

## **VALIDATION EVIDENCE OF AN EDUCATIONAL BOOKLET ON CARE MEASURES WITH VASCULAR ACCESSSES FOR HEMODIALYSIS**

Francisco Gerlai Lima Oliveira<sup>1</sup> 

Gabriela Araújo Rocha<sup>2</sup> 

Ana Karoline Lima de Oliveira<sup>3</sup> 

Evelton Barros Sousa<sup>2</sup> 

Vitória Eduarda Silva Rodrigues<sup>4</sup> 

Ana Larissa Gomes Machado<sup>5</sup> 

<sup>1</sup>Universidade Federal do Ceará, Programa de Pós-graduação em Enfermagem. Fortaleza, Ceará, Brasil.

<sup>2</sup>Universidade Federal do Piauí, Departamento de Enfermagem. Picos, Piauí, Brasil.

<sup>3</sup>Escola de Saúde Pública do Ceará. Fortaleza, Ceará, Brasil.

<sup>4</sup>Universidade Federal do Piauí, Hospital Universitário. Teresina, Piauí, Brasil.

<sup>5</sup>Universidade Federal do Piauí, Programa de Pós-graduação em Enfermagem. Teresina, Piauí, Brasil.

### **ABSTRACT**

**Objective:** to verify the validation evidence of an educational booklet focused on the care of patients with vascular accesses for hemodialysis.

**Method:** the methodological study was structured into three different aspects: content validity by expert judges based on calculation of the Content Validity Index; face evaluation by design expert judges; and pilot implementation, carried out with the target population, consisting of 30 patients in a nephrology clinic from Picos, Piauí, Brazil. Data collection took place from December 2020 to April 2021, and included a descriptive and inferential analysis of the findings.

**Results:** the final version of the booklet had 32 pages, and its overall Content Validity Index was 0.88, thus proving its content validity and indicating clarity of the language, theoretical relevance and practical pertinence of the educational technology. The design expert judges rated the booklet as adequate or as with superior quality. The mean of the overall agreement rate by the target audience was 0.99.

**Conclusion:** the educational booklet presented satisfactory validation evidence, based on its face and content, with good potential for use in the clinical practice.

**DESCRIPTORS:** Renal dialysis. Educational technology. Nursing. Validation studies.

**HOW CITED:** Oliveira FGLO, Rocha GA, Oliveira AKL, Sousa EB, Rodrigues VES, Machado ALG. Validation evidence of an educational booklet on care measures with vascular accesses for hemodialysis. *Texto Contexto Enferm* [Internet]. 2023 [cited YEAR MONTH DAY]; 32:e20230212. Available from: <https://doi.org/10.1590/1980-265X-TCE-2023-0212en>

# EVIDÊNCIAS DE VALIDADE DE CARTILHA EDUCATIVA SOBRE CUIDADOS COM ACESSOS VASCULARES PARA HEMODIÁLISE

## RESUMO

**Objetivo:** verificar as evidências de validade de uma cartilha educativa acerca dos cuidados com acessos vasculares para hemodiálise.

**Método:** estudo metodológico estruturado em três vertentes: validação de conteúdo por juízes especialistas com base no cálculo do Índice de Validade de Conteúdo; avaliação de aparência por juízes de design; e aplicação piloto, realizada com a população-alvo, composta por 30 pacientes de uma clínica de nefrologia em Picos, Piauí, Brasil. A coleta de dados ocorreu de dezembro de 2020 a abril de 2021, com análise descritiva e inferencial dos achados.

**Resultados:** a versão final da cartilha contou com 32 páginas, cujo Índice de Validade de Conteúdo geral mostrou-se em 0,88, evidenciando sua validade de conteúdo e sinalizando clareza na linguagem, relevância teórica e pertinência prática da tecnologia educacional. Os juízes de design avaliaram a cartilha como adequada ou superior. A média do índice de concordância total do público-alvo foi de 0,99.

**Conclusão:** a cartilha educativa demonstrou evidências de validade satisfatórias, baseadas no conteúdo e na aparência, com potencial de utilização na prática clínica.

**DESCRITORES:** Diálise renal. Tecnologia educacional. Enfermagem. Estudos de validação.

# EVIDENCIAS DE VALIDEZ DE UN FOLLETO EDUCATIVO SOBRE PRECAUCIONES CON ACCESOS VASCULARES PARA HEMODIÁLISIS

## RESUMEN

**Objetivo:** verificar las evidencias de validez de un folleto educativo acerca de las precauciones con accesos vasculares para hemodiálisis.

**Método:** estudio metodológico estructurado en tres vertientes: validación de contenido a cargo de jueces especialistas sobre la base de calcular el Índice de Validez de Contenido; evaluación del aspecto estético a cargo de jueces especializados en diseño; y aplicación piloto realizada con la población objetivo, compuesta por 30 pacientes de una clínica de Nefrología de Picos, Piauí, Brasil. La recolección de datos tuvo lugar entre diciembre de 2020 y abril de 2021, con análisis descriptivo e inferencial de los hallazgos.

