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Development of an interactive game for the evaluation, prevention, and treatment of incontinence-associated dermatitis

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ABSTRACT

Objective: To develop and validate an educational game for the assessment, prevention, and treatment of IAD. **Method:** The game "IAD – Incontinence-Associated Dermatitis" is an applied research study with technological production. The process followed three stages: analysis, design, and validation. In the analysis phase, an integrative literature review was conducted to support the game's development, identifying assessment, prevention, and treatment measures for IAD. During the design phase, planning and construction of the didactic content were carried out, including topic selection, text development for each screen, media selection, and interface layout design. The validation phase involved 44 experts, using the Delphi technique and the Content Validity Index (CVI), ensuring a validated educational resource for clinical practice. **Results:** In the initial assessment, most evaluators rated the game from inadequate to fully adequate, with a CVI ranging from 86.36 to 95.45%. After incorporating improvement suggestions, the game was reassessed and rated between adequate and fully adequate, achieving a CVI of 99.99 to 100.00%. **Conclusion:** The game "IAD – Incontinence-Associated Dermatitis" was developed as an educational tool based on scientific evidence for the assessment, prevention, and treatment of IAD, with the potential to contribute to clinical practice.

DESCRIPTORS: Dermatitis. Diaper rash. Skin care. Enterostomal therapy.

Desenvolvimento de um jogo interativo para avaliação, prevenção e tratamento da dermatite associada à incontinência

RESUMO

Objetivo: Desenvolver e validar um jogo educativo para a avaliação, a prevenção e o tratamento de dermatite associada à incontinência. **Método:** O jogo "DAI – Dermatite Associada à Incontinência" é um estudo de natureza aplicada com produção tecnológica. O processo seguiu três etapas: análise, *design* e validação. Na análise, foi realizada uma revisão integrativa da literatura para embasar a construção do jogo, identificando medidas de avaliação, prevenção e tratamento para a dermatite associada à incontinência. Durante a etapa de *design* do jogo, foram desenvolvidos o planejamento e a construção do conteúdo didático, englobando a seleção dos tópicos a serem tratados, a elaboração dos textos para cada tela, a escolha das mídias adequadas e o desenvolvimento do *layout* da interface. A validação envolveu 44 especialistas, utilizando a técnica Delphi e o índice de validade de conteúdo, garantindo um material educativo validado para a prática clínica. **Resultados:** Na primeira análise, a maioria dos avaliadores classificou o jogo como variando de inadequado a totalmente adequado, com o índice de validade de conteúdo entre 86,36 e 95,45%. Após a incorporação das sugestões de melhorias, o jogo foi reavaliado e considerado entre adequado e totalmente adequado, atingindo um índice de validade de conteúdo de 99,99 a 100,00%. **Conclusão:** O jogo "DAI – Dermatite Associada à Incontinência" foi desenvolvido como uma ferramenta educativa baseado em evidências científicas para a avaliação, a prevenção e o tratamento da dermatite associada à incontinência, podendo contribuir para a prática clínica.

DESCRITORES: Dermatite. Dermatite das fraldas. Higiene da pele. Estomaterapia.

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Desarrollo de un juego interactivo para la evaluación, prevención y manejo de la dermatitis asociada a la incontinencia

