SAÚDE E PESQUISA
e-ISSN 2176-9206

ORIGINAL ARTICLE

https://doi.org/10.17765/2176-9206.2025v18e12742

DEVELOPMENT OF EDUCATIONAL MATERIAL ON MEDICATION USE IN CHILDREN WITH CHRONIC KIDNEY DISEASE

DESENVOLVIMENTO DE MATERIAL EDUCATIVO SOBRE USO DE MEDICAMENTOS EM CRIANÇAS COM DOENÇA RENAL CRÔNICA

Charles Allan Pedro[1], Nathalya dos Santos Reis Santos[1], André Luiz Barbosa Dantas Gonçalves[1], Ana Clara Garcia Marton[2], Dyego Carlos Souza Anacleto de Araújo[2*]

ABSTRACT: **Aim:** To develop educational material for the parents and caregivers of children and adolescents with chronic kidney disease who are undergoing conservative treatment, focusing on the safe and rational use of medication. **Methodology:** This study was conducted in three phases: developing educational materials based on the literature, evaluating by professionals, and evaluating by the population. **Results:** The material covered topics such as adherence to pharmacotherapy, drug-drug interactions, dose adjustments, and nephrotoxic agents. The material was written in short sentences and in simple language, with pictures used to complement the written content. **Conclusions:** The material showed evidence of validity and has the potential to contribute to better adherence through the provision of reliable and accessible information to guardians and caregivers.

KEYWORDS: Educational and Promotional Materials. Health Education. Health Literacy. Renal Insufficiency Chronic. Validation Study.

RESUMO: **Objetivo:** Desenvolver material educativo para responsáveis e cuidadores de crianças e adolescentes com Doença Renal Crônica em tratamento conservador, abordando o uso seguro e racional de medicamentos. **Metodologia:** Estudo realizado em três etapas: elaboração do material educativo a partir da literatura; avaliação por especialistas e avaliação pela população. **Resultados:** O material abrangeu tópicos sobre adesão à farmacoterapia, interações medicamentosas, ajustes de dose e agentes nefrotóxicos. O material foi escrito com frases curtas, em linguagem simples e com imagens para complementar a parte escrita. **Conclusões:** O material apresentou evidências de validade e tem potencial para contribuir para uma melhor adesão ao tratamento ao disponibilizar informações confiáveis e acessíveis aos pacientes, responsáveis, cuidadores e profissionais de saúde.

PALAVRAS-CHAVE: Doença Renal Crônica. Educação em saúde. Estudos de Validação. Letramento em Saúde. Materiais Educativos e de Divulgação.

[1] Cassiano Antonio de Moraes University Hospital, Multiprofessional Residency in Child and Adolescent Health Care, Federal University of Espírito Santo (UFES), Vitória (ES), Brazil; [2] Laboratory for Innovation in Health Care, Federal University of Espírito Santo (UFES), Vitória (ES), Brazil.

***Corresponding author**: Dyego Carlos Souza Anacleto de Araújo – *Email*: dyego.araujo@ufes.br.

Received: 24 apr. 2024
Accepted: 28 sept. 2024

INTRODUCTION

Chronic kidney disease (CKD) is a health condition characterized by the progressive and irreversible loss of kidney function over time. It can affect children, adolescents and adults.[1] It is estimated that CKD affects approximately 9.1% of the global population. It is one of the 15 leading causes of death worldwide.[2] CKD treatment differs by stage, with conservative treatment indicated for people in stages 1 to 3.[3] The objective of conservative treatment is to slow the disease progression, correct symptoms and treat complications. This type of treatment employs lifestyle modifications, dietary changes, and pharmacological agents.[4]

It is challenging for parents and caregivers to effectively manage the use of medications in children and adolescents with CKD due to the complexity of pharmacotherapy. Furthermore, the potential for adverse effects and a lack of clarity regarding the intended use of medications can complicate the process of ensuring appropriate usage.[5] The issue of self-medication in children and adolescents with CKD is also a significant concern that requires attention, as it is a prevalent practice in Brazil and has the potential to exacerbate existing health issues and contribute to adverse effects in their clinical condition.[6,7]

In this context, family members and patients with CKD should be informed about the risks of using prescribed medications, over-the-counter medications, or dietary supplements.[8,4] It is essential to implement strategies which increase knowledge, develop skills, and improve attitudes for managing health problems and promoting health, such as health education.[9-11] Health education plays a fundamental role in preventing and managing worsening CKD, as well as in promoting adherence to medication. Health education is defined as the process of providing information about health issues to the community. Its objective is to promote health and prevent disease by raising awareness and empowering people to improve their health.[12]

The World Health Organization has highlighted the importance of health literacy in the context of health promotion initiatives.[13] Health literacy can be defined as an individual's capacity to locate, comprehend, and effectively utilize information and services in order to make informed decisions and act in ways that enhance their own and their community's health.[14,15] Research has demonstrated that inadequate health literacy is linked to adverse consequences for chronic conditions[16,17]. It is therefore essential to assess users' comprehension levels and create health policies and interventions that facilitate positive outcomes to guarantee quality care provision.[18] Health education activities can utilize various tools, such as educational materials like folders, booklets, leaflets, and posters. These tools are of significant importance in promoting adherence to treatment among children and adolescents with chronic diseases.[19] The educational materials employed in health education activities must be tailored to the audience, utilizing language which captures their attention and encourages reflection. The objective of this reflection is to facilitate behavioral change, which occurs when the reader actively engages with the material. Attaining this level of engagement enables educational material to effectively reach the intended audience, enhance their health literacy and empower them to make informed decisions about their treatment.[20]