**Resultados:** la versión final del folleto tuvo 32 páginas, con un Índice de Validez de Contenido general de 0,88, evidenciando su validez en términos de contenido e indicando claridad en el lenguaje, relevancia teórica y pertinencia práctica de la tecnología educativa. Los jueces especializados en diseño calificaron al folleto al menos como adecuado. El valor medio del índice de concordancia total en la población objetivo fue 0,99.

**Conclusión:** el folleto educativo demostró evidencias de validez satisfactorias, basadas en su contenido y apariencia, con potencial para ser usado en la práctica clínica.

**DESCRIPTORES:** Diálisis renal. Tecnología educativa. Enfermería. Estudios de validación.

## INTRODUCTION

Chronic Kidney Disease (CKD) is a condition that affects 10% of the world's population and, in people over 60 years of age, its prevalence is greater than 20% and is progressively increasing<sup>1</sup>. In Brazil, the CKD scale can be clearly perceived as its estimated prevalence, in 2018, was 640 million people and the estimated number of new cases was 42,546, with a 58% absolute increase<sup>2</sup>.

The epidemiological profile of the Brazilian population shows that, in 2016, 122,825 individuals with CKD were on Renal Replacement Therapy (RRT) and that, in 2018, this number increased to 133,464. Regarding the costs incurred due to the disease, it is estimated that the country spends 1.4 billion reais per year on dialysis and transplants<sup>2-3</sup>.

Hemodialysis (HD) is the most commonly used RRT in the treatment of CKD and requires the use of a patent vascular access, with Arteriovenous Fistula (AVF) and Central Venous Catheter (CVC) as the most frequently used procedures. To improve vascular access maintenance and, consequently, provide good quality treatments with reduced costs for the Public Health system, care should be jointly performed both by the health team and by the patients themselves in order to avoid complications during treatment<sup>4</sup>.

Complications related to the vascular access are the main reasons for hospitalization among CKD patients who undergo HD, and the limitations caused by the vascular access affect their life quality<sup>5</sup>; therefore, there is a need to promote the teaching of self-care, thus encouraging patients to develop the necessary skills to perform actions related to maintenance of their vascular access.

Nursing teams that provide Nephrology care are responsible for conducting daily and straightforward patient treatments, and should routinely provide training and guidance to the patients, identifying their real needs and difficulties in the treatment and guiding strategies focused on self-care practices<sup>6</sup>.

To carry out educational practices with patients undergoing hemodialysis treatment, it is essential that nurses use dialogical methodologies focused on promoting the necessary knowledge to the patients, thus providing them with information about the health-disease process and teaching them how to recognize warning signs and make appropriate decisions to preserve the vascular access. By doing so, these patients can be empowered as critical and autonomous subjects during their treatment<sup>7-8</sup>.

In this sense, the increasing use of instructional materials in the field of health education has proved to be an important tool in therapeutic interventions and in the teaching-learning process<sup>9</sup>. Booklets are examples of effective educational technologies, as they allow readers to revisit the material on later occasions, like when they are at home, thus representing a facilitating instrument to solve doubts and reinforce verbal instructions that may be forgotten. In this way, they can improve understanding and assimilation of the topic covered, directly influencing the learning process of the target audience<sup>6</sup>.

The process of creating and validating educational booklets must spread scientifically based knowledge, strictly following the pre-established methodological stages, to then become innovative tools in the health education process, thus promoting knowledge and autonomy for HD patients. In this way, the objective of this paper was to verify the validation evidence of an educational booklet focused on the care measures with vascular accesses for hemodialysis.

## METHOD

This study refers to the development of an educational technology based on methodological studies that focus on educational technologies applicable to health care and the paths required for its creation and validation<sup>6,9-12</sup>.



The study was developed in two phases: creation and validation of the educational booklet, which include the following steps: preparation of the booklet content, content validation using a Likert Scale instrument and, subsequently, face validation by design experts; finally, implementation of the referred pilot project in patients hospitalized at a Nephrology clinic in the city of Picos, state of Piauí, Brazil.

The booklet of the was prepared based on the results of an integrative literature review made and published by the authors<sup>13</sup>. The content concerns specific care for patients who use vascular accesses for hemodialysis, such as AVF (the access site must be properly washed before every hemodialysis treatment, they must avoid lifting weight with the access arm and laying on the access arm, they should also squeeze a malleable object to ensure good access maturation and check daily for the presence of any abnormal thrill) and dual lumen catheter (the patients must preserve the catheter dressing made in the health care facility).

The content validation stage carried out by expert judges took place from December 2020 to January 2021, in virtual modality via email. An invitation letter was sent which included the study objective and the importance of validating the booklet, as well as the access link to an electronic form divided into three sections: Free and Informed Consent Form (FICF); first digital version of the booklet; and the evaluation instrument which included questions regarding their personal profile and professional training followed by questions related to the booklet, as well as a space for comments and/or suggestions.

Content expert judges with experience in the following topics participated in the study: chronic kidney disease, hemodialysis, validation of educational technologies and/or health assistance for people with chronic kidney disease undergoing hemodialysis. The study also had the participation of design expert judges graduated in Graphic Design and Art Direction as well as of audiovisual technicians.

