

# Creation and validation of a serial album for the prevention of Pressure Ulcer: a methodological study

*Construção e validação de álbum seriado para prevenção de Lesão por Pressão: estudo metodológico*  
*Construcción y validación de un rotafolio para la prevención de Úlcera por Presión: estudio metodológico*

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## ABSTRACT

**Objectives:** to create and validate a serial album for Pressure Ulcer prevention in the hospital environment. **Methods:** a methodological study with the production of the serial album and validation by 22 judges and 22 patients. The content was based on the integrative review and the reports of the World Health Organization. It was considered a Content Validity Index equal to or greater than 80% in the items and the binomial test for the judges' agreement. **Results:** the serial album entitled "Pressure Ulcer Prevention in the hospital environment" has 13 pages. In the content and layout validation, all items had an agreement above 80% among the participants. The overall Content Validity Index was 0.99 for the judges and 1.0 for the patients. **Conclusions:** the constructed and validated material presented itself as an adequate instrument to be used in health education activities.

**Descriptors:** Pressure Ulcer; Health Education; Nursing Care; Validation Study; Patient Safety.

## RESUMO

**Objetivos:** construir e validar álbum seriado para prevenção de Lesão por Pressão no ambiente hospitalar. **Métodos:** estudo metodológico com construção do álbum seriado e validação por 22 juízes e 22 pacientes. O conteúdo fundamentou-se na revisão integrativa e nos relatórios da Organização Mundial da Saúde. Considerou-se Índice de Validade de Conteúdo igual ou superior a 80% nos itens e no teste binomial para concordância dos juízes. **Resultados:** o álbum seriado intitulado "Prevenção de Lesão por Pressão no ambiente hospitalar" possui 13 páginas. Na validação de conteúdo e aparência, todos os itens tiveram concordância acima de 80% entre os participantes. O Índice de Validade de Conteúdo global foi igual 0,99 entre os juízes e 1,0 entre os pacientes. **Conclusões:** o material construído e validado apresentou-se como instrumento adequado para ser utilizado nas atividades de educação em saúde.

**Descritores:** Lesão por Pressão; Educação em Saúde; Cuidados de Enfermagem; Estudos de Validação; Segurança do Paciente.

## RESUMEN

**Objetivos:** construir y validar un rotafolio para la prevención de Úlceras por Presión en el ambiente hospitalario. **Métodos:** se trata de un estudio metodológico realizado mediante la construcción de un rotafolio que ha sido validado por 22 jueces y 22 pacientes. El contenido se basó en la revisión integradora y en los informes de la Organización Mundial de la Salud. Se consideró un Índice de Validez de Contenido del 80% o superior, en los ítems y en la prueba binomial de concordancia de los jueces. **Resultados:** el rotafolio titulado "Prevención de Úlceras por Presión en el ambiente hospitalario" posee 13 páginas. En la validación de contenido y apariencia, todos los ítems tuvieron, entre los participantes, un acuerdo superior al 80%. El Índice de Validez Global de Contenido fue de 0,99 entre los jueces y de 1,0 entre los pacientes. **Conclusiones:** el material construido y validado se mostró como un instrumento adecuado para ser utilizado en las actividades de educación en salud.

**Descriptorios:** Úlcera por Presión; Educación en Salud; Atención de Enfermería; Estudio de Validación; Seguridad del Paciente.

## INTRODUCTION

Pressure Ulcers (PU) are adverse events that characterize complications associated with health care, which lead to increased morbidity and hospital costs. They appear when the skin is under constant pressure for a long time or when using a medical device or artifact. They occur more frequently in bone prominence sites<sup>(1-2)</sup>.

PU, in countries worldwide, varies from 1.9% to 71.6%. Research in the United States found a variation from 9% to 41%, besides an estimated prevalence of 23%. In Brazil, the incidence rate of PU in hospitalized patients is 2.42/1,000 person-days and can vary from 22% to 49.2%, depending on the hospital unit<sup>(3-7)</sup>.

