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Development and validation of an educational technology for the prevention and treatment of pressure injuries

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ABSTRACT

Objective: To develop and validate an educational technology designed for patients, family members, and caregivers focused on the prevention and treatment of pressure injuries. **Method:** This methodological study was conducted in three stages: 1) an integrative review (IR) that guided the development of the technology's content; 2) the development of a website-based educational tool; and 3) content validation by experts, valuating both the content and the technology itself. Regarding the integrative review stage, research was conducted using the databases of the Virtual Health Library (Portuguese Acronym: BVS), the Journal Portal of the Coordination for the Improvement of Higher Education Personnel (Portuguese Acronym: CAPES), and the Scientific Electronic Library Online (SciELO). Articles published between 2015 and 2019 were included. Experts for content evaluation were selected through convenience sampling, and validation was conducted using the Content Validity Index (CVI). **Results:** In the integrative review, ten articles and one guideline were selected. Two categories emerged from the analysis: pressure injury prevention and nutritional treatment, which guided the development of the educational technology titled "PreventPele". The literature review also informed the development of care guidance tabs, a measurement scale, and sections on treatment-related products and technologies. Content validation was conducted by 12 expert judges, achieving a 95.2% agreement rate and an overall Content Validity Index (CVI) of 1. **Conclusion:** This study led to the development of an open-access website on pressure injury prevention designed for healthcare professionals, family members, and caregivers, offering validated, up-to-date, and high-quality information.

DESCRIPTORS: Pressure injury. Educational technology. Nursing care.

Construção e validação de uma tecnologia educativa para prevenção e tratamento de lesão por pressão

RESUMO

Objetivo: Construir e validar uma tecnologia educativa para pacientes, familiares e cuidadores sobre prevenção e tratamento de lesão por pressão. **Método:** Estudo metodológico desenvolvido em três etapas: 1) revisão integrativa, que subsidiou o conteúdo da tecnologia; 2) construção de uma tecnologia educativa do tipo *website*; e 3) validação do conteúdo com especialistas (conteúdo e tecnologia). Para a revisão integrativa, a pesquisa foi

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realizada nas bases da Biblioteca Virtual em Saúde, do Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior e do *Scientific Eletronic Library Online*. Foram incluídos artigos publicados no período de 2015 a 2019. Os especialistas para a avaliação de conteúdo foram selecionados por conveniência. A validação ocorreu por meio do Índice de Validação de Conteúdo. **Resultados:** Na revisão integrativa, foram selecionados dez artigos e um *guideline*. Da análise, emergiram duas categorias: prevenção de lesão por pressão e tratamento nutricional, as quais respaldaram a construção da tecnologia educativa intitulada "PreventPele". Da análise da literatura, ainda surgiram abas de conhecimento para cuidados, escala de medição, assim como produtos e tecnologia para o tratamento. A validação de conteúdo foi realizada por 12 juízes, com concordância de 95,2%, e Índice de Validade de Conteúdo Geral 1. **Conclusão:** Este estudo construiu um website sobre prevenção de lesão por pressão destinado a pacientes, familiares e cuidadores, o qual fornece acesso aberto a informações validadas, atualizadas e de qualidade.

DESCRITORES: Lesão por pressão. Tecnologia educacional. Cuidados de enfermagem.

Construcción y validación de una tecnología educativa para la prevención y tratamiento de lesiones por presión

RESUMEN

Objetivo: Construir y validar una tecnología educativa para pacientes, familiares y cuidadores sobre la prevención y el tratamiento de lesiones por presión (LP). **Método:** Estudio metodológico desarrollado en tres etapas: 1) revisión integradora (RI), que fundamentó el contenido de la tecnología; 2) construcción de una tecnología educativa del tipo sitio web; 3) Validación del contenido con expertos (contenido y tecnología). Para la RI, la investigación se realizó en las bases de la Biblioteca Virtual en Salud (BVS), del Portal de Revistas de la Coordinación de Perfeccionamiento del Personal de Nivel Superior (CAPES) y de la Biblioteca Electrónica Científica Online (SciELO). Se incluyeron artículos publicados entre 2015 y 2019. Los expertos para la evaluación de contenido fueron seleccionados por conveniencia. La validación se realizó a través del Índice de Validez de Contenido. **Resultados:** En la revisión integrativa se seleccionaron diez artículos y una guía de práctica clínica. Del análisis surgieron dos categorías: prevención de LP y tratamiento nutricional, que respaldaron la construcción de la tecnología educativa titulada "PreventPele". Del análisis de la literatura también emergieron pestañas de conocimiento sobre cuidados, escalas de medición, así como productos y tecnología para el tratamiento. La validación de contenido fue realizada por 12 jueces, con una concordancia del 95,2% y un Índice de Validez de Contenido General de 1. **Conclusión:** Este estudio construyó un sitio *web* sobre la prevención de LP destinado a pacientes, familiares y cuidadores, el cual ofrece acceso abierto a información validada, actualizada y de calidad.