A systematic review conducted by Tong et al. (2008)[21] identified two studies which evaluated the impact of printed educational materials designed to support caregivers of individuals with CKD. One of the studies was conducted in India and evaluated the impact of an information booklet for caregivers of hemodialysis patients on the management of home care. The study revealed notable enhancement in knowledge following implementation of the intervention.[22] Another study which was conducted in Spain, employed participatory action research methodologies and engaged pediatric kidney transplant

recipients and their caregivers in developing a self-care information manual. The manual in question focused on four key areas: preventing immunosuppression-related diseases, managing side effects, adjusting to the disease, and facilitating social support.[23] Educational materials for patients with CKD in Brazil cover a plethora of topics, including hemodialysis, adherence and quality of life, dietary guidelines, diseases related to CKD, the promotion of self-care, the use of antibiotics by patients with CKD, taste changes in CKD, and the care of central venous catheters and arteriovenous fistulae.[24-34]

A literature review revealed no scientific publications focused on developing educational materials for caregivers regarding medication use in children and adolescents with CKD at the international or national level. The development of such material could prove beneficial as a complement to the guidance of healthcare professionals and as a source of advice for the target group.[35] In light of the above, the objective of this study was to develop educational materials for parents and caregivers on the use of medications in children and adolescents with CKD undergoing conservative treatment.

METHODOLOGY

This is a methodological development study conducted between September and December 2023. The study focused on developing educational materials to guide caregivers of children and adolescents with CKD undergoing conservative treatment. The study was conducted in three stages: 1) development of the educational material; 2) evaluation of content validity evidence by a panel of experts; and 3) evaluation by the population.

STAGE 01 - DEVELOPMENT OF THE EDUCATIONAL MATERIAL

THEORETICAL BASIS FOR DEVELOPING THE MATERIAL

A literature review on the use of medications in patients with CKD was initially conducted to prepare the educational materials. This review aimed to outline the topic, then organize and select the topics to be included in the materials. The guidelines included in the educational material were based on various documents, such as articles, booklets and guidelines:

- Safe use of medicines by patients with chronic kidney disease[8]
- KDIGO 2013 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease[4]
- Strategies to involve the patient in preventing medication errors[36]
- Chronic kidney disease: assessment and management[37]
- Primer to promote the rational use of medicines[38]
- Medicines: Using Them Safely[39]

PREPARATION OF THE PROTOTYPE EDUCATIONAL MATERIAL

The research team comprised of pharmacists was tasked with developing the prototype for the educational material. They selected and evaluated the content to be included in the material. During this phase, they took into consideration the Instrument for the Evaluation of Printed Educational Materials focusing on Health Literacy for Brazil (AMEELS-BR), whose content validity evidence was

assessed by Abreu et al. (2021). This instrument consists of 56 evaluation items divided into six sections related to content, language, illustrations, layout, typography, presentation, learning stimulus/motivation and cultural appropriateness.[40]

The educational material was designed to present information in clear, objective language, making it easier for the general population to understand, especially those with limited formal education.[41] Illustrations were also included to enhance the written information. The texts and illustrations were organized in a logical, aesthetic, and sequential manner to facilitate the reader's understanding and guide them in identifying information of specific interest within each topic covered.

STAGE 02 - EVALUATION OF CONTENT VALIDITY EVIDENCE BY A PANEL OF EXPERTS

The content validity evidence was subsequently assessed in the second stage. The initial version of the material was submitted to expert evaluation for consensus using the Delphi technique. This technique involves a systematic method for evaluating information to obtain consensus from experts on a specific topic through validations articulated in phases or cycles without their being physically together.[42]

SELECTION OF THE EXPERT PANEL

Eight experts from the fields of pharmacy, medicine, nursing, and nutrition were invited to form the expert panel. Professionals with academic training and/or professional experience in caring for children and adolescents with CKD undergoing conservative treatment were considered experts. They were selected based on convenience, and an invitation letter outlining the work objectives and the evaluation method was sent by e-mail.

EVALUATION OF EDUCATIONAL MATERIALS BY THE EXPERT COMMITTEE

The educational material and the Informed Consent Form (ICF) were made available to the experts in digital form. The evaluation tool was accessible online through the Google Forms tool, which was sent to the experts by e-mail. Data collection took place between October and November 2023. The evaluation instrument was adapted from the model created by Teixeira and Mota,[43] which aims to assess educational materials based on their intended purposes, goals or objectives; structure and presentation, which includes overall organization, structure, presentation style, coherence and formatting; and relevance of the material, which evaluates the importance of the material.

