

Board game to guide nurses in the assessment, prevention, and treatment of pressure injury**

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ABSTRACT

Objective: To develop and validate an educational game to guide nurses in the assessment, prevention, and treatment of pressure injury. **Method:** Applied research involving technological production based on software engineering. Game construction occurred in four stages: analysis (integrative literature review), design (content planning, topic, media, and layout definition), development (tool selection and navigation structure), and implementation (creation of a digital environment for download and installation on mobile devices). Content validation was performed using the Delphi technique with 60 nurses. **Results:** A total of 11,222 articles were identified. After excluding 179 duplicates, 11,043 titles were evaluated, of which 10,548 were excluded. Subsequently, 496 abstracts were analyzed, with 324 excluded. Of the 171 full-text articles assessed, 147 were excluded, leaving 24 studies that formed the theoretical basis for game development. In the first round, items ranged from inappropriate to completely appropriate. In the second, they were classified as appropriate or completely appropriate. The content validity index initially ranged from 0.85 to 1.0, reaching 1.0 for all items after revision. **Conclusion:** The game proved functional, reliable, and effective in supporting nurses caring for patients at risk for or with pressure injury.

DESCRIPTORS: Pressure ulcer; Risk assessment; Enterostomal therapy; Nursing care; Recreational games.

Jogo de tabuleiro para orientar enfermeiros na avaliação, prevenção e tratamento de lesão por pressão**

RESUMO

Objetivo: Desenvolver e validar um jogo educativo para orientar enfermeiros na avaliação, prevenção e tratamento da lesão por pressão. **Método:** Pesquisa aplicada de produção tecnológica baseada na engenharia de *software*. A construção do jogo ocorreu em quatro etapas: análise (revisão integrativa da literatura), *design* (planejamento do conteúdo, definição de tópicos, mídias e *layout*), desenvolvimento (seleção de ferramentas e estrutura de navegação) e implementação (criação do ambiente digital para *download* e instalação em dispositivos móveis). A validação do conteúdo deu-se pela técnica *Delphi*, com 60 enfermeiros. **Resultados:** Foram identificados 11.222 artigos. Excluídos 179 duplicados, 11.043 títulos foram avaliados, resultando na eliminação de 10.548. Em seguida, 496 resumos foram analisados, com exclusão de 324. Dos 171 artigos lidos na íntegra, 147 foram excluídos, restando assim 24 estudos que compuseram a base teórica para o

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desenvolvimento do jogo. Na primeira rodada, os itens foram classificados entre inadequados e totalmente adequados. Na segunda, em adequados e totalmente adequados. O índice de validade de conteúdo variou de 0,85 a 1,0 inicialmente, atingindo 1,0 em todos os itens posteriormente à revisão. **Conclusão:** O jogo mostrou-se funcional, confiável e eficaz para apoiar enfermeiros no cuidado a pacientes com risco ou presença de lesão por pressão.

DESCRIPTORES: Lesão por pressão. Medição de risco. Estomaterapia. Cuidados de enfermagem. Jogos recreativos.

Juego de mesa para orientar a los enfermeros en la evaluación, prevención y tratamiento de las lesiones por presión**

RESUMEN

Objetivo: Desarrollar y validar un juego educativo para orientar a los enfermeros en la evaluación, prevención y tratamiento de lesiones por presión. **Método:** Investigación aplicada de producción tecnológica basada en ingeniería de software. El juego se desarrolló en cuatro etapas: análisis (revisión integradora de la literatura), diseño (planificación del contenido y definición de temas, medios y layout), desarrollo (selección de herramientas y estructura de navegación) e implementación (creación del entorno digital para descarga e instalación en dispositivos móviles). La validación del contenido se realizó mediante la técnica Delphi con 60 enfermeros. **Resultados:** Se identificaron 11.222 artículos. Tras excluir 179 duplicados, se evaluaron 11.043 títulos, de los cuales 10.548 fueron excluidos. Se analizaron 496 resúmenes y se excluyeron 324. De los 171 artículos evaluados en texto completo, 147 fueron excluidos, quedando 24 estudios como base para el desarrollo del juego. En la primera ronda, los ítems variaron de inadecuados a totalmente adecuados; en la segunda, fueron adecuados o totalmente adecuados. El índice de validez de contenido varió inicialmente de 0,85 a 1,0 y alcanzó 1,0 en todos los ítems. **Conclusión:** El juego demostró ser funcional, confiable y eficaz para apoyar el cuidado de pacientes con riesgo o presencia de lesiones.