DESCRIPTORES: Úlcera por presión. Tecnología educacional. Atención de enfermería.

INTRODUCTION

In the hospital setting, pressure injury (PI) is a condition that increases the length of hospitalization, the risk of infection, and overall healthcare costs, in addition to being classified as an adverse event. Notably, both mortality and morbidity are associated with the prevalence and severity of pressure injuries, as nearly 70% of affected patients die within six months[1].

A pressure injury is defined as damage to the skin, mucous membranes, and/or underlying soft tissues, usually over a bony prominence caused by sustained pressure, pressure combined with shear forces or associated with the use of medical devices or other components[1]. Its etiology is multifactorial, involving intrinsic factors (age, comorbidities, nutritional and hydration status, mobility limitations, and sensory deficits) or extrinsic factors (reduced tissue tolerance, impaired sensitivity, and lack of mobility)[2].

The epidemiological impact of PI can be observed across various healthcare settings. A systematic review investigating the prevalence of pressure injuries in hospitalized adult patients reported a global prevalence rate of 12.8%. In Brazil, higher prevalence rates were observed, reaching 22.3% in intensive care units (ICUs) and 21.2% in clinical inpatient units[3-5].

The nursing team plays a key role in assessing potential risks, implementing preventive measures, and treating PI, as well as in providing guidance to families on home care. Given that many patients are now discharged from the hospital while still in need of specialized care, careful planning of the transition to home or long-term care facilities is essential to ensure effective treatment outcomes[6,7].

The hospital discharge process is complex and multifaceted, involving a broad team of professionals and family arrangements, particularly when the patient requires care at home. This transition should be well-structured and gradual; however, it does not always occur as intended, often resulting in hospital readmissions. Hospital discharge and care transition are interconnected processes that, when carefully planned, enhance the overall effectiveness of dehospitalization[7].

The gap between patient discharge and reentry into healthcare services may also result in hospital readmission, often due to the unpreparedness of family members and caregivers, frequently stemming from insufficient guidance. Various strategies to ensure continuity of care should be implemented, as they provide greater safety for the patient and support for the family or caregiver. The use of educational technologies, combined with nursing expertise, can equip families with the knowledge needed to provide effective home care, thereby enhancing the patient's quality of life, an essential rationale for this study[8].

The development of educational technology for PI prevention can support family members in caring for at-risk patients, helping to reduce the burden associated with caring for individuals with some level of dependency, while also offering accessible knowledge at their fingertips via mobile phones or computers.

OBJECTIVES

Considering the above, this study aimed to develop and validate an educational technology designed for patients, family members, and caregivers focused on pressure injury prevention.

METHODS

This methodological study[9] was conducted from August 2019 to December 2020, and it is linked to the Professional Nursing Graduate Program at the *Universidade do Vale do Rio dos Sinos* (UNISINOS) and the Stomatherapy Reference Group at *Hospital Moinhos de Vento* (Portuguese Acronym: GREST) in Rio Grande do Sul, Brazil. It guided the development and validation of an educational technology in the form of a website accessible on both smartphones and computers.

The research was conducted in three stages:

1. An integrative literature review that served as the foundation for developing the educational technology's content;
2. The development of the website; and
3. Validation by experts[10].

The integrative review was carried out in six stages: formulation of the research question, literature search, data extraction, critical appraisal, analysis and summarization of studies, and knowledge synthesis[11]. This review was conducted from January to March 2020, with its reporting rigorously adhering to the methodological standards set forth by the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) checklist [12].

To identify the research question, the PICO strategy[13] was used (an acronym for P - population, I - intervention, C - comparison/control, and O - outcome). Accordingly, the population consisted of patients at risk of developing pressure injuries or already affected by them; the intervention comprised nursing guidance and care for PI prevention; the comparison element was not applied; and the outcome focused on prevention and treatment of patients with PI. This led to the following research question: "What nursing care practices are employed in the prevention and treatment of PIs?"

The research was conducted using databases from the Virtual Health Library (Portuguese Acronym: BVS), the Journal Portal of the Coordination for the Improvement of Higher Education Personnel (Portuguese Acronym: CAPES), and the Scientific Electronic Library Online (SciELO), as these are considered key sources in the health field. Articles published between 2015 and 2019 that were relevant to the research question were included to ensure the review reflected the most up-to-date literature on the subject. Exclusion criteria comprised conference proceedings, theses, and dissertations.

The search strategy combined the descriptors and keywords "Pressure Injury," "Prevention," "Treatment," "Nursing Care," "Elderly," and "Patient Discharge," which were extracted from the Health Sciences Descriptors (Portuguese Acronym: DeCS) and combined using the Boolean operators OR or AND.

For data extraction, the titles and abstracts of the articles were first screened, followed by a full-text analysis of the selected studies. This step was conducted by two independent researchers, and in cases of disagreement, a third reviewer was consulted. For data extraction, the authors developed a synoptic table containing study characteristics and information relevant to the research question. The studies were analyzed and interpreted using a descriptive approach, which led to the identification of categories that guided the development of the website's content. The findings were presented in table format.