These professionals were recruited using the snowball sampling method, which is recurrent in studies with populations that are difficult to identify<sup>14</sup>. The first content expert was selected by consulting the Lattes Platform, in which the key terms “hemodialysis”, “educational technologies” and “chronic kidney disease” were inserted. In turn, the other expert judges were subdivided into teachers/researchers and technicians/clinicians, according to their experience, performance area and area of interest<sup>10,15</sup>.

To validate the booklet’s aesthetic aspect, professionals who met at least one of the following eligibility criteria were selected: having a degree in Graphic Design, having practical experience in their training area or similar field (Art, Design, or Communication) for at least one year, and having participated in the evaluation of other validation studies regarding the aesthetic aspect of materials.

Regarding the number of expert judges, in this study we adopted a formula that considers the final proportion of the subjects in relation to a given dichotomous variable and the maximum acceptable difference of this proportion<sup>16</sup>. The calculation was defined by the formula  $n = \frac{(1.96^2 * 0.85 * 0.15)}{0.15^2}$ , thus obtaining a sample of 22 judges but, to avoid a tie, we decided to work with 21 judges: nine teachers/researchers and seven technicians/nurse clinicians, totaling 16 content expert judges and five judges specialized in design<sup>17</sup>.

Regarding validation of the booklet by the content expert judges (teachers/researchers and technicians/clinicians), we used an instrument that included the following items: objectives; structure and presentation; and relevance. The scoring system adopted to rate the experts’ answers ranged from 1 to 4 points, and they had to ground their choice on an evaluation that best represented their agreement level toward each criterion, as follows: 1- Inadequate; 2- Partially adequate; 3- Adequate; 4- Totally adequate; and N/A- Not applicable.

Regarding the validation by the judges specialized in design, an instrument adapted from the Suitability Assessment of Materials (SAM)<sup>18</sup> questionnaire was used. The scoring system adopted to rate the experts’ answers ranged from 0 to 2, where 0 - Inadequate; 1-Partially adequate; and 2- Adequate, according to their agreement level toward each evaluated criterion, which included: content, writing style, aesthetic aspect, motivation and cultural suitability of the educational material.

The evaluation by the target audience took place from February to April 2021. Non-probabilistic intentional sampling was used, following the recommendations of 30 participants<sup>19</sup>. Data collection was carried out at their homes, allowing more time for reading and analyzing the educational material. Due to the health crisis caused by the COVID-19 pandemic, the researchers used Personal Protective Equipment for their own safety and that of the participants during data collection.

Regarding evaluation of the booklet by the target audience, an adapted instrument<sup>15,19</sup> was used, which included: a) sociodemographic variables and clinical characteristics related to CKD; b) items such as organization, writing style, aesthetic aspect, and motivation. The participants marked an "X" in the available answer options for each question: positive answers (yes/easy to understand/clear/interesting/simple); neutral answers (partially/I don't know/other); and negative answers (no/difficult to understand/confusing/uninteresting/complicated). Finally, in the third part, a space was made available for the participants to express their personal opinions about the booklet.

The agreement level among the content expert judges was calculated using the Content Validity Index (CVI), and the items with CVI values greater than or equal to 0.70<sup>14,20</sup> were considered valid. To calculate the CVI, an electronic spreadsheet was created in Microsoft Excel®, where analyses were carried out regarding the agreement among the judges.

Regarding validation of the booklet by the design expert judges, the percentage of scores obtained in the SAM instrument was calculated. Interpretation of the SAM estimate percentage is expressed as follows: 70%-100% (Superior material); 40%-69% (Suitable material) or 0%-39% (Unsuitable material)<sup>18</sup>.

The analysis by the target audience was carried out considering a minimum agreement level of 75% in the positive answers among the participants<sup>11</sup>.

The study was approved by the Research Ethics Committee of *Universidade Federal de Piauí* and met the requirements of the national ethical standards for research involving human beings.

## RESULTS

A total of 16 judges participated in the content validation of the booklet: nine teachers/researchers and seven technicians/clinicians. The judges working as teachers/researchers were predominantly female (77.78%), all nurses, with a mean of 11 ( $\pm 5.53$ ) years since graduation. Regarding their academic background, 55.5% had a PhD degree, and 88.89% had developed scientific productions focused on educational technologies or validation of instruments.

Regarding the profile of the judges who worked as technicians or nurse clinicians, 57.1% were female with a mean of 7 ( $\pm 2.79$ ) years since graduation. Regarding their academic background, most of the participants were experts, and 85.7% had developed scientific publications focused on chronic kidney disease, with 42.86% on hemodialysis and/or educational technologies.

The target audience representatives consisted of 30 individuals, mostly male and aged between 60 and 80 years old, who earned a minimum wage, were married and had Incomplete Elementary School. Most of them had been undergoing treatment for one to five years and had AVF as vascular access.