RESUMEN

Objetivo: Desarrollar y validar un juego educativo para la evaluación, prevención y tratamiento de la dermatitis asociada a la incontinencia (DAI). **Método:** El juego "DAI – Dermatitis Asociada a la Incontinencia" es un estudio de naturaleza aplicada con producción tecnológica. El proceso se llevó a cabo en tres etapas: análisis, diseño y validación. En la fase de análisis, se realizó una revisión integradora de la literatura para fundamentar el desarrollo del juego, identificando medidas de evaluación, prevención y tratamiento de la DAI. Durante la fase de diseño, se desarrollaron la planificación y la construcción del contenido didáctico, incluyendo la selección de los temas a tratar, la elaboración de los textos para cada pantalla, la elección de los medios adecuados y el diseño de la interfaz. La validación involucró a 44 expertos, utilizando la técnica Delphi y el Índice de Validez de Contenido (IVC), garantizando un material educativo validado para la práctica clínica. **Resultados:** En la evaluación inicial, la mayoría de los evaluadores clasificaron el juego entre inadecuado y totalmente adecuado, con un IVC que osciló entre 86,36 y 95,45%. Tras la incorporación de las sugerencias de mejora, el juego fue reevaluado y considerado entre adecuado y totalmente adecuado, alcanzando un IVC del 99,99 al 100,00%. **Conclusión:** El juego "DAI - Dermatitis Asociada a la Incontinencia" fue desarrollado como una herramienta educativa basada en evidencias científicas para la evaluación, prevención y tratamiento de la DAI, con el potencial de contribuir a la práctica clínica.

DESCRIPTORES: Dermatitis. Dermatitis del pañal. Cuidados de la piel. Estomaterapia.

INTRODUCTION

Incontinence-associated dermatitis (IAD) is characterized by skin inflammation that occurs in individuals with urinary and/or fecal incontinence. Its initial signs include redness and edema on the skin surface, which may progress to the formation of blisters with serous fluid, erosive lesions, or even secondary infections. The areas most commonly affected are the perineum, buttocks, lower abdomen, and thighs [1,2].

For IAD to develop, the skin must be exposed to moisture for a prolonged period. This compromises the skin's protective function, making it more susceptible to damage caused by friction, shear, or pressure. In addition to moisture, feces contain digestive enzymes that increase the risk of skin injury[3,4].

Environmental factors, such as aging, also compromise skin moisture levels and its protective function. Consequently, IAD is more common in older adults, whose skin tends to be more fragile due to changes in turgor and hydration. It is important to emphasize that the multidisciplinary team, especially nursing professionals, must be aware of the risks and characteristics of IAD. Difficulty in identifying and distinguishing this condition from other types of lesions, such as pressure injuries, may lead to inappropriate clinical management [6].

In nursing practice, technological devices such as smartphones, tablets, and laptops have been increasingly used to improve the organization of care and facilitate access to up-to-date information on procedures. This aims to minimize risks during patient care, preventing harm or adverse events. As a result, the care provided is safe and of high quality for both the patient and the healthcare professional [7].

Educational games in clinical practice promote rapid and effective learning, enabling individualized, systematized, and personalized care. This approach contributes to the enhancement of care by allowing healthcare professionals to use these tools to access accurate information and provide care supported by innovative technology, ensuring quality and safety[8].

Educational games have proven to be valuable tools in the clinical decision-making process, helping to support choices based on scientific evidence. Additionally, they serve as guides for self-care, prevention, and the management of skin injuries. They also provide information on the most appropriate prophylactic and therapeutic approaches, assisting the nursing

and multidisciplinary teams in their clinical assessments. This approach reinforces the effectiveness and relevance of these games as guiding instruments for patient care[9-11].

Undoubtedly, the development of educational technologies, including app-based games, plays a crucial role in providing appropriate information to healthcare professionals. By using these technologies effectively, professionals can learn and update their knowledge to prevent and treat patients with IAD. This fosters care that is risk-reducing, prevents harm and adverse events, and is organized, tailored to specific needs, personalized, and safe for the patient. Therefore, developing educational games focused on IAD emerges as an effective approach to improving clinical practice and ensuring high-quality care.

OBJECTIVES

Develop and validate an educational game for the assessment, prevention, and treatment of incontinence-associated dermatitis.

METHODS

This study is characterized as applied research, falling within the category of technological production and classified as methodological development.

For the development of the game, contextualized instructional design was used, based on a constructivist approach. This method involves the planning, development, and implementation of targeted educational activities, incorporating elements that promote contextualization and meaningful learning[12]. The game was developed and validated in three stages: analysis, design, and validation.

In the analysis stage, an integrative literature review was conducted following the methodological guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA Statement)[13].