The questionnaire was divided into sections within the cases rated using a Likert scale, categorizing responses as inadequate, partially adequate, adequate or completely adequate. The experts were also given the opportunity to provide suggestions and comments on the evaluation tool as they saw fit. Any recommendations and suggestions deemed relevant were implemented to enhance the educational material. Following the evaluation, the experts and their suggestions were identified using a combination of letters and numbers.

CONTENT VALIDITY INDEX

Following the expert evaluation, the Content Validity Index (CVI) was calculated to assess the representativeness and relevance of the construct, allowing for adjustments if necessary.[44] The material was considered valid if it achieved an overall CVI of 0.80.[45] To do so, responses 1 and 2 were coded as "0", and responses 3 and 4 were coded as "1". Microsoft Excel® was used to calculate the Content Validity Index (CVI-I) at the item level by determining the proportion of experts who rated each item in the educational material as 3 or 4. If the CVI-I was < 0.80, the experts' suggestions were reviewed by the research team and incorporated into the final version of the educational materials as appropriate.

STAGE 03 - EVALUATION OF THE EDUCATIONAL MATERIAL BY THE POPULATION

The study population consisted of individuals conveniently selected through a messaging app (WhatsApp®) and at a primary healthcare unit in Vitória, ES, Brazil, with data collection taking place in November 2023. The inclusion criterion was literacy (ability to read and write). People with visual and/or mental disabilities were excluded. Additionally, participants with prior knowledge of CKD were excluded, since the main objective of this phase was to assess whether the material was written in simple, accessible language. Individuals who are familiar with the topic may have an easier time understanding terms and expressions which are considered complex. Participants were invited through verbal contact and a messaging app. After accepting the researchers' invitation, they were provided with the educational materials as well as the assessment tool and the ICF in printed or online form.

After reading the educational material, participants were asked to evaluate it using a model questionnaire adapted from Gonçales, Barbieri & Gabrielloni.[46] They were asked to rate the material based on its organization, writing style, appearance, and motivation. As in Galdino et al.,[47] items receiving more than 75% positive responses were considered valid. Participants were also given the opportunity to provide suggestions through notes, comments on the evaluation tool, or verbally. The participants' recommendations and suggestions were evaluated and discussed by the researchers to improve the educational materials. Following the evaluations, the responses and suggestions were summarized in a table and analyzed as percentages.

RESULTS

The educational material entitled "Medication Use in Children and Adolescents with Chronic Kidney Disease under Conservative Treatment" (Appendix A) consists of 20 pages. It is formatted in 210 x 297 mm (A4 sheet) and is divided as follows: 13 pages of information for the public, two pages for healthcare professionals, and the remaining pages include the front cover, title page, table of contents, and back cover. The material is organized into topics covering medication adherence, drug interactions, drug dose adjustments, and nephrotoxic agents. The information is presented in short sentences using simple and understandable language, with pictures included to complement the written content.

The content validity evidence was assessed by a committee of four experts from three different fields: nursing, pharmacy, and medicine. The profile of the reviewers, including gender, training area, length of professional experience and specialization, is shown in Chart 1.

Chart 1 - Profile of the experts who evaluated the educational material

Expert	Sex	Training area	Length of experience	Specialization
E1	Male	Pharmacy	8 years	Multiprofessional Residency in Nephrology
E2	Female	Medicine	20 years	Residency in Pediatrics and Pediatric Nephrology
E3	Female	Nursing	14 years	Lato Sensu Postgraduate Degree in Nephrology Nursing and Professional Master's Degree in Nursing
E4	Female	Pharmacy	8 years	Residency in Planning and Management of Pharmaceutical Services and Hospital Pharmacy

The overall Content Validity Index (CVI) for the educational material was 0.94. The CVI-B for the "Objectives" section was 0.95, with only item 1.4 (related to the disseminating the material in scientific circles) had a CVI-I below 0.80, as the expert suggested using a more formal message. The "structure and organization of the educational material" had a CVI-B of 0.93. The "relevance" block had a CVI-B of 0.95. The evaluation of the training material and the content validity index are shown in Table 1.

Table 1 - Content validity index for the educational material

	Items	I	PA	A	TA	IVC-I
OBJECTIVES IVC-B = 0.95	1.1 The information/content is aligned with the daily needs of the target audience of the educational material.	-	-	1	3	1
	1.2 The information/content is significant for the quality of life and/or work of the target audience of the educational material.	-	-	1	3	1
	1.3 It encourages and/or initiates a change in behavior and attitude.	-	-	2	2	1
	1.4 It can be disseminated within the scientific community of the area.	-	1	1	1	0.75
	1.5 It meets the objectives of institutions that serve and/or work with the target audience of the educational material.	-	-	1	3	1
STRUCTURE AND PRESENTATION IVC-B= 0.93	2.1 The educational material is suitable for the target audience.			1	3	1
	2.2 The messages are presented in a clear and objective manner.	-	-	2	2	1
	2.3 The information presented is based on scientific evidence.	-	1	1	2	0.75
	2.4 The material is appropriate for the sociocultural level of the target audience of the educational material.	-	-	2	2	1
	2.5 The proposed content is presented in a logical sequence.	-	-	3	1	1
	2.6 The information is presented in a well-structured manner regarding agreement and spelling.	-	-	3	1	1
	2.7 The writing style is appropriate for the level of knowledge of the target audience.	-	1	1	2	0.75
	2.8 The information on the front cover, back cover, table of contents, acknowledgments, and introduction is coherent.	-	1	1	2	0.75
	2.9 The size of the title and the font size of the topics is appropriate.	-	-	1	3	1
	2.10 The illustrations are expressive and sufficient.	-	-	-	4	1
	2.11 The number of pages is adequate.	-	-	2	2	1
RELEVANCE IVC-B = 0.95	3.1 The themes illustrate pivotal elements that warrant reinforcement.	-	-	1	3	1
	3.2 The educational material allows for generalization and transfer of learning to different contexts.	-	1	1	2	0.75
	3.3 The educational material proposes the construction of knowledge.	-	-	1	3	1
	3.4 The educational material covers the subjects necessary for the target audience to know.	-	-	1	3	1
	3.5. The educational material is appropriate for utilization by any professional with the target audience.	-	-	1	3	1

