Original Article

TEXTO & CONTEXTO ENFERMAGEM
TEXT & CONTEXT NURSING TEXTO & CONTEXTO ENFERMERÍA

DEVELOPMENT OF AN EDUCATIONAL TECHNOLOGY ON CLEAN INTERMITTENT BLADDER CATHETERIZATION IN CHILDREN TO INSTRUCT FAMILY MEMBERS

Isadora Cristina de Oliveira Yoneiama[1]
Alice Barreto Santana[1]
Mila Torii Correa Leite[2]
Ariane Ferreira Machado Avelar[1]
Aline Santa Cruz Belela-Anacleto[1]
Edmara Bazoni Soares Maia[1]

[1]Universidade Federal de São Paulo, Escola Paulista de Enfermagem. São Paulo, SP, Brasil.
[2]Universidade Federal de São Paulo, Escola Paulista de Medicina. São Paulo, SP, Brasil.

ABSTRACT

Objectives: to prepare and validate an illustrated guide to instruct family members on clean intermittent bladder catheterizarion in children.
Method: a methodological research study carried out between January 2021 and February 2022 and developed in three stages: Bibliographical review and elaboration of the illustrated guide; Content validation by expert judges (Delphi technique); and Validation of the response process by representatives of the target audience. The study was conducted in the specialties outpatient service of a large-sized university hospital from the municipality of São Paulo, Brazil. The sample consisted of 18 expert judges and 9 mothers of children undergoing clean intermittent bladder catheterization and in outpatient care. Agreement levels equal to or greater than 80% were considered as consensus, and a 0.80 rate was the acceptable minimum for the Content Validity Index.
Results: the illustrated guide consists in 18 sessions, from the step-by-step instructions for clean intermittent bladder catheterization to including children in the procedure. In the first and second validation rounds with the evaluators, Content Validity Index values of 0.8 and 1.0 were obtained, respectively. In the validation by the target audience, 100% agreement was reached in the understanding, Appeal, Self-efficacy, Cultural acceptability and Persuasion domains.
Conclusion: the illustrated guide proved to be valid in terms of content by the judges and family members, with the potential to mediate the educational practice in care settings for children in need of clean intermittent bladder catheterization.

DESCRIPTORS: Urinary catheterization. Neurogenic urinary bladder. Education in health. Comprehensive assistance to children's health. Methodological study. Pediatric nursing.

HOW CITED: Yoneiama ICO, Santana AB, Leite MTC, Avelar AFM, Belela-Anacleto ASC, Maia EBS. Development of an educational technology on clean intermittent bladder catheterization in children to instruct family members. Texto Contexto Enferm [Internet]. 2023 [cited YEAR MONTH DAY]; 32:e20230008. Available from: https://doi.org/10.1590/1980-265X-TCE-2023-0008en

DESENVOLVIMENTO DE TECNOLOGIA EDUCACIONAL SOBRE CATETERISMO VESICAL INTERMITENTE LIMPO EM CRIANÇAS PARA ORIENTAÇÃO DE FAMILIARES

RESUMO

Objetivos: elaborar e validar um guia ilustrado para orientações de familiares sobre o cateterismo vesical intermitente limpo em crianças.
Método: pesquisa metodológica, realizada entre janeiro de 2021 e fevereiro de 2022, desenvolvida em três etapas: revisão bibliográfica e elaboração do guia ilustrado; validação de conteúdo por juízes especialistas (técnica Delphi) e validação de processo de resposta por representantes do público-alvo. O estudo foi conduzido no ambulatório de especialidades de um hospital universitário de grande porte do município de São Paulo, Brasil. A amostra foi composta por 18 juízes especialistas e 9 mães de crianças que realizavam cateterismo vesical intermitente limpo e estavam em atendimento ambulatorial. Foi considerado consenso concordância igual ou superior a 80%, e taxa de 0,80 como concordância mínima aceitável para o índice de validade de conteúdo.
Resultados: o guia ilustrado é composto por 18 sessões, desde o passo a passo do cateterismo vesical intermitente limpo até a inclusão da criança no procedimento. Na primeira rodada de validação com juízes, obteve-se índice de validade de conteúdo maior que 0,8 e, na segunda rodada, de 1,0. Na validação por parte do público-alvo obteve-se 100% de concordância nos domínios compreensão, atratividade, autoeficácia, aceitabilidade cultural e persuasão.
Conclusão: o guia ilustrado mostrou-se válido quanto ao conteúdo pelos juízes e familiares com potencial para mediar a prática educativa em cenários de cuidado à criança com necessidade de cateterismo vesical intermitente limpo.

DESCRITORES: Cateterismo urinário. Bexiga urinária neurogênica. Educação em saúde. Assistência integral à saúde da criança. Estudo metodológico. Enfermagem pediátrica.