PU negatively affect patients' quality of life and extend their hospital stay. To prevent this adverse event, it is essential to adopt educational strategies mediated by Educational Technologies (ET) to guide the population on preventive measures. These technologies are the set of knowledge and actions linked to materials and products that define work and therapeutic processes for carrying out actions in the production of health. Among the most used ETs developed by health professionals, printed items stand out<sup>(2,8-9)</sup>.

A study carried out in France, with patients with spinal cord injuries, showed that the patient education program with the use of printed materials positively affects knowledge and adherence to PU prevention practices. It is therefore, crucial to develop methodological studies that contemplate the construction and validation of educational materials, such as booklets, serial albums, and flyers on PU prevention, aimed at supporting nursing care in health education<sup>(10-11)</sup>.

In Brazil, studies have shown the importance of printed technologies for health care. In Fortaleza, methodological research, to create an educational booklet for the PU prevention, characterized the technology as innovative and positive for the treatment and prevention of PU. Another study carried out in Rio de Janeiro, on the construction and validation of an educational booklet about PU for nurses, revealed the significance of educational material for health care<sup>(12-13)</sup>.

Thus, a search in the literature was carried out that evidenced the absence of a methodological study for the construction and validation of a serial album, aimed at hospitalized patients, on the PU prevention. The serial album is a collection of organized sheets that contain illustrative figures, exposed to the target audience, and the script sheets, located in the front of the images, which are aimed at the professional as guidance at the time of the intervention to standardize the guidelines given at the educational moment, besides promoting knowledge intermediation<sup>(14)</sup>.

The use of the serial album to prevent PU can enable the process of information and integration of the professional, patient and companion in the hospital setting and lessen the incidence of PU, besides assisting the quality indicators of care and patient safety. However, for this type of technology to be used, the educational material must be created and submitted to the scientific content validation process.

## OBJECTIVES

To create and validate a serial album for Pressure Ulcer prevention in the hospital environment.

## METHODS

### Ethical aspects

The original project that resulted in this study was submitted to and approved by the Research Ethics Committee, of the *Universidade Estadual Vale do Acaraú*, according to the Resolution 466/2012 of the National Health Council<sup>(15)</sup>. All research participants signed the Informed Consent Form (ICF).

### Study design, period, and location

A descriptive methodological study developed in three stages: an integrative review; elaboration of the serial album; content and layout validation by judges and target audience. The writing of the study was generally guided by Equator, using the tool "Development and validation of the guideline for reporting evidence-based practice educational interventions and teaching (GREET)"<sup>(16)</sup>. However, adaptations were made considering the peculiarity of the material analysis process.

In the first stage, an integrative review was carried out and the choice of guidelines for documents on PU prevention made available by the World Health Organization, the *Política Nacional de Segurança do Paciente e Agência Nacional de Vigilância Sanitária* (ANVISA) (National Patient Safety Policy and the National Health Surveillance Agency), between November and December 2019. The construction of the serial album took place from January to March 2020.

The content validation process took place from April to July 2020. Layout validation was carried out in August 2020, at the medical clinic of a public hospital in the city of Sobral, Ceará.

### Population/sample; inclusion and exclusion criteria

Once created, the serial album, its validation was carried out by judges with expertise in educational technologies, assistance in the hospital environment and patient safety. The criteria for selecting specialists were to have knowledge/skill in the subject (publication in the area of elaboration and validation of educational technologies and/or patient safety) and having knowledge/skill through professional experience (teaching experience in clinical nursing, experience assistance in the hospital and/or stoma therapy)<sup>(17)</sup>.

The sample size was estimated by the formula that considers the final proportion of judges concerning a given dichotomous variable, and the maximum acceptable difference of this proportion is  $n = Za2xP(-1-P)/e^2$ . The  $Za$  value (confidence level) equal to 95%,  $P$  (proportion of agreement of the judges) equal to 85%, and (accepted difference from what is expected) equal to 15% were considered, resulting in 22 specialists<sup>(18)</sup>.