Notes: I= Inadequate; PA= Partially adequate; A= Adequate; TA= Totally adequate; CVI= Content Validity Index

The recommendations proposed by the experts are presented in Chat 2. Following an evaluation of the suggestions, six were deemed relevant (S3, S4, S5, S6, S7, and S8) and resulted in modifications to the material. Suggestion 3 (S3) was integrated into the educational material as a cautionary note regarding "Adjusting Medication Doses" for caregivers and on the detachable sheet for professionals. Regarding suggestion 5 (S5), it was resolved to remove information regarding nephrotoxic drugs from the detachable sheet. This decision was made considering the observation that the recommendation to avoid these drugs in certain cases may be at odds with their occasional necessity, a discrepancy which could potentially lead to confusion among caregivers. Regarding suggestion 8 (S8), the educational material was primarily intended for individuals responsible for patients undergoing conservative renal therapy. However, this was not explicitly stated in the title. Accordingly, amendments were implemented in the cover design to address this feedback. The remaining suggestions were accepted in their entirety.

Table 2 - Sociodemographic profile of the population

Sample characterization	**n**	**%**
Sex		
Female	22	78,6
Male	6	21,4
Age group		
18 - 28 years	15	53,6
29 - 38 years	5	17,9
39 - 48 years	6	21,4
49 - 58 years	2	7,1
Education		
Not informed	1	3,6
Incomplete primary education	1	3,6
Complete primary education	-	-
Incomplete High School	1	3,6
Complete High School	6	21,4
Incomplete Higher education	8	28,6
Complete Higher Education	11	39,3

With regard to the suggestions that were not accepted, the objective of the material was to utilize language that is readily comprehensible by individuals with diverse educational backgrounds. Consequently, we opted to retain the original text and not accept suggestion S1. With respect to suggestion 2 (S2), it was determined to be superfluous, as the examples provided by the expert were already present in the material. The educational material was evaluated by 28 individuals, as detailed in Table 2.

Chart 2 - Suggestions made by experts on educational material

Suggestions from the experts		*Question*	Expert	Acceptability
S1	“I'd suggest using a more formal tone when sharing this with other scientists and academics.”	*1.4*	*E3*	Not accepted
S2	"I think it'd be a good idea to add the word "moment" to the definition of dose on page 10 of the booklet, with examples in brackets: ... at a time (if there is pain, if there is nausea)."	*2.2*	*E1*	Not accepted
S3	"It would be a good idea to get the input of a nephrologist when it comes to adjusting doses, as general practitioners often lack this knowledge. So, it'd be best to get recommendations for specific medications and dosages from a pediatric nephrologist, not just a doctor.”	*2.3*	*E3*	Accept
S4	"On page 4, you could switch up the order of the examples to make it clearer for parents or caregivers. I think we should keep the text and examples but change the order to: It helps you avoid a lot of problems. For example, you won't have to go to the emergency room, your kidney function won't get worse, you won't need to take more medication, and you won't have to spend more money.”	*2.5*	*E4*	Accept
S5	“We should include a reference or a short text saying, "The doctor decides whether or not to stop using the medication, always looking at the risks and benefits," on the material we're sharing. This suggestion is meant to help parents feel more confident and avoid asking questions like: "I gave this medicine a piece of paper stating which other medicines should be avoided, but the doctor prescribed it in the inpatient unit anyway."	*2.6*	*E4*	Accept
S6	"Just a heads-up: The term "thing" is repeated on page 7, guideline 6. I think it would be better to say "symptoms," since that's a term the public is already familiar with.”	*2.7*	*E3*	Accept
S7	“I couldn't find an "Acknowledgments" page, so it hasn't been evaluated.”	*2.8*	*E3*	Accept
S8	"Patients with CKD are followed for a long time, so they'll get familiar with specific terms and guidelines. But guidelines for grade III and IV CKD patients (conservative) and grade V dialysis patients (peritoneal or hemodialysis) may vary. So, generalizing for the entire CKD public is a risk.”	*2.10*	*E1*	Accept

Legend: S - suggestion; E - expert.

Table 3 describes individual's evaluations of the organization, writing style, appearance, and motivation.