In the content validation stage, the scores assigned to each answer were analyzed, followed by an overall analysis of each block and a global analysis of the instrument. In Table 1, we can see that most answers obtained CVI values greater than 0.7 (70%) for all items, indicating agreement among the judges' answers. As for the evaluation per block, we can see that they were considered adequate in 93% of the answers regarding the objectives, 88% regarding structure and presentation, and 87% regarding relevance. In terms of the global assessment of the technology, 88% of the answers considered it to be adequate. Therefore, taking these findings into account, the content proposed was considered validated by the expert judges, with a global CVI of 0.88.

**Table 1** – Evaluation made by the content judges regarding the objectives and relevance, as well as structure and presentation of the educational booklet. Picos, PI, Brazil, 2021. (n=16)

Items	I*	PA†	A ‡	TA§	CVI
<b>Block 1- Objectives</b>					
1.1 They are consistent with the needs of patients with chronic kidney disease regarding health education focused on the care measures with vascular accesses for hemodialysis.	0	1	5	10	0.93
1.2 It provides the patients with greater motivation to change their habits when taking care of their vascular accesses.	0	1	6	9	0.93
1.3 It can circulate in the scientific community, in hemodialysis and chronic kidney disease areas.	0	1	4	11	0.93
<b>Partial total</b>		<b>3(6.25%)</b>	<b>15(31.25%)</b>	<b>30(62.5%)</b>	<b>0.93</b>
<b>Block 2- Structure and presentation</b>					
2.1 The educational material is appropriate for guiding patients undergoing hemodialysis on how to take care of their vascular access.	0	1	6	9	0.87
2.2 The messages are presented in a clear and objective way.	0	2	5	9	0.87
2.3 The information presented is scientifically correct.	0	2	4	10	0.87
2.4 There is a logical sequence of content proposed.	0	2	7	7	1.00
2.5 The material is appropriate to the sociocultural level of the proposed target audience.	0	0	9	7	0.87
2.6 The information is well structured in terms of agreement and spelling.	0	2	6	8	0.93
2.7 The writing style corresponds to the knowledge level of the target audience.	0	1	8	7	0.93
2.8 The information on the cover, back cover, acknowledgments and/or foreword are coherent.	0	1	7	8	0.93
2.9 The illustrations are expressive and sufficient in number.	0	4	4	8	0.75
2.10 The number of pages is adequate.	0	1	5	10	0.93
2.11 The size of the title and topics is adequate.	1	4	2	9	0.75
<b>Partial total</b>	<b>1(0.57%)</b>	<b>20(11.36%)</b>	<b>63(35.80%)</b>	<b>92(52.27%)</b>	<b>0.88</b>
<b>Block 3- Relevance</b>					
3.1 The themes portray the key aspects that must be reinforced.	0	1	3	12	0.93
3.2 The material encourages the patients to acquire knowledge regarding the types of vascular access and care procedures recommended for each of them.	0	2	3	11	0.87

**Table 1 – Cont.**

Items	I*	PA†	A ‡	TA§	CVI
3.3 The material addresses topics required to prevent complications (infections, aneurysms, hand ischemia, hemorrhage).	0	3	5	8	0.81
3.4 It is suitable for use by any professional in the nephrology/hemodialysis fields during their educational activities.	0	2	3	11	0.87
<b>Partial total</b>		<b>8(12.5%)</b>	<b>14(21.88%)</b>	<b>42(65.62%)</b>	<b>0.87</b>
<b>Overall total</b>	<b>1(0.35%)</b>	<b>31(10.76%)</b>	<b>92(31.94%)</b>	<b>164(56.95%)</b>	<b>0.88</b>

\*Inadequate; †Partially Adequate; ‡Adequate; §Totally Adequate; ||Content Validity Index.

The items that obtained lower scores were in Block 2, “Structure and presentation”, and referred to the following topics: “The illustrations are expressive and sufficient in number”, and “The size of the title and topics is adequate”. Based on the comments and suggestions made by the judges, the layout and illustration features were remodeled, rendering them more elaborate. As for the font size, the titles are now two points larger than the body text.

Regarding face validation, the design expert judges rated the booklet as being of superior quality, as shown in Table 2.

**Table 2 – Evaluation scores by the design experts, according to the SAM instrument. Picos, PI, Brazil, 2021. (n=5)**

	SAM Score	Percentage	Rating of the Material
Judge 1	26	100%	Superior quality
Judge 2	26	100%	Superior quality
Judge 3	26	100%	Superior quality
Judge 4	24	92.3%	Superior quality
Judge 5	24	92.3%	Superior quality
<b>Mean</b>	<b>25.2</b>	<b>96.92%</b>	<b>Superior quality</b>

Once the booklet content was duly reviewed and validated, the pilot implementation phase was carried out with the target audience. Based on the data obtained, we can observe that there were no negative answers regarding the items evaluated by the patients in Table 3. Among the 13 items evaluated, 11 obtained 100% positive agreement and only two items had neutral answers; however, these participants did not make any suggestions or comments on these aspects. The overall mean of the agreement rate was 0.99.