DESCRIPTORES: Úlcera por presión. Medición de riesgo. Estomaterapia. Atención de enfermería. Juegos recreacionales.

INTRODUCTION

Pressure injury (PI) is localized damage to the skin or underlying soft tissue, usually over a bony prominence, related to the use of medical devices or other artifacts¹. It is caused by intense and/or prolonged pressure, combined with shear forces. The tolerance of soft tissue to pressure and shear can be influenced by factors such as microclimate, nutrition, perfusion, comorbidities, and combinations thereof².

PI is considered a global public health problem, contributing significantly to morbidity and mortality rates. Studies indicate that the incidence of PI ranges from 13.13% to 62.5%, while the prevalence is between 9.2% and 37.41%³⁻⁷.

The choice of dressings and devices for the prevention or treatment of PI requires technical and scientific knowledge from professionals, including physiology, anatomy, and the efficacy of available market options. Educational instruments, such as games and applications, must be developed based on scientific evidence and national and international guidelines^{8,9}.

Educational games have been created to assist healthcare professionals in acquiring knowledge and consulting practical content during clinical practice, thereby contributing to preventive and therapeutic decisions related to PIs. These games must be validated and grounded in scientific evidence and clinical guidelines⁹.

Softwares and educational materials are technologies that support clinical decision-making, promoting self-care and the prevention of these injuries. They provide information regarding the most appropriate prophylactic-therapeutic conduct for each clinical evaluation performed by multidisciplinary teams, standing out as instruments of care^{9,10}.

Games combine fun and learning, generally involving multiple players, with pedagogical objectives in the teaching-learning context. Their primary purpose is to contribute to the educational development of participants^{11,12}.

The PI game was developed in this study with the purpose of guiding and supporting healthcare professionals in clinical practice. Through playful activity, participants are empowered to identify risk factors, implement preventive measures, perform meticulous assessments, and select appropriate interventions according to the stage of the lesion.

OBJECTIVES

To develop and validate a game to guide nurses in the assessment, prevention, and treatment of PI.

METHODS

This is an applied study in the modality of technological production based on software engineering, classified as methodological development research. Contextualized Instructional Design was adopted as the methodology for developing the game, which involves a constructivist approach and consists of the intentional action of planning, developing, and applying specific didactic situations, incorporating mechanisms that favor contextualization¹³.

The construction of the game took place in the following stages:

First stage – analysis

An integrative literature review was conducted, prepared in accordance with the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology¹⁴. The chosen theme was “Assessment, prevention, and treatment of PI”, with the objective of answering the following guiding question: What is the evidence regarding the assessment, prevention, and treatment of PI? The PICO format was used to define the research question, as detailed below:

Population (P): patients at risk of developing or who have already developed PI.

Intervention (I): assessment methods, preventive measures, and treatment strategies for PI.

Comparison (C): comparison of types of intervention or with the absence of intervention.

Outcome (O): effectiveness of interventions in the prevention and treatment of PI¹⁵.

The literature review was based on health science data, including PubMed, Scientific Electronic Library Online (SciELO), and Latin American and Caribbean Literature in Health Sciences (Lilacs), considering publications between 2020 and 2024. Controlled Health Sciences Descriptors were used: Pressure injury, Risk assessment, and Enterostomal therapy, in addition to the corresponding terms in Portuguese, English, and Spanish. The search strategy for each language was defined by combining the selected descriptors with the Boolean operator “OR”.