The guiding question was: "What preventive measures available in the literature can support the development of an educational game for the assessment, prevention, and treatment of incontinence-associated dermatitis?" The PICO strategy was applied, in which "P" refers to the target population (patients with risk factors or a diagnosis of incontinence-associated dermatitis), "I" refers to the intervention (assessment, prevention, and treatment protocols for IAD), "C" indicates the comparison (not applicable, as this is not a comparative study), and "O" represents the expected outcome (the development of an educational game)[14].

To support the development of the educational game, searches were conducted in the following scientific databases: Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS), Scientific Electronic Library Online (SciELO), PubMed, and Cochrane. Filters were applied to select documents published between 2019 and 2024.

The Health Sciences Descriptors (DeCS) used included: dermatitis, diaper dermatitis, and skin hygiene, in their Portuguese, English, and Spanish versions. Search strategies were developed in each language by combining the selected descriptors using the Boolean operator "OR."

The selection of publications for the review followed specific criteria, including only primary studies, materials that directly addressed the proposed topic, and full-text articles. Conversely, academic works such as theses, dissertations, monographs, and technical reports were excluded, as well as articles that, upon abstract analysis, were not related to the study objective, along with duplicates identified in the databases or the virtual library.

Two authors independently analyzed the titles and abstracts, ensuring that the selected materials met the review's guiding question and the established inclusion criteria. Since there were no disagreements, the involvement of a third reviewer was not necessary.

The level of evidence of the selected studies was categorized according to the guidelines of the Agency for Healthcare Research and Quality, which establishes six levels of classification:

Level I: meta-analyses of multiple randomized clinical trials;

Level II: individual experimental studies;

Level III: quasi-experimental studies;
Level IV: descriptive or qualitative studies;
Level V: case reports or case series;
Level VI: expert opinions [15].

During the game design stage, the instructional content was planned and developed, including the selection of topics to be addressed, the creation of textual content for each screen (or game phase), the selection of appropriate media, and the development of the interface layout. The structure was organized into topics, with illustrated texts interconnected by hyperlinks to facilitate interaction.

The initial phase focuses on the thorough assessment of the skin in the genital, perigenital, and perineal areas, including the collection of patient history, physical examination, application of the Perineal Assessment Tool, and identification of risk factors associated with the development of IAD[15].

The second phase of the game addresses the classification of IAD based on the Ghent Global IAD Categorization Tool. This scale organizes lesions into two main categories. Category 1 refers to persistent erythema and is subdivided into 1A, which corresponds to persistent erythema without clinical signs of infection, and 1B, which indicates persistent erythema with clinical signs of infection. Category 2 involves skin loss and is subdivided into 2A, skin loss without clinical signs of infection, and 2B, skin loss with clinical signs of infection[16.17].

The third phase of the game is dedicated to standardizing care and the recommended products for the daily hygiene of the genital, perigenital, and perineal areas, as well as implementing preventive measures for IAD. These preventive measures were developed based on the results obtained from the physical examination, patient history, and the application of the Perineal Assessment Tool, ensuring a personalized and effective approach for each case[17-19].

The fourth phase presents the standardization of therapeutic approaches for the treatment of IAD. This stage details the correct sequence and appropriate selection of products used for the hygiene of the genital, perigenital, and perineal areas. The therapeutic approaches were developed based on the results of the assessment of these areas and the information obtained through the Perineal Assessment Tool, ensuring a targeted and effective treatment[20.21].

After the game development was completed, the validation stage began, involving the participation of expert judges. The sample size was calculated using the formula for infinite populations, considering a minimum expected proportion of 80% (P=0.8), a 95% confidence level (Z=1.96), and a margin of error of 15% (e=0.15), resulting in a minimum sample size of 28 professionals. The selection of judges was carried out through convenience sampling, complemented by the snowball technique.