In the validating stage of the serial album by the target audience, there was the participation of 22 patients hospitalized in the medical clinic of a public hospital in the city of Sobral, Ceará, Brazil. The sample size of participants was also estimated by the same formula used to calculate the sample of the judges responsible for content validation. Thus, the inclusion criterion of the sample was used: having a stable clinical condition and being

literate. Patients discharged from the hospital and/or transferred to another unit were excluded.

### Study protocol

In the creation of the serial album, an integrative review was carried out on the online Medical Literature Analysis and Retrieval System databases, Cumulative Index to Nursing and Allied Health Literature, SciVerse Scopus, Web of Science, Scielo, Cochrane and Latin American and Caribbean Literature in Health Sciences. We selected articles that fit the inclusion criteria and answered the guiding question: what is the nursing care for the prevention of PU? The final sample consisted of 12 articles. After reading the articles in full, a synthesis of the main information about care with PU was carried out, to guide the preparation of the serial album's content. Therefore, the findings regarding the summary of the main results were structured with the following subjects: definition of PU, the main sites of PU occurrence, the main risk factors for PU, the measures to prevent PU in the hospital and the treatment of PU.

For the creation of the serial album, the compilation of the findings of the integrative review and the guidelines of the documents on the prevention of PU made available by the World Health Organization, National Patient Safety Policy, and the National Health Surveillance Agency (ANVISA) were considered as the foundation. The illustrations were created by a designer who used Adobe Illustrator® and Adobe Photoshop® to edit the images. Another expert professional was in charge of the layout and structuring of the texts/phrases in the serial album using Photoshop®.

For the content validation stage, the search for the judges was carried out on the Lattes Platform of the *Conselho Nacional de Pesquisa* (CNPq) (National Research Council), Thesis Bank of the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (CAPES) (Coordination for the Improvement of Higher Education Personnel) and by consulting the nurse professors nursing courses at public universities that met the criteria mentioned above. This was followed by the sending, by e-mail, of letters of invitation to the possible judges, together with the request for the indication of other specialists who met the selection criteria (snowball sampling). The possible judges indicated had the Lattes Curriculum analyzed to verify the established inclusion criteria.

A total of 40 judges were invited, however, 18 did not return contact, which equaled the final sample of 22 judges. Data collection was performed using the Google Forms tool, using a form that was shared, via e-mail, with the following documents: ICF; an instrument with socioeconomic, professional and academic variables; the first version of the serial album; validation instrument with 18 items, with variables about the objective (purposes, goals or objectives of the serial album), structure/presentation (organization, structure, language, coherence and size of the text) and material relevance (significance, impact, motivation and interest in using the serial album)<sup>(19)</sup>. After reading, the specialists could answer the item as adequate, partially adequate, or inadequate, besides having a field to record suggestions.

For the technology assessment by patients, the serial album, and guidelines for signing the Informed Consent Term were applied. An evaluation questionnaire was used, with clinical-epidemiological data and the Suitability Assessment of Materials (SAM) instrument,

translated and validated into Portuguese, which presents the assessment of the objective, organization, language, layout and motivation of the printed technology<sup>(20)</sup>. This assessment included five levels of valuation: 1 = Strongly disagree; 2 = Disagree; 3 = I neither agree nor disagree; 4 = I agree; 5 = I Strongly agree. Also, a field for suggestions and material classification was added (approved, approved with changes and disapproved).

The invitation to participate in the study was done individually, at each patient's bed. First, the researcher introduced herself, explained the research's objective and invited. After acceptance, participants were asked to sign the (ICF) consent form and the serial album's layout validating process began.

Individually, the researcher implemented an educational intervention through the serial album. Each participant was asked to observe the images and pay attention to the guidelines' content, which would be disclosed by the researcher through the educational occasion. At the end of the intervention, the data collection instrument was handed in to filling out and then, there was no interference from the researcher, who stood by the participant and answered possible doubts.

