

Construction and validation of self-care educational technology for caregivers

Construção e validação de tecnologia educacional de autocuidado para cuidadores informais
Construcción y validez de tecnología educacional de autocuidado para cuidadores

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ABSTRACT

Objectives: to build and validate educational self-care technology for informal caregivers. **Methods:** methodological study, anchored in the Delphi technique, carried out in a municipality in the state of Paraná, Brazil, between September 2018 and November 2019. It was developed in three stages: situational diagnosis; elaboration of educational technology; content and appearance validation by expert judges and informal caregivers, using the content validity index and coefficient of variation. **Results:** after the steps of the methodological process, an educational technology called "Taking Care of Those Who Care" was produced, as an information tool that deals with the self-care of informal caregivers, receiving a content validity index above 0.86 and a variation coefficient. below 20% on all items. **Conclusions:** the educational technology was built and evaluated with satisfactory rates by the specialists and target audience, showing a high correlation of agreement, characterizing it as adequate and informative to informal caregivers. **Descriptors:** Educational Technology; Health Education; Validation Studies; Caregivers; Self-care.

RESUMO

Objetivos: construir e validar uma tecnologia educacional de autocuidado para cuidadores informais. **Métodos:** estudo metodológico, ancorado na técnica Delphi, realizado em um município do estado do Paraná, Brasil, entre setembro de 2018 a novembro de 2019. Desenvolveu-se em três etapas: diagnóstico situacional; elaboração da tecnologia educacional; validação de conteúdo e aparência por juízes especialistas e por cuidadores informais, por meio do índice de validade de conteúdo e coeficiente de variação. **Resultados:** após as etapas do processo metodológico, produziu-se uma tecnologia educacional denominada "Cuidando de Quem Cuida", como instrumento informativo que versa sobre o autocuidado de cuidadores informais, recebendo avaliação do índice de validade de conteúdo acima de 0,86 e coeficiente de variação abaixo de 20% em todos itens. **Conclusões:** a tecnologia educacional foi construída e avaliada com índices satisfatórios pelos especialistas e público-alvo, apresentando alta correlação de concordância, caracterizando-a como adequada e informativa a cuidadores informais.

Descritores: Tecnologia Educacional; Educação em Saúde; Estudos de Validação; Cuidadores; Autocuidado.

RESUMEN

Objetivos: construir y validar una tecnología educacional de autocuidado para cuidadores informales. **Métodos:** estudio metodológico, ancorado en la técnica Delphi, realizado en un municipio de Paraná, Brasil, entre septiembre de 2018 a noviembre de 2019. Desarrolló en tres etapas: diagnóstico situacional; elaboración de la tecnología educacional; validez de contenido y apariencia por jueces especialistas y por cuidadores informales, por medio del índice de validez de contenido y coeficiente de variación. **Resultados:** después de las etapas del proceso metodológico, produjo una tecnología educacional denominada "Cuidando de Quien Cuida", como instrumento informativo que versa sobre el autocuidado de cuidadores informales, recibiendo evaluación del índice de validez de contenido arriba de 0,86 y coeficiente de variación debajo de 20% en todos ítems. **Conclusiones:** la tecnología educacional fue construida y evaluada con índices satisfactorios por los especialistas y público objetivo, presentando alta correlación de concordancia, la caracterizando como adecuada e informativa a cuidadores informales.

Descritores: Tecnología Educacional; Educación en Salud; Estudios de Validez; Cuidadores; Autocuidado.

INTRODUCTION

Population aging is a challenge for public health, as it implies greater demand for care and people with dependency in basic activities of daily living⁽¹⁾. Concomitantly with aging, other conditions increase the dependence on care, such as the number of traffic accidents, urban violence, genetic, degenerative and chronic diseases⁽²⁾.

In this context, caregivers play an important role in assisting people dependent on care⁽¹⁾. Often, in situations of illness, the family is organized in such a way that one of the members is in charge of the care, configuring itself as the family caregiver⁽³⁾. The international literature points out that 55% to 64% of the elderly with functional difficulties receive help from caregivers living in the same household⁽⁴⁾, and the Brazilian reality is similar to this scenario⁽³⁻⁵⁾.