DESARROLLO DE UNA TECNOLOGÍA EDUCATIVA SOBRE CATETERISMO VESICAL INTERMITENTE LIMPIO EN NIÑOS PARA ORIENTAR A LOS FAMILIARES

RESUMEN

Objetivos: elaborar y validar una guía ilustrada para orientar a los familiares sobre el cateterismo vesical intermitente limpio en niños.
Método: investigación metodológica realizada entre enero de 2021 y febrero de 2022 y desarrollada en tres etapas: Revisión bibliográfica y elaboración de la guía ilustrada; Validación del contenido a cargo de jueces especialistas (técnica Delphi); y Validación del proceso de respuesta por parte de representantes de la población objetivo. El estudio se condujo en el servicio ambulatorio de especialidades de un hospital universitario de gran porte del municipio de San Pablo, Brasil. La muestra estuvo compuesta por 18 jueces especialistas y 9 madres de niños sometidos a cateterismo vesical intermitente limpio y se encontraban en tratamiento ambulatorio. Un nivel de concordancia de al menos el 80% se consideró como consenso, al igual que el índice de 0,80 como concordancia mínima aceptable para el Índice de Validez de Contenido.
Resultados: la guía ilustrada consta de 18 sesiones, desde las instrucciones paso a paso para realizar el cateterismo vesical intermitente limpio hasta la inclusión de los niños en el procedimiento. En la primera ronda de validación con los jueces se obtuvo un Índice de Validez de Contenido superior a 0,8 y, en la segunda ronda, dicho índice fue 1,0. En la validación por parte de la población objetivo se obtuvo 100% de concordancia en los dominios de Comprensión, Aspecto atractivo, Autoeficacia, Aceptabilidad cultural y Persuasión.
Conclusión: la guía ilustrada demostró ser válida en cuanto al contenido según la evaluación de los jueces y familiares, con potencial para mediar la práctica educativa en situaciones de atención a niños que precisan cateterismo vesical intermitente limpio.

DESCRIPTORES: Cateterismo urinario. Vejiga urinaria neurogénica. Educación en salud. Asistencia integral de la salud infantil. Estudio metodológico. Enfermería pediátrica.

INTRODUCTION

In the clinical practice context in Brazilian Pediatrics, *Crianças com Necessidades Especiais de Saúde* (CRIANES)[1], internationally known as Children with Special Health Care Needs[2], are subgroups on the rise and represent a challenge to the health system in terms of access to specialized care and of comprehensively meeting their demands[3,4]. They are characterized by presenting chronic conditions (physical, developmental, behavioral or emotional) and demanding continuous, complex and innovative therapeutic regimes, which in turn imply the need to incorporate new knowledge and unusual practices into the life routine of their families[3–5].

Children with the condition called Neurogenic Bladder (NB) are included in this context; this is a term that describes changes in bladder function triggered by a neurological disease or injury and which is characterized by changes in the normal voiding pattern in the phases of filling/reservoir and bladder emptying[6]. Morphological alterations and irreversible functional damage in the lower and upper urinary tracts constitute the main complications of NB. Thus, the treatment aims at preserving and optimizing renal function, controlling and preventing urinary infections and acquiring urinary continence, in addition to providing better quality of life and autonomy for older children[6].

A number of studies indicate that conservative management should be initiated early in time and that around two-thirds of children can become continent after implementing the treatment, which includes using anticholinergics and clean intermittent bladder catheterization (CIBC)[7–8].

CIBC consists in introducing a lubricated catheter through the urinary meatus to the bladder, using a clean technique and non-sterile materials, allowing its emptying[6]. By eliminating urinary residue, CICB increases functional bladder capacity and decreases intravesical pressure, reducing the risk of urinary tract infection, vesicoureteral reflux and, consequently, upper urinary tract injury. It is an easy-to-perform procedure, which is closest to the physiological function of the bladder and contributes to increased self-esteem, social reintegration and consequent improvement in quality of life[6–7].

In parallel to the aforementioned benefits, performing a CIBC requires learning technical care measures, adaptation and engagement both from the child and from the family. Children's right to actively participate in their own health care, along with the family, has been advocated in the children-centered care approach[9]. From this perspective, it is essential that both professionals and parents help them in this involvement so that they gradually gain confidence and autonomy. It is a complex process in which feelings such as fear, embarrassment, insecurity, anguish and concern related to CICB are described both by patients and by family members. Associated with lack of information and materials, clinical complications, in addition to doubts and unavailability of time, these factors represent significant barriers to performing the procedure as recommended[10–11].

Considering nurses' educational role, health education is a fundamental element of the care plan, contributing to health promotion and maintenance and to achieving autonomy, according to each person's needs[12]. In this context, using educational technologies becomes an important didactic resource that, in addition to providing diverse information, seeks to sensitize the individual to changing behaviors with regard to the control of modifiable risk factors and adherence to the treatment[13].

Thus, the objective of this study is to prepare and validate an illustrated guide to instruct family members on clean intermittent bladder catheterizarion in children. It is considered that production of the educational material contributes to the sharing of grounded, standardized and enlightening information, subsidizing qualified care and with the potential to promote safety and autonomy in children, family members and caregivers.

METHOD

This is a methodological research study[14] carried out in three stages: Bibliographical review and elaboration of the illustrated guide; Content validation by expert judges (Delphi technique); and Validation of the response process by representatives of the target audience.

Methodologically, the study was based on the concepts of the contemporary model[15] of types of validity, translated and adapted by Ferretti-Rebustini[16], which establishes that an instrument gathers diverse evidence of content validity when it contains relevant and pertinent items for measuring the phenomenon in a comprehensive and accurate way (test content) and that the items are in line with the expected cognitive processes (response process).

The study was conducted in the specialties outpatient service of a large-sized university hospital from the municipality of São Paulo. The institution is a reference center for the treatment of children with congenital malformations, especially urological and gastrointestinal anomalies.

For selection of the specialist judges, considering the specificity of the theme of the educational material, the following criteria were defined: work in the Pediatric Nursing or Pediatrics areas, clinical practice with patients who undergo CIBC, experience with health education and technology development, and graduate degree (*latu* or *stricto sensu*). Through a search on the Lattes Platform of the National Council for Scientific and Technological Development and as recommended in the literature[17], 24 judges who met the established criteria were selected and invited.