### Analysis of results and statistics

To analyze the album's content validity, the Content Validity Index (IVC-I)<sup>(21)</sup>, the proportion of the judges' agreement for each item assessed and the global CVI were used. The binomial test was calculated to check that the proportion of agreement in the serial album items was statistically equal to or greater than 80%, with a 5% significance level.

## RESULTS

The serial album for PU was entitled "*Pressure Ulcer Prevention in the hospital environment*" and comprises 13 pages: cover, technical file with the creators' names and the five figures with respective script sheets. Its characters are the nurse, patient, and companion.

The album has an initial presentation and then, the following subjects in the script sheets: knowing the concept of PU, main causes of PU and care and procedures for preventing LPP.

### Serial album validation

About the validation process, most of the judges were female (59%), stoma therapists (18%), with experience in care (45%) and with a master's degree (32%). The average age was 31.2 years, ranging from 24 to 49 years. Regarding content and layout validation, Table 1 shows the judges' agreement on the items evaluated.

The judges evaluated the serial album concerning the objectives achieved and none of the items were considered "unsuitable". This item was validated and reached CVI-I higher than 0.9. However, some items were "partially suitable" by 21 (95.5%) of the judges, concerning the suitability of the material for the teaching-learning process and the information that clarified possible doubts about the theme addressed. The suggestions pointed by the judges such as positioning the head of the bed, excluding the image of the nurse from the second sheet, and restructuring some sentences were analyzed and accepted.

**Table 1** - Judges' agreement on the content validation of the serial album on Pressure Ulcers prevention in the hospital environment, Sobral, Ceará, Brazil, 2020

Items	n (%)	CVI-I *	p†
1. Objectives			
1.1 Includes the proposed theme	22 (100.0)	1	1
1.2 Suitable for the teaching-learning process	21 (95.5)	0.95	0.972
1.3 Clarifies potential doubts on the theme addressed	21 (95.5)	0.95	0.972
1.4 Provides reflection on the theme	22 (100.0)	1	1
1.5 Encourages behavior change	22 (100.0)	1	1
2. Structure and presentation			
2.1 Language suitable for the target audience	22 (100.0)	1	1
2.2 Language appropriate to educational material	22 (100.0)	1	1
2.3 Interactive language, allowing active involvement	22 (100.0)	1	1
2.4 Correct information	22 (100.0)	1	1
2.5 Objective information	22 (100.0)	1	1
2.6 Clarifying information	22 (100.0)	1	1
2.7 Sufficient information	22 (100.0)	1	1
2.8 Logical sequence of ideas	22 (100.0)	1	1
2.9 Current theme	22 (100.0)	1	1
2.10 Suitable text size	21 (95.5)	0.95	0.972
3. Relevance			
3.1 The serial album encourages learning	22 (100.0)	1	1
3.2 Adds to knowledge to the field	22 (100.0)	1	1
3.3 Stimulates interest in the theme	22 (100.0)	1	1

Note: \*Content Validity Index; †Binomial test.

**Table 2** - Patients' agreement about the layout validation of the serial album on Pressure Ulcers prevention in the hospital environment, Sobral, Ceará, Brazil, 2020