The caregiver is a member of the family or not who cares for people dependent on care; and, most of the time, they are not trained to perform such activity, having the responsibility to assist or perform the tasks that their family member is unable to do, in order to provide comfort, safety and quality of life⁽⁵⁾. Thus, becoming a caregiver requires knowing the sick person's life condition, as well as learning to adapt/adapt to the new routine, which will include direct care associated with the management of conflicts and resources. This requires a constant learning process on the issues that cover home care, especially in order to prepare to deal with the derangements resulting from care and with your own demands⁽³⁾.

However, it is noted that many caregivers do not receive the proper guidance to perform this complex task, nor do they know the practices of self-care, with a view to reducing the burden, which is inherent to their intense care routine and compromising their health⁽⁵⁾. It is known that, when designing an intervention plan for people dependent on care, it is essential to contemplate the needs of the family and caregivers, however such practice shows itself incipient in Brazil, both in the field of clinical practice and research⁽⁶⁻⁷⁾.

In this sense, the development of educational health technologies is revealed to be a practice with the possibility of helping to improve the quality of life of caregivers and people dependent on care. There is a clear need for educational materials to be constructed and implemented, to assist in promoting the autonomy and safety of patients and family members who require more intensive care, with a reduction in the burden and promotion of self-care activities by the caregiver⁽⁸⁾.

Considering this premise, educational materials constitute a category of technologies that help and standardize the guidelines provided during the health education process, acting as facilitating tools in the promotion of adequate and safe care. The purpose is to facilitate the care provided by the caregiver, contributing both to the recovery and comfort of the patient and to the prevention and reduction of the physical and mental burden of the caregivers. This is very valid, because considering the self-care practices of caregivers is still incipient in the literature as well as in the conduct and guidance provided by health professionals in their daily work routine⁽⁸⁻¹⁰⁾.

OBJECTIVES

To build and validate educational self-care technology for caregivers.

METHODS

Ethical aspects

The study followed in line with Resolution 466/2012 of the National Health Council and was approved by the Ethics and Research with Humans Committee. All participants signed the Free and Informed Consent Form, in two copies of equal content. To preserve anonymity, the participants' reports were identified using the letter C (caregiver), followed by the order in which the interviews took place (eg, C-01).

Study design, location, and period

This is a study of methodological design for the construction and validation of an educational technology of self-care for caregivers of people dependent on care, anchored in the Delphi methodology as a content validation technique. Its use in this study is based on the potential to reinforce anonymity and controlled feedback, as well as the statistical response of the participating group⁽¹¹⁻¹²⁾. It was conducted in a medium-sized municipality, located in the southern region of Brazil. Data collection for situational diagnosis, construction, and validation of the technology in its pilot version and in the two stages of the definitive version took place from September 2018 to November 2019.

Sample, inclusion and exclusion criteria and data source

The study was carried out in three stages, namely: situational diagnosis; construction; and validation of educational technology - both in the pilot and final phases, with a population selected for each phase. The sample was intentional, and a random draw was carried out to include caregivers from different geographic points of the city, from the central region to the peripheral zone, in order to obtain individuals who experienced diversified routines.

The inclusion criteria established were: being 18 years of age or older, being a caregiver for people with dependence on basic and instrumental activities of daily living, being literate, according to self-report. Formal and trained caregivers were excluded. For the first phase, whose objective was to detect the target audience and perform the situational diagnosis of the needs of caregivers, a list of people dependent on care was requested from the nurses responsible for each of the 35 Basic Health Units (BHU) of the reference municipality. With the list available, prior contact was made with caregivers, based on a random draw, intended for a greater diversity of participants belonging to 16 BHUs previously consulted.

Regarding this stage, the objectives, and questions about participation in the study were presented; and, to those who accepted, a day and time was scheduled, according to availability. Thus, a semi-structured interview was conducted in

order to know the caregiver's needs/difficulties in relation to the care of dependent people to support the next stage of the study. With the data collection carried out continuously to the analysis, the collection ended when no new elements emerged in the analyzes, without adding new discoveries, ending the sample in 25 caregivers, who were monitored by the health teams of several BHUs of the County.

In the second stage, for the validation of the technology, the recommendations of Pasqual⁽¹³⁾ and Vianna⁽¹⁴⁾ were followed, considering a minimum number of seven specialists. The judges were selected according to the criteria adapted from Tolentino⁽¹⁵⁾, Batista⁽¹⁶⁾ and Medeiros⁽¹⁷⁾ and, in turn, were elected upon reaching 5 points, being considered experts, the professionals who presented at least one of the following criteria: development of prevention and/or health promotion actions aimed at caregivers of people in need of home care; being a doctor in nursing or in related areas; and have published scientific papers on educational technology development, caregivers and home care.

