

EDUCATIONAL TECHNOLOGY FOR PEOPLE WITH CHRONIC RENAL DISEASE: CONSTRUCTION AND VALIDATION OF CONTENT

Tecnologia educacional para pessoas com doença renal crônica: construção e validação de conteúdo

Tecnología educativa para personas con enfermedad renal crónica: construcción y validación de contenido

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ABSTRACT

Objective: To describe the construction and content validation of an educational booklet technology for people with Chronic Kidney Disease. **Method:** Methodological research developed in four phases: situational diagnosis; literature review; booklet preparation and content validation with five experts. The participants in the elaboration process were 48 people on hemodialysis and, validating, five health professionals. **Results:** The situational diagnosis consisted of interviews with hemodialysis patients who agreed to participate, who chose the booklet technology that addressed the themes of food and kidney transplantation. The literature review aimed to delve into the chosen themes and build the booklet, using clear language and illustrative figures. The booklet was sent to five experts in the area for content validation. **Conclusion:** The construction and validation of educational technology booklet aims to promote self-care of people with Chronic Kidney Disease, based on dietary guidelines and kidney transplantation.

DESCRIPTORS: Renal insufficiency chronic; Health education; Educational technology; Validation studies; Nursing.

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RESUMO

Objetivo: Descrever a construção e validação de conteúdo de uma tecnologia educativa do tipo cartilha para pessoas com Doença Renal Crônica. **Método:** Pesquisa metodológica desenvolvida em quatro fases: diagnóstico situacional; revisão de literatura; elaboração da cartilha e validação do conteúdo com cinco *experts*. Os participantes do processo de elaboração foram 48 pessoas em hemodiálise e, de validação, cinco profissionais de saúde. **Resultados:** O diagnóstico situacional foi composto pelas entrevistas com os pacientes em hemodiálise que aceitaram participar, os quais escolheram a tecnologia tipo cartilha que abordassem os temas alimentação e transplante renal. A revisão da literatura teve como objetivo aprofundar sobre as temáticas escolhidas e construir a cartilha, com uso de linguagem clara e figuras ilustrativas. A cartilha foi encaminhada para cinco *experts* da área para a realização da validação do conteúdo. **Conclusão:** A construção e validação da tecnologia educativa tipo cartilha visa promover o autocuidado das pessoas com Doença Renal Crônica, a partir de orientações sobre alimentação e transplante renal. **DESCRITORES:** Doença renal crônica; Educação em saúde; Tecnologia educacional; Estudos de validação; Enfermagem.

RESUMEN

Objetivo: Describir la construcción y validación de contenido de una tecnología educativa tipo folleto para personas con enfermedad renal crónica. **Método:** Investigación metodológica desarrollada en cuatro fases: diagnóstico situacional; revisión de literatura; preparación de folletos y validación de contenido con cinco expertos. Los participantes en el proceso de elaboración fueron 48 personas en hemodiálisis y, validando, cinco profesionales de la salud. **Resultados:** El diagnóstico situacional consistió en entrevistas con pacientes de hemodiálisis que aceptaron participar, quienes eligieron la tecnología de folleto que abordó los temas del trasplante de alimentos y riñón. La revisión de la literatura tuvo como objetivo profundizar en los temas elegidos y construir el folleto, utilizando un lenguaje claro y figuras ilustrativas. El folleto se envió a cinco expertos en el área para la validación de contenido. **Conclusión:** La construcción y validación del folleto de tecnología educativa tiene como objetivo promover el autocuidado de las personas con enfermedad renal crónica, según las pautas dietéticas y el trasplante de riñón. **DESCRITORES:** Insuficiencia renal crónica; Educación en salud; Tecnología educacional; Estudios de validación; Enfermería.