Table 3 - Evaluations carried out by the population

ORGANIZATION	**Did the cover catch your eye?**		
	Yes	25	89.3
	More or less	3	10.7
	No	0	0
	Does it show what it's about?		
	Yes	28	100
	No	0	0
	Do the topics follow one another?		
	Yes	28	100
	No	0	0
	Was the size of the topic content appropriate?		
	Yes	28	100
	No	0	0
WRITING STYLE	**When it comes to understanding sentences, are they?**		
	Easy to understand	28	100
	Difficult to understand	0	0
	Don't know	0	0
	Are the questions linked to the sentences?		
	Yes	28	100
	No	0	0
	The written content is:		
	Clear	27	96.4
	Confused	0	0
	Don't know	1	3.6
	The text is:		
	Interesting	28	100
	Uninteresting	0	0
	Repetitive	0	0
APPEARANCE	**The illustrations are:**		
	Simple	28	100
	Complicated	0	0
	Other	0	0
	The illustrations		
	They helped with understanding the text	26	92.9
	Difficult to understand the text	0	0
	Other	2	7,1
MOTIVATION	**Do you think anyone who reads this material will understand what it's about?**		
	Yes	26	92.9
	No	2	7.1
	Were you motivated to read to the end?		
	Yes	27	96.4
	No	1	3.6

Based on the population's assessment of the organization of the educational material, 89.3% (n=25) of the participants said that the cover was attractive. All participants indicated that the cover accurately represented the topic covered in the material, had a logical sequence of topics, and contained an appropriate amount of content. In terms of the written content, the data showed that all participants found the sentences easy to understand, saw a clear connection between questions and answers, and found the text engaging. Additionally, 96.4% (n= 27) found the written content to be clear.

Regarding the appearance of the materials, 92.9% (n= 26) of the participants believed that the illustrations helped them understand the text. In terms of motivation to read the material, 92.9% of the participants felt that anyone who reads the material will grasp its content. When it came to motivation to read to the end, only 3.6% (n=1) of the participants did not feel motivated. All items rated by the population had an agreement rate of over 75% (with an average of 97.3%).

Two changes/inclusions were suggested by the public: the first was to change the phrase "Only use medications with a doctor's prescription or pharmaceutical indication" to "Only use medications with the recommendation of a qualified professional (doctor, dentist, nurse, pharmacist)". The second suggestion was to include information on drug intoxication and overdose. Another participant noted that the font size used in the material was considered small.

DISCUSSION

The developed educational materials demonstrated validity in terms of objectives, structure, presentation, relevance, motivation, appearance, writing style, and organization. It could serve as a valuable tool for healthcare professionals who wish to educate parents and caregivers of children and adolescents with CKD undergoing conservative treatment to help them make informed decisions about medication use. Evaluation by the expert panel ensured that the educational materials were consistent and provided safe, high-quality information.

The CVI obtained was comparable to that of other educational tools described in the literature.[47,24] Given the straightforward nature of the material, it is likely to facilitate comprehension of the care requirements associated with a complex health condition such as CKD. However, it is important to note that the material does not replace the dialogue between healthcare professionals and patients.[19] Rather, it serves as a tool to be used in the health education process. Furthermore, the fact that the material has been validated by a multi-professional team of experts means that it can be utilized by various categories of professionals. Furthermore, this aspect of the expert panel permits the material to be assessed from a multiplicity of perspectives and viewpoints on the subject.[48,49] The professional experience of the experts also enables evaluation of the information's relevance and practical applicability.

One expert proposed the use of more formal language in the educational material, but this suggestion is at odds with the recommendations of AMEELS-BR. This instrument advises that educational materials should be written in a "conversational style" and in the "active voice," and that the vocabulary should include "common words" in the text.[40] Consequently, the use of more formal language may result in reduced comprehension among less educated individuals.[50]

As evidenced by the evaluations, the illustrations are aligned with the text, facilitating a more engaging and less overwhelming reading experience. This enhances the tool's appeal, provides a wealth of details, and captures the reader's attention. Incorporating illustrations in educational materials facilitates comprehension by presenting characters, experiences which are pertinent to the target population, examples drawn from everyday life, and other visual aids. Moreover, one member of the

target group evaluation team highlighted the necessity for font size adjustments. The material was intended to adhere to the recommendation of Abreu et al. (2021) [40] regarding a font size of 12. However, the material was printed in a smaller size (A4, landscape, 2 pages per sheet) for evaluation by the population, which was not done correctly. It can be concluded that printing has a significant impact on the quality and accessibility of the material for the population and should not be overlooked.

The educational material was met with high levels of appreciation from the population, yielding results which align with those observed in the studies.[46,47] The participants indicated that the educational material is visually appealing, well-structured, readily comprehensible, and free of jargon. It is hoped that the educational material will prove useful in providing information to the guardians and caregivers of children and adolescents with CKD undergoing conservative treatment, thereby promoting rational use of medications in this population. However, it is important to note that the evaluation of the material was primarily conducted with participants who had completed or were in the process of completing higher education. Consequently, it was not possible to assess the clarity and comprehensibility of the tool for individuals with lower levels of education. Future studies should assess the comprehension of the educational material by people with lower levels of education.

