ORIGINAL ARTICLE

REVISTA ENFERMAGEM ATUAL IN DERME

# *EDUCATIONAL TECHNOLOGY FOR SELF-CARE OF PEOPLE WITH INTESTINAL STOMA: CONSTRUCTION AND METHODOLOGICAL VALIDATION*

# *TECNOLOGÍA EDUCATIVA PARA EL AUTOCUIDADO DE PERSONAS CON ESTOMA INTESTINAL: CONSTRUCCIÓN Y VALIDACIÓN METODOLÓGICA*

# *TECNOLOGIA EDUCATIVA PARA AUTOCUIDADO DE PESSOAS COM ESTOMIA INTESTINAL: CONSTRUÇÃO E VALIDAÇÃO METODOLÓGICA*

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**ABSTRACT**
**Introduction:** Intestinal stomas are common in clinical practice and in individuals with intestinal diseases, used for the elimination of feces, functioning as an artificial anus due to the loss of sphincter control, allowing fecal content to exit through the abdomen and be collected in a pouch. **Objective:** To develop and validate an educational technology for self-care in individuals with intestinal stomas. **Methodology:** This is a methodological study conducted from September 2021 to February 2024, in 5 stages: 1) Construction of the educational technology based on the identification of clinical evidence and the development of an Integrative Literature Review; 2) Creation of content and design of the educational technology in the form of a booklet; 3) Evaluation and validation of content and design by a panel of expert judges; 4) Evaluation and validation of content and design by individuals with intestinal stomas; 5) Final adaptation of the educational technology. The degree of agreement between expert judges was calculated using the weighted average of responses, according to the scoring of each item in the Likert scale. Thus, components/recommendations of the educational technology with an agreement degree above 0.80 did not require changes, remaining unchanged. **Results:** The study involved 33 expert nurses in stomatherapy and 33 individuals with intestinal stomas registered at the Stomatherapy Department of Policlínica Piquet Carneiro, UERJ. The agreement index between expert judges and individuals with intestinal stomas was considered greater than 0.80. **Conclusions:** The booklet was validated for both appearance and content, and is an instrument that can enhance communication between specialist nurses and individuals with intestinal stomas.
**Keywords:** Self-Care; Nursing; Health Education; Stoma; Validation Study; Educational Technology.

**RESUMEN**
**Introducción:** Los estomas intestinales son comunes en la práctica clínica y en personas con enfermedades intestinales, utilizados para la eliminación de heces, funcionando como un ano artificial debido a la pérdida del control esfinteriano, lo que permite que el contenido fecal salga por el abdomen y se almacene en un dispositivo de recolección. **Objetivo:** Construir y validar una tecnología educativa para el autocuidado de personas con estomas intestinales. **Metodología:** Se trata de un estudio metodológico realizado de septiembre de 2021 a febrero de 2024, en 5 etapas: 1) Construcción de la tecnología educativa a partir de la identificación de evidencias clínicas y la construcción de una Revisión Integrativa de la Literatura; 2) Elaboración del contenido y diseño de la tecnología educativa en formato de folleto; 3) Evaluación y validación del contenido y diseño por un panel de jueces expertos; 4) Evaluación y validación del contenido y diseño por personas con estomas intestinales; 5) Adecuación de la versión final de la tecnología educativa. El grado de concordancia entre los jueces expertos se calculó mediante la media ponderada de las respuestas, de acuerdo con la puntuación de cada ítem de la escala Likert. Así, se determinó que los componentes/recomendaciones de la tecnología educativa que presentaran un grado de concordancia superior a 0.80 no necesitarían sufrir cambios, permaneciendo inalterados. **Resultados:** El estudio contó con la participación de 33 enfermeras expertas en estomaterapia y 33 personas con estomas intestinales, registradas en el sector de estomaterapia de la Policlínica Piquet Carneiro de la UERJ. El índice de concordancia entre los jueces expertos y las personas con estomas intestinales fue considerado superior a 0.80. **Conclusiones:** El folleto fue validado en cuanto a apariencia y contenido, siendo un instrumento que puede favorecer la comunicación entre enfermeras especializadas y personas con estomas intestinales.
**Palabras clave:** Autocuidados; Enfermería; Educación Sanitaria; Estoma; Estudio de Validación; Tecnología Educativa.

**RESUMO**
**Introdução**: Os estomas intestinais são comuns na prática clínica e em pessoas com doenças de origem intestinal, utilizados para a eliminação de fezes, que funcionam como um ânus artificial, devido à perda do controlo esfincteriano que permite que o conteúdo fecal saia pelo abdómen e seja armazenado num dispositivo de recolha. **Objetivo:** Construir e validar uma tecnologia educacional para o autocuidado de pessoas com estomas intestinais. **Metodologia**: Trata-se de estudo metodológico, realizado de setembro de 2021 a fevereiro de 2024, em 5 etapas: 1) Construção da tecnologia educacional a partir da identificação de evidências clínicas e construção da Revisão Integrativa da Literatura; 2) Elaboração do conteúdo e design da tecnologia educacional em formato de cartilha; 3) Avaliação e validação do conteúdo e design por um painel de juízes especialistas; 4) Avaliação e validação do conteúdo e design por pessoas com estomias intestinais; 5) Adequação da versão final da tecnologia educacional. O grau de concordância entre os juízes especialistas foi calculado por meio da média ponderada das respostas, de acordo com a pontuação de cada item da escala tipo Likert. Assim, determinou-se que os componentes/recomendações da tecnologia educacional que apresentassem grau de concordância superior a 0,80 não necessitariam sofrer alterações, permanecendo inalterados. **Resultados:** O estudo contou com a participação de 33 juízes enfermeiros expertises em estomaterapia, e 33 pessoas com estomas intestinais, cadastradas no setor de estomaterapia da Policlínica Piquet Carneiro da UERJ. O índice de concordância entre os juízes especialistas e as pessoas com estomas intestinais foi considerado maior que 0,80. **Conclusões:** A cartilha foi validada quanto à aparência e ao conteúdo, sendo um instrumento que pode favorecer a comunicação entre enfermeiros especialistas e pessoas com estomias intestinais.
**Palabras clave:** Autocuidado; Enfermagem; Educação em Saúde; Estomia; Estudo de Validação; Tecnologia Educacional.