The inclusion criteria for the evaluators were as follows: holding a bachelor's degree in nursing with at least two years of experience in wound prevention and treatment, or holding a bachelor's degree in software development. A total of 50 professionals who met the selection criteria—35 nurses and 15 software developers—received an invitation letter. Those who agreed to participate were then sent the evaluation instrument. Six professionals were excluded because, although they agreed to participate, they either did not respond or failed to submit the evaluation questionnaire within the 15-day deadline.

The group of judges consisted of 29 nurses specialized in wound care and 15 software developers, totaling 44 participants. The software developers were affiliated with the Hospital de Clínicas Samuel Libânio and the Universidade do Vale do Sapucaí. The nurses were identified through the Lattes Platform of the CNPq portal. The search was conducted using keywords such as "diaper dermatitis" and "dermatitis" in the simple search option, with filters applied to refine the criteria. In addition, nurses with postgraduate degrees in stomatherapy, registered with the Brazilian Association of Stomatherapy, and professionals specialized in dermatology, affiliated with the Brazilian Association of Dermatology Nursing, also participated.

The research instruments were sent to participants via email using the Google Forms platform. Participants were able to read and sign the Informed Consent Form (ICF) electronically, voluntarily agreeing to participate in the study. As a means of identification, participants were asked to provide the initials of their names.

To validate the game, two questionnaires were applied: one aimed at professionals responsible for evaluating the content and another for those assessing the game's usability, totaling 22 questions.

The invitation letter sent to participants included an introduction to the study, detailed information about the research, the questionnaires, approval from the Ethics Committee, and the importance of the evaluator in the process. The deadline for submitting responses was 15 days per round, starting from the date the questionnaires were sent.

The initial section of the questionnaire collected general information about the participants, such as academic background (residency, specialization, master's, or doctorate), time since graduation, teaching experience, and duration of clinical practice.

The questionnaire for content evaluation by the judges included the following items: whether the game is interesting and useful; whether the language used is appropriate; whether the game is easy to use; whether the content is easy to understand; whether the game presented any failures during use. It also assessed whether the game covered the definition of IAD, the clinical assessment of the skin in the genital, perigenital, and perineal areas, the technique for applying the NIX scale, the skin cleansing technique in these areas, preventive measures for IAD, and the wound dressings used in its treatment.

The questionnaire for usability evaluation addressed the following aspects: whether the language of the game is easy to understand; whether the game performs its functions accurately; whether the participant would recommend the game to others; whether access to the game is secure via password; whether the game presented any failures; whether the game's response to failures is appropriate; whether the game contributes to understanding the content; whether the content is easy to comprehend; whether the execution time of the functions is appropriate; whether the available resources are suitable; and whether the game is easy to install.

Responses for both questionnaires were recorded using a Likert scale with the following options: "not applicable," "inadequate," "partially adequate," "adequate," and "fully adequate."

In data analysis, responses rated as 3 ("adequate") or 4 ("fully adequate") were considered validated. However, responses rated as 1 ("inadequate") or 2 ("partially adequate") were not disregarded. Suggestions provided by the judges were analyzed, and when pertinent, revisions and adjustments were made so that the content could achieve the required level of validation. This procedure follows the recommendations of previous studies that use this evaluation method.

Items rated as 1 or 2 were resent to the 44 judges in a second evaluation round, along with the suggested modifications, to be reassessed. The objective was to reach a consensus among the evaluators. This process is known as the Delphi technique and is widely used in evaluations that require expert validation[22].

Statistical analysis was performed using the Content Validity Index (CVI) to assess the proportion of judges who agreed on specific aspects of the instrument and its items. The CVI was calculated by summing the number of responses rated as "adequate" and "fully adequate" and dividing this total by the number of responses evaluated. For the questionnaire to be considered validated, the CVI needed to be equal to or greater than 0.80[23].