As for the representatives of the target audience, the criterion established for invitation for convenience was to be a parent or guardian of children who undergo CIBC and who were in outpatient monitoring service at the institution during the research[18]. The framework adopted in this study recommends selecting 10 participants, considering specificity of the context[18].

Thus, considering the period stipulated for data collection, the convenience sample consisted of 18 expert judges who agreed to participate in the study and nine mothers of children undergoing CIBC.

Stage 1 – Bibliographical review and elaboration of the educational material

Initially, a search for publications related to the theme was carried out using the following keywords: urinary catheterization: urinary catheters; neurogenic bladder; outpatient care for children; and knowledge, attitudes and practice in health. The articles selected were those corresponding to the following research question: “which care measures should be instituted when performing clean intermittent bladder catheterization in children?” All the texts that answered the guiding question were read and analyzed in full. According to the objective of the educational material, all the information assessed as relevant by the authors was recorded and considered for inclusion in the content of the illustrated guide.

When writing the educational material texts, the content of an information booklet already used in the aforementioned service was considered, although not yet validated. The content of the illustrated guide was divided into topics, based on the diverse information and evidence obtained from the literature review. After several versions of the text and once its writing was concluded, the illustrations conceived in a contextualized way by the researchers were drawn by an illustrator. Subsequently, a graphic designer diagrammed the illustrated guide, in order to produce an appealing material consistent with the target audience’s cultural context. The first version of the illustrated guide consisted of 32 pages divided into 16 sessions.

Stage 2 – Validation of the instrument's content by expert judges

The stage to verify the diverse evidence of validity of the instrument's content by expert judges took place from January to August 2021, it involved qualitative and quantitative procedures, and was performed using the Delphi technique in two rounds. An online questionnaire software program was used, a form containing the study variables and specifically developed for this research. The judges were invited via email, when a letter was sent containing the study objective, a description of the instrument, the evaluation criteria and the answer form. After accepting, they were sent a link to fill in the form to evaluate the illustrated guide.

The first part of the data collection instrument consisted of sample characterization variables, namely: gender, age, degree, professional training time, expertise area, clinical experience and with educational materials and instrument validation, and publications about the theme.

Qualitatively, each of the 32 pages included in the instrument was assessed as 'Adequate', 'Adequate with changes' or 'Inadequate'. Thus, the content was analyzed considering the criteria adapted from Pasquali: Clarity (clear, simple, unambiguous sentences and appropriate to the target population), Pertinence (relevant and consistent information and concepts to the construct proposed), Simplicity (the content expresses a single idea), Up-to-date (content based on up-to-date scientific evidence), Precision (the content is different from the one addressed in other sessions; they are not to be confused), Credibility (content formulated so that it does not appear as ridiculous, unreasonable or childish) and Behavior (it does not present abstract items)[14–15]. The images and format were also analyzed. Agreement levels equal to or greater than 80% were considered as consensus.

The quantitative assessment was performed based on calculation of the Content Validity Index (CVI), which measures the proportion or percentage of judges who agree on certain aspects of the instrument and its items. Based on a Likert-type scale from one to four, each item of the instrument was assessed regarding representativeness, as follows: 1=Not relevant or not representative; 2=The item needs major review to be representative; 3 = The item needs minor review to be representative; and 4 = Relevant or representative item. The index score was calculated by adding up the agreement of the items marked as "3" or "4" by the experts, divided by the total number of answers. The items scored with "1" or "2" were reviewed or removed[14,17].

The assessment of the instrument as a whole was performed by calculating the overall CVI, based on the sum of all CVI values calculated separately divided by the number of items considered in the assessment. The Fleiss Kappa test was applied to evaluate agreement among the judges.

Stage 3 – Validation of the response process

The researchers approached the family members individually in the outpatient service waiting room. This stage took place in January and February 2022. After clarifying the study objectives and agreeing to participate, the material was presented and the participants were asked to handle the illustrated guide freely. Subsequently, a joint reading session was carried out with the family member and, then, the interview was carried out to fill in the data collection form. The interviews lasted a mean of 15 minutes.

The first part of the form consisted of the participants' characterization variables, including gender, age, degree of kinship with the child, marital status, schooling, occupation, whether the respondent was the main caregiver and, if not, what the degree of kinship with the person in question was, in addition to the time of experience in CIBC performance. Variables related to the child were also included, such as gender, age, date when CICB was first performed, and if the child is an active participant in CICB and how.

In the second part, following the framework proposed by Doak, Doak & Root[18], the illustrated guide items were assessed for understanding, appeal, self-efficacy, cultural acceptability and persuasion[18] (Chart 1). Following the adopted framework, questions representing each evaluated domain were prepared, and the participant should answer "Yes" or "No" and make comments for each of them.

Chart 1 – Definition of the domains corresponding to the assessment by the target audience[18].

Understanding	The participants can express or show the content with their own words.
Appeal	The material is sufficiently appealing to convey the message proposed; the colors and images are suitable for the theme.
Self-efficacy	The educational material is accessible to the participants; the participants feel confident that they have sufficient information and skills to carry out the instructions.
Cultural acceptability	The message is perceived as true; the material contains elements that may irritate or offend; the characteristics and context settings of the material enhance or compromise cultural appropriateness.
Persuasion	The material presents convincing information; other people would be influenced by the information presented.