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## INTRODUCTION

Intestinal stomas are common in clinical practice and are commonly made for people with diseases of intestinal origin. They function as an artificial anus, allowing fecal contents to exit through the abdomen and be stored in a collection device[1-2].

Nowadays, there are several causes of the creation of an artificial opening in the abdominal wall, most notably diverticular and inflammatory bowel diseases, such as Crohn's disease and ulcerative colitis. According to epidemiological data, Crohn's disease affects around 0.3 to 2.5 people per 100,000 inhabitants per year, with an increasing prevalence, especially in young adults. Ulcerative colitis, on the other hand, has an estimated global prevalence of 0.8 to 25 cases per 100,000 inhabitants, and is more common in Western countries. In addition to these conditions, other important causes include abdominal trauma, colorectal anomalies and colorectal cancer, which, according to the National Cancer Institute (INCA), is the second most common cancer in Brazil, with an estimated 40,000 new cases per year. These conditions represent a significant part of the indications for intestinal stomas, providing a solution for managing serious complications and improving patients' quality of life [3-4].

Intestinal stomas can be classified as colostomies and ileostomies and, depending on the therapeutic approach and the patient's clinical condition, they can be definitive or temporary. The choice between a definitive or temporary stoma depends on the cause and purpose for which they are constructed. For example, temporary stomas, such as in the case of an intestinal obstruction caused by colorectal cancer, when the problem that led to their construction has been properly treated, make it possible to reconstruct intestinal transit after surgery. Definitive stomas, on the other hand, such as in patients with advanced cancer of the rectum or severe Crohn's disease, which require the removal of the distal segment of the intestine, prevent the re-establishment of intestinal transit and are permanent. In both cases, these interventions aim to improve patients' quality of life, providing an effective way of managing the complications associated with these conditions[5-8].

Against this backdrop, it can be seen that people with stomas represent a significant number worldwide, and health care for this population must be constantly evaluated and improved. In addition, these patients face a number of adversities, especially in the post-operative period, such as infections, peristomal skin complications, intestinal obstruction, and psychological problems due to adaptation to the new condition. These challenges highlight the need for continuous guidance from the health team, for the development of self-care and the rehabilitation process, ensuring a better quality of life and minimizing complications related to the stoma[8].

Self-care is one of the main factors altered in the life of the person with a stoma, due to the new demands of caring for the body that permeate aspects such as body hygiene, the

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stoma and peristomal skin, nutrition, sexuality, social relationships and psychological factors. Insufficient self-care can lead to complications associated with the stoma and impair the adaptive process[9-10].

Nurses can work in different care scenarios, from health promotion in primary care to interventions at levels of greater technical complexity, which also includes stomatherapy, performing duties inherent to professional practice, articulating and integrating care and health education actions in the care of individuals, families, groups and the community, favoring access and the exchange of knowledge with a view to ensuring user autonomy and possibilities for self-care and co-participation in their therapeutic process, providing specialized care to people[10].

The theory of self-care developed by Dorothea Orem is based on the assumption that, when empowered, individuals should take care of themselves, and it is up to nurses to identify with patients their difficulties in carrying out self-care, creating conditions for them to gradually develop their autonomy according to their possibilities. Self-care, in Orem's view, is the practice of activities carried out by the individual to maintain their life, health and well-being. When the individual is unable to provide this care for various reasons, the family must support and provide strategies so that the person can achieve self-care. Thus, it is understood that when there is an imbalance between self-care capacity and the necessary demands, there is a self-care deficit, which requires learning new knowledge, facilitated by nursing interventions[11-12-13].

It is therefore understood that in order to minimize the difficulties faced by people with intestinal stomas in their daily lives, nurses need to act as mediators and/or facilitators, developing and implementing practices based on an individualized assessment, with the aim of guiding, encouraging and supporting the development of these people's capacity for self-care[14], which can be facilitated through the use of educational health technologies.

Educational technology (ET) is an Educational Technology that has emerged as a pedagogical resource, enabling dialogic interaction between people and the construction of knowledge in various dimensions, easily available and at a low cost, capable of strengthening users' understanding[15]. There is a need to produce ET in stomatherapy in order to improve communication, the work of the stomatherapy nurse and to promote self-care for people with stomas, making it possible to promote and innovate teaching and learning in a dynamic and interactive way. However, there are still few educational technologies developed in the field of enterostomal therapy, especially with regard to the self-care of people with intestinal stomas in its many aspects[9].

In view of the above, this study aims to build and validate an educational technology for the self-care of people with intestinal stomas. This product will be developed in the form of a booklet.