Thus, after searching for studies on the theme of this research, on indexing platforms and in the Research Groups Directory of the National Council for Scientific and Technological Development (CNPq), 19 judges were invited by formal contact, via email. After accepting to participate in the research, they received the pilot educational technology and the validation instrument via e-mail, to be filled out and returned within 30 days. Of the 19 guests, 9 accepted to participate in the study, however two questionnaires were incomplete and were excluded from the sample, totaling 7 specialists.

The participants were the same caregivers who were part of the situational diagnosis stage, including those who expressed the desire to evaluate the educational technology produced. This choice was made in order for caregivers to verify whether the needs listed in the initial stage of the study were covered in the final material. Thus, the final sample for validating the target audience was made with nine caregivers. The conditions of functional incapacity for basic and instrumental activities of daily living, referring to the subject cared for, were assessed, respectively, by the Katz index⁽¹⁸⁾ and Lawton scale⁽¹⁹⁾. With those who met the criteria established in the initial stage, listed for situational diagnosis, prior contact was made to schedule a new home visit.

Study protocol

The study procedure took place in three phases: 1) situational diagnosis; 2) construction of educational technology - for which we chose to prepare a booklet, which involved sequential processes based on situational diagnosis -, literature review, booklet elaboration; and 3) content and appearance validation by expert judges in the area and by the target audience. In the first stage of the study, the objective was to raise the needs of caregivers to assist the person in home care.

To conduct the interviews, a socioeconomic characterization questionnaire and semi-structured interview were used, adapted⁽²⁰⁾ from the guiding question: What are your difficulties in face of the practices carried out on your care dependent family member? They were carried out from September to

December 2018. The interviews ended when the information was repeated, adding no new events, using the steps recommended by Fontanilla⁽²¹⁾.

All were recorded and later transcribed; and the results, analyzed using the written text. To reinforce the results obtained in the analysis of the reports and carry out the orientations according to the analyzes of the situational diagnosis, an integrative literature review was carried out, conducted according to the protocol proposed by Preferred Reporting Items for Systematic Reviews and Meta-analyzes (PRISMA)⁽²²⁾.

To review the literature, firstly, the keywords for each generating theme were delimited, such as "absence of leisure and distraction", "difficulties for activities that involve mobility and transfer" and "social support needs" (Chart 1), according to the Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH). Subsequently, only materials from open publications, from related organizations and articles from national and international databases, such as Latin American and Caribbean Literature in Health Sciences (LILACS), International Literature in Health Sciences (MEDLINE) and Web Of Science were included.

For the elaboration of educational technology, a professional graphic designer, with qualifications in visual arts, was assisted. The educational material chosen was a booklet, and its construction process included steps that include image design, typography, color choice and diagramming. The entire process was intermediated with the researchers in this study, in which, as the construction stages progressed, this booklet was sent to the researchers for feedback and subsequent approval. All material was made using Adobe Photoshop CC[®] 2015.

Data analysis and statistics

In order to analyze both the transcripts from the interviews for situational diagnosis and the literature findings derived from the integrative review, the "content analysis" modality was used, following the stages of interpretation, ordering and categorization⁽²³⁾. The legibility of the texts was evaluated to facilitate the reading of the educational technology, based on the reader's education, using the Flesh Legibility Index in the Coh-Metrix-Port 2.0 system, which reached an index above 75% in the first and second round Delphi after reviewing Portuguese.

At the end of the construction of the booklet, validation with specialists was performed, using the Delphi methodology⁽¹¹⁻¹²⁾. The questionnaire used for validation was adapted from the instrument developed in Lopes' studies⁽²⁴⁾, organized in questions, with answers in the form of a Likert scale, with four levels of response: 4 - Totally adequate, 3 - Adequate, 2 - Partially adequate, 1 - Inadequate. Experts could also make suggestions and comments to improve items rated "Partially adequate" or "Inadequate".

To evaluate the booklet, the Content Validity Index (CVI) was adopted, by calculating the number of responses "Totally adequate" and "Adequate", divided by the number of responses in total, assuming the same value as "good evaluation" or greater than 0.80. The coefficient of variation was performed by calculating the standard deviation divided by the weight average of the responses, ideally values below 20%⁽²⁵⁾.

