

Elaboration and validation of a reader on childhood diarrhea prevention

Elaboração e validação de cartilha para prevenção da diarreia infantil
Elaboración y validación de libreta para la prevención de la diarrea infantil

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Descritores

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Descriptores

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Abstract

Objective: Elaborate, validate and evaluate an educational reader to promote maternal self-efficacy in the prevention of childhood diarrhea.

Method: Methodological study, developed based on the elaboration, validation and evaluation of educational material by 30 content judges and three technicians. For the validation, the clarity of the language, practical pertinence and theoretical relevance were considered, calculating the Content Validity Index for each item; and the tool *Suitability Assessment of Materials* (SAM) was applied to evaluate the reader.

Results: The reader was titled "You can prevent diarrhea in you child" was elaborated in the framework of Self-Efficacy Theory. The content judges attributed a global Content Validity Index (CVI) of 0.88 for language clarity, 0.91 for practical pertinence and 0.92 for theoretical relevance; and the technical judges attributed CVI of 0.96, 1.00 and 1.00 for the same items assessed, respectively. The assessment of the content and technical judges based on the SAM tool classified the material as "superior", with average coefficients of 88.7% and 90.1%, respectively.

Conclusion: The reader was considered appropriate in terms of face and content validation to promote maternal self-efficacy in the prevention of childhood diarrhea.

Resumo

Objetivo: Elaborar, validar e avaliar uma cartilha educativa para a promoção da autoeficácia materna na prevenção da diarreia infantil.

Método: Estudo metodológico, desenvolvido a partir da elaboração, validação e avaliação do material educativo por 30 juizes de conteúdo e três técnicos. Para validação, avaliou-se a clareza da linguagem, pertinência prática e relevância teórica, calculando-se o Índice de Validade de Conteúdo para cada item; e aplicou-se o instrumento *Suitability Assessment of Materials* (SAM) para avaliação da cartilha.

Resultados: A cartilha teve como título "Você é capaz de prevenir a diarreia no seu filho!" e foi elaborada tendo como referencial a Teoria da Autoeficácia. Os juizes de conteúdo atribuíram Índice de Validade de Conteúdo (IVC) global de 0,88 para clareza da linguagem, 0,91 para pertinência prática e 0,92 para relevância teórica; e os juizes técnicos atribuíram IVC de 0,96, 1,00 e 1,00 para os mesmos itens avaliados, respectivamente. A avaliação dos juizes de conteúdo e técnicos a partir do SAM classificou o material como "superior", com média de 88,7% e 90,1%, respectivamente.

Conclusão: A cartilha apresenta conteúdo e aparência adequados para a promoção da autoeficácia materna na prevenção da diarreia infantil.

Resumen

Objetivo: Elaborar, validar y evaluar una libreta educativa para la promoción de la Autoeficacia materna en la prevención de la diarrea infantil.

Método: Estudio metodológico desarrollado partiendo de la elaboración, validación y evaluación del material educativo por 30 expertos en contenido y tres técnicos. Para la validación se evaluó claridad del lenguaje, adecuación práctica y relevancia teórica, calculándose el Índice de Validez de Contenido para cada ítem; y se aplicó el instrumento *Suitability Assessment of Materials* (SAM) para evaluación de la libreta.

Resultados: La libreta se tituló "¡Tú eres capaz de prevenir la diarrea de tu hijo!", y fue elaborada sobre el referencial de la Teoría de la Autoeficacia. Los expertos en contenido le otorgaron Índice de Validez de Contenido (IVC) global de 0,88 a la claridad del lenguaje, 0,91 a adecuación práctica y 0,92 a relevancia teórica; y los técnicos puntuaron con IVC de 0,96, 1,00 y 1,00 a los mismos ítems evaluados, respectivamente. La evaluación de los expertos en contenido y técnicos a partir del SAM clasificaron al material como "superior", con promedio de 88,7% y 90,1%, respectivamente.

Conclusión: La libreta ofrece contenido y apariencia adecuados para promoción de Autoeficacia materna en la prevención de la diarrea infantil.