Items	n (%)	CVI-I *	p†
1. Objectives			
1.1 Meets the objectives of patients and/or companions who are bedbound.	22 (100.0)	1	1
1.2 Helps guide care to prevent Pressure Ulcer.	22 (100.0)	1	1
1.3 It enables reflection on the necessary skin care.	22 (100.0)	1	1
1.4 It is ideal for use by any healthcare professional.	22 (100.0)	1	1
2. Organization			
2.1 The serial album cover is attractive.	22 (100.0)	1	1
2.2 The serial album cover includes information on the material.	22 (100.0)	1	1
2.3 The size of the title and content in the topics is suitable.	22 (100.0)	1	1
2.4 The topics have a logical sequence.	22 (100.0)	1	1
2.5 The themes describe key aspects of care that are important to prevent Pressure Ulcer.	22 (100.0)	1	1
2.6 There is consistency among the cover information, presentation, summary, and content of the serial album.	22 (100.0)	1	1
2.7 The paper of the printed material is suitable.	22 (100.0)	1	1
2.8 The number of pages is suitable.	22 (100.0)	1	1
2.9 The material is of suitable size.	22 (100.0)	1	1
3. Language			
3.1 The writing is in an appropriate style.	22 (100.0)	1	1
3.2 The text is interesting.	22 (100.0)	1	1
3.3 The language is comprehensible, with easy and familiar words.	22 (100.0)	1	1
3.4 All the important ideas are addressed in a clear and objective way.	22 (100.0)	1	1
3.5 There is an association between the theme of each session and the corresponding text.	22 (100.0)	1	1
3.6 The text presents interaction with guidelines between professional and target audience.	22 (100.0)	1	1
3.7 The text is written so the target audience is the focus, that is, the patient is more important.	22 (100.0)	1	1
4. Layout			
4.1 The design is attractive.	22 (100.0)	1	1
4.2 The pages or sessions are organized.	22 (100.0)	1	1
4.3 The number of figures is sufficient.	22 (100.0)	1	1
4.4 The figures have an appropriate size.	22 (100.0)	1	1
4.5 The figures correspond to the illustrated contents.	22 (100.0)	1	1
4.6 The figures are plain, appropriate, and drew easy to understand.	22 (100.0)	1	1
4.7 The figures are self-explanatory.	22 (100.0)	1	1
4.8 The figures are familiar to readers.	22 (100.0)	1	1
4.9 The figures raise questions about the theme.	22 (100.0)	1	1
4.10 Figures are linked to the text.	22 (100.0)	1	1
5. Motivation			
5.2 The serial album presents a logical sequence about care to prevent Pressure Ulcer.	22 (100.0)	1	1
5.3 The serial album provokes interest and curiosity.	22 (100.0)	1	1
5.4 The serial album's information is important for preventing Pressure Ulcer.	22 (100.0)	1	1
5.5 The serial album promotes a change in behavior and attitude.	22 (100.0)	1	1

To be continued

Table 2 (concluded)

Items	n (%)	CVI-I*	p <sup>†</sup>
5.6 The serial album proposes to the learner to acquire knowledge to carry out self-care.	22 (100.0)	1	1
5.7 The serial album guides the target audience to perform the desired care.	22 (100.0)	1	1
4.8 The content of the serial album keeps the dynamics of reading.	22 (100.0)	1	1
5.9 The use of the serial album is relevant.	22 (100.0)	1	1
5.9 O uso do álbum seriado se faz relevante.	22 (100.0)	1	1

Note: \*Content Validity Index; †Binomial test.

The illustration of script sheet 1 highlights the concept of PU and the main places of occurrence. Script sheet 2 gives the main causes for developing PU and the risk factors in the hospital. The illustration in script sheet 3 refers to care for the PU prevention and highlights the companion's participation in this care process.

Regarding the illustration of script sheet 4, possible doubts that the companion may have regarding specific nursing care in the PU management are exposed. Finally, the print of script sheet 5 highlights the value of preventing PU and the benefits of adhering to preventive care. The corresponding illustrations are shown below.

## DISCUSSION

The serial album, as a didactic technology of an educational and preventive kind, was designed to assist the nurse in guiding on the PU for patients in the hospital environment. In this sense, this technology allows greater integration between the tutor and the learner, as well as representing a tool that can enhance the health education carried out by the professional.

In this work, the serial album "Pressure Ulcer Prevention in the hospital environment" was validated by specialists, with broad experience in educational technologies and/or PU prevention. This educational material signifies technological innovation in Brazil, considering that although the PU prevention theme has been explored in national studies, research with resources such as serial album type, built and validated for the health education of patients and companions has not been identified on the theme, especially in the nursing area.

Throughout the content validation with the professionals, the CVI was equal to 1.0 in most of the analyzed topics. Only the variables on adequacy to the teaching-learning process, clarifying doubts and text size had CVI of 0.95. This finding validates other methodological studies carried out in Brazil that achieved satisfactory results in the validation of serial album content on infant body weight control, with a CVI of 0.88, and breastfeeding promotion, with a CVI of 0.92<sup>(22-23)</sup>.