To select the publications included in the review, the inclusion criteria adopted were only studies directly related to the theme and available in full text. The exclusion criteria considered were theses, dissertations, monographs, technical reports, and articles that, after reading their abstracts, were found to be unrelated to the proposed object of study, in addition to publications duplicated across the databases and the virtual library.

Titles and abstracts were independently read by two authors to ensure that the texts addressed the guiding question of the review and met the established inclusion criteria. In case of doubt regarding selection, the publication was initially included and a decision on its retention was made only after reading the full content.

To classify the level of evidence of the selected studies, the following categories were used:

Level 1: evidence from meta-analysis of multiple randomized controlled trials;

Level 2: evidence from individual studies with an experimental design;

Level 3: evidence from pilot studies;

Level 4: evidence from descriptive (non-experimental) studies or a qualitative approach;

Level 5: evidence from case reports or information; Level 6: evidence based on expert opinion.

Second stage — design

This stage involved the planning and production of the didactic content, including the definition of topics, drafting of themes, selection of media, and layout. The content of the game was structured into phases, as described below:

First phase: addresses the definition of pressure injury, associated risk factors, and the classification proposed by the National Pressure Ulcer Advisory Panel¹⁶.

Second phase: presents preventive measures developed based on the identification of risk factors during clinical evaluation¹⁷.

Third phase: deals with the assessment of pressure injury, including measurement, staging, and the definition of the most appropriate treatment, considering aspects such as the type of exudate, the tissue present in the lesion, and the presence of infection¹⁸.

Fourth phase: focuses on lesion cleansing techniques based on tissue and debridement types, as well as the quantity and type of exudate¹⁹.

Fifth phase: provides professionals with guidance on appropriate therapeutic conducts according to the stage of the pressure injury²⁰.

Third stage — development

This stage comprised the selection of tools that make up the phases and squares of each stage of the Pressure Injury game, the definition of the navigation structure, the planning of the environments, and the choice of programming languages used: C# and C++.

Software structure

The Pressure Injury game was developed in a digital board format, consisting of nine phases. In each phase, the user must answer five questions related to the theme, each containing three alternatives, with only one being correct.

The board has a regular format with dimensions of 250 mm by 50 mm. Each phase contains five squares identified by specific colors according to the type of approach. The path is marked by the words “Start” and “Finish”. During the game, all squares in each phase remain locked, except for the first one. To unlock the next square, the user must correctly answer the previous question, following this logic until the last square of the phase. Upon completing all squares, the player advances to the next phase. To win the game, it is necessary to get at least 80% of the questions right.

Phases and colors of the Pressure Injury game:

Yellow = Phase 1: “Definition of PI”;

Orange = Phase 2: “Risk factors for the patient to acquire PI”;

Light blue = Phase 3: “PI staging classification”;

Black = Phase 4: “PI assessment”;

Pumpkin = Phase 5: “Preventive measures for PI”;

Saffron = Phase 6: “PI cleansing technique and type”;

Amber = Phase 7: “Definition and type of debridement”;

Light green = Phase 8: “Type of dressings and devices to treat PI”;

Red = Phase 9: “Therapeutic conducts to treat PI, according to tissue type, amount and type of exudate, and presence of infection”.

Fourth stage — implementation

The fourth stage consisted of building a digital environment to make the game available, allowing the application to be downloaded from the internet and installed on mobile devices. The game will be available on the Play Store and App Store.

Once the game was developed, the validation process began with 60 nurses. The evaluators were selected through convenience sampling, specifically snowball sampling. For the sample size calculation, the formula for an infinite population was used: $n = Z^2_{1-\alpha/2} P(1-P)/e^2$, where “ $Z_{1-\alpha/2}$ ” corresponds to the adopted confidence level (95%), “P” represents the expected proportion of experts (80%), indicating the adequacy of each item, and “e” refers to the acceptable margin of error (15%). Based on these parameters, a minimum sample of 48 professionals was obtained.