It should also be noted that this study is not without limitations. The first limitation is the exclusion of parents and caregivers of pediatric patients with CKD from the evaluation population, who could have provided valuable input to the development of the tool. Secondly, due to the educational background of the participants, it was not feasible to assess the readability of the material for individuals with lower levels of education. A third limitation is the absence of a health literacy specialist, despite repeated unsuccessful attempts to secure one. Finally, the absence of a graphic designer limited incorporating illustrations into the material, at times precluding the use of the most appropriate or desired ones.

Following the development of educational materials for parents and caregivers, researchers identified a need to create educational tools on medication use for children and adolescents with CKD. It is imperative to implement strategies which facilitate independent and secure medication use, particularly during the transition to adolescence. It is hypothesized that utilizing educational technology may prove to be the optimal methodology for disseminating information to this demographic. Furthermore, it is imperative to conduct periodic reviews of the material in accordance with the evolving needs of patients and caregivers, and to ensure that the information is kept current.

The developed educational materials can assist healthcare professionals in guiding and encouraging the autonomy of guardians and caregivers of children and adolescents with CKD undergoing conservative treatment. These materials aim to enhance health literacy, facilitate informed decision-making, prevent adverse events, recognize warning signs, and promote safe practices. Future studies should focus on gathering new evidence of validity with the specific target population to assess the relevance and practicality of the material, as well as determine if it can promote behavioral changes related to medication use.

CONCLUSION

The educational material entitled “Medication Use by Children and Adolescents with Chronic Kidney Disease under Conservative Treatment,” exhibited evidence of content validity. The material was evaluated by individuals with no prior familiarity with CKD and was found to employ clear and accessible language. This material has the potential to positively impact the care of children and adolescents with CKD by providing parents and caregivers with a more comprehensive understanding of their child’s

health condition and appropriate medication use. This could result in enhanced adherence, diminished risk of adverse effects, and increased patient autonomy.

REFERENCES

1. Inker LA, *et al.* KDOQI US commentary on the 2012 KDIGO clinical practice guideline for the evaluation and management of CKD. Am J Kidney Dis. 2014;63(5):713-735. http://dx.doi.org/10.1053/j.ajkd.2014.01.416

2. Bikbov B, *et al.* Global, regional, and national burden of chronic kidney disease, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. The Lancet [Internet]. 2020;395(10225):709-733. https://doi.org/10.1016/S0140-6736(20)30045-3
3. Ministério da Saúde. Doenças Renais Crônicas (DRC). 15 fev. 2022. Disponível em: https://www.gov.br/saude/pt-br/assuntos/saude-de-a-a-z/d/drc. Acesso em: 25 nov. 2023.

4. KDIGO. Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Kidney Int., Suppl. 2013;3:1–150. https://kdigo.org/wp-content/uploads/2017/02/KDIGO_2012_CKD_GL.pdf

5. Ferris MEDG, *et al.* An interdisciplinary approach to optimize the care of transitioning adolescents and young adults with CKD. Blood Purif [Internet]. 2021;50(4-5):684-695. http://dx.doi.org/10.1159/000513520

6. Macedo MA, *et al.* A prática da automedicação em criança por pais e responsáveis. Holos [Internet]. 2019;35(5):1-13. https://doi.org/10.15628/holos.2019.5120

7. Nunes ALM, Vilela SS, Siqueira LP. A automedicação em crianças e adolescentes através da influência parental: uma revisão integrativa. RSD [Internet]. 2022Nov;11(14):e534111436741. http://doi.org/10.33448/rsd-v11i14.36741

8. Instituto para Práticas Seguras no Uso de Medicamentos. Uso seguro de medicamentos por pacientes com doença renal crônica. Bol ISMP Brasil. 2021;10(5). Disponível em: https://www.ismp-brasil.org/site/wp-content/uploads/2021/10/Boletim_outubro_2021_doenca_renal_cronica.pdf. Acesso em: 12 jun. 2023.

9. Costa CIA, *et al.* Construção e validação de materiais educativos para criança com doença crônica: uma revisão integrativa. Rev Enferm UERJ [Internet]. 2018;26:e34208. https://doi.org/10.12957/reuerj.2018.34208.

10. Owsiany MT, Hawley CE, Paik JM. Differential diagnoses and clinical implications of medication nonadherence in older patients with chronic kidney disease: a review. Drugs Aging [Internet]. 2020;37:875-884. https://doi.org/10.1007/s40266-020-00804-8.

11. Torres RCF, Azevedo MVC, Vieira JS, Santos GB. Educação em saúde como ferramenta para o enfrentamento das doenças renais crônicas. J Health Connect [Internet]. 2020;9(2):15-26. http://revistaadmmade.estacio.br/index.php/journalhc/article/view/6884/47966697

12. Nogueira DL, Sousa MS, Dias MSA, Pinto VPT, Lindsay AC, Machado MMT. Educação em saúde e na saúde: conceitos, pressupostos e abordagens teóricas. Sanare [Internet]. 2022;21(2). https://doi.org/10.36925/sanare.v21i2.1669.