RESULTS

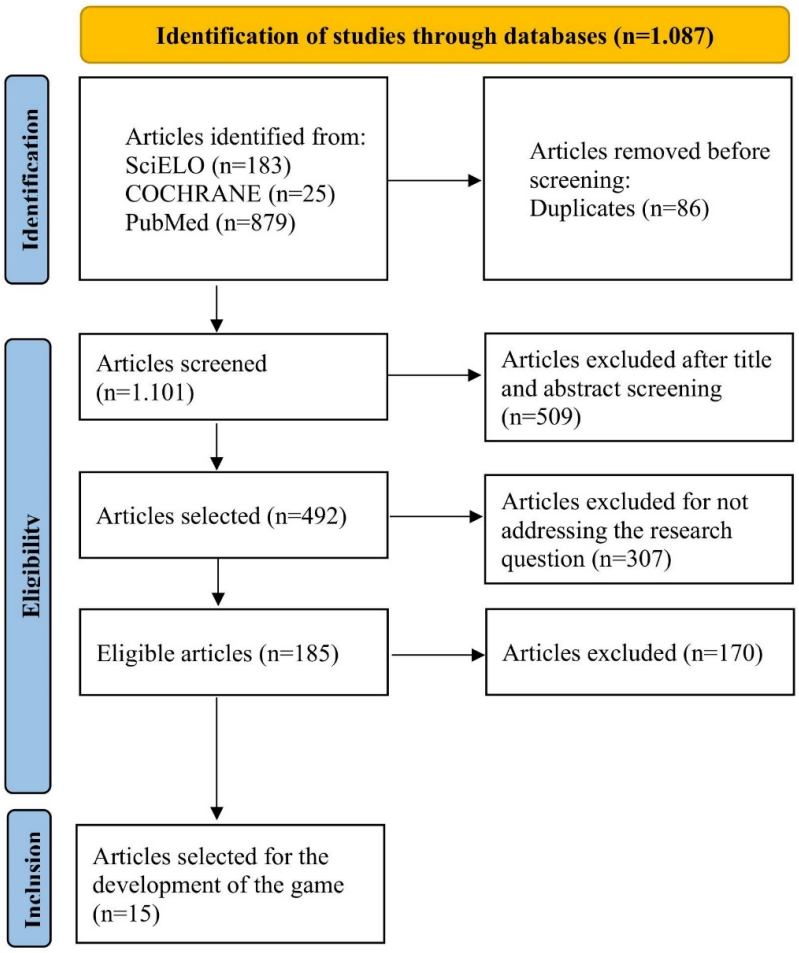
The research participants had more than 10 years of professional experience, with 4 (9%) holding doctoral degrees, 16 (36%) holding master's degrees, and 24 (55%) holding specialization degrees. Most had experience in both clinical practice and teaching.

In the integrative literature review, a total of 1.087 articles were initially identified. After removing 86 duplicates, 509 were excluded based on title review, 307 based on abstract review, and 170 after full-text review. In the end, 15 articles were selected to support the development of the educational game (Figure 1)[13].

Figure 2 illustrates some screens from the game "IAD – Incontinence-Associated Dermatitis," which contains a total of 25 interactive screens. The content is organized as follows: 3 screens dedicated to the conceptualization of incontinence-associated dermatitis, 10 screens addressing risk factors, 10 screens focused on the clinical assessment of patients with predisposition to or a confirmed diagnosis of IAD, 13 screens dedicated to prevention strategies, and 15 screens detailing the skin cleansing technique for the genital, perigenital, and perineal areas, in addition to the guidelines for appropriate treatment.

The game was officially registered with the National Institute of Industrial Property (INPI) under process number BR512023003583-1 and can be accessed via the following link: https://dai.progm.net.br.

Box 1 presents a summary of the suggestions provided by the nurses who participated in the game evaluation. The accepted suggestions reflect an ongoing effort to improve the content of the game "IAD – Incontinence-Associated Dermatitis"



Fonte: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA Statement)[13].

Figure 1. Flowchart of the identification process and the selection stages of the studies included for the development of the game "IAD – Incontinence-Associated Dermatitis". Pouso Alegre (MG), Brazil, 2024.