The study was conducted with nurses working at the *Hospital das Clínicas Samuel Libânio* and faculty members of the *Universidade do Vale do Sapucaí* (UNIVÁS), both located in Pouso Alegre, Minas Gerais. Participants included nurses with postgraduate degrees in enterostomal therapy, registered with the Brazilian Association of Enterostomal Therapy, and dermatology nurses registered with the Brazilian Association of Dermatology Nursing.

Professionals with a bachelor's degree in nursing and a minimum of two years of experience in caring for individuals with wounds were included, as well as nurses with specialization in enterostomal therapy and dermatology.

Exclusion criteria applied to nurses who agreed to participate in the research but failed to answer or submit the evaluation questionnaire within the 15-day deadline.

In the first stage of data collection, evaluators were identified through the Lattes platform, provided by the portal of the National Council for Scientific and Technological Development. An invitation letter was sent to the professionals who met the selection criteria, and those who agreed to participate received the research instrument by email and WhatsApp to be filled out, along with the Free and Informed Consent Term, which was read and signed by the participants.

The invitation letter contained a personal introduction, explanations of the research theme, a clear definition of the study objectives, approval from the UNIVÁS Research Ethics Committee, and guidance on the importance of the evaluators' participation. It also described the step-by-step participation stages. The deadline for each evaluation round was 15 days from the date the instrument was sent.

The game validation questionnaire was structured into three parts:

1. Participants' sociodemographic data;
2. Content evaluation related to pressure injury;
3. Items regarding the functionality, usability, and efficiency of the game, totaling 22 questions.

The questions were answered using a Likert scale with the following options: “not applicable”, “inappropriate”, “partially appropriate”, “appropriate”, and “completely appropriate”. In the data analysis, responses classified as 3 (appropriate) or 4 (completely appropriate) were considered valid. Responses classified as 1 (inappropriate) or 2 (partially appropriate) were not excluded, but the judges' suggestions were analyzed, allowing for reviews and corrections of the content to be considered validated, in accordance with guidelines from previous studies on this method.

Questions that received a rating of 1 or 2 were revised, and the material was resent for a second evaluation round, allowing for a new judgment by the judges. Upon reaching 100% consensus among the evaluators, the validation stage was concluded. This procedure is known as the Delphi Technique, characterized by the participation of experts in the field and the requirement for total consensus. Once the specialists' suggestions were incorporated, the researchers reevaluated the instrument until all items were consensually approved²¹.

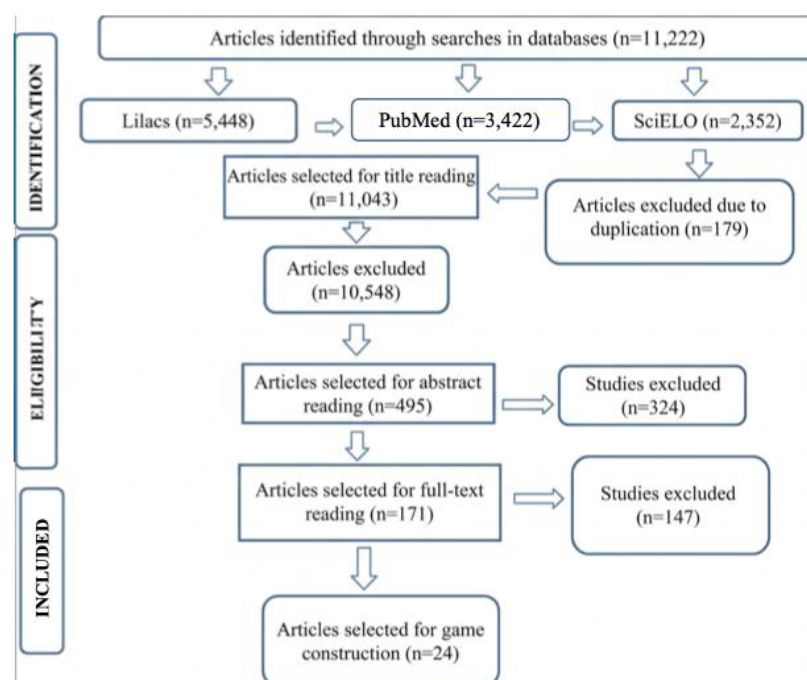
This study followed the ethical precepts established by Resolution No. 466 of December 12, 2012, of the Ministry of Health, which addresses ethics in research involving human beings. The principles of anonymity, privacy, and autonomy of the participants were respected.

