

When considering the importance of developing educational technologies in the field of obstetric nursing and the relevance of the theme, the study aimed to validate the content and usability of educational hypermedia on embracement and obstetric risk classification.

METHOD

This is an applied and methodological research, that involved the technologic production for teaching in nursing, on the embracement and obstetric risk classification[8].

For the development and validation of educational hypermedia, it was used the classic instructional design model ADDIE[17], an acronym for analysis, design, development, implementation, and evaluation, presented in Figure 1.

In the stage of instructional design analysis, it was sought to understand the educational gap and the possible solutions to solve the study problem. To clarify the situational diagnosis, it was performed a narrative review of the literature, whose databases used to survey the content were the following: Latin American and Caribbean Literature on Health Sciences (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE) via PubMed, Cumulative Index to Nursing and Allied Health Literature (CINHAL), Scopus and Cochrane, as well as Ministry of Health websites that contained the ACRO manual.

The following terms were used to survey published studies: Education in Nursing; Educational technology; Validation Studies; Risk to Human Health; Nursing; Risk Classification; Obstetrics; Obstetric Nursing; Pregnancy Complications. Then, it was defined the planning of the modules addressed in the hypermedia.

In the content survey, which expanded the understanding of embracement and obstetric risk classification and the use of educational technologies, allowed to subsidize the development of the teaching plan and learning objectives, with digital resources that supported the formative matrix for learning by the educational technologies.

The design consisted in the planning in which the basic requirements for hypermedia were defined, the target audience, the workload needed for the educational action, the learning objectives, the necessary resources, evaluation of learning through the VLE and the references that provided theoretical, methodological and applicability support[4,11,13,18].

In the development stage, learning objects and media production were constructed. It was opted to use both static (texts, images, flowcharts, books, and articles) and dynamic (videos and website links) media. Criteria were established for the selection of works in the public domain, with open access, available in Portuguese, such as videos, images and texts produced by the Research Group on Advanced Practices and Nursing Technologies (*Grupo de Pesquisa em Práticas Avançadas e Tecnologias em Enfermagem* – GEPATE) in partnership with the Department of communication at *Faculdade Uninta Itapipoca*.

The implementation of the ACRO contents was divided into two stages, the first on the elaboration of the material for the internet and the second, the availability of hypermedia in a publicly hosted e-mail address. It is emphasized that the materials made available were implemented by the researchers and their scientific initiation scholarships from April to June 2021.