Figure 2. Screens from the game *"IAD – Incontinence-Associated Dermatitis"*. Pouso Alegre (MG), Brazil, 2024.

in order to make it more effective, accessible, and educational. These improvements have the potential to significantly benefit both healthcare professionals and patients by promoting better health outcomes and more efficient management of IAD.

Table 1 presents the items evaluated by the judges and the corresponding CVI values. In the first evaluation round, the values ranged from 86.36 to 100.00 percent, while in the second round they ranged from 97.78 to 100.00 percent. These results indicate that the content of the game "IAD – Incontinence-Associated Dermatitis" was considered to be of excellent quality.

Table 2 details the main topics addressed in each item, along with the judges' analysis of the game's content. The evaluation was conducted using the Delphi technique. The items received high ratings already in the first round, indicating a strong initial consensus. In the second round, a significant improvement in the items was observed, demonstrating that the feedback received in the first round was effectively incorporated, resulting in an overall enhancement of the evaluated content.

Table 1. Content Validity Index (CVI) values according to the analysis performed by the judges. Pouso Alegre (MG), Brazil, 2024 (n=44)).

Items evaluated	Content Validity Index (CVI)	
	First Evaluation %	Second Evaluation %
The game is interesting and useful for clinical practice	95.45	97.78
The language of the game is appropriate	88.64	100.00
The game is easy to use	88.64	100.00
The content of the game is clear and easy to understand	90.91	100.00
The game presented failures during its use	95.45	100.00
The game performs its functions accurately	93.18	100.00
The game provides secure access through a password	93.18	99.88
The application responds appropriately when failures occur	90.91	100.00
You would recommend the game to others	93.18	100.00
The game contributes to the understanding of the content	93.20	100.00
The execution time of the game's functions is adequate	88.64	100.00
The game's resources are appropriate	86.36	100.00
The game is easy to install	90.91	100.00
Description of the definition of IAD	100.00	100.00
Description of the clinical skin assessment procedure (genital, perigenital, and perineal areas)	93.18	99.99
Description of the technique for applying the Perineal Assessment Tool scale	100.00	100.00
Technical description of the cleansing of the genital, perigenital, and perineal areas	100.00	100.00
Description of the classification of incontinence-associated dermatitis (Ghent Global IAD Categorization Scale)	93.18	100.00
Description of preventive measures for IAD	97.73	100.00
Description of the dressings indicated for the treatment of IAD	100.00	100.00

IAD: Incontinence-Associated Dermatitis.

Box 1. Suggestions from the evaluators regarding the content of the game "IAD – Incontinence-Associated Dermatitis" for the prevention and treatment of incontinence-associated dermatitis. Pouso Alegre (MG), Brazil, 2024.

Accepted Suggestions
Replace the term "dressing" with "barrier cream."
Change the font color and size, as the current color is difficult to read.
Include information on skin cleansing and care.
Add items related to the daily assessment of IAD and skin affected by candidiasis.
Provide more detailed information on preventive measures, including the recommended frequency for diaper changes and the selection of appropriate products for skin protection

IAD: Incontinence-Associated Dermatitis.

Table 2. Content evaluation of the game "IAD – Incontinence-Associated Dermatitis" by the judges using the Delphi technique. Pouso Alegre (MG), Brazil, 2024 (n=44).