Of the items that obtained a CVI lower than 0.80 and a variation coefficient above 20%, a revision was carried out according to the experts' recommendations, and a new version of the booklet was issued, sent to a new evaluation round. To assess the measure of agreement between the expert judges, regarding all sets of objects evaluated in the technology (objectives, content, language, relevance, illustrations, layout, motivation, and culture), Kendall's W coefficient was used, considering adequate results above 0.7, as a high correlation of agreement between the evaluators.

For validation by the target audience, an evaluation instrument adapted from Feitoza's study⁽²⁶⁾ was used, also organized on a Likert-type scale with four response levels, as in the instrument used for evaluation by expert judges. The validation analysis by the target audience followed the criteria used by Tales⁽²⁷⁾, in which items with a 75% agreement level were considered validated. Among the target audience, agreement in the first round showed values above 90% for its acceptability, not requiring a second round of evaluation.

RESULTS

Construction of educational technology

25 caregivers participated in the situational diagnosis, most of whom were over 60 years old (60%), were female (88%), had completed elementary school (32%), married (64%), had no paid activity (44%), were retired and/or pensioners (40%). As for the caregiver's relationship with the care dependent subject, the majority were children (56.0%), followed by a spouse (28.0%), and the time of care provision was predominantly over 26 months.

In the reports of caregivers, it was identified that the main difficulties and needs were related to the physical and emotional burden of the caregiver. Thus, the contents of the booklet were directed to health and well-being, expressed, and categorized as follows: presentation; warning signs; where to look for help; which professionals are available; coping strategies; leisure tips; tips to avoid physical overload; stretches; caregivers' right; conclusion and learning test (Chart 1). In the construction and design of the layout, a trained professional with experience in web design was hired, who met the recommendations for the preparation of effective educational materials, with active feedback between the professional and the main author.

Chart 1 – Coding of generating themes for the construction of educational technology for caregivers, Maringá, Paraná, Brazil, 2021

Depositions	Generating Themes	Content
<i>I have a very busy routine. I can't go to the places I want. (C4) What I lack is freedom to do what I want. (C12)</i>	Need for leisure and distraction	
<i>Especially his children, they should help more, because it's not just my obligation. (C13) If the nurses and doctors at the clinic came here, they could help me. (C22)</i>	Need for social support	
<i>Getting him out of bed to take anywhere else is difficult, because of the weight. (C9) I suffer to lift it up and put it from place to place. (C9)</i>	Difficulty for activities involving mobility and transfer	

Note: C – Carer.

Validation of educational technology by expert judges

In the two rounds of the Delphi technique, seven specialists participated in the study, of which four (57.1%) were PhD teachers in the Nursing course, and the others (42.9%) were PhDs in health related to nursing. Of these, three (42.9%) worked in the Adult Health area; two, in Primary Health Care (28.5%); one (14.5%), in Public Health/Public Health; and one (14.5%), in Gerontology. The seven participants had experience with the theme, in the construction of educational technology and with publication in the area. In the first round of validation, there was no consensus among experts on the elements evaluated, with CVI below the recommended and with a variation coefficient above 20% (Table 1).

The suggestions pointed out by the experts were related to the objectives and content of the booklet, in which the guidelines regarding the care practice for people dependent on care were replaced by content specific to the caregiver's own self-care, with a topic summarizing the content exposed and an item added knowledge test at the end of the material. In addition, the layout of the material was reworked by the graphic designer, to improve the aesthetics of the booklet, and a character was created, which appears on almost every page of the material.

Table 1 – Agreement distribution, Content Validity Index, and coefficient of variation of the evaluation of specialists in all items of the validation instrument in the first round of the Delphi technique, Maringá, Paraná, Brazil, 2021

	Objective	Content	Language	Relevance	Illustration	Layout	Motivation	Culture
Judge 1	4	4	4	4	3	3	3	3
Judge 2	2	3	3	3	3	3	3	3
Judge 3	2	3	3	3	3	3	3	3
Judge 4	3	3	3	3	3	3	3	3
Judge 5	1	2	2	3	2	2	3	2
Judge 6	3	2	2	2	2	2	1	2
Judge 7	3	1	1	1	1	1	1	1
M	2.57	2.57	2.57	2.71	2.43	2.43	2.43	2.43
SD	0.98	0.98	0.98	0.95	0.79	0.79	0.98	0.79
CV	37.95	37.95	37.95	35.04	32.40	32.40	40.18	32.40
CVI	0.57	0.57	0.57	0.71	0.57	0.57	0.71	0.57

Note: M – Mean; SD – Standard deviation; CV – Coefficient of variation; CVI – Content Validity Index.