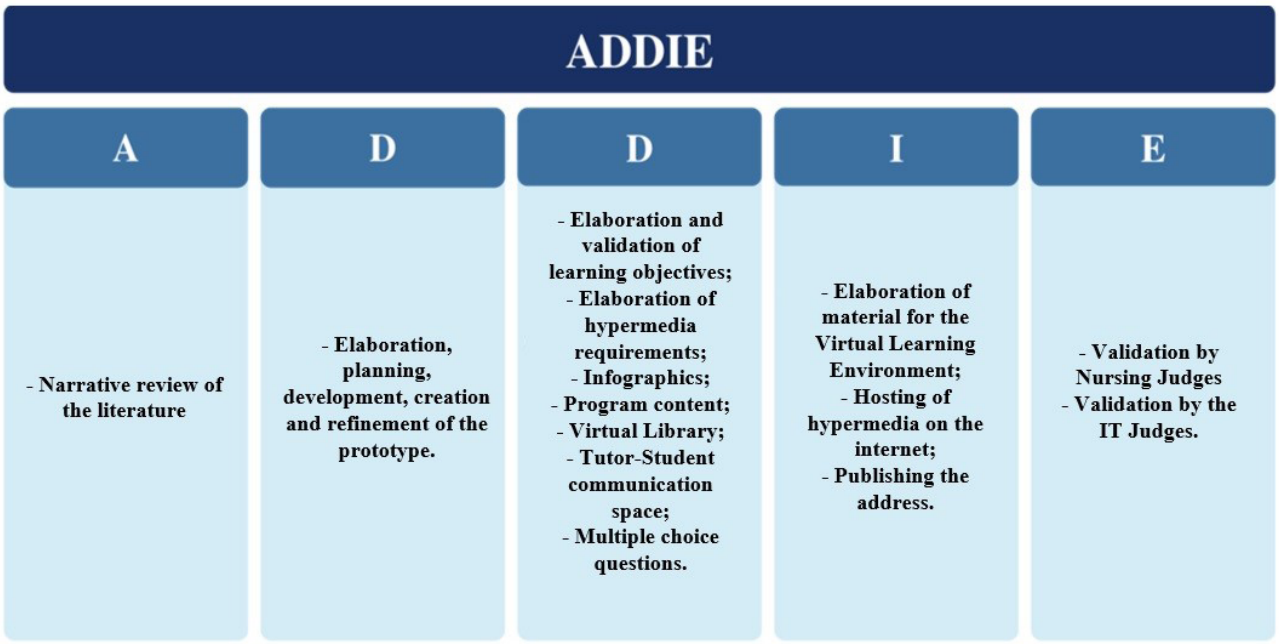

Figure 1 – Instructional design phases that were covered and the actions performed in this study. Itapipoca, Ceará, Brazil, 2021
Source: Designed by the authors.

The evaluation stage of the study refers to the validity of the educational material, the hypermedia from its analysis by judges, its content, and its functionality. The literature recommends that the validation process should be performed by a professional specialized in the subject area of the material[10].

To calculate the number of experts, a non-probabilistic and intentional sample was used. The calculation estimate was based on the infinite population formula, with the statistical criteria in a minimum proportion of 85% agreement with the pertinence of each item evaluated. It was assumed a difference of 15% in this agreement. Thus, the sample size was defined according to the following calculation: $n= Za^2. P.(1-P)/d^2$, where Zα is the confidence coefficient (95% – 1,96), P is the proportion of individuals (85%) and d is the difference to be detected[8,19].

As for the final calculation, it was determined by n= 1,962x085x0,1/0,152 and, therefore, the sample consisted of 22 experts[20]. From these, eleven were experts in the area of nursing (content validation) and, the same number, eleven for the area of computing (usability validation).

The judges' selection criteria were those used in a study[20] about the impact on teaching, care and research activities involving the following areas of obstetric nursing, emergency and technology validation, based on the database of the Directory of the National Council for Scientific and Technological Development (*Conselho Nacional de Desenvolvimento Científico e Tecnológico* – CNPq).

It is emphasized that the judges were contacted via e-mail, after contact, the expert professors were recruited, who were also asked to indicate other professionals with an eligible profile for participation (non-probabilistic sampling, snowball type). After the indication, the Lattes Curriculum was consulted to verify the judge's suitability for the selection criteria for this study.

Twenty-five (25) nurses and twenty-two (22) IT professionals were invited to participate in the study, of which sixteen (16) nurses and thirteen (13) IT professionals responded, after accepting the invitation, a link to the Google Forms form was sent containing the Free and Informed Consent Form and the validation instruments of the ACRO hypermedia. To set the sample of twenty-two expert judges, the first eleven of each group who answered the questionnaire within the requested period of 30 days were considered.

During data collection, two instruments were used[13,15] validated and available in the literature and of the Likert type, ranging from 1 – inappropriate to 5 – appropriate, which included overall impressions; goals; structure and presentation, relevance, usability and efficiency, in addition to a space for suggestions for improving hypermedia, besides these, to evaluate the usability of hypermedia, it was used the System Usability Scale (SUS), translated and validated into Portuguese, which demonstrates acceptable levels of internal consistency (Cronbach's alpha 0.76)[21].

The data filled in the forms by the judges were tabulated and statistically analyzed using the computer software, SPSS, version 24.0. For analysis, the Content Validity Index (CVI) was considered, which measures the proportion of judges who agree on certain aspects of the instrument. The index score for each item was calculated by adding the items marked as 4 or 5 (agree and strongly agree, respectively) by the judges, divided by the total number of responses.

For the analysis of the global validation of educational hypermedia, the sum of all CVI calculated independently was used, dividing them by the number of items of the instrument[22].

Usability was calculated from the SUS scale scores from the sum of the individual collaboration of each statement. The odd items were subtracted one from the scale marked by the user, however for the even items the score was five minus the scale marked by the user. Next, the individual scores of the participants were summed and the value was multiplied by 2.5 to obtain the total usability scale (SUS Score) with the satisfaction index ranging from 0 to 100 points[23].