The study was approved by the Research Ethics Committee of the Dr. José Antônio Garcia Coutinho Faculty of Medical Sciences under opinion no. 5,294,001 and CAAE no. 56121322.3.0000.5102.

To validate the content of the Pressure Injury game, the content validity index (CVI) was used, calculated by the average of the “appropriate” and “completely appropriate” responses selected by the judges. A cutoff point of 0.70 was adopted to determine satisfactory levels for each item.

RESULTS

A total of 11,222 articles were initially identified, of which 179 were excluded because they were duplicated across the databases. Thus, 11,043 articles were selected for title reading, and 10,548 were excluded. The abstracts of 495 articles were read, resulting in a sample of 171 articles for full-text reading. Of these, 147 were excluded for not answering the guiding question, culminating in 24 articles selected to construct the game, as shown in Figure 1.



Source: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).

Figure 1. Flowchart of the identification, selection, and inclusion process of the studies selected to develop the content of the Pressure Injury game.

The Pressure Injury game developed in this study was registered at the National Institute of Industrial Property under number BR512024004803-0 and is available at the following link: https://fnunes.azurewebsites.net/UPP_Inicial.asp

The game features 66 screens and 27 figures, with 21 screens dedicated to the tutorial and 45 to the assessment of PI. Presented in a digital board format, the game has regular dimensions of 250 mm by 50 mm. The path is marked by the words “Start” and “Finish” and is divided into nine phases, each represented by a specific color and composed of five squares that address topics related to PI.

In each phase, the player must answer five questions, each with three alternatives, with only one being correct. The squares on the board initially remain locked, except for the first one. To unlock the next square, the user must correctly answer the previous question, following this pattern until the last square of the phase. Upon completing all questions in a phase, the player advances to the next stage (Figure 2).

In Figure 2, the user views the first screen of the game, where they can identify the professionals responsible for the content development, the name of the game, and the place of origin. On the next screen, they must enter their name and click “OK”. Subsequently, the tutorial is displayed, and by clicking “Next”, the first question of the game appears.

Once preferences are selected and confirmed by clicking “OK”, the next move is unlocked. To win the game, it is necessary to get at least 80% of the answers right. The score, which ranges from 1 to 45, can be tracked in the upper left

corner of the screen. In the upper right corner, there is an option to access the main menu, allowing the user to return to the board and navigate through the phases.

The game offers immediate feedback: a vibration signals correct answers, while a specific sound accompanied by the message “Wrong answer” indicates errors, making the experience more interactive and playful.



Source: Authors' own.

Figure 2. Selected screens from the Pressure Injury board game.

At the end, two professional characters appear to report the result. In case of a victory, there is a celebration with a congratulatory message to the player; otherwise, the player is suggested to try again.

In Table 1, we observe that in the first evaluation, the CVI ranged between 0.85 and 1.0, and after correcting the judges' suggestions, the CVI was 1.0 with a Cronbach's alpha of 0.93.

Table 1. Content validity index and Cronbach's alpha of the questions used by the judges to validate the Pressure Injury game.