Items Evaluated	First Evaluation				Second Evaluation			
	IND	PAD	ADQ	TAD	IND	PAD	ADQ	TAD
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
The game is interesting and useful for clinical practice	00 (00)	05 (11)	21 (48)	18 (41)	01 (02)	00 (00)	21 (48)	22 (50)
The language of the game is appropriate	00 (00)	06 (14)	20 (45)	18 (41)	00 (00)	00 (00)	26 (59)	18 (41)
The game is easy to use	00 (00)	04 (09)	28 (64)	12 (27)	00 (00)	00 (00)	29 (66)	15 (34)
The content of the game is clear and easy to understand	00 (00)	00 (00)	23 (52)	21 (48)	00 (00)	00 (00)	22 (50)	22 (50)
The game presented failures during use	00 (00)	03 (07)	15 (34)	26 (59)	00 (00)	00 (00)	18 (41)	26 (59)
The game performs its functions accurately	00 (00)	00 (00)	19 (66)	15 (34)	00 (00)	00 (00)	25 (57)	19 (43)
The game provides secure access through a password	00 (00)	00 (00)	24 (55)	20 (45)	00 (00)	00 (00)	23 (52)	21 (48)
The application responds appropriately when failures occur	00 (00)	01 (02)	20 (46)	23 (52)	00 (00)	00 (00)	20 (45)	24 (55)
You would recommend the game to others	00 (00)	00 (00)	24 (55)	14 (45)	00 (00)	00 (00)	21 (48)	23 (52)
The game contributes to the understanding of the content	02 (04)	03 (07)	18 (41)	21 (48)	00 (00)	00 (00)	25 (57)	19 (43)
The execution time of the game's functions is adequate	02 (04)	03 (07)	21 (48)	18 (41)	00 (00)	00 (00)	24 (55)	20 (45)
The game's resources are appropriate	02 (04)	02 (05)	17 (39)	23 (52)	00 (00)	00 (00)	21 (48)	23 (52)
The game is easy to install	01 (02)	01 (02)	25 (57)	17 (39)	00 (00)	00 (00)	25 (57)	19 (43)
Description of the definition of IAD	00 (00)	03 (07)	18 (41)	23 (52)	00 (00)	00 (00)	20 (45)	24 (55)
Description of the clinical skin assessment procedure (genital, perigenital, and perineal areas)	00 (00)	04 (09)	16 (36)	24 (55)	00 (00)	00 (00)	23 (52)	21 (48)
Description of the technique for applying the Perineal Assessment Tool scale	00 (00)	03 (07)	19 (43)	22 (50)	00 (00)	00 (00)	21 (48)	23 (52)
Technical description of the cleansing of the genital, perigenital, and perineal areas	02 (04)	03 (07)	21 (48)	18 (41)	00 (00)	00 (00)	21 (48)	23 (52)
Description of the classification of incontinence-associated dermatitis (Ghent Global IAD Categorization Scale)	00 (00)	00 (00)	24 (55)	20 (45)	00 (00)	00 (00)	24 (55)	20 (45)
Description of preventive measures for IAD	00 (00)	06 (14)	20 (45)	18 (41)	00 (00)	00 (00)	23 (52)	21 (48)
Description of the dressings indicated for the treatment of IAD	00 (00)	04 (09)	16 (36)	24 (55)	00 (00)	00 (00)	22 (50)	22 (50)

IAD: Incontinence-Associated Dermatitis; IND: Inadequate; PAD: Partially Adequate; ADQ: Adequate; TAD: Totally Adequate.

DISCUSSION

The development of the game "IAD – Incontinence-Associated Dermatitis" aimed primarily to provide nurses with a resource based on the scientific literature to support the management of patients at risk for or already diagnosed with IAD. The game emphasizes guidance on preventive measures and updated treatments, aiming to prevent complications during hospitalization and to promote personalized, individualized, and safe care, minimizing risks, harm, and adverse events.

The development of educational games in stomatherapy plays a crucial role in providing essential information for the assessment, prevention, and treatment of tissue injuries. These games are fundamental for the planning and implementation of patient care. Correct identification of the type of injury is essential to ensure appropriate treatment, the application of preventive measures, and effective management. However, it is crucial to validate these materials to ensure their effectiveness and reliability in clinical practice[3.17.24].

In the study, the judges validated the game using the Delphi technique. In the first evaluation, the game content showed an agreement rate above 86.36 percent, classifying it as excellent. However, the judges suggested several corrections. After these adjustments were made, the content was reassessed, and the agreement rate exceeded 97.78 percent. This indicates that the game's content is excellent, clear, written in language appropriate for the target audience, with an intuitive interface, representative content, and easy usability[3.17.24].