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Introduction

Diarrhea is considered a global public health problem with high morbidity and mortality rates, mainly in developing countries.⁽¹⁾ In Brazil, the State of Ceará, located in the Northeast, is one of the states with the worst environmental and health conditions, favoring the presence of risk factors for the disease, especially in children.⁽²⁾ In 2016, 3,711 cases of diarrhea in children under five years of age were registered in the city of Fortaleza, CE.⁽³⁾

Considered as a multifactorial disease, diarrhea can be prevented by adopting measures to protect against infectious agents.⁽⁴⁾ The need for prevention strategies is highlighted, aimed at families of children under five years of age, which can improve knowledge and maternal confidence in preventive care for childhood diarrhea.⁽⁵⁾

Thus, an educational video based on Bandura's Theory of Self-Efficacy titled "Childhood Diarrhea: you can prevent it", applied to mothers of children under five years old, permitted enhancing maternal self-efficacy to prevent childhood diarrhea and reducing the cases of diarrhea up to two months after this intervention. After this period, however, the mothers' self-efficacy decreased, suggesting the need to develop and use other technologies in this area to keep up the implementation of interventions to prevent this condition.^(5,6)

Thus, it was decided to elaborate an educational reader the promotion of maternal self-efficacy in the prevention of childhood diarrhea, using the Theory of Self-Efficacy as a reference framework. Readers are printed materials useful to describe health-related subjects, and can be used as a tool for health promotion, which facilitates the educational process.⁽⁷⁾

The use of this reader can contribute to improve educational activities for the prevention of childhood diarrhea performed by nurses, and will help the mothers in their childcare behaviors in the care of their child, increasing their confidence and influencing the reduction of cases of morbidity and mortality in children under five years of age due to diarrhea.

Therefore, the objective was to elaborate, validate and evaluate an educational reader for the pro-

motion of maternal self-efficacy in the prevention of childhood diarrhea.

Methods

It is a methodological study, in which an educational reader was developed to promote maternal self-efficacy in the prevention of childhood diarrhea, based on the elaboration, validation and evaluation of that educational material.

Initially, the educational reader was elaborated, whose content was based on the items of the Maternal Self-Efficacy Scale for Prevention of Childhood Diarrhea (EAPDI) and the scenes of the educational video "Childhood Diarrhea: you can prevent it". Therefore, the reader was constructed in the light of Bandura's Theory of Self-Efficacy.⁽⁶⁾ It is highlighted that both the EAPDI and the video mentioned were validated and had their reliability proven.^(8,9)

In this construction stage of the reader, it is worth noting that theoretical and methodological references have been used which emphasize elements that should be considered in the elaboration of printed educational materials with a view to improving the readers' comprehension.⁽¹⁰⁻¹³⁾

Initially, the script of the reader was developed and the Flesch Readability Test was applied to ensure easy reading. The test classifies the textual comprehension as follows: very easy, easy, difficult and very difficult; also classifying the sentences in the active and passive voice.⁽¹⁴⁾ Afterwards, a qualified design professional developed the illustrations and layout of the reader.

The reader was then submitted to validation, involving content and technical judges, to enhance the credibility of the material elaborated.⁽¹⁵⁾ Thirty content judges, who were specialists in the thematic area of the reader; and three technical judges, graphic design experts, participated in this validation stage. They were recruited and selected according to the criteria described by Jasper.⁽¹⁶⁾ The number of judges followed the recommendations suggested by the authors regarding the number of evaluators for this type of study.^(17,18)

The instrument used for the validation was a five-point Likert scale, ranging from "very low" to

“very high”, which permits evaluating each page of the reader based on: clarity of language, practical pertinence and theoretical relevance. In addition, space was provided for the judges’ suggestions.⁽¹⁹⁾

The judges also evaluated the educational material using SAM. This tool makes it possible to evaluate the material in the following areas: content; language fit for the population; graphical illustrations, lists, tables and graphs; layout and type; stimulation for learning and motivation; cultural appropriateness.⁽¹⁰⁾

After validation and evaluation of the educational reader by content and technical judges, their suggestions were analyzed and the technical professional responsible for the illustration and diagramming of the reader was again contacted to modify and adapt the material according to the judges’ recommendations.