Table 2 – Agreement distribution, Content Validity Index, and coefficient of variation of the experts' assessment on all items of the validation instrument in the second round of the Delphi technique, Maringá, Paraná, Brazil, 2021

	Objective	Content	Language	Relevance	Illustration	Layout	Motivation	Culture
Judge 1	4	3	4	4	3	4	3	4
Judge 2	2	4	3	4	4	3	3	4
Judge 3	4	3	3	4	3	3	4	4
Judge 4	4	4	3	4	4	4	4	3
Judge 5	3	3	3	4	4	4	3	3
Judge 6	3	2	2	4	3	3	4	4
Judge 7	4	4	4	3	4	4	4	4
M	3.43	3.29	3.14	3.86	3.57	3.57	3.57	3.71
SD	0.68	0.59	0.60	0.38	0.53	0.53	0.53	0.49
CV	19.83	17.96	19.09	9.80	14.97	14.97	14.97	13.14
CVI	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00

Note: M – Mean; SD – Standard deviation; CV – Coefficient of variation; CVI – Content Validity Index.

With the new round of validation, the Objectives, Content, Language elements obtained CVI of 0.86. The items Relevance, Illustrations, Layout, Motivation and Culture obtained a CVI of 1.00, and all the elements of evaluation presented a variation coefficient below 20%, demonstrating compliance with the needs of caregivers, visual attractiveness and contained information (Table 2).

The experts' concordance test showed a *W* Kendall coefficient of 0.399 ($p = 0.004$), a moderate correlation between the judges' assessment in the first round of Delphi, with disagreements regarding the quality of the items evaluated. After the reformulations, the evaluation of the second round showed a *W* Kendall coefficient of 0.804 ($p < 0.001$), with a strong correlation between the evaluation of the specialists, showing a statistically significant agreement in the evaluation of educational technology (Table 3). Considering these results, the booklet showed high agreement between the judges, with CVI above 0.86 and variation coefficient below 20%, so there was no need for a third round of evaluation.

Table 3 – Evaluation of significance for the degree of coordination of the evaluation by expert judges in the first and second round of the Delphi technique, Maringá, Paraná, Brazil, 2021

	<i>W</i> Kendall	χ^2	<i>P</i>
First round	0.399	19.129	0.004
Second round	0.804	38.591	< 0.001

Note: χ^2 – Chi-square; *p* – Value of statistical significance.

Validation of educational technology by caregivers

Of the nine caregivers representing the target audience who validated the booklet, all were female, with an average age of 55 years, four (44.5%) with complete elementary school; daughters who took care of their parents (55.6%) and parents who took care of their children (22.2%). All respondents reported that they had never participated in any support group or meeting for caregivers. The participants answered the 29 questions of the validation instrument, with all aspects classified as "Totally adequate" and "Adequate", obtaining an agreement rate of 90%. In its final version, the booklet was called "Caring for those who take care", consisting of a cover and 35 pages, with a standard format of 21 centimeters high by 15cm wide, in A4 (Figure 1).

DISCUSSION

The educational technology developed was intended to promote self-care for the caregiver, as it provides information to contribute to their care, generating, in turn, an improvement in the care offered to the sick family member. It emerged from the needs of the interviewed caregivers and was built according to scientific criteria, referenced by Pasquali⁽¹³⁾. These points were essential for its construction and constituted important evidence for the development of technology⁽²⁸⁾.

It is consistent to judge that the informational urgencies of caregivers are directed to direct techniques of care for the family, since they are commonly new procedures, with the handling of devices never seen before. However, this research showed that the main needs of this public were related to leisure, rest, time for themselves, autonomy to fulfill their own wishes, as well as improvement for body aches. The burden that affects caregivers is well documented in the literature, especially with regard to doubts about direct care^(3-5,8-9).

In the language and illustrations used in the booklet, we tried to use words and figures that portrayed the context of caregivers. The language used was clear, simple and direct, not using complex or excessively long sentences⁽²⁹⁾. A satisfactory percentage was observed, consistent with the assessment of the target population, who considered the language to be comprehensive and accessible; as well as the images, simple and expressive. Thus, it became clear the importance of investigating the opinion of the target audience regarding the understanding of the illustrations, as well as receiving other possible suggestions that may favor the material presented, expanding the applicability to the illiterate public and removing misinterpretations that can prevent the prevention, promotion and recovery of health⁽³⁰⁾.