The development of the educational technology was carried out in five[14] stages, with the support of an IT professional:

a. This stage was carried out through meetings with GREST, a group affiliated with the hospital where one of the researchers works and of which she is a member. Suggestions were also considered based on frequently asked questions from nursing professionals and caregivers about the topic, as observed in daily nursing practice during patient hospitalization and discharge, along with insights gained from the integrative review;

b. Identification of the website's target users: family members or caregivers of individuals at risk of developing pressure injuries who require nursing care for treatment, nursing professionals working in hospital-based primary care or home care settings, and other individuals interested in the subject;

c. Systematization of the educational technology: the internet was used to enhance the learning experience by incorporating multimedia resources, links, hyperlinks, and a range of interactive features to improve quality. The design of the material's infrastructure for this tool was organized based on information about the research topic. The layout and graphic design, together with the use of accessible yet technically precise language, were developed during this stage to address the needs of healthcare professionals;

d. Development and monitoring of the educational technology: the website content was developed based on the findings of the integrative literature review;

e. Website maintenance: it was developed by the researcher and an in-house IT team responsible for ongoing website monitoring. Scientific content updates will be made periodically after the website's launch.

At the completion of the website development, the IT professional responsible for the tool's computerization conducted tests using *Google Lighthouse*®, an automated auditing software that provides a range of metrics and recommendations for web page improvements. This tool assesses performance, accessibility, adherence to best practices, and Search Engine Optimization (SEO). In this software, each indicator is assigned a performance score expressed as a percentage, calculated based on the measured response times to commands (in milliseconds). Following the evaluation, *Google Lighthouse*® generates an overall performance score calculated as the weighted average of the individual scores. Scores between 0 and 49 indicate poor performance; scores between 50 and 89 suggest the need for monitoring and/or improvements; and scores between 90 and 100 reflect a well-optimized software in terms of technical implementation.

To validate the educational technology's content, an online instrument was developed to assess content quality and was distributed via email.

Thus, a questionnaire encompassing three dimensions was employed to validate the educational technology:

1. Purposes and goals;
2. Organization, coherence, and sufficiency; and
3. Relevance, impact, and motivation[15].

Regarding the dimension of "purposes and goals," aspects such as information related to theme/content, clarification of doubts, reflection on subjects, and behavioral change were taken into account; with respect to the aspect of "organization, coherence, and sufficiency," the suitability of language and vocabulary was evaluated, alongside content quality, textual objectivity, and other elements concerning the presentation of topics; finally, within the dimension of "relevance, impact, and motivation," questions focused on knowledge enhancement, learning encouragement, and increased interest were included[15].

The instrument designed to validate the educational technology covered all content presented on the website, with each item or option receiving a designated score. To obtain the result, the Content Validity Index (CVI), which analyzes relevance and representativeness, was applied. The Likert scale was employed to measure responses, using the following scoring system: 1=I disagree; 2=I partially disagree; 3=I partially agree; and 4=I totally agree. Values above 0.78 are considered ideal[16].

The CVI is calculated by dividing the number of responses rated 3 or 4 by the total number of responses and may be analyzed either by individual item or across the entire document. Responses scoring 3 or 4 were deemed acceptable, whereas items receiving lower scores were subject to revision or exclusion[16].

To validate the content, all 15 expert nurses comprising the GREST team with a minimum of two years of experience in the field were included, while those on vacation or leave during the data collection period were excluded. Thus, an invitation was emailed to the 15 eligible professionals, 12 of whom completed the validation questionnaire, representing an adequate sample size[17] in accordance with the literature. Upon acceptance, the nurse received a link granting access to a Free and Informed Consent Form (Portuguese acronym: TCLE), the website, and the instruments for respondent characterization and technology evaluation, all administered online via *Google Forms*.

Descriptive statistics were employed to analyze data related to sample categorization.

The research was submitted to the Ethics and Research Committees of UNISINOS and the institution under study and approved under No. 3.912.439 (CAAE 29539220.2.0000.5344) and No. 4.033.057 (CAAE 29539220.2.3001.5330), respectively.

RESULTS

In the research first stage, an integrative review was conducted to support the development of the educational technology content. The database search identified 12,955 articles. After removing duplicates and screening the titles and abstracts of 192 publications, full-text readings were performed on 36 articles and one guideline, resulting in the inclusion of ten articles and one guideline in the study (Figure 1).

Among the included articles, three originated from Brazil, while seven were conducted in other countries (the United States of America, Iran, Spain, Australia, and Ireland). The guideline, published by the National Pressure Ulcer Advisory Panel (NPIAP) in 2019, serves as a reference document for the prevention and treatment of PI. From the analysis, two thematic categories emerged, composed of subcategories which were used to organize the educational technology content (Figure 2).