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## METHODS

### Ethical aspects

In compliance with Resolution Nº 466/2012 of the National Health Council (NHC), which regulates research with human beings, the project was submitted to the Research Ethics Committee (REC) of the Antônio Pedro University Hospital/Faculty of Medicine of the Fluminense Federal University, according to opinion number 5.900.489 and was also approved by the REC of the Pedro Ernesto University Hospital/State University of Rio de Janeiro, via Plataforma Brasil, according to opinion number 5.761.788.

### Type of study

This is methodological study of technological innovation. The aims to build a reliable, accurate and usable instrument that can be used by other researchers, as well as evaluating its success in achieving its objectives[15-16].

In this way, this study aimed to build and validate an educational technology, in the form of an electronic booklet, and it is necessary to validate the content and design of the material produced, in order to make it reliable and valid for its intended purpose[17].

This research was carried out in 5 stages of development and validation of the educational technology, as follows: 1) Construction of the educational technology based on the identification of clinical evidence and construction of the integrative literature review; 2) Elaboration of the content and design of the educational technology; 3) Evaluation and validation of the content and design by a panel of expert judges focusing on the objectives, organization and relevance of the educational technology; 4) Evaluation and validation of the content and design by people with intestinal stomas, as well as validation of the organization, writing style, appearance and motivation of the educational technology; 5) Adaptation of the final version of the educational technology[18].

### Methodological procedures, study setting and data organization

Five stages were used to develop and validate the educational technology.

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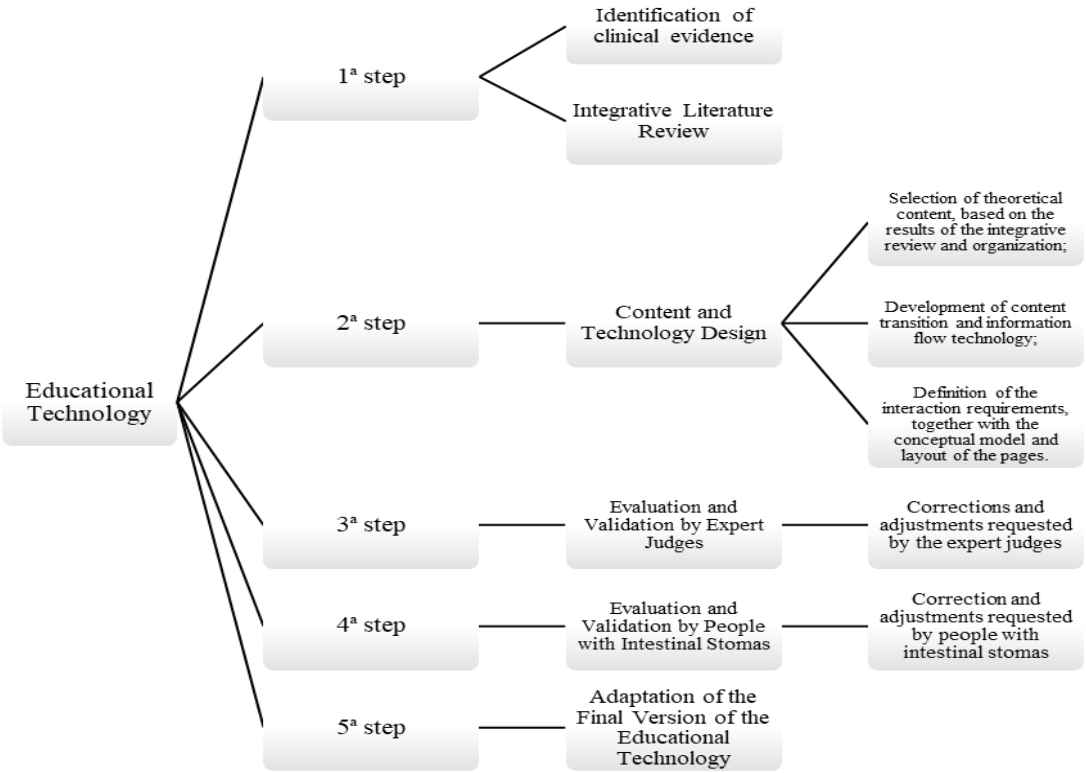
**Flowchart 1** - Diagram of the methodological path. Nova Iguaçu/RJ, Brazil, 2024.




The first stage was divided into two phases: identification of clinical evidence and construction of the integrative literature review. The clinical evidence emerged from the master's thesis, which included data collection from a semi-structured interview conducted in 2019. The sample of this study consisted of 32 participants, of both sexes, with a minimum age of 18 and a maximum age of 91, 13 of whom were female and 19 male. The average age of the participants was 54.5 years, with an approximate standard deviation of 21.1 years.

In the second phase of the first stage, an Integrative Literature Review (ILR) was carried out, with the aim of mapping self-care recommendations for people with intestinal stomas, in order to use the results of this review to compose the content of the educational technology guided by the reference of the Nursing Theory of Self-Care Deficit, adapted from Orem, and was carried out from September to December 2021, in the electronic databases, available in the Virtual Health Library (VHL): Latin American and Caribbean Health Sciences Literature (LILACS) and International Health Sciences Literature (MEDLINE), using the PICO strategy[18], The controlled descriptor vocabularies were the Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH): Self-care; Nursing; Health education; Stoma; Validation study; Educational technology, and the descriptors were searched for in studies available on the National Library of Medicine (PubMed) and CINAHL. This

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process took place in six stages: identification of the theme/question guiding the research; establishment of sampling criteria for inclusion and exclusion of studies; evaluation of the selected publications; evaluation of the publications included in the review; categorization/interpretation of the information extracted; and presentation of the review/synthesis of knowledge[18], with the aim of identifying in the literature the scientific evidence on the self-care of people with intestinal stomas.