The assessment of educational technologies by judges is relevant because it considers these professionals' expertise and ensures that the materials do not have incomplete information or with unsuitable language for the target population. These data corroborate with a study on the construction and validation of an educational booklet about PU, which obtained a satisfactory evaluation, with a CVI of 0.87<sup>(11,24)</sup>.

In this perspective, there was a concern with making the adjustments suggested by the judges, as the information in the serial album aims to achieve basic knowledge about preventing PU, both from the illustrations and the theoretical content. In this sense, according to the experts, the serial album can cooperate with the nurse's practice in the prevention of PU.

Therefore, in the content validation, the judges evaluated the language of the serial album to be adequate and understandable. Language is a



Figure 1 - Illustrations from the serial album "Pressure Ulcer Prevention in the hospital environment", Sobral, Ceará, Brazil, 2020

vital element to assist in health actions, and the guarantee that the writing of these educational materials is suitable to audiences with different levels of education is pertinent. This judgment is similar to the findings of a methodological study carried out in Mossoró about the validation of an educational booklet for the prevention and treatment of PPL, which highlights the importance of adequate information/content. The technology achieved a CVI of 0.90<sup>(13,25)</sup>.

The analysis of the illustrations of the serial album by the judges showed unanimity in the agreement on the help of these figures in understanding the theme. This data corroborates a study of construction and validation of a serial album about the positioning during spinal anesthesia in pregnant women, who evaluated the important, understandable, and clear figures, with CVI higher than 0.90<sup>(26)</sup>.

Regarding validation by the target audience, a positive evaluation of the printed technology was obtained, considering it to be objective, organized, comprehensive, playful, and motivating, considering that all items presented the CVI equal to 1.0.

The serial album is widely used in health education and, among its advantages, the following stand out: directing the sequence of the script exposure, enabling the immediate resumption of any information already presented and pointing out the key points of the script sheets. Due to its size and plastic pages, the serial album is portable and used in healthcare environments, besides being low cost. In this sense, the technology requires only creativity and motivation for its use in clinical practice in the hospital environment<sup>(27)</sup>.

It is worth stating that the plastic pages allow their cleaning before and after use in each educational intervention, which allows its reuse among the beds of the medical clinic, without the risk of cross-contamination. Given the historical context of the COVID-19 pandemic, this characteristic is considered essential for ensuring patient safety and reducing health care-related infections.

### Study limitations

As a limitation of the study, it is pointed out that the material was evaluated only by patients hospitalized in a public institution, with education from zero to eight years, in the medical clinic unit, so that the findings may change from the reality of care provided by private institutions, among patients with higher education.

However, it is believed that the album will also be understandable for individuals with higher education, as it contains clear and easily understandable information.

### Contributions to the field of nursing and health

The serial album about PU care can contribute to scientific advancement in nursing by enabling the use of a didactic technology built and validated in the clinical practice of nurses as a health educator. Moreover, this tool can be used in teaching, research and extension related to patient safety and preventive measures for PU, in nursing care.

In the context of health education, the serial album can be used by nurses in the context of teaching, research, extension, and clinical care. It is necessary to assess the technology for effectiveness in improving knowledge and adherence to the prevention of PU in hospitalized patients.

### CONCLUSIONS

The final version of the serial album was entitled "*Pressure Ulcer Prevention in the hospital environment*" and was composed of 13 pages, divided into cover, technical file and five figures with the script sheets. Its content was about the concept of PU, the main places of occurrences, the main causes, risk factors in the hospital, care for prevention, the participation of the companion in the care process, the management of PU, the importance of preventing PU and the benefits of preventive care. The serial album was validated in its content and layout by judges with an overall CVI of 0.99. When validated by the judges, the illustrations were considered attractive, relevant, and clear, while the content was evaluated as valid and easy to understand for patients and companions. In the layout assessment, it was considered valid and understandable by the target audience with a global CVI equal to 1.0.

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