INTRODUCTION

The increase in life expectancy and eating habits, linked to genetic alterations has increased the cases of the population with some renal impairment. North American countries like Canada and the United States of America have about 8% of the population with kidney problems. In Brazil, the incidence and prevalence rate has shown the same result, with a gross mortality rate reaching 18.2% of the population.^{1,2}

The development of Chronic Kidney Disease (CKD) is multifactorial and requires prolonged and systematized

treatment. Dialysis sessions require an average of three days a week lasting three to four hours per session and influence various aspects of the individual, such as social isolation, anguish due to body changes and anxiety about healing, which favors the manifestation of depressive mood, damaged self-image, and pessimistic feelings.¹⁻³

It is necessary to guarantee support to these patients for the success of the treatment. It should be noted that the family is fundamental and needs to reorganize the roles and routine of care for the sick person, offering support and encouraging adaptation and recovery, and significantly influencing the quality of their life.^{1,3}

In the unique context of each person with CKD, the health professional needs to offer comprehensive, humanized care and using health education strategies to assist in this process of adaptation and adherence to strict treatment, working directly with this population in the development of strategies aimed at strengthening and promoting autonomy and self-care practices, periodically guiding their doubts and difficulties in the treatment process.^{4,5}

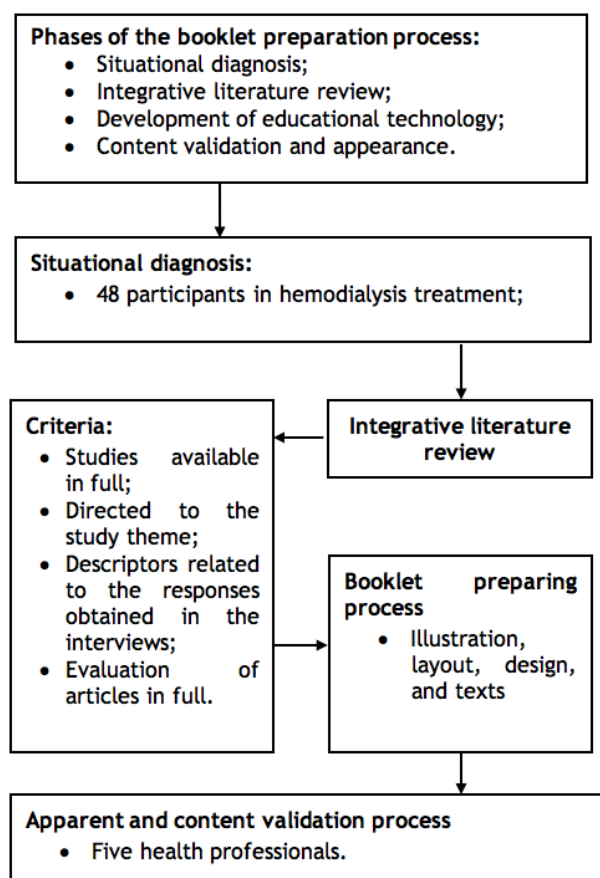
Bearing in mind the aforesaid, the importance of health education as a promotion strategy for self-care is emphasized. This practice contributes to the formation of skills and competences for self-care and promotes autonomy through knowledge. Educational interventions aim to transmit knowledge while encouraging people to get involved and understand the processes they experience. In this context, educational technologies are presented as an important strategy for carrying out training activities.^{4,5}

Nursing uses several educational technologies to disseminate information, booklets and software being the most used resources, in addition to sites, videos, manuals, notebook, educational games, and websites.⁴ The educational booklet is highlighted as an important technology, facilitating teaching-learning, as it is an instrument that accurately enables the dissemination of knowledge. The use of this type of technology in educational interventions favors reinforcement of verbal guidelines and clarification of possible doubts.^{4,6,7} Therefore, the present study has aimed to describe the content structuring and validation of the educational technology of the booklet type for people bearing CKD.