A proportion of agreement greater than or equal to 0.80 was considered to determine validation. In order to verify whether the proportion of agreement between the judges was statistically equal to or greater than the value 0.80, the binomial test was used, and the significance level adopted was 5%[19,20].

The study was approved by the Research Ethics Committee of *Faculdade Uninta Itapipoca* with a favorable opinion under Protocol nº 5.042.351/2021 and CAAE 46117521.3.0000.8133. The research was conducted in compliance with resolution 466/2012, following the required ethical standards, with a previous request for the signing of the Free and Informed Consent Form.

RESULTS

An educational hypermedia was designed, in the form of a website, entitled: "Embracement and Obstetric Risk Classification", or simply, ACRO, available at: www.crobstetrico.online. The guidelines of the Revised Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) were adopted, as it is a study aimed at improving the service.

The theoretical content developed for the educational hypermedia/ACRO was organized into the following topics: conceptual approach, Module I: Approach to the theme of Embracement and Obstetric Risk Classification; Module II: Emergency Obstetric Embracement; Module III: Obstetric Risk Classification; Module IV: Decision Making Process in

Embracement and Obstetric Risk Classification; Module V: Classifying the Risk – Classification Exercises, References, Complementary Material (virtual library) and Authors' presentation.

In the complementary material, there are submenus that have the organization of the educational hypermedia content, the checklist for the embracement and obstetric risk classification, the support materials with links to the main technical manuals related to the subject used nationally and internationally. A forum is available for any questions and doubts to be discussed asynchronously, in addition to a communication resource such as a chat for synchronous interaction between tutor-student and complementing a glossary of terms and acronyms used in hypermedia.

The multimedia created and used in hypermedia (videos, photos, forums, texts, among others) were displayed in each module, as shown in Figure 2.

Each hypermedia module built has a submenu, which, in addition to having content, performs a pre-test and a post-test to capture the users' level of knowledge and thus enable an evaluation and self-evaluation of the teaching-learning process and operational functionality.

The evaluation of general learning at the end was focused on clinical cases related to the possible reality that the student faces in their practices in obstetric emergencies. It is believed that this type of evaluation will stimulate the student's clinical and critical reasoning for possible situations in their daily practice.

Regarding the hypermedia content validation process, the eleven expert judges with expertise in obstetric emergency had care experience, with management in obstetric emergencies, where: one (9%) had a master's degree and ten (91.0%) had a doctoral degree in nursing and related areas, of these, nine were professors in the health area.

According to Table 1, the agreement between the judges was evidenced by p>0.05, ensuring a satisfactory sample proportion in agreement and reaffirming the content validation of the judges about the topics: overall impressions, objectives, structure and presentation, layout, usability, and efficiency.

It is emphasized that none of the items obtained the CVI below the cut-off score. The result shows the excellent internal consistency of the validation and, at the same time, reaffirms the content validation of the educational hypermedia, called ACRO. Except for the only items (1.3 and 2.7), in which there was slight disagreement. In the justification, the judge reported that the item could only be evaluated if there was an intervention study to measure behavior change and learning.

Regarding the process of validating the usability of hypermedia, according to the data in Table 2, of the eleven expert judges with expertise in IT had professional experience, in addition to software and technology validation, where: one (9%) was a doctor and ten (91 .0%) master's in computing, education or telecommunications related areas, of these, five were professors of higher education in IT and technologies.