13. World Health Organization. Health promotion. 2019. Disponível em: https://www.who.int/health-topics/health-promotion#tab=tab_1. Acesso em: 11 nov. 2023.

14. Center for Disease Control and Prevention. Health Literacy. 2020. Disponível em: https://www.cdc.gov/healthliteracy/learn/. Acesso em: 04 jun. 2023.

15. World Health Organization. Health promotion glossary of terms 2021. 2021. Disponível em: https://www.who.int/publications/i/item/9789240038349. Acesso em: 30 mai. 2023.

16. Santos LTM, Mansur HN, Paiva TFPS, Colugnati FAB, Bastos MG. Letramento em saúde: importância da avaliação em nefrologia. Braz J Nephrol [Internet]. 2012Jul;34(3):293-302. https://doi.org/10.5935/0101-2800.20120014

17. Sousa MLXF, Silva KL, Nóbrega MML, Collet N. Déficits de autocuidado em crianças e adolescentes com doença renal crônica. Texto Contexto - enferm [Internet]. 2012Jan;21(1):95-102. https://doi.org/10.1590/S0104-07072012000100011

18. Ribas KH, Araújo AHIM. The importance of Health Literacy in Primary Care: integrative literature review . RSD [Internet]. 2021Dec;10(16):e493101624063. http://doi.org/10.33448/rsd-v10i16.24063

19. Sugisaka ACA, Andrzejevski VM, Rotta I. Validação de materiais educativos para orientação de pacientes em tratamento de câncer de mama com hormonioterapia. Rev Bras Cancerol [Internet]. 2020;66(4):e-051079. https://doi.org/10.32635/2176-9745.RBC.2020v66n4.1079

20. Santos LTM, Bastos MG. Developing educational material on chronic kidney disease using best practices in health literacy. Braz J Nephrol [Internet]. 2017Jan;39(1):55–8. https://doi.org/10.5935/0101-2800.20170009

21. Tong A, Sainsbury P, Craig JC. Support interventions for caregivers of people with chronic kidney disease: a systematic review. Nephrol Dial Transplant [Internet]. 2008;23(12):3960-3965. https://doi.org/10.1093/ndt/gfn494

22. Fathima L. The effect of information booklet provided to caregivers of patients undergoing haemodialysis on knowledge of home care management. Nurs J India [Internet]. 2004 Apr;95(4):81-82. https://imsear.searo.who.int/handle/123456789/122732

23. Tornay E. Educational information for patients and caregivers in paediatric kidney transplant. J Ren Care [Internet]. 2007;33:115-118. https://doi.org/10.1111/j.1755-6686.2007.tb00055.x

24. Barbosa AS, *et al.* Construção e validação de uma cartilha educativa com orientações de cuidados durante a hemodiálise. Rev Enferm Atual In Derme. 2023;97(3). https://doi.org/10.31011/reaid-2023-v.97-n.3-art.1970.

25. Medeiros JRR, *et al.* Validação de tecnologia educativa para cuidado em hemodiálise. Rev enferm UFPE on line [Internet]. 2016; p. 3927-3934. https://doi.org/10.5205/1981-8963-v10i11a11474p3927-3934-2016.

26. Silva RRL, *et al.* Cuidados clínicos em hemodiálise: validação de cartilha educativa. Renome. 2019;7(1):5-16.

27. Teixeira MZ. Construção de um manual educativo para pacientes em tratamento hemodialítico [monografia] – (Graduação em Enfermagem) – Fortaleza: Centro Universitário Fametro, 2020. 21p.

28. Melo GCD. Atuação do psicólogo hospitalar em hemodiálise: a utilização de material psicoeducativo na adesão ao tratamento e qualidade de vida de pacientes renais crônicos [Trabalho de Conclusão de Especialização]. Recife: Faculdade Pernambucana de Saúde; 2017. 48p.

29. Dunzer LC, Vieira NCB, Arenhart T, Tomio C. Desenvolvimento de Material Educativo Com Orientações Nutricionais Para Pacientes Com Doença Renal Crônica em Hemodiálise. Epitaya [Internet]. 16º de janeiro de 2023;1(27):112-20. https://doi.org/10.47879/ed.ep.2023670p112

30. Queiroz MVO, Dantas MC de Q, Ramos IC, Jorge MSB. Tecnologia do cuidado ao paciente renal crônico: enfoque educativo-terapêutico a partir das necessidades dos sujeitos. Texto contexto - enferm [Internet]. 2008Jan;17(1):55–63. https://doi.org/10.1590/S0104-07072008000100006

31. Benites GO, Figueiredo PP, Canuso LDS, Francioni FF. Construction of education technology for the self-care of people with chronic kidney disease in hemodialysis. RSD [Internet]. 2022Jan;11(2):e14711222269. http://dx.doi.org/10.33448/rsd-v11i2.22269

32. Oliveira ZRC, *et al.* Avaliação de um manual para orientação de antibioticoterapia em pacientes com doença renal crônica dialítica na graduação de medicina. *Res Soc Dev.* 2023;12(2). https://doi.org/10.33448/rsd-v12i2.39214

33. Netzner NLC, Borges S. Alterações no paladar na doença renal crônica: elaboração de manual educativo. Health Resid. J. [Internet]. 2022;3(16):203-219. https://doi.org/10.51723/hrj.v3i16.287.