Questions	Cronbach's alpha	CVI – First assessment	CVI – Second assessment
Assessment of the content of the Pressure Injury game			
Definition of pressure injury	0.93	0.98	1.0
Risk factors for patients developing pressure injury	0.94	1.0	1.0
Pressure injury staging and assessment	0.94	0.98	1.0
Pressure injury cleansing technique	0.94	1.0	1.0
Definition of device-related pressure injury	0.93	0.98	1.0
Preventive measures for pressure injury	0.94	1.0	1.0
Treatment of pressure injury according to stage	0.94	1.0	1.0
Assessment of the efficiency of the Pressure Injury game			
Is the vocabulary accessible to the target audience?	0.98	0.85	1.0
Is the response time of the Pressure Injury game adequate?	1.0	0.92	1.0
During the game, players remain motivated and want to continue playing.	0.98	0.87	1.0
The stability, loading speed, and overall performance of the Pressure Injury game are consistent.	1.0	0.86	1.0
The features provided in the Pressure Injury game are appropriate.	1.0	1.0	1.0
Assessment of the usability of the Pressure Injury game			
The instructions for the Pressure Injury game are easy to understand.	0.85	1.0	1.0
When playing the Pressure Injury game, does the content facilitate the teaching and learning process on the topic?	0.92	1.0	1.0
The Pressure Injury game is easy to learn to use.	0.94	1.0	1.0
Players have full control over the actions and can easily undo errors.	0.93	0.98	1.0
The tutorial is clear and objective, helping to clarify questions effectively.	0.91	1.0	1.0
Assessment of the functionality of the Pressure Injury game			
The Pressure Injury game accurately performs its functions.	0.94	0.97	1.0
Does the content provide relevant information for the target audience?	0.94	1.0	1.0
The Pressure Injury game provides the necessary functions to assess, prevent, and treat pressure injury.	0.93	0.98	1.0
The Pressure Injury game provides secure access through password protection.	0.93	1.0	1.0

CVI: content validity index; PI: pressure injury.

Table 2 presents the main topics of each question in the questionnaire used and the judges' evaluation of the content of the Pressure Injury game using the Delphi technique. In the first evaluation, it ranged from inappropriate to completely appropriate. After the second evaluation of the game by the judges, consensus was reached.

DISCUSSION

The choice to develop an educational game as a tool to guide nurses in the assessment, prevention, and treatment of PI stemmed from difficulties observed in both clinical practice and the academic environment. It is common for some professionals to face challenges and exhibit knowledge gaps in areas such as assessing patients with PI, identifying risk

Table 2. Assessment of the content of the Pressure Injury game by judges using the Delphi technique.