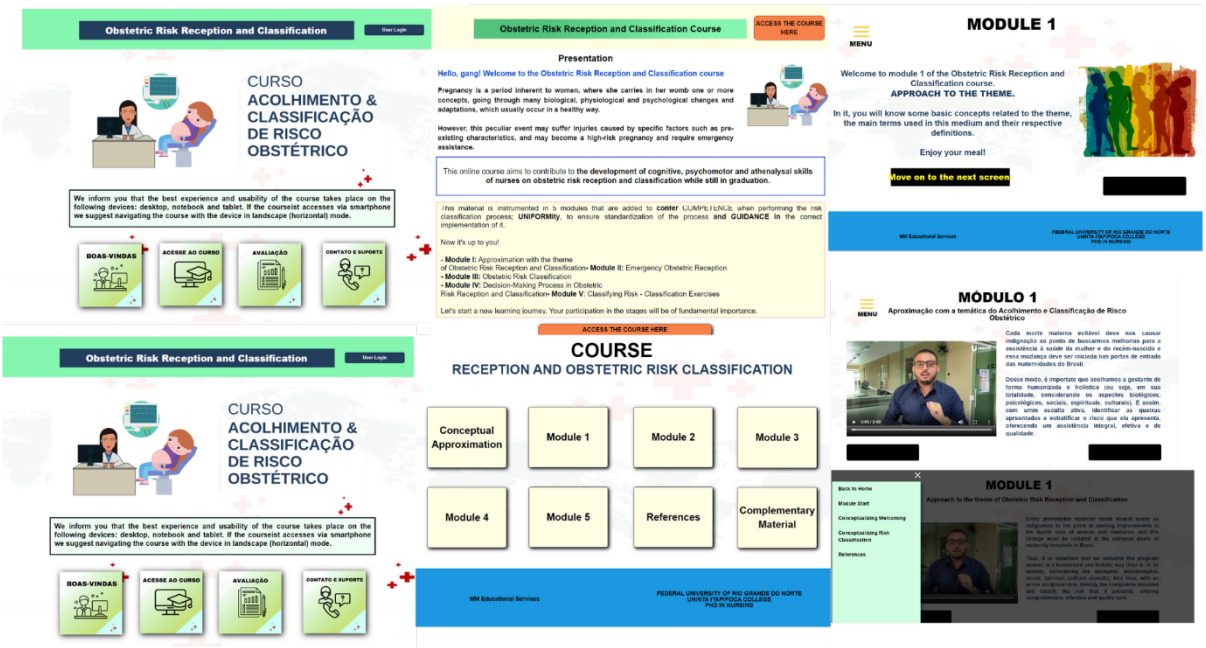

Figure 2 – Instructional design phases that were covered and the actions performed in this study. Itapipoca, Ceará, Brazil, 2022
Source: Designed by the authors.

Table 1 – Validation of educational hypermedia items by nursing professionals. Itapipoca, Ceará, Brazil, 2022

Evaluated Items	n (%)	CVI	p*
Overall impressions	**11(100.0)**	**1.00**	**1.000**
BL1 – It is easy to use.	11(100.0)	1.00	1.000
BL2 – It is didactic.	11(100.0)	1.00	1.000
BL3 – I recommend hypermedia for teaching the embracement of obstetric risk to Nursing students and professionals.	11(100.0)	1.00	1.000
Objective	**10.8 (8)**	**0.98**	**0.96**
1.1 They are coherent with Nursing practice.	11(100.0)	1.00	1.000
1.2 They are coherent from the point of view of the teaching-learning process.	11(100.0)	1.00	1.000
1.3 Promotes behavior change and develops critical thinking.	10(90.9)	0.90	0.832
1.4 It can circulate in the scientific environment, because the information is correct.	11(100.0)	1.00	1.000
1.5 Meets the objectives of hospital institutions that work with obstetric emergencies.	11(100.0)	1.00	1.000
Structure and presentation	**10.8 (98)**	**0.98**	**0.97**
2.1 The hypermedia script is appropriate for nursing students.	11(100.0)	1.00	1.000
2.2 Data are presented in an organized, clear, and objective manner.	11(100.0)	1.00	1.000
2.3 The material is appropriate for the level of nursing students.	11(100.0)	1.00	1.000
2.4 It follows the logical sequence of the content proposed for student learning.	11(100.0)	1.00	1.000
2.5 The way of presenting hypermedia contributes to student learning	11(100.0)	1.00	1.000
2.6 The patient profile provides sufficient data to make a clinical judgment	11(100.0)	1.00	1.000
2.7 The writing style corresponds to the level of knowledge of the target audience	10(90.9)	0.90	0.832

Table 1 – Cont.