METHODS

It is a methodological research for the development, validation and evaluation of research tools and methods,⁸ which was performed in four phases: situational diagnosis; literature review; elaboration of illustrations, layout, design and texts, and apparent and content validation (**Figure 1**).⁸

Figure 1 - Presentation of the developing educational technology process for people bearing chronic kidney disease. *Maringá* city, *Paraná* State, Brazil, 2017.



In the first phase, in the situational diagnosis, 48 patients participated in the nephrology service of a hospital in the city of *Maringá*, *Paraná* State, Brazil. The sample was for convenience and the inclusion criteria were as follows: patients with a diagnosis of CKD; undergoing hemodialysis treatment; between 18 and 59 years old; do not present any functional problem that prevents verbal communication.

The approach with the subjects was intermediated by the nursing team of the nephrology service and semi-structured, individual interviews were carried out in all hemodialysis shifts, which include morning, afternoon and night. Data collection took place from July to August 2017 and each interview lasted 10 to 15 minutes.

Two guiding questions were used for the interview: What topics do you consider important to be addressed in the educational material? What educational material do you consider to be most suitable to facilitate understanding about health care? The meetings were recorded on a digital device and later transcribed in full.

The identification of the themes served as a basis for carrying out the second phase, the literature review. The first literature survey was conducted on the Virtual Health Library (VHL), using the Health Science Descriptors “renal insufficiency, chronic”, “renal dialysis”, “Feeding”, “diet”, “kidney transplantation”, “transplantation”, and

“graft rejection”. We used the controlled descriptor “renal insufficiency, chronic” associated through the Boolean operator AND to the aforementioned descriptors. Studies published between 2013 and 2017 were included, with the aim of covering the most recent studies in the area of interest.

In operational terms, the analysis of the interviews followed the steps: 1) Establishment of the Corpus, which consists of delimiting the number of interviews to be worked on, the quality of the analysis replaces the quantity of the material; 2) Preparation of the material: exhaustive transcription of the material, preserving the record of the word such as silences, laughter, repetitions, lapses, sounds, and others; 3) Stages of analysis: collective alignment was sought to find the logic that structures the individual’s discourse, style, and atypical elements.⁹

The third stage involved the development of educational technology. From the results obtained in the first and second phases. The preliminary content and illustrations that made up the booklet were selected. The contents that integrated it were based on scientific articles and specialized literature in the area of nephrology, selected in the review of the previous step. The illustrations that made up the booklet were images without restriction of use or sharing by Google.

The fourth step was the content and apparent validation. Such procedures are applied after the structuring and organization of the technology and test the hypothesis that the chosen themes adequately represent its objective, evaluated by experts in the area addressed.¹⁰ Therefore, professional experts were considered to be those who presented at least one of the following inclusion criteria: holding a specialization, master’s or doctorate degree in the area of interest and having professional experience with hemodialysis patients.

Eleven evaluators were invited, including two professors from the nursing department of the adult health area, two nephrologist professors working in the clinic where the research was conducted, three nurses from the nephrology area and four nursing graduate students, who were researching in the area chronic non-communicable diseases. The invitation was made through formal contact, via e-mail, where they were informed about the objectives proposed in the research and the deadline for sending the evaluation.

Five experts accepted the invitation to which an evaluation instrument was sent, as proposed by Medeiros,¹¹ adapted by the author. The first five questions deal with the general organization, presentation strategy, formatting, and coherence, then five questions on the linguistic characteristic, comprehension and style of writing, and the final five questions assess the relevance of the material.