**Table 3** – Evaluation by the target audience regarding organization, writing style, aesthetic aspect and motivation. Picos, PI, Brazil, 2021. (n=30)

Items	Positive Answers	Neutral Answers	AR*
<b>1. Organization</b>			
1.1. Did the cover draw your attention?	29	1	0.96
1.2. Is the content sequence adequate?	30	0	1.00
1.3. Is the structure of the educational booklet well organized?	30	0	1.00
<b>2. Writing style</b>			
2.1 As for understanding of the sentences, they are: Easy to understand/Difficult to understand/I don't know.	29	1	0.96
2.2 The written content is: Clear/Confusing/I don't know.	30	0	1.00
2.3 The text is: Interesting/Uninteresting/I don't know.	30	0	1.00
<b>3. Aesthetic aspect</b>			
3.1. The illustrations are: Simple/Complex/Other. Which one(s)?	30	0	1.00
3.2. Can illustrations properly complement the text? Yes/No/Other. Which one(s)?	30	0	1.00
3.3. Do the pages or sections look well organized? Yes/No/Other. Which one(s)?	30	0	1.00
<b>4. Motivation</b>			
4.1. Do you think that, upon reading this booklet, any patient undergoing hemodialysis will be able understand what it is about? Yes/No/I don't know.	30	0	1.00
4.2. Did you feel motivated to read the booklet to the end? Yes/No/I don't know.	30	0	1.00
4.3. Does the educational material cover topics required for hemodialysis patients to feel motivated to take better care of their vascular access? Yes/No/I don't know.	30	0	1.00
4.4 Did the educational booklet make you act or think about adopting new care procedures to prevent infections or loss of your vascular access?	30	0	1.00
<b>Overall Mean of the AR</b>			<b>0.99</b>

\*Agreement Rate

Once the content and aesthetic aspects were validated, the booklet reached its final version with 32 pages, entitled: "Care measure with vascular accesses for hemodialysis: What you need to know", in booklet form, with an A4 sheet folded in half, printed on coated paper, with cover, foreword, catalog card, summary and the following items: What is hemodialysis and what is it for?; Vascular access for hemodialysis; Shall we learn more about the types of vascular access for hemodialysis?; Taking care of arteriovenous fistula and prosthesis at the health care facility; Attention! The vascular access arm should not be used in the following situations!; Taking care of catheters at the health care facility; Taking care of arteriovenous fistula and prosthesis at home; Taking care of catheters at home; Shall we recall some precautions for the proper functioning of vascular accesses for hemodialysis?; Shall we learn more about potential signs of infection?; Warning signs; Shall we practice?; 7 Errors Game!; References; Notes. The final version of the booklet can be accessed in the link below<sup>1</sup>.

<sup>1</sup> [https://drive.google.com/file/d/1ye9MCHkItOVIDM4wxUJIOQ5xIBei\\_Z5i/view?usp=sharing](https://drive.google.com/file/d/1ye9MCHkItOVIDM4wxUJIOQ5xIBei_Z5i/view?usp=sharing)

## DISCUSSION

The booklet's overall CVI was 0.88, presenting results similar to those of other studies that also obtained values greater than 0.80<sup>21-22</sup>. Another study that aimed at validating a booklet reached a CVI of 0.70 and, upon finding that some aspects did not reach the expected agreement level, several reformulations regarding language and face<sup>23</sup> were required.

The validation stages carried out with the experts and the target audience are complementary and interdependent. During the judges' evaluation, it is possible to correct inconsistencies, fill in gaps and improve the educational material. Admitting the inclusion of knowledge from professionals who critically evaluate the booklet is an essential strategy to achieve a material that matches the real needs of the target audience. In this sense, the need to adjust validated materials is recurrent in methodological studies, which includes adjusting information, excluding technical or confusing terms and reformulating illustrations<sup>24</sup>.

In the booklet validated in this study, the main reformulations highlighted by the experts were related to the font size used and to the illustrations, items in which the CVI scores were lower. In this sense, based on a guide that aims at providing information design guidelines and contributions for the creation of printed educational materials in the health care sector, changes were incorporated, which included, for example, standardization of the fonts and compliance with the idea of visual unity, in addition to grouping similar elements on the same page. These adjustments make the material visually clean and also organize its elements, placing illustrations that express similar ideas next to one another, thus easing the reader's understanding<sup>25</sup>.

It is important to point out that the booklet content was validated by nurses, which contributed to the proposal of an educational material suitable both for providing explanations to the target audience and to be used as a support tool for Nursing professionals during health education actions<sup>6</sup>.

The contributions of the design/marketing expert judges were also of great value, which included, for example, turning the flat style of the illustrations, characterized by simplified and minimalist features, into a more refined and appealing visual shape. Thus, the entire Graphic Design content of the booklet was reformulated. The use of bold type and highlighting for keywords was also standardized.

The importance of developing an educational material targeted at patients who undergo hemodialysis and must care for their vascular access is shown by the fact that many of them have little understanding of the chronicity of the pathology itself and of the type of care required, thus neglecting self-care<sup>26</sup>.

A Chinese multicenter study corroborates this perspective, in which the self-care of hemodialysis patients with AVF was evaluated and it was concluded that its levels were considered from low to moderate, suggesting that it should be improved through specific guidance given by nurses<sup>27</sup>. Therefore, there is a clear need to implement effective strategies focused on guiding patients during their treatment, thus encouraging health care compliance in patients with hemodialysis vascular accesses.