Evaluated Items	n (%)	CVI	p*
Relevance	**11(100.0)**	**1.00**	**1.000**
5.1 The number and the characters meet the proposed objective.	11(100.0)	1.00	1.000
5.2 The speech of the text is used efficiently and comprehensible to the clientele.	11(100.0)	1.00	1.000
5.3 Visual resources are used appropriately.	11(100.0)	1.00	1.000
5.4 The characters are presented as visual resources and reflect an approach to reality.	11(100.0)	1.00	1.000
Usability	**11(100.0)**	**1.00**	**1.000**
4.1 The concepts presented are understandable and easy to apply.	11(100.0)	1.00	1.000
4.2 Provides guidance clearly.	11(100.0)	1.00	1.000
4.3 Provides guidance effectively.	11(100.0)	1.00	1.000
4.4 Provides guidance quickly and reading is not exhaustive.	11(100.0)	1.00	1.000
Efficiency	**11(100.0)**	**1.00**	**1.000**
5.1 The number and the characters meet the proposed objective.	11(100.0)	1.00	1.000
5.2 The speech of the text is used efficiently and comprehensible to the clientele.	11(100.0)	1.00	1.000
5.3 Visual resources are used appropriately.	11(100.0)	1.00	1.000
5.4 The characters are presented as visual resources and reflect an approach to reality.	11(100.0)	1.00	1.000
Environment	**11(100.0)**	**1.00**	**1.000**
6.1 The website is appropriate for content presentation.	11(100.0)	1.00	1.000
6.2 Resources are appropriate for learning the subject.	11(100.0)	1.00	1.000
6.3 Resources provide learning situations.	11(100.0)	1.00	1.000
TOTAL	**10.9**	**0.98**	**0.98**

Source: Research data, 2022.
*p>0.05 Agreement Binomial Test; BL: Baseline; CVI: Content Validity Index

Table 2 – Validation of educational hypermedia items by IT professionals. Itapipoca, Ceará, Brazil, 2022

Evaluated Items	n (%)	CVI	p*
Overall impressions	**11(100.0)**	**1.00**	**1.000**
BL1 – It is easy to use.	11(100.0)	1.00	1.000
BL2 – It is didactic.	11(100.0)	1.00	1.000
BL3 – I recommend hypermedia for teaching the embracement of obstetric risk to Nursing students and professionals.	11(100.0)	1.00	1.000
Functionalities	**11(100.0)**	**1.00**	**1.000**
1.1 Hypermedia presents as an appropriate tool for the proposal for which it is intended.	11(100.0)	1.00	1.000
1.2 Hypermedia allows to generate positive results.	11(100.0)	1.00	1.000
Usability	**11(100.0)**	**1.00**	**1.000**
2.1 Hypermedia is easy to use.	11(100.0)	1.00	1.000
2.2 It is easy to learn the concepts used and their applications.	11(100.0)	1.00	1.000
2.3 Allows control of the activities presented in it, being easy to apply.	11(100.0)	1.00	1.000
2.4 Allows the user to easily apply the worked concepts.	11(100.0)	1.00	1.000
2.5 The way of presenting hypermedia contributes to student learning.	11(100.0)	1.00	1.000
2.6 Provides help clearly and completely.	11(100.0)	1.00	1.000
2.7 Provides help quickly, not being tiring.	11(100.0)	1.00	1.000
Efficiency	**11(100.0)**	**1.00**	**1.000**
5.1 The hypermedia design is appropriate for its use.	11(100.0)	1.00	1,000
5.2 The number of classes is consistent with the proposed time.	11(100.0)	1.00	1.000
5.3 The organization of thematic topics is appropriate for a good understanding of the content, as well as the easy location of the desired topic.	11(100.0)	1.00	1.000
5.4 Resources are used efficiently and understandably.	11(100.0)	1.00	1.000
Environment	**11(100.0)**	**1.00**	**1.000**
6.1 The website is appropriate for content presentation.	11(100.0)	1.00	1.000
6.2 Resources are appropriate for learning the subject.	11(100.0)	1.00	1.000
6.3 Resources provide learning situations.	11(100.0)	1.00	1.000
TOTAL	**11(100.0)**	**1.00**	**1.000**

Source: Research data, 2022.
p*>0.05 Agreement Binomial Test; BL: Baseline;| CVI: Content Validity Index

The Overall CVI of educational hypermedia was 0.98, therefore, the content and usability were validated with expert judges in nursing and IT.