The instrument was organized as a Likert scale, with four levels of response: 1. Totally adequate, 2. Adequate, 3. Partially adequate, 4. Inadequate. Experts could also make suggestions and comments to improve items rated “Partially adequate” or “Inadequate”.^{12,13}

The agreement between the judges was verified through the Content Validity Index (CVI), which measures the

proportion of judges who agree on certain aspects of the booklet and its items covered. The calculation was performed based on the sum of the answers “Totally adequate” and “Adequate” of each judge in each item of the evaluation questionnaire and was divided by the total number of responses.¹² For this study, the validity parameter was considered, the agreement index from 80%.^{13,14}

The development of the study was carried out following the resolution 466/2012 of the National Health Council. The project was approved by the *Comitê de Ética em Pesquisa com Seres Humanos (COPEP)* [Ethics Committee in Research with Human Beings] of the *Universidade Estadual de Maringá*, receiving favorable Legal Opinion No. 2.093.429/2017. All participants signed the Informed Consent Form in two copies.

RESULTS

Based on the answers obtained in the first phase of this study, the type of educational technology to be developed and which themes should compose it were established. The booklet was the educational technology selected because it was the preference of the participants (66.7%), and the main themes chosen were concerning to food (26.9%) and kidney transplantation (23.1%) (Table 1). The educational technology was called “Guidebook for people bearing CKD”, consisting of a cover and 20 pages.

Table 1 - Themes for educational material for people bearing chronic kidney disease undergoing hemodialysis. Maringá City, Paraná State, Brazil, 2017.

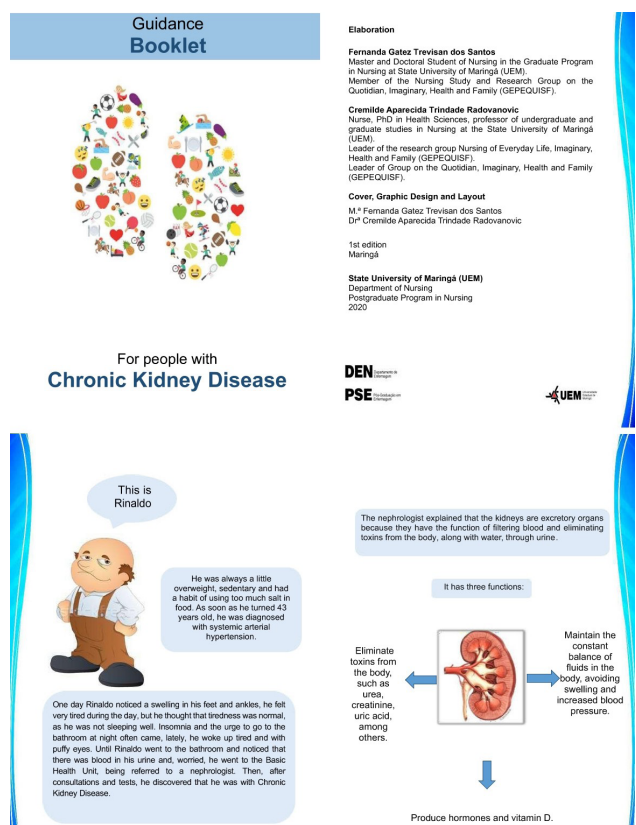
Themes	N	%
Feeding	14	26.9
Transplant	12	23.1
Fluid intake	4	7.7
Causes of CKD	4	7.7
How the body works without the kidney	3	5.8
Research and news about CKD	2	3.8
Possibility of artificial kidney	2	3.8
Why CKD is irreversible	2	3.8
Fistula care	1	1.9
CKD patient's legal rights	1	1.9
Dry weight	1	1.9
Pressure drop during hemodialysis	1	1.9
Care for pregnant women with CKD	1	1.9
Relationship between diuresis and CKD	1	1.9
Most suitable physical activities	1	1.9
Operation of the hemodialysis machine	1	1.9
Why cramps occur and how to avoid them	1	1.9

Source: The author. CKD: Chronic Kidney Disease.

After defining the themes to be included in the booklet, the selection of contents started. To support the preparation of the booklet, a literature review was carried out and the relevant information was selected and organized to compose a logical sequence. A total of 16 studies were read, added to the data obtained in the first phase of the research, and then the content was divided into nine topics: what constitutes CKD; hemodialysis; feeding “what can I eat?”; feeding “what I cannot eat”; water restriction; transplant “advantages and disadvantages”; compatibility tests; types of rejection and post-transplant care.