In this study, the following question was formulated to guide the search for studies: What is the scientific evidence on self-care for people with intestinal stomas?

Next, the criteria for including the studies in the survey were established, which, for this study proposal, were as follows: original research, dissertations, theses and reviews written in Portuguese, Spanish and English; indexed in the period from January 2010 to December 2021; and the presence of evidence on the chosen theme in relation to the self-care of people with intestinal stomas.

In the second stage, the content and design of the educational technology was developed according to the following phases: 1. Selection of the theoretical content, based on the results of the integrative review and organization; 2. Development of the content transition and the information flow of the technology and 3. Definition of the interaction requirements, along with the conceptual model and layout of the pages. This phase refers to the outline of the educational technology, determining the content, layout, textual and graphic languages, page flows and functionalities[18].

Shortly after defining the content, the language used in the educational technology was selected. Hypertexts, animations and graphic images and photos were then chosen, as they are visual resources that help in education and make the educational technology more engaging for the target audience, as well as making access more practical and simple, especially in terms of structure, interface and functionality[19].

In the third stage, the content was evaluated and validated by a panel of expert judges, which refers to the preliminary use of the educational technology to solve the problem, i.e. an initial use that does not yet involve the public that will use the educational technology[18]. The expert judges evaluated the educational technology based on three components, using an evaluation questionnaire constructed by the authors. The first was the objective, which had three evaluation items, the second component was the organization, which had nine items, and the last was the relevance, which had four items. A Likert-type scale was used to evaluate/validate each component, and when they didn't consider an item to be appropriate, they could make comments, pointing out the reason for their disagreement, as well as the possibility of suggesting a new recommendation, or improving those already described[20].

The study included 33 stomatherapist judges/nurses for the validation of the booklet,

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which took place between June and October 2023.

The search for judges was carried out through a search on the Lattes Platform of the CNPq portal. The search was initiated by subject (keyword: stomatherapy) in the simple search option, and filters were used to refine the criteria. Another strategy for finding judges was through snowball sampling. Thus, the judges identified by this type of sampling and who met the pre-established criteria adapted from the literature consulted were invited to take part in the study and were asked to recommend other participants[21].

For the selection of judges, the expert classification system was used[22], appropriate for this study, selecting judges who achieved a minimum score of 5 points and the criteria adopted are shown in Table 1 below.

**Chart 1 -** Criteria for selecting judges. Niterói/Rio de Janeiro, Brazil, 2024.

| CRITERIA | SCORE |
|---|---|
| Doctorate | 4 |
| Master's Degree | 3 |
| Dissertation or thesis with relevant content within the field of stomatherapy | 2 |
| Specialization in Stomatherapy | 2 |
| Research (with publications) in the field of enterostomal therapy | 2 |
| Clinical practice of at least one year's duration in the field of nursing and/or enterostomal therapy | 2 |
| Teaching practice of at least one year in the field of nursing and/or stomatherapy | 2 |

**Source**: Fehring[22] adapted by the author.

After applying the inclusion criteria for the judges, they were approached in person and given a printed invitation letter containing the research proposal and a personalized call for experts; the Informed Consent Form (ICF); the guidelines manual on the evaluation tool; the booklet evaluation tool and the tablet with the link to access the booklet demonstration. Their work consisted of critically reading the booklet to fill in the evaluation form, which was made up of 18 items considering four requirements: objectives, structure, presentation and relevance.

The expert judges, who are stomatherapist nurses, used a 4-level support scale to evaluate the booklet, with a minimum score for the inadequate item (score = 0) and a maximum score for the totally adequate item (score = 1) [22]. The analysis of the degree of agreement between the expert judges was calculated using the average of the responses, according to the score for each item on the

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Likert-type scale. In this way, it was determined that the components/recommendations of the educational technology with a degree of agreement above 0.80 would not need to be altered and would remain unchanged in the composition of the educational technology[20]. On the other hand, those that achieved a weighted average of more than 0.50 and less than or equivalent to 0.80 could undergo changes, considering the analysis of the observations. However, recommendations with an average score of less than or equivalent to 0.50 had to be revised or discarded[22].

In order to verify the clarity, comprehension and relevance of the content presented by the educational technology, after making the corrections suggested by the expert judges, it was submitted to the evaluation of the target audience, made up of people with intestinal stomas.This second stage of data collection included 33 people with intestinal stomas for the validation of the booklet, which took place between January and April 2024.

It is worth mentioning that the inclusion criteria for people with an intestinal stoma were: being over eighteen years old, being registered as a patient at the clinic, having had an intestinal stoma for at least 6 months, being in outpatient follow-up, having received prior guidance on how to handle the stoma. Exclusion criteria were: patients who were not in good mental health, who did not come to the clinic during the validation period, even if they were patients, and who were not available to take part in the study after being approached.