Finally, after the content validation process, it was performed the usability evaluation of the educational hypermedia according to the data in Table 3. Hypermedia was considered easy to use and to learn the concepts used, providing help in the teaching-learning process.

The evaluation score of the total SUS obtained from the judges' evaluation was 91.9, demonstrating excellent usability of educational hypermedia in ACRO.

Table 3 – Distribution of the score of the professors' answers to the items of the System Usability Scale (SUS). Itapipoca, Ceará, Brazil, 2022

Usability Assessment Items	Mean	p*
1 – I think I would like to use this hypermedia often.	5.0	0.01
2 – I think the hypermedia is unnecessarily complex.	2.0	0.01
3 – I think the hypermedia system is easy to use.	5.0	0.01
4 – I think I would need help from a person with technical knowledge to use hypermedia.	1.5	0.001
5 – I think that the various functions of hypermedia are very well integrated.	4.0	0.003
6 – I think that hypermedia has a lot of inconsistency.	1.5	0.02
7 – I imagine people will learn how to use this hypermedia quickly.	5.0	0.007
8 – I think that the hypermedia is difficult to use.	1.0	0.01
9 – I felt confident using hypermedia.	5.0	
10 – I had to learn a lot of new things before I could use hypermedia.	1.0	0.001
Total Usability Score	**91.9**	0.595

Source: Research data, 2022.
* Shapiro-Wilk data normality test.

DISCUSSION

The teaching hypermedia about ACRO reached content validity and usability of all eligible nursing and IT judges and obtained excellent levels with an overall CVI of 0.98 and a result of the SUS score of 91.9.

The content judges acted as professors and doctors with experience in validating at least one educational material. While the usability ones acted as professors and programmers, which resulted in an accurate sample to validate the proposed teaching hypermedia. These findings are similar to other studies that validated the content and usability of a teaching program for airway suctioning, with an expert agreement of 0.89, therefore, almost perfect, and of a software for teaching diagnostic reasoning with a high validation index 4-5/5[18,24].

The legislation that supports good practices in the obstetric context mentions the nurse and the team as responsible for the ACRO process and the monitoring of the pregnant woman. Within this context, it is inferred that this is the first study that associated the theme of ACRO with an educational technology, of hypermedia type, for the purpose of improve the care provided.

It stands out the idea that teaching mediated by educational technologies represents an advance in producing nursing knowledge and the empowerment of students and professionals in interactive learning. Thus, the use of technologies should not compete with or replace traditional teaching but should be incorporated as a strategic resource for education in nursing.

In the area of urgency and emergency in the obstetric context, there is a need for teaching at the undergraduate level, which brings great benefits for students and future nursing professionals. The focus of using this hypermedia is to enable and qualify them for effective and safe care, which demands theoretical and practical training, making them empowered to work in obstetric care[25].

It is highlighted the importance of an evaluation process of different educational technologies that support and reinforce the use of clear, targeted, and concise information, respecting ethical, moral and cybernetic principles, especially fighting in the era of hyper information, against fake news. Thus, studies that underwent the process of evaluating educational hypermedia, with diverse themes, obtained satisfactory indexes of evidence of validity. Examples are one on childbirth care, one on prevention of bloodstream infection and another on cervical cancer screening, validated through the Delphi technique, with rates of over 80% of evaluation[26,27].

Validation research, such as the present study, favors the proper selection of Learning objects and effective methods to obtain satisfactory results in the teaching-learning process. The development of educational hypermedia fosters thinking and clinical reasoning skills and is provided by learning environments that ease the transfer of knowledge[9,10,16,23,24].

Hybrid teaching, with the reduction of rigid schedules, direct orders and mandatory classroom teaching, make the in-person moment better used when the theoretical is synchronously taught through digital learning[9,24,28].

The purpose of content evaluation is to determine what learners will acquire from the knowledge and techniques taught through the available content, besides to verifying the quality of the teaching provided. In view of this, the content presented/available previously and concomitantly in the VLE requires planning with clear, objective instructions, in a logical and organized sequence, with a self-explanatory and dynamic teaching method[18].

The teaching-learning process, promoter of skills and competences, when combined with the use of digital technologies, helps the development of clinical competences in a virtual environment. Based on the literature, learning modeled through VLE already presents superior gains when compared to the teaching of lectures/dialogued classes[18].