The booklet begins with the presentation of the main character, showing his/her illness process. Afterward, necessary information about CKD was addressed, these were written in the form of guidelines to facilitate the understanding of the information, all followed by illustrations. Each page had an average of two illustrations (Figure 2). The booklet can be found in its entirety in the Supplementary Document.

Figure 2 - Presentation of the booklet with guidelines for people bearing Chronic Kidney Disease. Maringá City, Paraná State, Brazil, 2017.



Note: The booklet's statements were kept as in their original language (Portuguese).

A logical sequence followed, such as kidney functions, the most important diseases related to kidney injury, consisting of CKD, dialysis treatment. Throughout the booklet, the character's trajectory and adaptation to treatment

are portrayed. Next, the guidelines regarding food and water restriction, kidney transplantation, their advantages and disadvantages, compatibility tests, types of rejection and post-transplant care were discussed.

After the process of preparing the educational booklet, apparent and content validation was initiated, which was carried out by five evaluators, one teacher, and four nurses. One PhD in nursing, three MSc and one specialist in nephrology. The suggestions were related to writing, cohesion and semantics and inclusion of images to improve understanding.

The items of linguistics, comprehension, and style of writing had the lowest scores, being considered suitable for two evaluators and partially suitable for three evaluators, a review of semantics and cohesion in some sentences of the booklet was suggested to facilitate understanding. As for the general organization items of the booklet, the cover was considered attractive and indicates the content of the material, the font size was considered adequate, as well as the number of pages and the sequence in the information.

Table 2 - Calculation of the Content Validity Index (CVI) of educational technology for people bearing chronic kidney disease undergoing hemodialysis. *Maringá* city, *Paraná* State, Brazil, 2017.

	Totally adequate	Adequate	Partially adequate	Inadequate	CVI
General organization, presentation strategy, formatting, and coherence					0.84
The cover can be attractive. Indicates the content of the material;	3	2			1.00
Title and content size of topics is appropriate;	3	2			1.00
Topics have a sequence.	1	3	1		0.80
There is consistency between the information.	2	2	1		0.80
The number of pages is adequate.	2	2	1		0.80
The terms portray important key aspects.	2	2	1		0.80
Linguistic characteristics, comprehension, and writing style					0.82
It is possible to understand all the information contained in the booklet;	2	2	1		0.80
Is the text interesting? Does the text encourage you to continue reading?	1	2	2		0.60
The vocabulary is accessible.	3	2			1.00
The text is clear.	3	2			1.00
The writing style corresponds to the patients' level of knowledge.	1	2	2		0.60
Material relevance					0.92
The material is appropriate for the age and culture of the patients.	3	2			1.00
The material is presented logically.	3	2			1.00
The booklet addresses the issues necessary for the patient undergoing dialysis.	4	1			1.00
It promotes change in behavior and attitude.	2	2	1		0.80
The booklet proposes to the patient to acquire knowledge to perform self-care.	2	2	1		0.80

Source: The authors. CVI: Content Validity Index.

As for the relevance of the material, it was considered totally appropriate by two evaluators, suitable by two evaluators and partially adequate by one evaluator. The suggestions were incorporated into the booklet and forwarded to the experts. The CVI was calculated and presented 80% individual agreement and, in general, it presented 0.84%.