Data analysis and treatment

The data were stored in an electronic database. The categorical variables were presented according to absolute and relative frequencies. Agreement levels equal to or greater than 80% were considered as consensus, and a 0.80 rate was the acceptable minimum for the CVI and for Fleiss Kappa.

Ethical aspects

Conduction of the study complied with all the norms set forth in National Health Council Resolution No. 466 of December 12th, 2012, being approved by the Research Ethics Committee of the proposing institution.

RESULTS

Content validation

In order to analyze the diverse content validity evidence, the illustrated guide was evaluated by 18 expert judges. Most of them were female (16; 88.9%), from the 'Nurse' professional category (14; 77.8%) and aged between 36 and 55 years old (12; 66.66%). PhD (7; 38.8%) prevailed as the most frequent degree, with the majority (14; 77.8%) having more than 10 years of professional training. All the judges (18; 100.0%) were active in the care area and had clinical experience in the theme researched. 83.3% (15) of the participants had experience in the development of educational materials, 55.5% (10) in the validation of instruments and 27.8% (5) had published on the theme.

Each page of the illustrative guide was evaluated according to the qualitative criteria selected. In the first validation round, the agreement level was not equal to or greater than 80% in the 'Clarity' criterion in six pages, as well as in the 'Precision' criterion in two pages of the instrument. In relation to the other criteria, the expected agreement level was achieved in all the pages. Consensus was also reached when evaluating the images and format. The overall agreement level of all pages of the illustrative guide according to the evaluative criteria is presented in Table 1.

In the first round, all pages of the illustrative guide presented CVI values equal to or greater than 0.80, and the total CVI was 0.96 (Table 1). Even so, various changes referring to writing and language and to the inclusion of technical information were suggested, all considered pertinent by the researchers.

Table 1 – Content Validity Index (CVI) values in both content validation rounds with judges. São Paulo, SP, Brazil, 2022.

Items of the educational material	Round 1	Round 2
Item 1	0.94	1.00
Item 2	1.00	1.00
Item 3	0.88	1.00
Item 4	0.94	1.00
Item 5	1.00	1.00
Item 6	1.00	1.00
Item 7	1.00	1.00
Item 8	0.94	1.00
Item 9	0.88	1.00
Item 10	1.00	0.93
Item 11	1.00	1.00
Item 12	0.94	1.00
Item 13	1.00	1.00
Item 14	1.00	1.00
Item 15	0.94	1.00
Item 16	1.00	0.93
Item 17	1.00	1.00
Item 18	1.00	1.00
Item 19	1.00	1.00
Item 20	1.00	1.00
Item 21	1.00	1.00
Item 22	1.00	1.00
Item 23	1.00	1.00
Item 24	0.94	0.93
Item 25	1.00	0.93
Item 26	1.00	1.00
Item 27	0.94	0.93
Item 28	0.82	1.00
Item 29	0.94	1.00
Item 30	1.00	0.93
Item 31	0.94	0.94
Item 32	0.83	0.83

Based on the changes made, the second version of the illustrated guide was organized in 36 pages and submitted to the second validation round. Feedback was obtained from 14 judges, who evaluated 21 pages, including those in which there was no consensus in the first round, those where changes were considered relevant and those that were included. The agreement level was equal to or

greater than 80% in all the pages and for all the evaluative criteria. Regarding the CVI, all the pages evaluated presented values equal to or greater than 0.80 and the total CVI was 1.0 (Table 1) again. The Fleiss Kappa coefficient was used to assess the agreement level among judges in the first (K=0.91; 95%CI: 0.87-0.96) and second (K=0.94; 95%CI: 0.9-0.98) rounds, showing excellent agreement.

Validation by the target audience

In order to verify diverse evidence corresponding to validity of the response process[17], nine family members of children undergoing CIBC were interviewed. All the participants (n=9; 100.0%) were mothers and identified themselves as the main caregivers. Their mean age was 38 years old (minimum of 29; maximum of 44), most of them were married (n=6; 66.7%), housewives (n=8; 88.9%) and had Complete High School (n=8; 88.9%). The mean CIBC performance time by the mothers was 4.4 years (minimum of 1; maximum of 10). In relation to the children's characteristics, there was predominance of schoolchildren (n=5; 55.56%) and of the female gender (n=7; 77.78%). Most of them (n=7; 77.8%) took part in the procedure engaging in self-catheterization, separation of materials, tube opening or removal or hygiene.

As presented in Table 2, total agreement was obtained in all the domains corresponding to the evaluation by the target audience.

Table 2 – Distribution of the answers obtained from the target audience participants according to the evaluation domains. São Paulo, SP, Brazil, 2022. (n=9)

Domains	Yes
Understanding	
Please comment on the subject matter of the guide and/or on what it talks about.	9(100%)
Can the participant comment on and describe what the guide talks about?	9(100%)
Can you describe which care measures are important when performing CIBC? Indicate at least one example.	9(100%)
Can the participant describe which care measures are important when performing CIBC?	9(100%)
After reading, can you clarify if the family can decide by itself if they can reduce the number of catheterization procedures per day?	9(100%)
Did the participant answer the question correctly, as described in the guide?	9(100%)
Do you consider that it is important to involve children in CIBC performance? Please comment on your answer.	9(100%)
Did the participant answer the question considering all the information included in the guide?	9(100%)
What part of the guide did you fail to understand or found difficult?	9(100%)
Appeal	
Did the guide draw your attention?	9(100%)
Did you feel motivated to read until the end? Why?	9(100%)
Do you consider that the colors and illustrations are suitable? If not, why?	9(100%)
Self-efficacy	
Can the information presented in the guide be applied in your CIBC practice?	9(100%)
Do you consider that the information presented in the guide is sufficient to instruct families in CIBC performance?	9(100%)
Might any information be added or removed?	9(100%)
Cultural acceptability	9(100%)
Was there anything that you did not like about the guide?	9(100%)
Do you consider that any information or image in the guide is aggressive, offensive or embarrassing? If so, which one(s)?	–

Table 2 – Cont.