Topics assessed	First assessment				Second assessment			
	INA n (%)	PA n (%)	A n (%)	FA n (%)	INA n (%)	PA n (%)	A n (%)	FA n (%)
Assessment of the content of the Pressure Injury game								
Definition of pressure injury	0 (0.0)	01 (1.67)	17 (28.30)	42 (71.70)	0 (0.0)	0 (0.0)	12 (20.00)	48 (80.00)
Risk factors for patients developing pressure injury	0 (0.0)	0 (0.0)	17 (28.30)	43 (71.70)				
Pressure injury staging and assessment	0 (0.0)	01 (1.67)	15 (25.0)	44 (73.30)	0 (0.0)	0 (0.0)	10 (16.70)	50 (83.30)
Pressure injury cleansing technique	0 (0.0)	0 (0.0)	16 (26.70)	44 (73.30)	0 (0.0)	0 (0.0)	16 (26.70)	44 (73.30)
Definition of device-related pressure injury	0 (0.0)	0 (0.0)	17 (28.30)	44 (73.30)	0 (0.0)	0 (0.0)	17 (28.30)	44 (73.30)
Preventive measures for pressure injury	0 (0.0)	0 (0.0)	17 (28.30)	43 (71.70)	0 (0.0)	0 (0.0)	17 (28.30)	43 (71.70)
Treatment of pressure injury according to stage	1 (1.67)	8 (13.33)	14 (23.30)	37 (61.70)	0 (0.0)	0 (0.0)	12 (20.00)	48 (80.00)
Assessment of the efficiency of the Pressure Injury game								
Is the vocabulary accessible to the target audience?	0 (0.0)	05 (08.33)	14 (23.33)	41 (68.30)	0 (0.0)	0 (0.0)	10 (16.70)	50 (83.30)
Is the response time of the Pressure Injury game adequate?	02 (03.33)	06 (10.00)	12 (20.00)	40 (66.70)	0 (0.0)	0 (0.0)	10 (16.70)	50 (83.30)
During the game, do players remain motivated and want to continue playing?	01 (1.67)	07 (11.67)	13 (21.70)	39 (65.00)	0 (0.0)	0 (0.0)	10 (16.70)	50 (83.30)
Are the stability, loading speed, and overall performance of the Pressure Injury game consistent?	0 (0.0)	0 (0.0)	16 (26.70)	44 (73.33)	0 (0.0)	0 (0.0)	16 (26.70)	44 (73.33)
Assessment of the usability of the Pressure Injury game								
The instructions for the Pressure Injury game are easy to understand.	0 (0.0)	0 (0.0)	16 (26.70)	44 (73.33)	0 (0.0)	0 (0.0)	16 (26.70)	44 (73.33)
When playing the Pressure Injury game, does the content facilitate the teaching and learning process on the topic?	0 (0.0)	0 (0.0)	09 (15.00)	51 (85.00)	0 (0.0)	0 (0.0)	09 (15.00)	51 (85.00)
Is the Pressure Injury game easy to learn to use?	0 (0.0)	0 (0.0)	12 (20.00)	48 (80.00)	0 (0.0)	0 (0.0)	12 (20.00)	48 (80.00)
Do players have full control over the actions and can they easily undo errors?	0 (0.0)	0 (0.0)	12 (20.00)	48 (80.00)	0 (0.0)	0 (0.0)	12 (20.00)	48 (80.00)
Is the tutorial clear and objective, helping to clarify questions effectively?	0 (0.0)	0 (0.0)	10 (16.70)	50 (83.30)	0 (0.0)	0 (0.0)	10 (16.70)	50 (83.30)
Assessment of the functionality of the Pressure Injury game								
The Pressure Injury game accurately performs its functions.	0 (0.0)	01 (16.70)	12 (20.00)	47 (78.30)	0 (0.0)	0 (0.0)	09 (15.00)	51 (85.00)
Does the content provide relevant information for the target audience?	0 (0.0)	0 (0.0)	15 (25.00)	45 (75.00)	0 (0.0)	0 (0.0)	15 (25.00)	45 (75.00)
Does the Pressure Injury game provide the necessary functions to assess, prevent, and treat pressure injury?	0 (0.0)	0 (0.0)	14 (23.30)	46 (76.70)	0 (0.0)	0 (0.0)	14 (23.30)	46 (76.70)
Does the Pressure Injury game provide secure access through password protection?	0 (0.0)	0 (0.0)	10 (16.70)	50 (83.30)	0 (0.0)	0 (0.0)	10 (16.70)	50 (83.30)

INA: inappropriate; PA: partially appropriate; A: appropriate; FA: fully appropriate.

factors for its development, determining the stage of the lesion, choosing the appropriate cleansing technique for each stage, recognizing tissue types, and prescribing preventive measures and dressings suitable for each type of lesion.

Faced with this scenario, a game was created to allow nurses to learn and update their knowledge in a practical and engaging way. During the activity, professionals have the opportunity to develop and consolidate essential skills, promoting effective learning and the competent application of the techniques required for the care of patients with PI.

The construction of educational games focused on the assessment, prevention, and treatment of PI is of utmost relevance for training and empowering nurses. This type of tool offers an interactive and dynamic approach, allowing professionals to acquire knowledge in a practical and playful manner. Through the game, nurses and other healthcare professionals can simulate real clinical scenarios, exercising decision-making and PI management in a safe and controlled environment¹¹.