The research with this audience was carried out at the Benedita M. R. Deusdará Rodrigues Stomatherapy Nursing Clinic, located at UERJ's Piquet Carneiro Polyclinic, and a questionnaire was used, constructed by the authors, taking into account the presentation, structure and content of the educational technology developed, with a view to pointing out its applicability, its use in relation to self-care needs, the evaluation of the educational technology using the instrument and tests of usability and technological appropriation.

To analyze the items judged by the target audience, data with a level of agreement greater than 0.80 in the positive responses were considered valid[15]. Items with a concordance index of less than 0.80 were considered worthy of alteration or exclusion. The index is calculated by adding up the concordance of the items marked as YES. The stage in question also involved validation in a practical context, in order to check that the educational technology met the objectives of the proposed solutions and also to make any necessary corrections, while the communication stage involved sharing the research with the public and the scientific community.

## RESULTS

To obtain the results, an integrative literature review was carried out on self-care recommendations for people with intestinal stomas, which served as the basis for constructing the content and design of the educational technology. The content and design

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were then assessed and validated by a panel of judges who are experts in the field. Subsequently, the educational technology was submitted for evaluation and validation by the people with intestinal stomas themselves, ensuring that the information was tailored to their needs. Finally, the final version of the educational technology was adjusted, incorporating the contributions received during the validation process. From this, the data will be displayed in two distinct categories: construction of the electronic educational technology and validation of the electronic educational technology, allowing for a detailed analysis of each phase of the process.

**Construction of the electronic educational technology**

Initially, data was collected for the textual content of the booklet, and searches were made for recent and relevant publications on the subject that were relevant to stoma care. As a result, 88 studies were obtained, including 77 articles, 09 dissertations and 02 theses on the subject in question.

The results presented are the fruit of the Integrative Literature Review (ILR), which enabled a detailed analysis of scientific production between 2010 and 2021. During this period, there was a significant increase in the number of publications, reflecting increased interest in various areas of knowledge. The number of articles went from 3 publications in 2010 to peaks of 14 and 15 articles in 2017 and 2019, respectively, highlighting a continuous growth in research. In 2020, production remained robust, with 12 articles published. Analysis of the levels of evidence showed that 60% of the publications were classified as level VI, with a predominance of qualitative studies, such as experience reports and content analysis. Although levels V and IV appeared less significantly, there was a gradual increase in these classifications, signaling an evolution in the quality of the studies. The separation between articles, dissertations and theses facilitated a more detailed analysis of the methodologies adopted, with articles being more concise and objective, while dissertations and theses offered a more in-depth analysis. This growth and diversification of publications indicates a significant contribution to the advancement of knowledge in the area.

In view of the above, the results of the selected studies were classified by similarities and presented through eleven thematic categories, which fall within the self-care requirements proposed by Orem, namely: “Needs of the person with an intestinal stoma related to the stoma”; ‘Care of the intestinal stoma and peristomal skin’; ‘Changing, hygiene and emptying of the collecting device’; ‘Complications related to the intestinal stoma’; ‘Repercussions on the daily life of the person undergoing an intestinal stoma’; “Nutritional suggestions for the person with an intestinal stoma“; ‘Collector devices and adjuvants’; ‘Leisure and physical activities; ’Sexuality of the person with an intestinal stoma” and “Nursing

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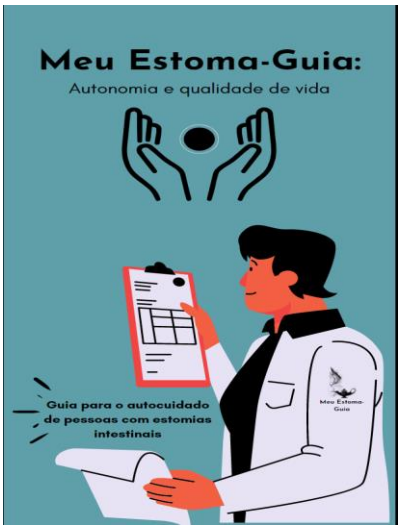
interventions to support the self-care of the person with an intestinal stoma".

**Figure 1 -** Illustration of the cover version of educational technology. Niterói/Rio de Janeiro, Brazil, 2024.




The content was arranged in the same sequence as that emerging from the integrative review, classified by similarities and presented in eleven thematic categories, which fall within the requirements of self-care.

**Chart 1 -** Content covered in each part of the first version of the educational technology entitled "*Meu estomaguia: autonomia e qualidade de vida*". Niterói/Rio de Janeiro. Brazil, 2024.

| Part of the educational technology | Content presented |
|---|---|
| Cover | Image of a nurse with a clipboard in his right hand, the care prescription in his left hand, two hands surrounding a stoma, and the title and subtitle of the educational technology. |
| Title page | Header with the name of the educational institution, title and subtitle of the educational technology and footer with the city and year in which the educational technology was produced. |
| Editorial | Presentation of the educational technology's collaborators. |
| Summary | Description of the educational technology's syllabus. |
| Historical background on self-care | Summary of Dorothea Orem's life and self-care theory |
| Presentation | It contains the reasons that prompted the development of the educational material with the aim of promoting self-care for people with intestinal stomas. |
| What are intestinal stomas (pages 07 and 08) | Concept of intestinal stomas and characteristics of a healthy stoma. |