Domains	Yes
Do you identify yourself with any of the guide's characters?	9(100%)
Do you identify your child with any of the guide's characters?	9(100%)
Persuasion	
Does the guide contribute important and/or useful information to instruct the families performing CIBC?	9(100%)
Do you intend to follow and/or use the information presented in the guide?	9(100%)
Do you believe that other families will be able to follow the guidelines presented in the guide?	9(100%)
Would you offer any suggestion to render the guide more useful?	–

In the "Understanding" domain, all the participants (n=9; 100.0%) were able to comment on and describe the content presented, emphasizing the step-by-step description of the procedure. The instrument was characterized as clarifying not only for the more experienced families but especially for those at the beginning of the process. [...] *it talks about exactly what I live every day, which is what I do, it's going to be very good for those starting now, it's going to be wonderful, really useful indeed. It says everything, illustrates everything, everything, perfect!* (F8)

Hand hygiene was the most mentioned care measure, in addition to intimate hygiene, maintaining the environment clean and performing the procedures at the proper times and intervals. After reading the material, all mothers were able to clarify that the family cannot decide autonomously regarding the reduction in the number of catheterization procedures per day, and three (33.3%) of them cited the development of autonomy and responsibility as a consequence of children's involvement in CIBC performance. The majority (n=8; 88.9%) was able to understand the content presented and stated having no doubts.

Regarding the "Appeal" domain, all the participants (n=9;100,0%) asserted that the guide drew their attention, motivating them to read the entire material. The illustrations were a highlight; they were considered suitable and explanatory.

In the "Self-efficacy" domain, 100% (n=9) of the mothers stated that all the information included in the guide can be applied to their routine and that it is sufficient to instruct families in CIBC performance. In addition to that, there were no reports of information to be added to the instrument. It is noted that, throughout the interviews, several participants asserted that the guide would be very useful for families who are starting to learn the procedure and that they would have fewer doubts and fears if they had the material at the beginning of the process. [...] *for a mother that's beginning the treatment, this guide is excellent, excellent indeed. Because you know it first-hand, because sometimes the nurse explains but, for you to go do it yourself, it's complicated* (F1).

In relation to Cultural acceptability, the participants identified several positive points, among which the illustrations, the complete information and in understandable language, the representativeness from the characters and the involvement of the family in the procedure stand out. None of the interviewees considered the images as aggressive, offensive or inappropriate, and all (n=9; 100.0%) stated that they were able to identify their children among the characters in the guide.

One participant emphasized the perceived inclusion in the illustrations, reporting that she recognized her family in the images in view of the diversity of races, skin colors, presence of other family members and children in wheelchairs. [...] *first, we already see right here that there's a mixture of everything. Colors, racism is present in our environment. A child that walks and a wheelchair user... So, we see each other here, because even L in the chair, her brother didn't come with crumbs, so, it's*

a great relief for us. And here it involves the whole family, grandfather, grandmother, mother, father and the nurse helping (F5).

In the "Persuasion" domain, all (n=9; 100.0%) the mothers asserted that the illustrated guide contributes important and useful information, that they will follow the guidelines presented in the material, and that certainly other families will also do so, after reading it. Two (22.2%) participants added the relevance and usefulness of the material for the families that are beginning catheterization in their children. One of the interviewees mentioned that the illustrated guide conveyed a welcoming sensation, as the material was able to present the information in a simple way, considering her own reality and that of her family. [...] *the fact of being there, everything explained, presenting it in a simple way, as if it were like that, the same thing happened to me... So the book showing would've helped me better. If I had the book to help me, I would've accepted it better, you know? It would've helped me, opened my mind more, to see that it wasn't something like that, that you could get used to it. But everything is great, I hope whoever uses it now really enjoys it, because it'll be very good* (F8).

When asked if they had suggestions, seven (77.8%) stated that they would not add any other topic to the material, one (11.1%) mentioned that it would be important to teach self-catheterization to children and another (n=1; 11.1%) reinforced that it would be important to continue transmitting information to the families that are not aware of the guidelines for the procedure and that need to perform CIBC.

Thus, the educational material entitled "*Cateterismo vesical intermitente limpo – o que é importante saber? Guia ilustrado para famílias*" ("Clean Intermittent Bladder Catheterization – What is important to know? Illustrated guide for families") was finally obtained (Figure 1).

Figure 1 – Final graphical representation of the cover page and of pages 18 and 20 from the guide entitled "Clean Intermittent Bladder Catheterization – What is important to know? Illustrated guide for families." São Paulo, SP, Brazil, 2022.

DISCUSSION

Health education represents one of the pillars of nurses' work and refers to sharing knowledge regarding the health and therapy of patients, family members and companions, in view of the demands identified[12,19]. This research presents the development and validation process of an educational material on CIBC that included an approach to the target audience, showing applicability of the product and

responding to a gap in the literature[19]. Additionally, the use of educational technologies in health validated by specialists with technical and scientific skills confers greater scientificity and reliability to the instrument and enhances the benefits of the teaching-learning process[20].