To assess whether an educational technology has achieved the objectives of meeting its target audience needs, the opinion of the individuals involved is substantial and leads to a satisfactory or inconsistent assessment. In this sense, the evaluation of this booklet by the subjects achieved a agreement level above the minimum percentage proposed, with a positive evaluation of the material in terms of organization, writing style, aesthetic aspect and motivation. This result was similar to the one obtained in another study, where an educational booklet was developed and validated to promote healthy lifestyles in people with HIV, and the target audience considered its language and illustrations appropriate<sup>28</sup>.

Educational materials must take into account the patients' characteristics and, therefore, they should match their sociocultural level, include information that is relevant and be presented in

a creative and appealing way for the reader<sup>29</sup>. The importance of representing the everyday lives of these individuals is highlighted since, when there is a trustworthy relationship that is also close to their reality, they become interested in adhering to educational proposals and, consequently, they become more likely to adopting new behaviors<sup>30</sup>.

It is considered that the overall mean regarding the evaluation of this booklet by the target audience has reached a high agreement level (the overall mean of the agreement rate was 0.99), as it was developed thinking about a logical sequence of contents, presented in an accessible language. The use of technical terms to explain concepts was avoided; instead, complementary texts and illustrations were employed, organized in a way to attract the reader's interest and attention. It is noteworthy that, for the researchers to achieve this level of understanding on how the material should be finished, the validation stage previously carried out with the experts served as an important guideline. Therefore, the importance of completing the internal and external validation stages must be highlighted, and both should be sequential, complementary and interdependent in filling in gaps, as this action subsequently favors public acceptance.

Therefore, this educational booklet assumes importance in the educational support provided to patients undergoing hemodialysis therapy because it addresses, in a holistic and objective manner, aspects such as: what hemodialysis is and what is it for; the existing types of vascular access; and how to take care of accesses in the health care facility and at home, in addition to presenting situations where the vascular access arm should not be used to avoid complications, signs of infection and warning signs. The teaching approach uses accessible language, fully illustrated and filled with topics that refer to previous items so that the reader can recap and memorize what has already been explained, as well as engaging games suitable for its adult target audience. Therefore, it can circulate both in printed format and in Portable Document Format (PDF).

Regarding its limitations, the study fails to carry out a clinical validation of the educational technology, which will be subsequently conducted. Furthermore, the high cost of replicating the printed material in large volumes and making it available to patients who cannot access it online is cited as a difficulty.

Thus, this study contributes to the advancement of the Health Care and Nursing fields, as it is a methodological study focused on the production of Nursing knowledge with creativity and scientific rigor. It contributes innovation in the context of Nursing care for patients with CKD, promoting new ways of thinking and managing educational care, which ultimately provides an innovative environment for the teaching-learning process, thus favoring patients' adherence to their treatments with autonomy and increased quality of life.

## **CONCLUSION**

The educational booklet called "Care measures with vascular accesses for hemodialysis: What you need to know" showed satisfactory validation evidence based on its face and content.

It constitutes an educational technology with potential for use in the clinical practice. It may be used by Nursing teams with a focus on health education for dialysis patients and their families, thus aiming to promote self-care and, consequently, reduce complications arising from incorrect management of vascular accesses.