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| | |
|---|---|
| Types of stomas (pages 09 and 10) | Presentation of ascending, transverse, descending and sigmoid colostomies, as well as ileostomy, through the location of the large and small intestine on the image. |
| Surgical classification of intestinal stomas (pages 11 and 12) | Images showing the differences between terminal, loop and double-mouthed ostomies. |
| Self-care (pages 13 to 16) | Guidance on recommended and non-recommended foods for people with an intestinal stoma, as well as instructions on the contributions of water intake, using interactive figures for the reader's better understanding. |
| Main complications related to the intestinal stoma (page 17) | Video, lasting 4:28 (four minutes and twenty-eight seconds), attached to educational technology, presenting the main complications, with the aim of familiarizing the recipient with identification related to the stoma or peristomal skin. The video includes audio of the instrumental song Night for a Lonely Soul by Brian Grey. |
| Care with the use of collecting equipment and adjuvants (pages 18 to 20) | Description of the types of collecting equipment, adjuvants and their functions. |
| Hygienizing the ostium and changing the collection bag (page 21) | Video, lasting 2:01 (two minutes and one second), attached to the educational technology, showing the steps for daily hygiene of the collecting equipment, followed by the correct way to change it. The video includes audio of the instrumental song Night for a Lonely Soul by Brian Grey. |
| Leisure and physical exercise (pages 22 to 25) | Recommendations for leisure and physical activity, with interactive images and guidance on emptying the collector before physical activity, swimming, sea bathing, travel and work. |
| Sexuality (pages 26 and 27) | Guidelines for maintaining and recovering the sexuality of people with intestinal stomas |
| Spirituality (pages 28 and 29) | Guidelines for practicing religious and spiritual activities as a support network for people with intestinal stomas, plus a 1:21 video. The video features audio of the instrumental song Fairy Tail by Yasuharu Takanashi. |
| Frequently asked questions (pages 30 and 31) | Guidelines answering the following questions: What are the possible reasons for making a stoma? and What is the difference between a temporary and permanent stoma? In addition, a video lasting 10:18 (ten minutes and eighteen seconds), attached to the educational technology, presents other possible questions. The video includes audio of the instrumental song Don't Worry be Happy by The Hit Crew. |
| Laws (page 32) | Presentation of laws and ordinances that cover the rights of people with intestinal stomas. |

**Source:** survey data, 2024.

Subsequently, the textual elaboration of the information contained in the booklet began, in a clear and objective manner, with the aim of reaching all audiences, regardless of their social class and/or level of education. The educational booklet submitted for evaluation by people with intestinal stomas contained 32 pages, measuring 150x200mm, in light and dark blue.

The title chosen for the booklet was "*Meu estomaguia: autonomia e qualidade de vida*".

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The designs and artwork for the booklet were made using the Canva graphic design platform, which allows visual elements to be created in an intuitive and accessible way. The tool made it easy to create layouts, choose colors, fonts and insert images, allowing for an aesthetic and functional presentation of the content. The platform was also essential in ensuring the visual cohesion of the booklet, providing a pleasant and clear structure to make it easier for users to understand the information. By using Canva, it was possible to integrate graphic elements in a simple and effective way, aligning the visual part with the educational objectives of the technology, ensuring that the information was not only informative, but also attractive and easy to understand for the target audience.

**Validation of the electronic educational technology**

Once the booklet had been created, it was subjected to content validation. At this stage, the electronic educational technology was evaluated by 33 judges who are specialists in the subject, the majority of whom are female, 27 (84.37%), 33 (100%) have a specialization in stomatherapy, 7 (21.87%) have a master's degree and, with regard to a doctorate, 3 (9.37%) of them reported having the title. With regard to years of training, 3 (9.37%) had completed their training 16 years ago, 4 (12.5%) between 10 and 15 years ago, 11 (34.37%) between 5 and 10 years ago and 15 (46.87%) between 1 and 5 years ago.

In relation to the evaluation by the expert judges, the items evaluated on the objectives of the educational technology generally show a high degree of adequacy. In item 1.1, which examines whether the information and content of the technology are consistent with the needs of people with an intestinal stoma, the evaluation was mostly positive, with 68.8% of respondents considering it totally adequate and 31.3% finding it mostly adequate. This score reflects a weighted average of 0.90, indicating that the majority of evaluators believe that the educational material is well aligned with the specific needs of patients with intestinal stomas.

As for item 1.2, which analyzes whether the educational technology promotes changes in behavior and attitude among individuals with intestinal stomas, the evaluation was even more favorable. With 90.6% of respondents rating it as totally adequate and 9.4% as mostly adequate, the weighted average of 0.97 suggests that the technology is effective in encouraging significant changes. Finally, item 1.3, which investigates the technology's ability to circulate in the scientific environment of stomatherapy, also obtained positive results, with 90.6% of the evaluators considering it totally adequate and 9.4% as mostly adequate, resulting in a weighted average of 0.98. These results indicate strong acceptance and potential for disseminating the material in the specialized scientific context.

For validation, the corrected version of the educational technology was made available individually to the patient and only after handling and reading the material were they asked to answer the validation instrument.

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With regard to people with intestinal stomas, the sample for this study was made up of 33 people with intestinal stomas, seen at the outpatient clinic, of both sexes and a minimum age of 22 and a maximum of 75. During the data collection period, 38 patients were invited to take part in the study, 03 said they were not interested and 02 had no time available. Among the target group, most of the patients were male, aged between 60 and 70, married, white, living in the municipalities of Queimados and Nova Iguaçu, in the Baixada Fluminense and of the Christian/Evangelical/Protestant faith.