Furthermore, the Pressure Injury game reinforces the theoretical knowledge acquired during professional training, helping practitioners consolidate and apply this knowledge in clinical practice. By guiding professionals on best practices to avoid pressure injuries, the game also contributes to reducing complications and improving patients' quality of life^{12,13}.

The game was developed based on an integrative literature review, ensuring that each content item and screen is grounded in scientific evidence. This approach makes the game an essential tool for the teaching and learning of nurses active in clinical practice. In addition to encouraging team adherence to care aimed at patients with risk factors or PI, the game provides consistent information that combines portability, flexibility, and reinforcement of verbal orientations¹¹.

Games developed based on scientific evidence spark the interest of healthcare professionals, strengthen previously provided guidelines, and offer quick and practical access to clarify specific doubts. These games also assist in day-to-day activities, contributing to safe care with minimal risk of harm and adverse events¹¹.

The creation of games grounded in literature reviews is crucial to ensure the updating and relevance of content, reflecting best practices and current guidelines. This process makes it possible to identify gaps in knowledge and practices, in addition to providing a solid scientific foundation for game development. Thus, professionals who use this tool learn and apply techniques backed by rigorous and current research, enabling safer and more effective patient care^{11,12,21}.

The Pressure Injury game is a digital board with a clear and accessible interface, facilitating content comprehension and encouraging active player participation. Through decisions and responses to questions, users engage in a practical and relevant learning process in an interactive way. The simple and didactic interface, combined with intuitive navigation, ensures a positive experience.

The clarity and simplicity of screens and content in educational games are essential to ensure the effective understanding and assimilation of information by users. Well-designed screens with clear and objective texts facilitate learning and minimize confusion. The use of soft colors also contributes to a pleasant visual experience, reducing eye fatigue and maintaining engagement for longer periods. Furthermore, an intuitive and user-friendly interface allows healthcare professionals to navigate the game without difficulties, focusing on learning and the practical application of acquired knowledge^{8,9,12}.

In this study, the judges used the Delphi technique. In the first game evaluation cycle, several suggestions related to formatting, vocabulary, preventive measures, and treatments were made. The suggestions were incorporated, and the game was resented for a second evaluation round, at which point consensus was reached for the approval of the judges (100%).

The validation of educational material using the Delphi technique is essential to ensure the quality and effectiveness of the developed content. The changes suggested by the evaluators are fundamental, as this process allows for the incorporation of knowledge and experience from various professionals in the field, ensuring that the content is relevant, accurate, and based on scientific evidence^{8,11}.

Once the corrections suggested by the evaluators were made, the research contributed to refining and enhancing the game's content, ensuring that it met users' needs and fulfilled its educational objectives. Validation through the Delphi technique also conferred greater credibility to the game, demonstrating that it was rigorously evaluated and approved by qualified professionals, which increased users' confidence in the tool^{9,10}.

After the second evaluation by the judges, the game was considered "appropriate" or "completely appropriate", and no further corrections were necessary. This result was fundamental for the Pressure Injury game to offer a solid theoretical

foundation and support for nurses' clinical practice, guiding them in standardizing assessment, lesion staging, wound cleansing, preventive measures, and treatment. This contributed to systematized, individualized, and personalized care.

The Pressure Injury game promotes prevention and care with the minimum possible risk, avoiding harm and adverse events and favoring quality and safe care, with a potential positive impact on patients' quality of life.

Study limitations

The limitations of the study include the absence of practical validation of the game in real teaching environments.

Recommendations

Therefore, field testing with diverse audiences and periodic updates of the game's content are recommended in order to ensure its relevance and pedagogical efficacy.

CONCLUSION

The construction and validation of the Pressure Injury game demonstrated a significant step forward in improving the training of nursing professionals. Through the literature review and the use of the Delphi technique, it was possible to ensure that the content of the game was based on scientific evidence and recognized practices, guaranteeing its relevance and accuracy. The validation by nursing experts highlighted the effectiveness of the game as an educational tool, providing an innovative and engaging method to assess, prevent, and treat pressure injuries.

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