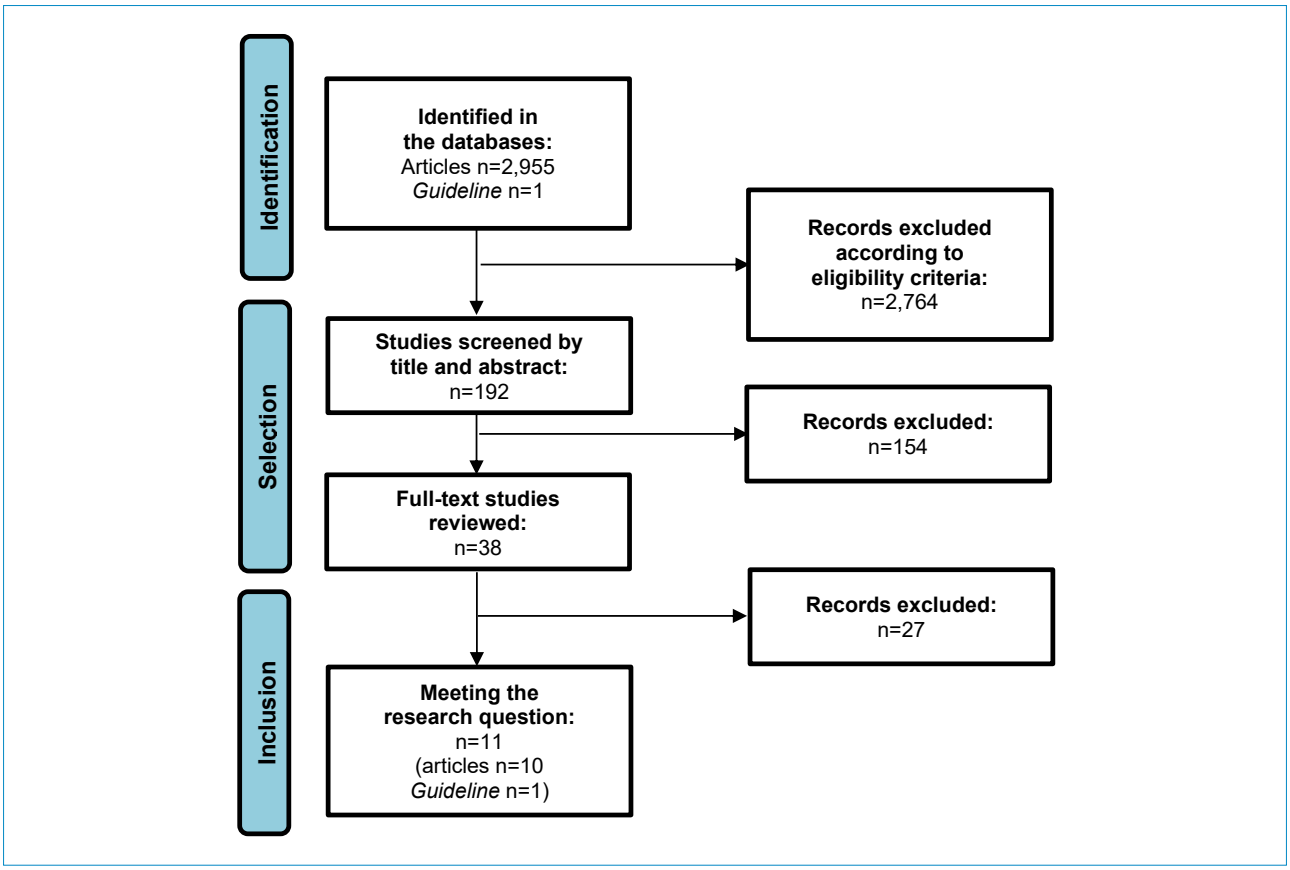
The educational technology was named "PreventPele", with domain registration No. 20957345. It is an online educational tool designed to facilitate the care of individuals with impaired skin integrity and prevent PI. It is accessible through the website https://preventpele.com.br[18].

Among the 15 professionals in the GREST group, 12 met the inclusion criteria. All participants were female (12; 100%), with the majority aged between 31 and 40 years (75%). Additionally, 41.6% had ten years of professional experience. Regarding academic qualifications, 66.6% held a specialization degree, while 33.3% possessed a master's degree (Table 1).

Table 2 presents the evaluators' level of agreement for each criterion/dimension established by the author. The final average agreement among the reviewers reached a score of 95.2%. At the end of the questionnaire, participants were given the opportunity to express doubts and make comments, which are detailed in Chart 1 and were used to improve the website.