DISCUSSION

Nowadays, the nursing profession has adopted the use of technologies to assist in its activities, whether they are assistance, administrative or educational. The difficulties and scarcity of resources in health services make the educational practice monotonous, discouraging, and repetitive for the clientele.¹⁵ Such technologies are important, as they provide information that improves the patient's knowledge and coping with their chronic disease, making them able to understand how their actions influence their health.⁷

The use of educational technologies also helps in communication between the health team, patients, and their families, offering guidance on care. However, for communication to be efficient, technologies should never replace the exchange of experiences, dialogue, and the human bond. Thus, participants can be active in the process of building their knowledge.¹⁶

In preparing this research, patients' knowledge and doubts were considered, as the literature reveals that this is an important factor to guide the research. The type of technology chosen by the participants was the booklet, which is justified because it is a technology that is easily accessible, manipulated and understood by its readers. Furthermore, the booklets have proved to be an important means of health education, as previously mentioned.¹⁶

After building an educational technology, content validation is required. This type of validation is performed by expert judges and has been widely used by researchers in the assessment of technologies.⁷ The Ministry of Health highlights that the language used in educational technologies is a requirement that requires careful attention, as it can facilitate or hinder the capture of the message conveyed, so the text must be clear, objective and appropriate to the patient's characteristics, as well as to their culture.^{7,17,18}

In a validation study of a booklet on sickle cell disease, the language and presentation were well evaluated by the judges, who consider it important to make changes to some terms to make the text more understandable, which was requested in the validation of this booklet. The clearest and most easily understood language facilitates the understanding of the guidelines that are provided and enhances decision-making and the self-care process.¹⁹

The evaluators requested that the information be directed to the public with CKD, undergoing hemodialysis, because they understand that the needs about the disease are much broader than the diet and the transplantation process, which would make the booklet with a lot of information and exhaustive for the reader. A booklet validation study on the management of health actions to prevent child diarrhea pointed out that the requested changes, restricting to the pediatric-infantile population and according to the instructional level of the child and those responsible, were relevant because the self-care practices were different.²⁰

As for the illustrations, it was requested to insert figures that addressed the proposed theme in certain pages, which was accepted in the reformulation of the technology. A similar result was evidenced in a study that validated an educational booklet for overweight in people bearing hypertension, in which the illustrations were fundamental points to encourage the reader to better understand the recorded information.²¹

Concerning the study relevance, most judges assessed all questions as adequate or totally adequate, with the domain being best evaluated in the booklet. This assessment reinforces the need for the booklet developed in this circular survey among people bearing CKD, to strengthen self-care

practices, promoting knowledge about food and reducing doubts about the kidney transplantation process, improving care about their health.²²

Regarding the themes evidenced by the interviews with the participants of the present research, it corroborates the literature review carried out in Brazil, in which feeding was one of the most prevalent points in the studies included in the assessment. People bearing CKD undergoing hemodialysis need strategies to manage hunger, mainly due to dietary restrictions imposed by the treatment of renal replacement therapy.²³

The need for information on transplantation that includes numerous doubts about the process should not be just a topic of educational technologies. Health professionals must use the critical-reflective dialogue so that the patient can share their experience and build knowledge about the surgical process and care in the postoperative period. Health professionals are called upon to provide health care in a resolute manner, with a care character and guidance and training in health.²⁴

Conclusively, the development of this educational technology and its validation, proved to be an important instrument for health education, mainly because this construction occurred with the participation of patients with kidney disease, both in the choice of the type of technology, and the theme to be addressed. As a limitation of the study, it is noteworthy that booklet-type technology is not inclusive for visually impaired and illiterate patients. The specificity of the participants who chose the theme and style of technology is also a limitation, as they all reside in the city of *Maringá* and are assisted by the same institution that provides the hemodialysis service.

CONCLUSIONS

The realization of this study made it possible to describe the process of construction and validation of the educational booklet to assist in the self-care of patients with CKD, sustained between the needs of the people interviewed and the scientific knowledge about the topic addressed.

Due to the importance of the subject, it is necessary to develop educational technologies in health, carried out in a coherent, continuous, and sensitive way to the needs of the population. The Guidance Booklet for people bearing Chronic Kidney Disease is a tool for health education, which can assist in the teaching-learning process of the patient affected by the disease, promoting the acquisition and improvement of skills in self-care.

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