It is essential to implement corrections based on the suggestions provided by the judges who validated the game. These adjustments contribute to improving the game and ensuring that it meets the required quality standards. Moreover, incorporating the judges' suggestions demonstrates respect for the evaluation process and a continuous pursuit of excellence. Therefore, it is important to value and apply the experts' feedback to achieve an even more effective and relevant product[10.15].

The Delphi technique is a valuable tool for validating game content, especially when it involves educational materials. By engaging expert judges, this approach aims to ensure that the game content is accurate, reliable, and useful for users. Additionally, the Delphi technique enhances the quality of the content, contributing to a more effective learning experience[10]. When professionals use the game, they have the opportunity to learn and reinforce the procedural technique. This results in safer and higher-quality care delivery. The knowledge acquired through the game enables professionals to implement systematized, individualized, and personalized actions, managing care effectively and safely[10-12].

Developing an educational game is a strategy that promotes learning in an interactive manner, supporting the decision-making process regarding patient care. It is a resource that contributes to enhancing professionals' autonomy and improving their clinical practice[9].

The educational game *"IAD – Incontinence-Associated Dermatitis"*, through its content, aligns with the recommendations of several studies that emphasize the importance of educational materials grounded in scientific evidence. This foundation ensures greater effectiveness in the implementation of clinical practice. Furthermore, the authors highlight how the use of games can be a valuable tool for enhancing learning and increasing student motivation in the educational process, making teaching more dynamic and engaging[9-11.25].

Games can be a valuable resource for professional development, fostering professional skills in different contexts. Through games, users can engage in playful and meaningful learning, stimulating skills such as oral and written communication, as well as logical-mathematical reasoning[9-11.25].

Caring for patients with IAD requires a strategic approach from healthcare professionals that involves prevention, thorough assessment, and the selection of the most appropriate treatment. In this context, the use of available resources and technologies is essential to support decisions that balance effectiveness and cost-efficiency. By adopting clinical practices grounded in scientific evidence, professionals can make more assertive decisions, identifying specific products to prevent and treat incontinence-associated dermatitis, thereby contributing to higher-quality and safer patient care[10.15].

The development and evaluation of a game focused on the assessment, prevention, and treatment of incontinence-associated dermatitis represents a significant advancement in the field of stomatherapy. Through this playful and interactive approach, nursing professionals can acquire essential knowledge about skin care, early identification of lesions, and strategies to minimize the risks associated with incontinence. The use of this game as an educational tool can contribute to more effective, personalized, and evidence-based care, resulting in better outcomes for patients. Therefore, investing in the development and validation of such digital resources is essential to improving clinical practice and promoting the quality of life of individuals affected by this condition.

Study Limitations

The main limitations of this study were the restricted selection of judges due to a lack of response and the scarcity of specific studies on nursing care for patients with IAD in Brazil.

Recommendations

It is recommended that multicenter studies be conducted to expand the validation of the game, along with the inclusion of professionals from different fields to enrich its content. Additionally, testing in clinical settings is suggested to evaluate its effectiveness, as well as broader dissemination in training programs. Longitudinal studies are also recommended to assess the impact of the game on clinical practice and on the quality of care provided to patients with IAD.

CONCLUSION

The game *"IAD – Incontinence-Associated Dermatitis"* was developed with the objective of serving as an educational tool for the assessment, prevention, and treatment of IAD. It was grounded in the best available evidence in the literature,

which highlights essential preventive measures such as proper skin hygiene, the use of protective barriers, the selection of appropriate products for fragile skin, and the education of healthcare professionals on the assessment and management of incontinence. Following a rigorous content and usability validation process conducted by experienced professionals, the results demonstrated high agreement among the judges, reflected in the elevated content validity indices. The use of the Delphi technique enabled continuous improvement of the material, ensuring that expert feedback was effectively incorporated. The improvements observed in the second evaluation round confirm that the game meets the required quality standards and can be implemented in clinical practice as a validated educational resource to support the management of IAD.

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