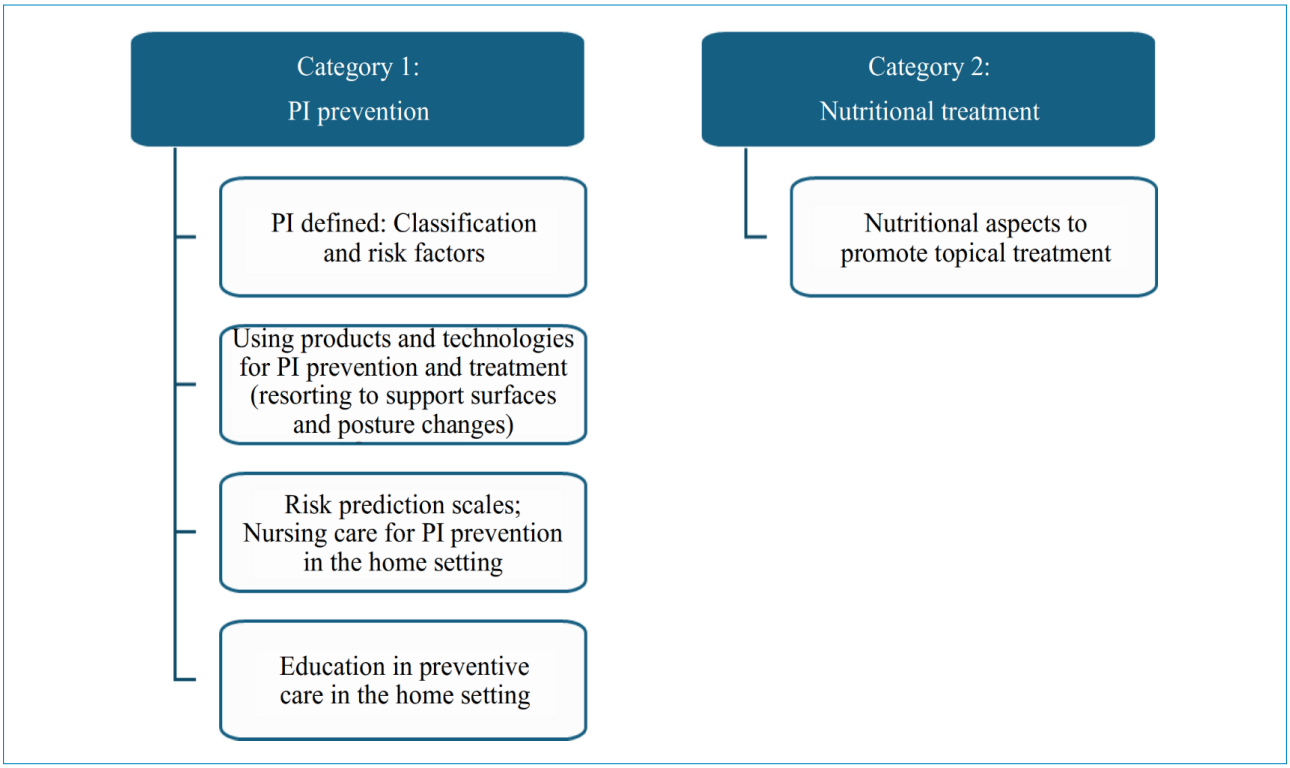
The overall CVI score for the website was 1, indicating agreement among the evaluators (Table 3).

Regarding the tests conducted by the IT professional, performance was rated at 25%, a score that reflects the number of elements used, particularly on the homepage, such as images and news components displaying videos and articles. Nevertheless, despite the score, the loading speed was not adversely impacted by the graphical elements.



Source: Prepared by the authors.

Figure 1. Flowchart illustrating the number of studies included and excluded in the review, along with the respective reasons for exclusion.



PI: pressure injury.
Source: Research data, 2020.

Figure 2. Description of the categories and subcategories identified through integrative review data analysis, which guided the content definition of the "PreventPele" educational portal. Porto Alegre (RS), Brazil, 2023.

Table 1. Profile description of the expert judges who evaluated the Educational Portal, including gender, age, years of professional experience, current role, and academic qualification. Porto Alegre (RS), Brazil, 2023 (n=12).

Variables	n; %
Gender	
Female	12; 100
Age (years old)	
<30	—
31–40	9; 75
41–50	1; 8.4
>50	2; 16.6
Professional experience in nursing (years)	
<5	2; 16.6
6–10	5; 41.6
11–15	1; 8.4
16–20	1; 8.4
>20	3; 25
Current role	
Staff nurse	5; 41.6
Leadership	3; 25
Coordination	2; 16.7
Other	2; 16.7
Academic qualification	
Specialization	8; 66.7
Master's degree	4; 33.3
Doctorate	-
Professional experience (years)	
<1	-
2–5	2; 16.7
6–10	5; 41.6
11–15	1; 8.4
>15	4; 33.3

Source: Research data, 2020.

Accessibility scored 80%. The evaluation considered factors such as color contrast, proper use of HTML tags in images, and appropriately structured website headings. Best practices received a score of 93%, based on criteria including website security, the use of an SSL certificate enforcing HTTPS upon loading, JavaScript library implementation, server-side caching, absence of error logs, and appropriate image resolution and dimensions.

The SEO category received a score of 91%. The evaluation considered the website's mobile-friendliness, proper insertion of metatags in all page titles, descriptive link texts, inclusion of alt attributes in images, and appropriate configuration to guarantee unrestricted page indexing.