The data obtained were organized, processed and analyzed using the Statistical Package for the Social Sciences (SPSS), version 20.0. As far as the data analysis was concerned, for the textual evaluation of the reader based on the application of the Flesch Readability test, the following indices were adopted: 100-75: very easy; 74-50: easy; 49-25: difficult; 24-0: very difficult.⁽¹⁴⁾ To analyze the content validation of the educational reader, the CVI was calculated. Items were considered valid if the inter-rater agreement corresponded to CVIs equal to or greater than 0.80.

The data obtained by the application of the SAM questionnaire were organized in Excel. The obtained scores were processed using percentage analysis, as follows: 70% to 100% of the scores, “superior” educational material; from 40 to 69%, “adequate”; and 0 to 39%, “not suitable”.⁽¹⁰⁾

The study received approval from the Research Ethics Committee of the Federal University of Ceará (UFC), under opinion 1.116.855, in compliance with Resolution 466/12.⁽²²⁾

Results

The reader titled “You Can Prevent Diarrhea in Your Child!” was organized into eight sub-topics:

1. How to know if your child has diarrhea;
2. How to take care of your child’s hygiene;
3. Learn how to take care of your hygiene;
4. Cleaning the environment helps prevent disease;
5. Let’s learn how to wash the fruits and vegetables;
6. See how to take care of your child’s nutrition;
7. Know the importance of vaccination for your child;
8. How to care for the child with diarrhea.

In relation to the elaboration of the material, the main characters present in the pages of the reader were portrayed on the cover. We sought to use simple and direct language to favor the population’s understanding. In the illustrations, we sought to approach the cultural reality of the reader’s target audience. In the layout, we used Arial font, size 16 points for the body of the text and 18 points for the subtitles.

Based on the script, the Flesch readability test was applied to the 44 paragraphs of the reader. Of these, 34 (77%) were considered very easy and 10 (23%) were easy. In the analysis of the complete reader, the test revealed a score of 91, classifying the material as very easy to read, with all phrases written in the active voice.

The first version of the reader consisted of 32 pages, 21 pages for content, eight pre-textual and post-textual pages and three blank pages the mothers can use to make notes.

Thirty content and three technical judges validated the first version of the reader. The 30 content judges were nurses, 24 of whom held a specialization degree, 20 an M.Sc. and 15 a Ph.D. Of these, 17 judges were teachers and 13 were active in care practice. As for the training of the technical judges, two were advertising agents and one was a musician. In addition, two had completed a specialization course in graphic design, two judges were working in the area of graphic design and one in art direction.

The CVI of each page of the reader was calculated considering the clarity of the language, the practical pertinence and the theoretical relevance; and later the global CVI, which is represented in table 1.

For most pages in the reader, the CVI was superior to 0.80. For pages 7, 21 and 23, the CVI was lower than 0.80 with regard to clear language. Changes were made in the language based on the judges’ recommendations.

Table 1. Distribution of CVIs for each page according to the content and technical judges' analysis

Page/Theme	Clear language		Practical relevance		Theoretical relevance	
	Judges					
	C*	T**	C*	T**	C*	T**
Cover	0.9	1	0.93	1	0.9	1
Presentation	0.9	1	0.93	1	0.93	1
Page 7/ Definition of childhood diarrhea	0.76	1	0.93	1	0.93	1
Page 8/ Care with child hygiene	0.86	1	0.9	1	0.93	1
Page 9/ Care with child hygiene	0.83	1	0.9	1	0.9	1
Page 10/ Care with child hygiene	0.83	1	0.9	1	0.9	1
Page 11/ Care with maternal hygiene	0.8	1	0.9	1	0.9	1
Page 12/ Environmental cleaning	0.96	1	0.96	1	0.93	1
Page 13/ Environmental cleaning	0.93	1	0.86	1	0.93	1
Page 14/ Environmental cleaning	0.96	1	0.96	1	0.96	1
Page 15/ Environmental cleaning	0.86	1	0.9	1	0.86	1
Page 16/ Washing fruit and vegetables	0.93	1	0.93	1	0.96	1
Page 17/ Washing fruit and vegetables	0.86	1	0.9	1	0.93	1
Page 18/ Food	0.9	1	0.9	1	0.96	1
Page 19/ Food	0.83	1	0.93	1	0.9	1
Page 20/ Food	0.8	1	0.86	1	0.83	1
Page 21/ Food	0.9	0.66	0.9	1	0.9	1
Page 22/ Food	0.86	1	0.86	1	0.9	1
Page 23/ Vaccination	0.96	0.66	1	1	1	1
Page 24/ Diarrhea management conducts	0.96	1	0.96	1	0.96	1
Page 25/ Diarrhea management conducts	0.93	1	0.83	1	0.9	1
Page 26/ Closure	0.96	1	1	1	1	1
Global CVI	0.88	0.96	0.91	1.00	0.92	1.00