34. Freitas LR, Pennafort VPS, Mendonça AEO, Pinto FJM, Aguiar LL, Studart RMB. Guidebook for renal dialysis patients: care of central venous catheters and arteriovenous fistula. Rev Bras Enferm [Internet]. 2019Jul;72(4):896-902. https://doi.org/10.1590/0034-7167-2018-0131

35. Katsarou A, Intas G, Pierrakos G. Investigating the needs of caregivers of patients suffering from chronic diseases: a mixed-method study. Indian J Palliat Care. 2023;29(3):285-291. http://dx.doi.org/10.25259/IJPC_179_2022

36. Instituto para Práticas Seguras no Uso de Medicamentos. Estratégias para envolver o paciente na prevenção de erros de medicação. Bol ISMP. 2019;8(3):9. Disponível em: https://www.ismp-brasil.org/site/wp-content/uploads/2019/05/Estrategias_para_envolver_o_paciente_Boletim_ISMP_Brasil.pdf. Acesso em: 25 nov. 2023.

37. National Institute for Health and Care Excellence. Chronic kidney disease: assessment and management. 25 ago. 2021. Disponível em: https://www.nice.org.uk/guidance/ng203/chapter/Recommendations#information-and-education-for-people-with-ckd. Acesso em: 25 nov. 2023.

38. Brasil. Ministério da Saúde. Secretaria de Ciência, Tecnologia e Insumos Estratégicos. Departamento de Assistência Farmacêutica e Insumos Estratégicos. Cartilha para a promoção do uso racional de medicamentos. Brasília: Ministério da Saúde; 2015.

39. Nemours KidsHealth. Medicines: Using Them Safely. 7 jun. 2023. Disponível em: https://kidshealth.org/en/parents/medication-safety.html. Acesso em: 25 nov. 2023.

40. Abreu RB, Carioca AAF, Sampaio HAC, Vasconcelos CMCS. Validação do Instrumento de Avaliação de Materiais Educativos Impressos com foco no Letramento em Saúde para o Brasil (AMEELS-BR). RSD [Internet]. 2021Sep.1310(12):e68101220104. http://dx.doi.org/10.33448/rsd-v10i12.20104.

41. Silva EL, Mendez SP, Baptista AF, Sá KN. Métodos de elaboração de materiais de educação em saúde para adultos: revisão integrativa. Saude Tecnol [Internet]. 29 de Julho de 2022;(21):60-7. https://doi.org/10.25758/set.2222.

42. Pereira RDM, Alvim NAT. Técnica Delphi no diálogo com enfermeiros sobre a acupuntura como proposta de intervenção de enfermagem. Esc Anna Nery [Internet]. 2015Jan;19(1):174-180. https://doi.org/10.5935/1414-8145.20150024.

43. Teixeira E, Mota VMSS. Educação em saúde: Tecnologias Educacionais em Foco. Série educação em saúde. São Caetano do Sul (SP): Difusão Editora; 2011;2.

44. Yusoff MSB. ABC of content validation and content validity index calculation. Educ Med J. 2019;11(2):49-54. https://doi.org/10.21315/eimj2019.11.2.6.

45. Silva KN, Alves SAA, Lopes MSV, Pinto AGA, Pereira MLD, Cavalcante EGR. Development and validity of an educational folder for pulmonar tuberculosis sputum collection. Rev Bras Enferm [Internet]. 2023;76(1):e20220194. https://doi.org/10.1590/0034-7167-2022-0194pt.

46. Gonçales MB, Barbieri M, Gabrielloni MC. Teste de Papanicolau: construção e validação de material educativo para usuárias de serviços de saúde. Saúde Colet [Internet]. 2008;5(20):39-44. Disponível em: https://www.redalyc.org/pdf/842/84202003.pdf.

47. Galdino YLS, Moreira TMM, Marques ADB, Silva FAA. Validation of a booklet on self-care with the diabetic foot. Rev Bras Enferm [Internet]. 2019;72(3):780-787. https://doi.org/10.1590/0034-7167-2017-0900.

48. Fonseca CC, Carbogim FC, Poveda VB, Santos KB. Construção e validação de cartilha educativa sobre o uso de imunossupressores no pós transplante renal. Cogitare Enferm [Internet]. 2022;27. https://doi.org/10.5380/ce.v27i0.81630.

49. Wild CF, Nietsche EA, Salbego C, Teixeira E, Favero NB. Validação de cartilha educativa: uma tecnologia educacional na prevenção da dengue. Rev Bras Enferm [Internet]. 2019Sep;72(5):1318-1325. http://dx.doi.org/10.1590/0034-7167-2018-0771.

50. Santos LTM, Sarkis LBS, Colugnati FAB, Bastos MG. Metodologia de criação de uma ferramenta didático-pedagógica de intervenção em doença renal crônica, segundo preceitos do letramento em saúde. HU Rev [Internet]. 2018;43(3):255-263. https://doi.org/10.34019/1982-8047.2017.v43.2936.