Considering all evaluated items, the website received an overall score of 72.25%, demonstrating that the tool exhibited a satisfactory level of performance. To achieve a higher score, it would be necessary to reduce the number of elements on each page to improve overall loading speed.

The website improvement suggestions are listed in Chart 1, all of which have been addressed.

Table 2. Results of the evaluators' level of agreement for each website assessment criterion. Porto Alegre (RS), Brazil, 2023 (n=12; n; %).

Dimensions	D	PD	PA	TA
Purposes and goals				
a) Covers the proposed topic	—	—	—	12; 100
b) Content appropriate for the teaching-learning process	—	—	2; 16.7	10; 83.3
c) Clarifies doubts about the topic	—	—	1; 8.4	11; 91.6
d) Provides reflection on the topic	—	—	—	12; 100
e) Encourages behavioral changes	—	—	2; 16.7	10; 83.3
Organization, coherence, and sufficiency				
a) Appropriate language	—	—	1; 8.4	11; 91.6
b) Vocabulary suitable for the educational material	—	—	—	12; 100
c) The data provided are correct	—	—	—	12; 100
d) The information is objective	—	—	—	12; 100
e) The information is clear and informative for the target audience	—	—	2; 16.7	83.3
f) The information is essential	—	—	1; 8.4	11; 91.6
g) Logical sequence of ideas	—	—	—	11; 91.6
h) Current topic	—	—	—	12; 100
i) Appropriate text length	—	—	1; 8.4	11; 91.6
Relevance, impact, and motivation				
a) Encourages learning	—	—	—	12; 100
b) Contributes to knowledge in the field	—	—	—	12; 100
c) Sparks interest in the topic	—	—	—	12; 100

D: I disagree; PD: I partially disagree; PA: I partially agree; TA: I totally agree.
Source: Research data, 2020.

Chart 1. Evaluators' suggestions for improving the Educational Portal. Porto Alegre (RS), Brazil, 2023.

Suggestions
In the website's menu bar, reversing the order of the items "About" and "Care" may enhance comprehension by providing a more intuitive navigation flow.
In the "Measurement Scale" item, it would be helpful to indicate the level of risk according to the score obtained.
In the "Nutrition" tab, the guidance provided is excellent, but it lacks clearer, more straightforward information, as well as proper highlighting of the Braden Scale.
To improve visitors' experience, it would be beneficial to link a YouTube account and provide tutorial videos on care procedures and postural changes, thereby increasing the website's exposure and advertising revenue.
In the care section, Figure 19 reports the use of film on bony prominences, while Chart 2 reports the use of multilayer dressings — conflicting information.
In the PI prevention section, the figure illustrating deep tissue injury is currently unclassifiable; it would be advisable to replace it with an image that more clearly depicts this type of lesion to enhance clarity.
The blog is nicely put together. User-friendly, straightforward, and well organized. I would have liked to see some clinical cases presented from start to finish, including management and treatments used, as well as a tab with quick questions and answers addressing common doubts that may arise during our work shifts.
In the "Products and Technologies" tab, the spelling of the word "neoplásicas" is incorrect.
The content is thorough and presented in a clear, straightforward manner. I think the only update needed is to replace the acronym NPUAP with NPIAP, (following the 2019 guideline update).

NPUAP: National Pressure Ulcer Advisory Panel; NPIAP: National Pressure Injury Advisory Panel.
Source: Research data, 2020.

Table 3. Distribution of the overall Content Validity Index. Porto Alegre (RS), Brazil, 2023.

Dimensions	Answers	CVI
Objectives: purposes, goals, or aims	12 answers scoring 3 or 4	1
Structure/presentation: organization, structure, strategy, coherence, and sufficiency	12 answers scoring 3 or 4	1
Relevance: significance, motivation, interest	12 answers scoring 4	1

CVI: Content Validity Index.
Source: Research data, 2020.

DISCUSSION

This study developed and validated an educational technology for patients, family members, and caregivers, aimed at preventing pressure injuries. The product provides information and support to those involved in the care process, aiming to reduce the burden of caring for individuals with some level of dependency and, in turn, to promote the quality of life of patients receiving care at home.

The widespread use of mobile devices that provide real-time information is a phenomenon that has transformed society's relationship with technology. The use of such technological tools serves to promote well-being, as they support actions aimed at monitoring, informing, rehabilitating, and accessing healthcare services. In this context, the development of computational solutions through educational technologies represents an effective strategy to enhance access to essential knowledge for the care of individuals with PI[19].

The overall CVI score for the website was 1, indicating agreement among the evaluators. This finding is consistent with other initiatives employing methodological studies to promote knowledge of PI prevention, which also achieved positive results in content validation[20,21].

The validation process revealed unanimous agreement that the items comprehensively covered the proposed topic, encouraged reflection on the subject, employed appropriate vocabulary, presented accurate data and objective information, addressed a current topic, promoted learning, contributed to knowledge in the field, and sparked interest in the topic.