## REFERENCES

1. Chevalier RL. Evolution, kidney development, and chronic kidney disease. *Semin Cell Dev Biol* [Internet]. 2019 [cited 2022 Aug 12];91:119-31. Available from: <https://doi.org/10.1016/j.semcdb.2018.05.024>
2. Neves PDMM, Sesso RCC, Thomé FS, Lugon JR, Nascimento MM. Censo Brasileiro de Diálise: análise de dados da década 2009-2018. *Braz J Bras Nefrol* [Internet]. 2020 [cited 2022 Aug 20];42(2):191-200. Available from: <https://doi.org/10.1590/2175-8239-JBN-2019-0234>
3. Aguiar LK, Prado RR, Gazzinelli A, Malta DC. Fatores associados à doença renal crônica: Inquérito epidemiológico da Pesquisa Nacional de Saúde. *Rev Bras Epidemiol* [Internet]. 2020 [cited 2023 Jan 15];23:e200044. Available from: <https://doi.org/10.1590/1980-549720200044>
4. Murea M, Geary R, Davis RP, Moossavi S. Vascular access for hemodialysis: A perpetual challenge. *Semin Dial* [Internet]. 2019 [cited 2022 Aug 12];32(6):527–34. Available from: <http://doi.org/10.1111/sdi.12828>
5. Lawson JH, Niklason LE, Roy-Chaudhury P. Challenges and novel therapies for vascular access in haemodialysis. *Nat Rev Nephrol* [Internet]. 2020 [cited 2022 Nov 5];16:586–602. Available from: <https://doi.org/10.1038/s41581-020-0333-2>
6. Freitas LR, Pennafort VPS, Mendonça AEO, Pinto FJM, Aguiar LL, Studart RMB. Cartilha para o paciente em diálise renal: Cuidados com cateteres venosos centrais e fístula arteriovenosa. *Rev Bras Enferm* [Internet]. 2019 [cited 2022 Aug 12];72(4):947-53. Available from: <https://doi.org/10.1590/0034-7167-2018-0131>
7. Clementino DC, Souza AMQ, Barros DCC, Carvalho DMA, Santos CR, Fraga SN. Pacientes em hemodiálise: importância do autocuidado com a fístula arteriovenosa. *Rev Enferm UFPE on line* [Internet]. 2018 [cited 2022 Aug 12];12(7):1841-52. Available from: <https://doi.org/10.5205/1981-8963-v12i7a234970p1841-1852-2018>
8. Lavich CRP, Terra MG, Arnemann CT, Mello AL, Raddatz M. Educação em saúde e educação permanente: Ações que integram o processo educativo da enfermagem. *Rev Baiana Enferm* [Internet]. 2018 [cited 2022 Sep 15];32:e24719. Available from: <https://periodicos.ufba.br/index.php/enfermagem/article/view/24719>
9. Sena JF, Silva IP, Lucena SKP, Oliveira ACS, Costa IKF. Validation of educational material for the care of people with intestinal stoma. *Rev Latino-Am Nursing* [Internet]. 2020 [cited 2022 Sep 15];28:e3269. Available from: <http://doi.org/10.1590/1518-8345.3179.3269>
10. Moura JRA, Silva KCB, Rocha AESH, Santos SD, Amorim TRS, Silva ARV. Construction and validation of a booklet to prevent overweight in adolescents. *Acta Paul Enferm* [Internet]. 2019 [cited 2022 Aug 12];32(4):365-373. Available from: <https://doi.org/10.1590/1982-0194201900051>
11. Lima ACMACC, Bezerra KC, Sousa DMN, Rocha JF, Oriá MOB. Development and validation of a booklet for prevention of vertical HIV transmission. *Acta Paul Enferm* [Internet]. 2017 [cited 2022 Dec 1];30(2):181-9. Available from: <https://doi.org/10.1590/1982-0194201700028>
12. Mello N da C, Góes FGB, Pereira-Ávila FMV, Moraes JRMM de, Silva LF da, Silva M da A. Construction and validation of an educational booklet for mobile devices on breastfeeding. *Texto Contexto Enferm* [Internet]. 2020 [cited 2023 Sep 17];29:e20180492. Available from: <https://doi.org/10.1590/1980-265X-TCE-2018-0492>
13. Rocha GA, Oliveira AKL, Oliveira FGL, Rodrigues VES, Moura AGS, Sousa EB, et al. Cuidados com o acesso vascular para hemodiálise: revisão integrativa. *Rev Cuidarte* [Internet]. 2020 [cited 2021 Sep 15];12(3):e2090. Available from: <https://doi.org/10.15649/cuidarte.2090>
14. Polit DF, Beck CT. Fundamentos de pesquisa em enfermagem: Avaliação de evidências para a prática de enfermagem. 7th ed. Porto Alegre: Artmed; 2011