*Content Judges **Technical Judges

In addition, the judges gave relevant suggestions on the readers, mainly: update how long the fruit and vegetables should be left to soak for the sake of hygiene; and change the scenario on some pages (type of refrigerator and stove, foods shown in the refrigerator and on the meal table), recovering the population's reality. In addition, the inclusion of a new page was requested to discuss care for the child with diarrhea and signs of alert for diarrhea. All of these recommendations were accepted after the researchers' analysis.

The judges also evaluated the reader using the tool SAM (Table 2).

According to the analysis of the judges' evaluation, they considered the educational reader to be "superior", reaching an agreement percentage of 88.7% among the content judges and 90.1% among the technical judges. The judges also assigned a score of zero to ten concerning the recommendation to use the reader, averaging 9.26 by the content judges and 9.66 by the technical judges.

After the judges' analysis, the final version of the reader consisted of 32 pages, 22 pages of content,

Table 2. Assessment of educational reader by content and technical judges

Domains	Higher		Appropriate		Inappropriate		Total – Mean agreement (%)	
	Judges							
	C*	T**	C*	T**	C*	T**	C*	T**
1. Content								
a) Clear objective	23	3	7	-	-	-	88.3	100
b) Content discusses behavior	28	3	2	-	-	-	96.7	100
c) The proposal is limited	24	3	6	-	-	-	90	100
d) Abstract or review	16	-	5	2	9	1	61.7	33.3
2. Language fit for the population								
a) Level of reading	22	3	8	-	-	-	86.7	100
b) Active voice style	25	2	5	1	-	-	91.6	83.3
c) Vocabulary uses common words	23	3	7	-	-	-	88.3	100
d) Context first	26	2	4	1	-	-	93.3	83.3
e) Learning mediated by advanced signs	27	3	3	-	-	-	95	100
3. Graphical illustrations, lists, tables and graphs								
a) Cover	24	2	6	1	-	-	90	83.3
b) Type of illustrations	28	3	2	-	-	-	96.7	100
c) Relevance of illustrations	28	3	1	-	1	-	95	100
d) Lists, tables, graphs and forms	26	3	1	-	3	-	88.3	100
e) Captions are used	23	3	4	-	3	-	88.3	100
4. Layout and type								
a) Layout factors	24	2	6	1	-	-	90	83.3
b) Type	26	3	4	-	-	-	93.3	100
c) Subtitles are used	23	3	7	-	-	-	83.3	100
5. Stimulation for learning and motivation								
a) Interaction is included in the text and/or figures	15	-	13	3	2	-	71.7	50
b) Desired behavioral standards are modeled or shown in specific terms	26	2	4	1	-	-	93.3	83.3
c) Motivation/self-efficacy	23	3	7	-	-	-	88.3	100
6. Cultural Appropriateness								
a) Cultural game – logic, language and experience (LLE)	22	3	8	-	-	-	86.7	100
b) Cultural Image and Examples	27	2	2	1	1	-	93.3	83.3
Total							88.7	90.1

*Content Judges **Technical Judges

eight pre-textual and post-textual pages and two blank pages for notes.

Discussion

As a limitation of the study, the validation of the readers only by content and technical judges is highlighted. Its clinical application to the mothers who will use this material in practice is important.