When assessing whether the educational technology complies with the organization required to understand educational material, the proportions among the target audience were statistically no lower than 80% for item 1.3 and 97% for items 1.2 and 1.3. In terms of writing style, the material was clear and objective, with simple and friendly vocabulary, in line with the target audience. All items were considered to have positive and statistically significant responses and agreement of over 95% among the participants. With regard to the illustrations, all the items were statistically significant with a proportion of agreement among the target audience of 100%. The motivation of the educational technology also had a positive evaluation, with patients agreeing that the material presents a current and relevant topic that arouses interest in reading and contributes to the acquisition of new knowledge, serving as a tool for resolving doubts, with proportions of no less than 95% statistically significant in all the items evaluated.

## DISCUSSION

The studies analyzed indicated that, although the stoma provides benefits, it generates significant changes in the patients' experience, thus requiring adjustments and challenges to the new and unknown daily life. As a consequence, individuals often feel insecure about socializing, returning to work, adjusting their eating habits and self-care, which involves hygiene and the use of collecting equipment. This makes it essential for nurses to support people with intestinal stomas in order to facilitate their adaptation and acceptance of their new way of life and thus perform self-care[23].

The first topic assessed by the expert judges was the "**objectives**", which refer to the purposes, goals or ends that the use of educational technology is intended to achieve. Polit, Beck and Hungler[15] describe that an instrument can be said to be reliable if its measurements accurately reflect the real measurements of the attribute being investigated. When analyzing the ratings given by the judges, it can be seen that all the items were validated, as they gave Fully Adequate and Mostly Adequate ratings to all the questions.

The second topic deals with "**organization**", covering the structure and presentation of the educational technology, referring to the way in which the guidelines are presented. This includes its general organization, structure, presentation strategy, coherence and formatting. Pasquali[24] warns that this type of

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analysis aims to establish the suitability and conformity of the attributes in question. The largest number of suggestions came from this topic. Most of these suggestions were accepted.

When asked whether the educational technology is appropriate for people with intestinal stomas, and whether the messages are presented clearly and objectively, all the judges answered Fully Adequate and Mostly Adequate. On the topic of whether the information presented is scientifically correct, three judges rated it Mostly Adequate and thirty rated it Fully Adequate.

When asked about the logical sequence of the proposed content, twenty-five judges considered it Totally Adequate and eight considered it Mostly Adequate. Based on the latter assessment, a review was carried out on each topic of the educational technology and the content was given a logical sequence.

With regard to the coherence of the information on the front cover, back cover, acknowledgements and/or presentation, twenty-eight judges considered them Fully Adequate, while five classified them as Mostly Adequate. Based on this analysis, a detailed review was carried out, ensuring that each element of the educational technology followed a logical order.

Furthermore, when asked about the expressiveness and sufficiency of the illustrations, twenty-one judges rated them as Fully Adequate, eleven as Mostly Adequate and one as Adequate. In response to these comments, a review was also carried out on all the topics, ensuring that the illustrations adequately complemented the content.

The last topic assessed concerns "**relevance**", and refers to elements that assess the degree of significance of the educational material presented. When analyzing whether the topics portray key aspects that should be reinforced, it was rated Fully Adequate by twenty-eight judges and Mostly Adequate by five judges, confirming that the items covered are important in guiding patients with intestinal stomas.

Twenty-nine judges rated the educational technology as Fully Adequate and Mostly Adequate, while four judges considered it Partially Adequate. The main changes made to the educational technology were mainly in relation to aesthetics; the front and back covers were almost unchanged, with the exception of the removal of the white border from the back cover, which followed on the other subsequent pages.

From the "**sociodemographic**" survey of intestinal stoma patients, it was observed that the majority are male, followed by a smaller number of females. The same finding can be seen in the studies by Diniz *et al.*[25], Gonzaga *et al.*[26], Amaral; Sakae; Souza[27], Jesus *et al.*[28] and Ferreira *et al.*[29], which found a proportion of men attended of 56.6%, 62.8%, 60.8%, 54% and 61%, respectively. The gender variable may indicate that the male population seeks primary health care less frequently, which leads to an increase in this population group at more advanced levels of health care[30].

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In association with the "**clinical characterization of the participants**", it should be noted that ostomies are surgical procedures that can be performed for various reasons. Digestive ostomies are performed in order to drain physiological effluents, which makes them better known as elimination ostomies. In addition, they are common procedures in digestive tract surgeries and can be given different names according to their location in the intestinal segment. Among the most common factors leading to an elimination ostomy are malignant neoplasms, congenital malformations, inflammatory diseases or accidental trauma[31]. It should be noted that colorectal cancer is the main cause of elimination intestinal ostomies, whether colostomies or ileostomie[2].

To validate the corrected version of the educational technology, four phases were followed: Organization; Writing style; Appearance and Motivation.

With regard to "**organization**" and layout, the content was arranged together with the illustrations so that the reader could understand them and captions with key messages. Two fonts were used in a size suitable for reading, with attractive colors, but without making the material visually polluted with too much information[32].

The literature emphasizes that in the process of building and evaluating educational technologies, one should investigate whether they are really considered relevant for use by the target audience. Even if the content is valid and understandable, the technology needs to make a difference to reality for it to be viable to use. Therefore, with teachers in mind, it is essential that technologies for this audience highlight situations that they may encounter in their daily lives[33].