The validation process allowed, through the evaluations and suggestions of the expert judges, to improve the content and structure of the booklet, in order to meet the necessary guidelines for achieving the caregiver's self-care. The international literature points out that research on caregivers is still of a negative nature, abstaining from technologies with a view to self-care practices among caregivers and the relationships between personal self-care, perceived stress and other health variables, culminating in the need for self-care, new technologies that address this perceived need^(3-7,31).

The figure consists of 34 numbered cards arranged in a grid, providing educational content for caregivers. Each card typically includes a title, a brief text or list of instructions, and simple illustrations. The topics covered include:

- 1. CUIDANDO DE QUEM CUIDA:** Focuses on caregiver well-being and stress management.
- 2. CUIDANDO DA SUA SAÚDE:** Discusses recognizing warning signs and maintaining health through exercise and diet.
- 3. ATENÇÃO:** Emphasizes the importance of taking breaks and not being overworked.
- 4. TRANSFERÊNCIA DA CAMA PARA CADEIRA:** Provides techniques for safely moving a person from bed to a wheelchair.
- 5. MOVIMENTAÇÃO NA CAMA:** Offers strategies for repositioning a person in bed to prevent falls.
- 6. SUGESTÕES DE ALONGAMENTOS:** Lists various stretching exercises to relieve muscle pain.
- 7. EXERCÍCIOS PARA OS BRAÇOS:** Details arm exercises to improve strength and flexibility.
- 8. EXERCÍCIOS PARA O PESCOÇO:** Provides neck exercises to reduce tension.
- 9. EXERCÍCIOS PARA A COLUNA E PERNAS:** Focuses on back and leg exercises to prevent injury.
- 10. EXERCÍCIOS PARA OS OMBROS:** Includes shoulder exercises to maintain range of motion.
- 11. DIREITOS GARANTIDOS POR LEI:** Explains legal rights for caregivers, including discounts on vehicle purchase.
- 12. ISENÇÃO DE IMPOSTO SOBRE PROPRIEDADE DE VEÍCULOS AUTOMOTORES (IPVA):** Details the process for tax exemption on vehicles.
- 13. REDUÇÃO DA CARGA HORÁRIA DE TRABALHO:** Discusses legal options for reducing work hours.
- 14. PASSE LIVRE PARA ACOMPANHANTE:** Explains the 'Free Pass' benefit for caregivers.
- 15. PASSE LIVRE:** Discusses the general 'Free Pass' benefit for people with disabilities.
- 16. HORA DO TESTE!:** A self-test section where caregivers can assess their knowledge.
- 17. TELEFONES ÚTEIS:** Lists contact numbers for various municipal services.
- 18. RESUMINDO...:** A summary of key takeaways from the cards.
- 19. REFERÊNCIAS:** A list of sources used in the development of the cards.

Each card also features the logo of UEM (Universidade Estadual de Maringá) and the year 2021.

Figure 1 – Final version of educational technology for self-care of caregivers of people dependent on home care, Maringá, Paraná, Brazil, 2021

Regarding validation by expert judges, most judged the Objective item as "Adequate" and "Totally adequate", presenting results similar to the study that carried out validation of a booklet for self-care with the feet of people with diabetes, whose objectives received the evaluation "Adequate" from almost all experts. The adequacy of the objectives of educational technology is essential both to determine the focus of the guidelines to be provided and to channel the most important needs, which were reported in the interviews during the situational diagnosis stage⁽³²⁾.

The relevance of the material obtained a good evaluation by the specialists, who pointed out the adequacy of the subject and the care needs. These results corroborate a study carried out in Ceará, whose educational technology aimed at the theme "Obesity and arterial hypertension" pointed out the importance of reinforcing that the target audience assumes some self-care practices⁽³³⁾. As previously presented, the caregiver is not seen as an actor in his own care, and his practices for taking care of himself are veiled actions and little explored by health professionals. They can use educational technology as a tool in health guidelines, especially with inexperienced people who have become caregivers due to events related to the pathological condition of a family member⁽¹⁻⁴⁾.

In this context, the relevance of educational technology is linked to the objectives and content used, which are responsible for the knowledge acquisition process by the reader⁽³⁴⁾. It is worth reiterating that the specialists suggested removing some important information about the necessary technique for the care of the dependent person, aiming to encompass information contiguous to the caregiver's health. In this context, the potential of educational technology as a vehicle for disseminating scientific evidence is evidenced, proven by experienced researchers in the subject addressed.