A study conducted in Spain that analyzed the effects of interactivity of students with digital media revealed that they prefer higher levels of interactivity and understand that digital learning technologies provide better positive subjective experiences[18]. Such evidence prospect important results that must be presented to educational institutions to integrate their learning activities in virtual environments.

Corroborating this aspect, during the pandemic, Brazil, in order to respond quickly and dynamically to the educational condition imposed by COVID-19, implemented several forms of hybrid learning, with synchronous and asynchronous aspects[26]. Thus, it is important to check that the strategy present in this study, in addition to following a strict methodological standard of development, is suitable for the teaching-learning process, both to narrow the educational losses due to the pandemic, as for strengthen learning mediated by digital technologies.

The usability of a technology consists of verifying how the product can be used by users to achieve the specific objectives of gaining knowledge, attractiveness and functionality in its use, whether synchronously or asynchronously. In this sense, usability studies propose to evaluate the development, functioning and adequacy centered on the user to develop better results of the increase of knowledge. This evaluative issue becomes important as it verifies how viable hypermedia will be in the teaching-learning context where the student is inserted[18,29].

CONCLUSION

The educational hypermedia of embracement and obstetric risk classification achieved the proposed objective and presents evidence of content validity and usability as a teaching tool. The use of this material with nursing students will ease the learning of ACRO, considering that it is an educational and interactive technology capable of favoring the learning process.

As limitations of this study, it was observed the summarized number of studies on embracement and obstetric risk classification. The absence of usability evaluation by the target audience, in addition to the difficulty of obtaining timely responses from the judges contacted for the validation of the hypermedia.

This study presents benefits and advances in knowledge, as it provides an educational hypermedia with free and universal access. A digital and educational resource that can be used in teaching and health institutions, as a permanent education strategy. In addition, the results of the present study may support the development of future research aimed at evaluating the effects on gaining knowledge

with the use of hypermedia for undergraduate nursing and health students.

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Authorship contribution:

Project administration: Francisco Mayron Morais Soares, Francisco Arnoldo Nunes de Miranda.
Formal analysis: Francisco Mayron Morais Soares, Gilson Vasconcelos Torres, Francisco Arnoldo Nunes de Miranda.
Conceptualization: Francisco Mayron Morais Soares, Francisco Arnoldo Nunes de Miranda.
Data curation: Francisco Mayron Morais Soares, Francisco Arnoldo Nunes de Miranda.
Writing-original draft: Francisco Mayron Morais Soares, Igor Cordeiro Mendes, João de Deus de Araújo Filho, Rodrigo da Silva Nunes, Kirley Kethellen Batista Mesquita, Luciana Mara Monti Fonseca, Gilson Vasconcelos Torres, Francisco Arnoldo Nunes de Miranda.
Writing-review & editing: Francisco Mayron Morais Soares, Luciana Mara Monti Fonseca, Gilson Vasconcelos Torres, Francisco Arnoldo Nunes de Miranda.
Investigation: Francisco Mayron Morais Soares, João de Deus de Araújo Filho, Rodrigo da Silva Nunes, Kirley Kethellen Batista Mesquita, Francisco Arnoldo Nunes de Miranda.
Methodology: Francisco Mayron Morais Soares, Igor Cordeiro Mendes, Kirley Kethellen Batista Mesquita, Luciana Mara Monti Fonseca, Gilson Vasconcelos Torres, Francisco Arnoldo Nunes de Miranda.
Software: Francisco Mayron Morais Soares, Gilson Vasconcelos Torres, Francisco Arnoldo Nunes de Miranda.
Supervision: Francisco Mayron Morais Soares, Francisco Arnoldo Nunes de Miranda.
Validation: Francisco Mayron Morais Soares, Igor Cordeiro Mendes, Luciana Mara Monti Fonseca, Gilson Vasconcelos Torres, Francisco Arnoldo Nunes de Miranda.

The authors declare that there is no conflict of interest.

Corresponding author:

Francisco Mayron Morais Soares
E-mail: mayronenfo@gmail.com

Associate editor:
Rosana Maffacciolli

Received: 05.09.2022
Approved: 09.02.2022

Editor-in-chief:
João Lucas Campos de Oliveira