In terms of the "**writing style**", educational materials must have an interaction between the speaker, receiver and written content, making them an efficient teaching resource[25].

With regard to textual and visual content, the active participation of colostomized people in the production of material ends up helping and increasing their quality of life in physical, psychological and social aspects, thus improving their appearance, self-esteem, comfort, sexuality, among others. This participation potentially contributes to the definitive engagement of the colostomized person and can therefore also help with their general well-being[25].

Regarding the evaluation of "**appearance**", it is worth mentioning that illustrations are a relevant axis for connecting the reader with the content. It is important to try to illustrate the guidelines in order to lighten the mood, make the educational material less cumbersome and make it easier to understand, since for some people illustrations explain more than many words[34]. The alternation between verbal and non-verbal communication makes educational technology attractive, by using texts and images, which makes it easier to memorize and recall the information transmitted, favoring its assimilation[31]. Simple line drawings can promote realism without including unwanted

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details. Images should present key messages visually, without being distracting[33].

The illustrations, a decisive factor in whether or not the instruction is read, must be friendly, attract the attention of the target audience and clearly portray the purpose of the material in a way that complements and reinforces the written information. They must be attractive, clearly communicating the aim of the educational material, helping to understand the message, highlighting relevant points and keeping the reader's attention. In addition, the images must reach a high level of attention and interest in reading the material, with acceptance by the population at various levels of education[36-37].

The last stage of the evaluation was the "**motivation**" of the usability of the educational technology. In this respect, it can be said that it is a pedagogical resource capable of enabling dialogical integration between nurse-patient and family, making it possible to build multidimensional knowledge that is easily available and low-cost, capable of empowering patients and families[32].

In this context, it should be emphasized that nursing can act both in health education interventions and in the construction and validation of educational resources. These actions should take place on an ongoing basis and using a variety of methodologies[25].

In line with the above, all the items inherent to the organization, writing style, appearance and motivation of the educational technology were considered validated by the target audience, as they achieved an agreement rate of over 75%.

In light of the above, it is worth mentioning that even the items rated with Negative Responses or Impartial Responses had no suggestions for changes from the target audience. Furthermore, all the items were unanimously rated positively. Participants were asked to make suggestions or to give their opinion on the educational technology. No suggestions were made by the participants.

**Contributions of the study**

The study on the construction and validation of an educational technology for the self-care of people with intestinal stomas makes significant contributions to the practice of stomatherapy and to health education. By developing and validating a specific educational booklet, the study not only provides a valuable resource for the self-care of these patients, but also fills a gap in the existing literature. The resulting educational technology can help improve patients' understanding of the proper management of their stomas, promoting practices that minimize complications and improve quality of life. Applied methodological research ensures that the material is not only relevant, but also evidence-based and tailored to the real needs of users.

In addition, the scientific validation of the educational booklet opens doors for its integration into academic circles and clinical practice. The high suitability and acceptance observed in the evaluations indicate that the

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material is suitable for both practical application and dissemination in educational and professional contexts. This strengthens the importance of continuing education and training for health professionals, contributing to a more informed and effective approach to the management of intestinal stomas. The methodological research demonstrates the effectiveness of educational technology in fostering changes in behavior and attitude, which is crucial for successful self-care and the prevention of complications associated with ostomies.

**Limitations of the study**

The study on the construction and validation of educational technology for the self-care of people with intestinal stomas has some limitations that should be considered. Firstly, the research may have been limited by the sample selected, which, if not representative of all people with intestinal stomas, may not fully reflect the diversity of needs and experiences of these patients. In addition, the methodological study focused on specific aspects of self-care and may not have addressed all the variables and contexts that influence the effectiveness of educational technology. The generalizability of the results to different contexts or populations may be restricted, which limits the universal applicability of the conclusions.

Another important limitation is the possible absence of a longitudinal evaluation to measure the effectiveness of the educational technology over time. The validation was carried out at a specific point in time, which makes it impossible to assess the durability of the effects on patients' behavior and attitudes. In addition, the reliance on subjective methods to assess the suitability and effectiveness of the booklet may introduce bias into the evaluators' perceptions, which may not fully capture the experiences of the end users. These limitations highlight the need for future studies that include a larger sample and long-term analysis to provide a more comprehensive and lasting view of the effectiveness and applicability of educational technology.

## CONCLUSIONS

It is concluded that the construction and validation of educational technology aimed at the self-care of people with intestinal stomas is fundamental to promoting the health and quality of life of these patients. The methodological study confirmed that the booklet developed effectively meets the informational and practical needs of individuals with intestinal stomas. The high score obtained in the evaluations, which cover the adequacy of the information, encouragement to change behavior and acceptance in the scientific environment, highlights the effectiveness of the resource as an essential tool for self-care.

In turn, the results show that the booklet has a significant impact by encouraging behaviors and attitudes that help prevent complications associated with intestinal stomas. As well as motivating patients to adopt correct practices, the educational technology promotes

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active involvement in self-care, making an important contribution to health education. A proactive approach to stoma management, providing practical information, is crucial to reducing complications and improving patients' quality of life.

Finally, some limitations must be acknowledged. The representativeness of the sample and the absence of a longitudinal evaluation may affect the generalizability and durability of the results obtained. To deepen understanding of the effectiveness of educational technology, future research should consider expanding the sample to include a greater diversity of experiences and conducting long-term follow-up studies to ensure the continued effectiveness and applicability of the educational material in different contexts.

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