15. Santiago JCS, Moreira TMM. Booklet content validation on excess weight for adults with hypertension. *Rev Bras Enferm* [Internet]. 2019 [cited 2022 Sep 15];72(1):102-8. Available from: <https://doi.org/10.1590/0034-7167-2018-0105>
16. Arango HG. *Bioestatística teórica e computacional*. 3rd ed. Rio de Janeiro: Guanabara Koogan; 2009
17. Vianna HM. *Testes em educação*. 5th ed. São Paulo: IBRASA; 1982
18. Doak CC, Doak LG, Root JH. *Teaching patients with low literacy skills*. 2nd ed. Philadelphia: J.B. Lippincott; 1996
19. Beaton D, Bombardier C, Guillemin F, Ferraz MB. Recommendations for the Cross-Cultural Adaptation of the DASH & Quick DASH Outcome Measures [Internet]. Ontario: Institute for Work & Health; 2007 [cited 2021 Oct 22]. Available from: [https://dash.iwh.on.ca/sites/dash/files/downloads/cross\\_cultural\\_adaptation\\_2007.pdf](https://dash.iwh.on.ca/sites/dash/files/downloads/cross_cultural_adaptation_2007.pdf)
20. Alexandre NMC, Coluci MZO. Validade de conteúdo nos processos de construção e adaptação de instrumentos de medidas. *Cienc Saúde Coletiva* [Internet]. 2011 [cited 2022 Nov 15];7(16):3061-8. Available from: <https://doi.org/10.1590/S1413-81232011000800006>
21. Rodrigues LN, Santos AS, Gomes PPS, Silva WCP, Chaves EM. Construction and validation of an educational booklet on care for children with gastrostomy. *Rev Bras Enferm* [Internet]. 2020 [cited 2022 Aug 12];73(3):e20190108. Available from: <http://doi.org/10.1590/0034-7167-2019-0108>
22. Cunha MBS, Frota KC, Ponte KMA, Felix TA. Construction and validation of an educational booklet to provide care for snakebite victims. *Rev Gaúcha Enferm* [Internet]. 2020 [cited 2023 Mar 15];41:e20190467. Available from: <https://doi.org/10.1590/1983-1447.2020.20190467>
23. Wild CFW, Nietsche E, Salbego C, Teixeira E, Favero NB. Validation of educational booklet: An educational technology in dengue prevention. *Rev Bras Enferm* [Internet]. 2019 [cited 2023 Mar 15];72:1318-25. Available from: <http://doi.org/10.1590/0034-7167-2018-0771>
24. Moura JR, Silva KC, Rocha AE, Santos SD, Amorim TR, Silva AR. Construção e validação de cartilha para prevenção do excesso ponderal em adolescentes. *Acta Paul Enferm* [Internet]. 2019 [cited 2022 Aug 12];32(4):365-73. Available from: <https://doi.org/10.1590/1982-0194201900051>
25. Freitas RF, Waechter HN, Coutinho SG, Gubert FA. Validação de aspectos semânticos em diretrizes para elaboração de Materiais Educativos Impressos para Promoção da Saúde: contribuição do Design da Informação. *InfoDesign* [Internet]. 2020 [cited 2023 Aug 19];17(1):152-69. Available from: <https://doi.org/10.51358/id.v17i1.759>
26. Poorgholami F, Abdollahifard S, Zamani M, Kargar Jahromi M, Badiyepeyma Jahromi Z. The effect of stress management training on hope in hemodialysis patients. *Glob J Health Sci* [Internet]. 2016 [cited 2022 Aug 12];8(7):165-71. Available from: <http://doi.org/10.5539/gjhs.v8n7p165>
27. Yang MM, Zhao HH, Ding XQ, Zhu GH, Yang ZH, Ding L, et al. Self care behavior of hemodialysis patients with arteriovenous fistula in China: A multicenter, cross sectional study. *Ther Apher Dial* [Internet]. 2018 [cited 2023 Feb 15];23(2):167-72. Available from: <https://doi.org/10.1111/1744-9987.12770>
28. Fontenele MSM, Cunha GH, Lopes MVO, Siqueira LR, Lima MAC, Moreira LA. Development and evaluation of a booklet to promote healthy lifestyle in people with HIV. *Rev Bras Enferm* [Internet]. 2021 [cited 2023 Mar 15];74(Suppl 5):e20200113. Available from: <https://doi.org/10.1590/0034-7167-2020-0113>
29. Cardoso RSS, Sá SPC, Domingos AM, Sabóia VM, Maia TN, Padilha JMFO, et al. Educational technology: A facilitating instrument for the elderly care. *Rev Bras Enferm* [Internet]. 2018 [cited 2021 Oct 21];71(Suppl 2):786-92. Available from: <http://doi.org/10.1590/0034-7167-2017-0129>

30. Grudniewicz A, Bhattacharyya O, McKibbin KA, Straus SE. Redesigning printed educational materials for primary care physicians: design improvements increase usability. *Implement Sci* [Internet]. 2015 [cited 2022 Aug 20];10:156. Available from: <http://doi.org/10.1186/s13012-015-0339-5>



## NOTES

### ORIGIN OF THE ARTICLE

Extracted from the Research Project - "Creation and validation of an educational technology on care measures with vascular accesses for hemodialysis therapy, developed at *Universidade Federal do Piauí – Senador Helvídio Nunes de Barros* Campus – Nursing Department/Nursing course, and presented in 2022.

### CONTRIBUTION OF AUTHORITY

Study design: Rocha GA, Machado ALG.

Data collection: Oliveira FGLO, Rocha GA, Oliveira AKL, Sousa EB, Machado ALG.

Data analysis and interpretation: Oliveira FGLO, Rocha GA, Sousa EB, Machado ALG.

Discussion of results: Oliveira FGLO, Rocha GA, Oliveira AKL, Sousa EB, Rodrigues VES, Machado ALG.

Writing and/or critical review of the content: Oliveira FGLO, Rocha GA, Oliveira AKL, Sousa EB, Rodrigues VES, Machado ALG.

Review and final approval of the final version: Oliveira FGLO, Rocha GA, Oliveira AKL, Sousa EB, Rodrigues VES, Machado ALG.

### FUNDING INFORMATION

Project funded by the Piauí State Research Support Foundation (*Fundação de Amparo à Pesquisa do Estado do Piauí*, FAPEPI) (Process No.: 5198.UNI253.56796.10052018).

### APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Approved by the Ethics Committee in Research of the *Universidade Federal do Piauí, Senador Helvídio Nunes de Barros* Campus, opinion No.2,668,544 and Certificate of Presentation for Ethical Appraisal 89268518.1.0000.8057.

### CONFLICT OF INTEREST

There is no conflict of interest.

### EDITORS

Associated Editors: Luciara Fabiane Sebold, Maria Lígia dos Reis Bellaguarda.

Editor-in-chief: Elisiane Lorenzini.

### HISTORICAL

Received: August 22, 2023.

Approved: October 02, 2023.

### CORRESPONDING AUTHOR

Francisco Gerlai Lima Oliveira

gerlailima@gmail.com