The use of this reader will support the practice of nurses and other health professionals who carry out educational activities, being an important tool to promote maternal self-efficacy in the prevention of childhood diarrhea.

The educational reader “You Can Prevent Diarrhea in Your Child!” was developed using Bandura’s Self-Efficacy Theory as a framework because, as self-efficacy is developed, people intensify their efforts to achieve or even exceed the desired result.⁽⁶⁾

The reader was divided into eight topics to facilitate the understanding and organization of the content, so as to make it more interactive, so that the reader is motivated to follow the message addressed.⁽²³⁾ Simple language was used, so that individuals with a low level of education can read and understand the material, enhancing the reader’s motivation.^(10,24) The reality of the families’ daily life was portrayed in the reader, as individuals who participate in educational approaches become more prone to adopt new behaviors when there is a relationship of trust and closeness to their reality.⁽¹⁵⁾

After the preparation of the first version of the reader, it was validated by content and technical judges, achieving a minimum CVI of 0.8, which is the recommended value in the literature.^(9,21,25) It is emphasized that validation is essential after the elaboration of educational materials, as judges knowledgeable on the subject need to be able to evaluate the material and suggest improvements.^(15,26,27) In addition, it is recommended that there should also be a group of judges knowledgeable in the field of graphic design in material validation studies.⁽²⁸⁾

As to the judges’ requests, changes were made in the time that fruits and vegetables should remain submerged in water with sodium hypochlorite;⁽²⁹⁾ and in some illustrations, the aim was to improve the socio-cultural adaptation, acknowledging the need to portray the contextual reality of the reader in the elaboration of the educational materials.⁽²⁴⁾

The overall evaluation of the reader, based on the sum of the average SAM scores among the items of the six domains, revealed that the technical judges considered the material to be “superior”. The SAM instrument can reveal weaknesses in the instruction

of a material, which could reduce its suitability for use by the target audience.⁽¹⁰⁾

In the content domain, the content and technical judges rated the abstract or review item as “adequate” and “not suitable”, respectively. Although some judges considered it pertinent to include this item in the reader, it was decided not to insert it; because it was elaborated in eight topics, according to authors’ recommendations, who indicate that the division of the material into topics presents the subjects dynamically, allowing the closing of each subject; and the figures in each page of the reader were intended to aid in the textual review, contributing to knowledge acquisition.^(23,24)

In the field of stimulation for learning and motivation, although the technical judges considered the item “interaction is included in the text and/or pictures” as “adequate”, it is known that the reader is intended to encourage the reader to adopt the same behavior as the character, motivating the performance of responses similar to those of the character. Thus, the importance of inserting the Theory of Self-Efficacy in the elaboration of the material is emphasized, as can allow the reader to feel able to perform the care portrayed in the booklet.^(5,6)

The domains language; graphical illustrations, lists, tables; layout and type; and cultural appropriateness were evaluated as “superior”. The adequacy of these domains is fundamental in the communication of health education, and it is important that the materials are creative to attract the public’s attention and more likely to achieve positive results.⁽³⁰⁾ In addition, it is essential that the population’s living and cultural conditions be pictured in the reader, as it encourages the target audience to visualize its own reality, alluding to the fact that, if the character is able to prevent diarrhea in her child, so will the mothers living in similar situations.⁽¹⁵⁾

The content and technical judges’ evaluation classified the educational reader as appropriate in terms of language clarity, practical pertinence and theoretical relevance. The reader was considered “superior” based on the application of the SAM tool, considering content; language fit for the population; graphical illustrations, lists, tables and graphs; layout and type; learning stimulation and motivation; and cultural appropriateness.

Conclusion

The educational reader “You can prevent diarrhea in your child” was considered valid educational material in terms of content and face validation to promote maternal self-efficacy in the prevention of childhood diarrhea.

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Collaborations

Sabino LMM, Ferreira AMV, Joventino ES, Lima FET, Penha JC, Lima KF, Nascimento LA and Ximenes LB participated in the project design, data interpretation, relevant critical review of the intellectual content and approval of the final version for publication.

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