Pressure injuries are preventable conditions, whether occurring in hospital settings, within the community, or at home. However, their occurrence remains frequent, highlighting the fragility of current interventions addressing this issue[22]. Effective actions must be implemented to mitigate the harm experienced by these patients.

The content was well accepted by the experts; only seven items received a small percentage of "partially agree" responses. Accordingly, the authors implemented the suggested adjustments to improve the educational technology. The validation process is crucial to guarantee that educational materials are free from incorrect or incomplete information. This measure helps protect the target population from misinformation and potential barriers to achieving a comprehensive understanding of the subject matter[23].

Providing information to caregivers and family members of bedridden patients at home is essential to supporting the patient's recovery process and preventing further harm. Therefore, all strategies employed to implement the educational intervention serve as important means to disseminate recommendations for pressure injury prevention[24].

The literature review identified several key categories, including risk factors and injury classification, the use of products and technologies for treatment, risk prediction scales, pressure injury prevention care at home, and education focused on additional home care practices. Literature data revealed that caregivers possess insufficient knowledge of PI prevention practices[25], thereby highlighting the relevance of the topics included in the portal.

Nutritional factors also emerged as a significant category. Inadequate nutrition can contribute to the development of PI, while adequate protein intake supports prevention and healing. Therefore, it is imperative to deliver comprehensive guidance on appropriate home nutrition, accompanied by ongoing assessment of nutritional status and individualized adjustment of patient-specific requirements[26].

Another aspect commonly encountered in caregiving practice is that the hospital discharge of patients requiring continuous care often provokes heightened anxiety. Consequently, not all instructions related to home care are thoroughly absorbed. Maintaining an educational portal that provides easy access to this information can promote timely knowledge acquisition exactly when caregiving demands emerge.

Limitations

A major limitation of this study was its execution during the COVID-19 pandemic, which substantially restricted face-to-face interactions with experts and delayed the timely collection of evaluation feedback. To mitigate these challenges, the authors employed online tools to minimize the pandemic's impact on the research process.

Recommendations

It is recommended that educational materials on pressure injury prevention also be made available to vulnerable populations through primary care services, with the support of nursing professionals, in order to minimize the impact of caring for bedridden patients.

CONCLUSION

This study successfully met its objective by developing and validating an educational technology designed to provide guidance on PI prevention, culminating in the creation of "PreventPele". The website content was built upon up-to-date evidence from both national and international literature, current guidelines on the subject, and was validated by experts, thus constituting a high-quality resource.

The developed product enhanced the delivery of standardized preventive care by providing healthcare professionals with vital decision-making support in assessing patients' risk of developing pressure injuries. The availability of free educational material focused on PI prevention offers professionals, family members, and caregivers an up-to-date resource, as well as the opportunity to implement effective preventive measures.

The primary impact of this study was to make up-to-date information readily accessible at users' fingertips via smartphones, tablets, or computers. The authors are committed to undertaking the next phase of this methodological study, which will focus on assessing user feedback.

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Conflict of interests: None.

REFERENCES

1. European Pressure Ulcer Advisory Panel NPIAP and PPPIA. National Pressure Injury Advisory Panel [Internet]. 3rd ed. Haesler E, editor. EPUAP/NPIAP/PPPIA; 2019 [cited 2020 Mar 27]. Available from: https://npiap.com/404.aspx?404;http://www.npuap.org:80/national-pressure-ulcer-advisory-panel-npuap-announces-a-change-in-terminology-from-pressureulcer-to-pressure-injury-and-updates-the-stages-of-pressure-injury/
2. Silva SL, Medeiros MAA, Alves MS, Guênes GT, Guênes GMT, Anjos RM, et al. Classificação, fatores de risco, fisiopatologia e complicações cicatriciais das lesões por pressão: uma síntese narrativa. Conjecturas. 2022;22(9):24-35. https://doi.org/10.53660/CONJ-1420-AG04
3. Li Z, Lin F, Thalib L, Chaboyer W. Global prevalence and incidence of pressure injuries in hospitalised adult patients: a systematic review and meta-analysis. Int J Nurs Stud. 2020 May;105:103546. https://doi.org/10.1016/j.ijnurstu.2020.103546

4. Gama BG, Mola R, Fernandes FECV, Xavier SB. Prevalência e fatores associados à ocorrência de lesão por pressão em pacientes internados em unidade de terapia intensiva. HU Rev. 2020 May;46(0):1-8. https://doi.org/10.34019/1982-8047.2020.v46.28248

5. Silva LLO, Felix LG, Negreiros RV, Abreu RA. Prevalence and incidence of pressure injury in patients hospitalized in medical clinic units. Braz J Dev. 2022 Mar;8(3):16138-49. https://doi.org/10.34117/BJDV8N3-042

6. Conselho Federal de Enfermagem. Resolução COFEN nº 567/2018. Regulamenta a atuação da equipe de enfermagem no cuidado aos pacientes com feridas [Internet]. Brasília: Diário Oficial da União; 2018. Seção 1; p. 112 [cited 2020 Mar 27]. Available from: https://www.cofen.gov.br/resolucao-cofenno-567-2018/