The harmonization of educational materials regarding the evaluation items needs to be considered in the validation processes, so that the final product is not short when ignoring important information or long enough to become tiring for the reader. Furthermore, the confirmation of the correctness, relevance and timeliness of the information contributes to the avoidance of erroneous guidelines, which can compromise the reader's health⁽³⁰⁾. Once all validation protocols were respected, it was possible to improve the content and structure of the booklet, in order to meet the necessary guidelines for achieving self-care of the caregiver.

It is pointed out that the booklet validation process was achieved, considering that the CVI of most items obtained 1.00, and the others, above 0.86, fulfilling the estimates recommended by the study method; in agreement by the target audience, all aspects of evaluation obtained more than 90% of "Totally adequate" and or "Adequate" responses, considering that the booklet is properly validated in terms of content and appearance by specialists and target audience, responding appropriately to what was proposed. The development of technology based on the active participation of expert professionals is essential to improve its quality⁽³⁵⁾.

The Delphi methodology used for the validation of educational technology proved to be relevant due to the ease in controlling the feedbacks that were presented by expert judges, active in the elaboration of this type of material. Based on the suggestions presented in the first round, it was possible to expand the thematic scope of the booklet beyond the practical-assistance

issue, inserting information that mainly elucidated divergent points about social support and rights that the caregiver has.

Nevertheless, the calculation of the variation coefficient and the analysis of the *W* Kendall coefficient - which verified the variance between the responses of the judges, both in the first and second rounds, considering the results above the recommended by the methodological framework adopted and as high correlation between the responses of the evaluators - allowed robustness in the quality of the evaluation, determining that the evaluations between judges did not differ and maintained unanimous agreement, guaranteeing the validation of the booklet.

In this context, linked to the steps for the construction of educational technologies presented by Pasquali⁽¹³⁾, Delphi provided a careful methodological description in the process of selecting the subjects and in the formulation of the content, with progress beyond the techniques of content analysis. The contributions by the judges were validated regarding the advances regarding the pedagogical qualities, such as the objectives, appearance and layout, consistency of content in relation to the proposed objectives of the study in general and adequacy to the teaching-learning proposal, with an informative and sequential approach.

Study limitations

The limitation of this study is related to the content of the booklet, which was built based on the view of caregivers of only one municipality in the Southern Region of Brazil; in view of the country's continental dimensions and the immense sociocultural diversity found, this material may present weaknesses regarding the needs faced by readers from other locations. Furthermore, the validation process by the target audience showed a satisfactory level of agreement, a result that can be attributed to the lack of information and low level of education of the interviewed public. A more educated population could suggest improvements that are supposedly not perceived in the context of this validation.

Contributions to the area of nursing, health, or public policies

The study's contributions to the nursing area and related ones are based on the use of the material by health professionals as a tool for education and health promotion, especially when the caregiver does not have experience of care, linking the booklet to the guidelines of self-care, the which is important to avoid overload and doubts about aspects contiguous to the difficult task of caring for someone with dependence.

It is expected that the educational material prepared will be widely disseminated to health professionals, family members and caregivers, disseminating information with the potential to change habits and awaken reflection. In addition, with this study, it is also possible to arouse the interest of different areas of the government to create public health policies that provide greater sustainability and support to caregivers, guaranteeing all individuals the full right to health.

CONCLUSIONS

Based on the results of this study, it can be said that the objectives were achieved, since, for the construction of the

booklet entitled “Taking Care of Those Who Cares”, the situational diagnosis of the caregiving population was carried out, considering their real aspects, and reported difficulties, and this facilitated the understanding of the material as an informative instrument that deals with the reality of care. As a consequence of the adequate construction and the validation rounds, satisfactory indexes were reached in the validation by the specialists, with CVI varying between 0.86 and 1.00; and by the target audience, which presented agreement greater than 90%.

Nevertheless, the experts’ agreement, confirmed through the variation coefficient and Kendall’s W, enhances the pertinence of the technology. The request for the protocol and registration of copyright of the material produced was sent to the Copyright Office of the National Library. It is expected that this work will contribute to other research and that health professionals use educational technologies for the adoption of good health practices aimed at caregivers who face challenging conditions on a daily basis, contributing to their quality of life, as well as improving the care provided to people dependent on home care.

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