We consider that the analysis carried out by specialist judges with extensive experience in the researched theme contributed strongly to improving quality of the content addressed in the educational material, especially with regard to the language applied in the clinical practice context, in order to reflect the everyday life of the target audience. The results indicated the elaboration of a material that is scientifically based, understandable and enlightening, appealing, useful and applicable to the families' everyday life. It is worth noting that all specialists and family members stressed the importance of presenting the guide's content to children and families at treatment initiation, so that they feel supported and safe from the beginning. It is considered that using the instrument can contribute for nurses to transform the reactions of fear and anger identified at treatment initiation into feelings of acceptance, understanding and mastery over a task that will preserve the child's health and quality of life[21]. Offering reinforcement, encouragement and information with adequate instruments is fundamental for a successful integration of the procedure into the child's lifestyle and general well-being[21], which corroborates what is proposed in the guide.

In a study that aimed at understanding the emotional perception of family caregivers in relation to CIBC, negative feelings resulting from the initial period of the procedure were identified[11]. Similarly, a participant in this research described the beginning of therapy as "a desperate, frightening and impossible moment to materialize", reinforcing the importance of sharing an instrument that establishes itself as a reliable information source that clarifies doubts and promotes the family members' confidence in the face of the new reality.

In addition to the scarcity of studies and materials on the theme, another difficulty pointed out by patients and family members in carrying out the procedure refers to insufficient guidelines by health professionals[22]. The step-by-step explanation of the CIBC technique for families should be a priority, as an incorrect technique implies complications in the short- and long-term. Thus, it becomes essential to seek and implement strategies that are interesting and understandable to the target audience and that contribute to overcoming the challenges of low health literacy, as proposed in the illustrated guide.

It should be noted that the participating family members had sufficient skills and knowledge to contribute to elaboration of the guide; however, they did not suggest modifications. They reinforced the importance of the guide portraying the CIBC technique in detail, strengthening the appropriate behavior and retrieving diverse information that, in general, is forgotten in the daily practice. Thus, they pointed out that the professionals should periodically retrieve information from the families, even those considered experienced, in order to maintain the safety and quality of home-based care.

With regard to the content, it is noted that, in addition to providing guidelines to the families of children in need of CIBC, the material provides diverse information on how to involve children in the procedure, emphasizing the construction of a participatory and gradual process, respecting their development stages and interests, intertwined with those of their family members. We recognize this aspect as a differential of the educational material, as most publications focus, above all, on procedural skills to be developed by the caregiver[22–23], without highlighting the child's potential.

We advocate for children's inclusion and involvement based on their right to participate in decisions and actions that affect them[24]. In addition to that, autonomy, decision-making power, appreciation of experiences and effective participation can contribute to the children's role in their health promotion process[25–26]. At the same time, we acknowledge that the balance between protecting and promoting autonomy represents a challenge and, therefore, the illustrated guide proposes sharing between the family and the child from treatment initiation, in addition to encouraging progressive independence. Until they reach maturity for autonomously carrying out CIBC, parents, family members

and legal representatives should act in the child's best interests[24], being prepared and supported with educational instruments that help them understand how to act, so that everyone benefits.

We emphasize that all participating families asserted that they considered it important to involve children in the CIBC process. One of the mothers recognized this process as extremely important for her daughter's achievement of autonomy and responsibility. Of the nine families interviewed, two mentioned that the children, between eight and 11 years old, were already performing self-catheterization, one was learning and four were already helping during the procedure, by gathering and delivering the material, opening the tube casing, removing the tube or through intimate hygiene. Such findings corroborate those of another study which highlights that children aged between seven and eight years old can be successful in performing self-catheterization; however, it reinforces that this practice must be carried out with parental support and supervision, which ensures that it is performed properly[21]. Other authors suggest that the ideal age for progressive independence is between nine and 12 years old[27].

Another contribution of the instrument prepared is the proposal for the family to involve the child through playful interactions such as the use of dolls, so that they can play and take care of the doll that needs CIBC. The benefits of this practice have been highlighted in the literature, as dramatizing the procedure allows children to understand it[21].

As an educational material in health, the illustrated guide was structured in a cohesive, coherent, sufficient and organized way and with language accessible to the target audience[28], based on a literature review, as recommended from the methodological point of view. Characters were created to present the content, with the purpose of welcoming, creating an identification relationship with the reader and making the explanations more credible[25]. All images were drawn by an illustrator aiming at producing figures consistent with the reality of children and families, and that were sufficiently enlightening. No illustrations were considered aggressive, offensive or disturbing by the target audience or the judges. The inclusive characterization of the characters was highlighted by the participants.

Additionally, when evaluating concepts and recent evidence on health literacy, it is possible to argue that the material developed contributes to promoting it, in view of its potential to provide access to information, training of children and families and empowerment to deal with the clinical condition.

A study limitation is the participation of families assisted in a single care scenario.

CONCLUSION

The educational material called "Clean Intermittent Bladder Catheterization- What is important to know? Illustrated guide for families" presented diverse content validity evidence characterized both by expert judges and by the target audience. The instrument has the potential to mediate the educational practice in care settings for children in need of CIBC, being considered appropriate and motivating by the family members. It is deemed that the instrument will contribute greatly so that nurses and the multidisciplinary team can share reliable and enlightening information, with appropriate language and a focus on the development of children's skills to gain self-confidence and autonomy in a progressive and shared way.