7. Gheno J, Weis AH. Care transtion in hospital discharge for adult patients: integrative literature review. Texto Contexto Enferm. 2021;30:e20210030. https://doi.org/10.1590/1980-265X-TCE-2021-003030

8. Pavinati G, Lima LV, Soares JPR, Nogueira IS, Jaques AE, Baldissera VDA. Tecnologias educacionais para o desenvolvimento de educação na saúde: uma revisão integrativa. Arquivos de Ciências da Saúde da UNIPAR. 2022;26(3):328-49. https://doi.org/10.25110/arqsaude.v26i3.2022.8844

9. Galvão PCC, Vasconcelos CB, Amorim CRF, Lima ROC, Fiorentino G. Caracterização dos estudos metodológicos em enfermagem: Revisão integrativa. International Journal of Development Research. 2022;12:23954.

10. Echer IC. Elaboração de manuais de orientação para o cuidado em saúde. Rev Latino-am Enfermagem. 2005;13(5):754-7. https://doi.org/10.1590/S0104-11692005000500022

11. Paula CC, Padoin SMM, Galvão CM. Revisão integrativa como ferramenta para tomada de decisão na prática em saúde. Porto Alegre: Moriá Editora; 2018.

12. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. Syst Rev. 2021;10:89. https://doi.org/10.1186/s13643-021-01626-4

13. Santos CMC, Pimenta CAM, Nobre MRC. The PICO strategy for the research question construction and evidence search. Rev Lat Am Enfermagem. 2007;15(3):508-11. https://doi.org/10.1590/s0104-11692007000300023

14. Silva RP. Portal educativo de apoio ao cuidado a pessoas com estomia [dissertação]. Porto Alegre: Universidade do Vale do Rio dos Sinos; 2018.

15. Coluci MZO, Alexandre NMC, Milani D. Construção de instrumentos de medida na área da saúde. Ciênc Saúde Coletiva. 2015;20(3):925-36. https://doi.org/10.1590/1413-81232015203.04332013

16. Alexandre NMC, Coluci MZO. Validade de conteúdo nos processos de construção e adaptação de instrumentos de medidas. Ciênc Saúde Coletiva. 2011;16(7):3061-8. https://doi.org/10.1590/S1413-81232011000800006

17. Pasquali L. Psicometria: teoria dos testes na psicologia e na educação. Petrópolis: Vozes; 2016.

18. Prevent Pele [Internet]. [cited 2024 Feb 21]. Available from: https://preventpele.com.br/

19. Tibes-Cherman CM, Westin UM, Cherman EA, Zem-Mascarenhas SH, Évora YDM. Uso de simulação digital no Ensino Técnico de Enfermagem para prevenção de lesões por pressão. Braz J Hea Rev. 2020;3(4):9649-66. https://doi.org/10.34119/bjhrv3n4-200

20. Fontenele NAO, Ximenes MAM, Brandão MGSA, Fernandes CS, Galindo Neto NM, Carvalho REFL, et al. Creation and validation of a serial album for the prevention of Pressure Ulcer: a methodological study. Rev Bras Enferm. 2021;74(3):e20201060. https://doi.org/10.1590/0034-7167-2020-1060

21. Andrade SM, Silva LV, Göttems LBD, Melo MC. Tecnologia educativa para prevenção e tratamento da lesão por pressão. Res Soc Dev. 2022;11(8):e51111831056. https://doi.org/10.33448/rsd-v11i8.31056

22. Souza MC, Loureiro MDR, Batiston AP. Cultura organizacional: prevenção, tratamento e gerenciamento de risco da lesão por pressão. Rev Bras Enferm. 2020;73(3):e20180510. https://doi.org/10.1590/0034-7167-2018-0510

23. Ximenes MAM, Fontenele NAO, Bastos IB, Macêdo TS, Galindo Neto NM, Caetano JA, et al. Construção e validação de conteúdo de cartilha educativa para prevenção de quedas no hospital. Acta Paul Enferm. 2019;32(4):433-41. https://doi.org/10.1590/1982-0194201900059

24. Santos RR, Ribeiro ER, Milani LRN, Osternack KT, Sanches LC, Garbelini MCL. Lesão por pressão: manual para o cuidador de paciente acamado. Braz J Hea Rev. 2022;5(3):9676-93. https://doi.org/10.34119/bjhrv5n3-141

25. Nogueira PC, Godoy S, Mendes IAC, Roza DL. Conhecimento dos cuidadores de indivíduos com lesão medular sobre prevenção de úlcera por pressão. Aquichan. 2015;15(2):188-99. https://doi.org/10.5294/AQUI.2015.15.2.3

26. Manganelli RR, Kirchhof RS, Pieszak GM, Dornelles CS. Intervenções de enfermeiros na prevenção de lesão por pressão em uma unidade de terapia intensiva. Rev Enferm UFSM. 2019;9:e41. https://doi.org/10.5902/2179769233881