REFERENCES

1. Rodrigues DZ, Ferreira FY, Okido ACC. The burden of family caregiver of children with special health needs. Rev Eletr Enf [Internet]. 2018 [cited 2023 May 31];20:v20a48. Available from: https://doi.org/10.5216/ree.v20.53190
2. McPherson M, Arango P, Fox H, Lauver C, McManus M, Newacheck PW, et al. A new definition of Children with Special Health Care Needs. Am Acad Pediatr [Internet]. 1998 [cited 2023 May 31];102(1):137-41. Available from: https://doi.org/10.1542/peds.102.1.137

3. Huang L, Freed GL, Dalziel K. Children with special health care needs: how special are their health care needs? Acad Pediatr [Internet]. 2020 [cited 2023 May 31];102(8):1109-15. Available from: https://doi.org/10.1016/j.acap.2020.01.007

4. Okido ACC, MMF Zago, Lima RAG. Care for technology dependent children and their relationship with the health care systems. Rev Lat Am Enfermagem [Internet]. 2015 [cited 2023 May 31];23(2):291-8. Available from: https://doi.org/10.1590/0104-1169.0258.2554

5. Goes FGB, Cabral IE. Discourses on discharge care for children with special healthcare needs. Rev Bras Enferm [Internet]. 2017 [cited 2023 May 31];70(1):154-61. Available from: https://doi.org/10.1590/0034-7167-2016-0248

6. Cruz ML, Macedo Jr A. Bexiga neurogênica. In: Calado A, Rondon AV, Murillo Netto J, Bresolin NL, Martins R, Barroso Jr U, orgs. Uropediatria: Guia para Pediatras [Internet]. Rio de Janeiro, RJ(BR): Sociedade Brasileira de Urologia; 2019 [cited 2023 May 31]. p. 153-68. Available from: https://www.sbp.com.br/fileadmin/user_upload/Manual_Uropediatria-Final.pdf

7. Sripathi V, Mitra A. Management of Neurogenic Bladder. Indian J Pediatr [Internet]. 2017 [cited 2023 May 31];84(7):545-54. Available from: https://doi.org/10.1007/s12098-017-2356-7

8. Johnston AW, Wiener JS, Todd Purves J. Pediatric neurogenic bladder and bowel dysfunction: will my child ever be out of diapers? Eur Urol Focus [Internet]. 2020 [cited 2023 May 31];15(5):838-67. Available from: https://doi.org/10.1016/j.euf.2020.01.003

9. Ford K, Dickinson A, Water T, Campbell S, Bray L, Carter B. Child Centred Care: Challenging Assumptions and Repositioning Children and Young People. J Pediatr Nurs [Internet]. 2018 [cited 2023 May 31];43:e39-e43. Available from: https://doi.org/10.1016/j.pedn.2018.08.012

10. Faleiros F, Cordeiro A, Favoretto N, Käppler C, Murray C, Tate D. Patients with spina bifida and their caregivers' feelings about intermittent bladder catheterization in Brazil and Germany: a correlational study. Rehabil Nurs [Internet]. 2017 [cited 2023 May 31];42(4):175-9. Available from: https://doi.org/10.1002/rnj.223

11. Costa RCV, Guiotoku ETS, Kravchychyn H, Rocha J, Carmo MM, Castro YPG. Emotional perception of family-member caregivers regarding the clean intermittent catheterization in myelomeningocele cases. Acta Fisiatr [Internet]. 2012 [cited 2023 May 31];19(4):222-7. Available from: https://doi.org/10.5935/0104-7795.20120035

12. Ferreira PBP, Porto IS, Espírito Santo FH, Figueiredo NMA, Enders BC, Cameron LE, et al. Health education for hospitalized patient in nursing care: a conceptual analysis. Rev Bras Enferm [Internet]. 2022 [cited 2023 May 31];75(2):e20200459. Available from: https://doi.org/10.1590/0034-7167-2020-0459

13. Maniva SJCF, Carvalho ZMF, Gomes RKG, Carvalho REFL, Ximenes LB, Freitas CHA. Educational technologies for health education on stroke: an integrative review. Rev Bras Enferm [Internet]. 2018 [cited 2023 May 31];71 Suppl 4:1824-32. Available from: https://doi.org/10.1590/0034-7167-2017-0041

14. Hutz CS, Bandeira DR, Trentini C, orgs. Psicometria. Porto Alegre, RS(BR): Artmed; 2015.

15. American Educational Research Association; American Psychological Association; National Council on Measurement in Education. Standards for educational and psychological testing. Washington, D.C.(US): American Educational Research Association; 2014.

16. Ferretti-Rebustini REL. Síndrome da fragilidade em idosos com doença cardiovascular: um olhar sobre as evidências de validade dos instrumentos de medida [Tese de Livre Docência]. São Paulo, SP(BR): Universidade de São Paulo, Escola de Enfermagem do Brasil; 2018.

17. Alexandre NMC, Coluci MZO. Content validity in the development and adaptation processes of measurement instruments. Cienc Saude Colet [Internet]. 2011 [cited 2023 May 31];16(7):3061-8. Available from: https://doi.org/10.1590/S1413-81232011000800006

18. Doak CC, Doak, LG, Root J. Teaching patients with low literacy skills. Philadelphia, PA(US): J.B. Lippincott; 1996.

19. Lima MB, Caldini LN, Ramos Junior A, Torquato RC, Pinto TR, Rebouças CBA. Educational material on intermittent urethral catheterization in children: a scoping review. Texto Contexto Enferm [Internet]. 2022 [cited 2023 May 31];31:e20220037. Available from: https://doi.org/10.1590/1980-265X-TCE-2022-0037en

20. Albuquerque AFLL, Pinheiro AKB, Linhares FMP, Guedes TG. Technology for self-care for ostomized women's sexual and reproductive health. Rev Bras Enferm [Internet]. 2016 [cited 2023 May 31];69(6):1099-106. Available from: https://doi.org/10.1590/0034-7167-2016-0302

21. Tobias NE. Practical considerations and current best practice for pediatric clean intermittent catheterization. Pediatric Nursing. 2017 [cited 2023 May 31];43(6):267-73.

22. Benício CDAV, Rocha DM, Dourado GOL, Bezerra SMG, Andrade EMLR, Nogueira LT. Factors associated with the knowledge of patients and caregivers about clean intermittent urethral catheterization: an integrative review. Rev Esc Enferm USP [Internet]. 2018 [cited 2023 May 31];52:e03362. Available from: https://doi.org/10.1590/S1980-220X2017033703362

23. Lima MB, Rebouças CBA, Castro RCMB, Cipriano MAB, Cardoso MVLML, Almeida PC. Construction and validation of educational video for the guidance of parents of children regarding clean intermittent catheterization. Rev Esc Enferm USP [Internet]. 2017 [cited 2023 May 31];51:e03273. Available from: https://doi.org/10.1590/S1980-220X2016005603273

24. Altavilla A, Halila R, Kostopoulou MA, Lwoff L, Uerpmann K. Strengthening children's participation in their health: the new initiative of the Council of Europe. The Lancet Child & Adolt Health [Internet]. 2021 [cited 2023 May 31];5(4):237-38. Available from: https://doi.org/10.1016/S2352-4642(21)00019-5

25. Masson LN, Silva MAI, Andrade LS, Gonçalves MFC, Santos BD. Critical health education as a tool for the empowerment of school adolescents in the face of their health vulnerabilities. REME Rev Min Enferm [Internet]. 2020 [cited 2023 May 31];24:e-1294. Available from: https://doi.org/10.5935/1415-2762.20200023

26. Santos LF, Oliveira GM, Silva JB, Santos NSS, Evangelista DR. Educational activities to empower children in relation to oreal health and hygiene. Rev Hum e Inov [Internet]. 2021 [cited 2023 May 31];8(44):40-51. Available from: https://revista.unitins.br/index.php/humanidadeseinovacao/article/view/4167

27. Fortuna SM, Korcal L, Thomas G. Bladder Management in Children: Intermittent Catheterization Education. NASN School Nurse [Internet]. 2018 [cited 2023 May 31];33(3):178-85. Available from: https://doi.org/10.1177/1942602X18756164

28. Leite SS, Áfio ACE, Carvalho LV, Silva JM, Almeida PC, Pagliuca LMF. Construction and validation of an educational content validation instrument in health. Rev Bras Enferm [Internet]. 2018 [cited 2023 May 31];71 Suppl 4:1635-41. Available from: https://doi.org/10.1590/0034-7167-2017-0648

NOTES

ORIGIN OF THE ARTICLE

Extracted from the Course Conclusion Paper – Development of an educational technology on clean intermittent bladder catheterization in children to instruct family members, presented to the Undergraduate Nursing Course, *Escola Paulista de Enfermagem*, *Universidade Federal de São Paulo*, in 2022.

CONTRIBUTION OF AUTHORITY

Study design: Yoneiama ICO, Maia EBS, Belela-Anacleto ASC.
Data collection: Yoneiama ICO, Santana AB.
Data analysis and interpretation: Yoneiama ICO, Santana AB, Maia EBS, Belela-Anacleto ASC.
Discussion of the results: Yoneiama ICO, Santana AB.
Writing of the article or relevant critical review of the intellectual content: Yoneiama ICO, Santana AB, Maia EBS, Belela-Anacleto ASC, Leite MTC, Avelar AFM.
Review and final approval of the version to be published: Maia EBS, Belela-Anacleto ASC, Leite MTC, Avelar AFM.
Agreement with all aspects of the manuscript in terms of truthfulness or integrity of the information: Yoneiama ICO, Santana AB, Maia EBS, Belela-Anacleto ASC, Leite MTC, Avelar AFM.

ACKNOWLEDGMENT

The authors would like to thank the participating expert professionals and families for the careful analysis and by their rich contributions to improving the product developed.

FUNDING INFORMATION

This research was funded by the National Council for Scientific and Technological Development, Brazil (Process number 139,192/2020-4).

APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Approved by the Research Ethics Committee of *Universidade Federal de São Paulo* under Opinion No.4,135,205/2020 and Certificate of Presentation for Ethical Appraisal No. 30687620.6.0000.5505.

CONFLICT OF INTEREST

There is no conflict of interest.

EDITORS

Associated Editors: Renata Cristina de Campos Pereira Silveira, Ana Izabel Jatobá de Souza
Editor-in-chief: Elisiane Lorenzini

HISTORICAL

Received: February 02, 2023.
Approved: May 26, 2023.

CORRESPONDING AUTHOR

Isadora Cristina de Oliveira Yoneiama
icoyoneiama@gmail.com