



Acta Paulista de Enfermagem

ISSN: 0103-2100

ape@unifesp.br

Universidade Federal de São Paulo
Brasil

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Acta Paulista de Enfermagem, vol. 30, núm. 1, enero-febrero, 2017, pp. 87-93
Universidade Federal de São Paulo
São Paulo, Brasil

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First aid in schools: construction and validation of an educational booklet for teachers

Primeiros socorros na escola: construção e validação de cartilha educativa para professores

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Keywords

Health education; First aid; Schools; Validation studies; Nursing

Descritores

Educação em saúde; Primeiros socorros; Escolas; Estudos de validação; Enfermagem

Submitted

December 7, 2016

Accepted

March 8, 2017

Abstract

Objective: To develop and validate an educational booklet for preschool and elementary I education teachers on first aid procedures in schools.

Methods: Methodological study based on the construction of an educational material with subsequent validation by 22 experts and assessment by 22 teachers. Content validation was established based on the Content Validity Index higher than 0.8. Binomial test considering p equal or higher than 0.8 was used for the proportion of agreement among the experts.

Results: The educational booklet containing 44 pages addresses first aid procedures that should be performed for 15 health-related problems. All the items were considered relevant and the Level Content Validity Index presented mean value of 0.96. The booklet was approved by the teachers with an agreement index of 1.0.

Conclusion: The booklet was developed and validated and may be used by nursing in health care education with teachers regarding first aid procedures in schools.

Resumo

Objetivo: Construir e validar uma cartilha educativa para professores da educação infantil e ensino fundamental I sobre primeiros socorros na escola.

Métodos: Estudo metodológico realizado a partir da construção do material educativo, com posterior validação por 22 juízes e avaliação de 22 professores. A validação de conteúdo foi estabelecida a partir do *Level Content Validity Index* maior que 0,8. Para proporção de concordância entre os juízes foi o utilizado o teste binomial e considerado p igual ou maior que 0,8.

Resultados: A cartilha aborda os primeiros socorros que devem ser realizados em 15 agravos e possui 44 páginas. Todos os itens foram avaliados como pertinentes e o *Level Content Validity Index* possuiu média de 0,96. A cartilha foi aprovada pelos professores com índice de concordância 1,0.

Conclusão: A cartilha foi construída e validada e pode ser utilizada pela enfermagem na educação em saúde com professores sobre primeiros socorros na escola.

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DOI: <http://dx.doi.org/10.1590/1982-0194201700013>



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Conflicts of interest: there are no conflicts of interest to declare.

Introduction

First aid procedures are defined as the initial actions aimed at helping people in suffer or at risk of death and that may be performed by any individual, not only by health professionals.⁽¹⁾ School is a major place where situations of urgency and emergency occurs. It consists in an environment in which injuries may affect students, and the teacher has a significant chance to be present and act during a situation. However, their education-oriented training lead teachers to lack self-confidence and qualification to perform first aid procedures.⁽²⁾

A study conducted in India assessing the knowledge of teachers about first aid procedures in schools showed that 13% of the teachers had low level of knowledge and 87% presented moderate level of knowledge, evidencing a scenario that reveals the lack of a proper qualification of teachers to provide first aid care.⁽³⁾ Similar results were observed in a study conducted in Africa that identified the lack of knowledge and qualification of elementary education teachers in relation to the appropriate first aid procedures.⁽⁴⁾

Education in health is an effective strategy for coping with the deficit of knowledge by teachers on the theme. A study conducted in China investigating the knowledge of teachers six months, nine months, and four years after conducting a training on pediatric first aid procedures concluded that, despite their decreased knowledge, overtime the educational intervention improved the apprehension of knowledge on a short-term and long-term basis.⁽⁵⁾ In view of the effectiveness of training programs on first aid procedures for teachers this study highlights the importance of conducting further studies contributing to the education in health for such professionals.

Nursing occupies a strategic position for education in health regarding first aid procedures in school as it is part of urgency and emergency services and due to its presence in schools. Nursing is present in the School Health Program, dealing with the promotion of health of students in projects such as SAMU in Schools and Samuzinho, in which professionals from the Mobile Emer-

gency Care Services (SAMU) conduct educational interventions in schools. Therefore, studies on educational technologies related to first aid procedures are relevant for nursing as they may contribute to the educational interventions conducted by this professional category in the school environment.

The effectiveness of educational interventions in health is affected by a number of variables, including the availability of materials that may be used as a didactic resource. Considering that teaching the first aid procedures should occur with the use of educational technologies developed from scientific evidence, this study points out the relevance of developing high-quality educational material with appropriate content to facilitate the understanding of information by the target audience.⁽⁶⁾ Such materials are useful resources that may be used to contribute to the training and qualification of teachers. In this sense, the objective of the present study was to develop and validate an educational booklet for preschool and elementary I education teachers on first aid procedures in schools.

Methods

The present methodological study was based on the development of an educational booklet with subsequent validation by experts and assessment by the target audience. The content of the booklet was obtained from the recommendations of the Prehospital Trauma Life Support, studies with the characterization of pediatric emergency care, the National Policy on Emergency Care, the manual of accidents by venomous animals of the Ministry of Health, and the guidelines of the American Heart Association.⁽⁷⁻⁹⁾

Previous knowledge and opinions of teachers regarding the themes that should be included in the booklet were investigated through the implementation of a focus group with teachers from the municipal education network of Bom Jesus-PI in order to base the educational material on the needs of its target audience. This survey

pointed out the influence of popular myths in the implementation of first aid procedures, and the teachers suggested that the booklet should contain information about the appropriate procedure for episodes of convulsive crisis, heat injuries, decreased level of consciousness, airway obstruction, exogenous intoxication, and drowning.

Considering that pediatric first aid procedures differ according to the age of the child and aiming at developing a didactic educational material without confusing information, the information of the booklet was specified for the actions to be adopted in first aid for children between four and ten years old as this age group encompasses seven years of the childhood and presents the same pattern of first aid procedures, without details and specifications existing for some first aid actions for older or younger children. Therefore, the educational material was developed for preschool and elementary I education teachers as it is in this school period that the age of students is compatible with the first aid procedures addressed in the booklet.

The layout and text structure of the booklet were based on recommendations in relation to the writing and formatting of the text of educational technologies.⁽¹⁰⁾ The theoretical framework of the instructional events of Gagné, which covers the components of the instruction that need to be present so that the apprehension of knowledge may occur from the cognitive processes that are responsible for learning, was used in the construction of the material.⁽¹¹⁾ The illustrations were created by a designer, and subsequently colored and adjusted with the use of the Corel Draw X7 software.

The next step consisted in the material validation. The sample calculation to determine the number of experts was obtained through the formula $n = Z\alpha^2 \cdot P(1-P)/e^2$. The stipulated values were $Z\alpha$ (level of confidence) = 95%, P (proportion of concordance between the experts) = 85%, and (accepted difference from the expected) = 15%,⁽¹²⁾ resulting in 22 experts. Working in the educational, care, and research areas involving first aid

was considered for the selection of participants.⁽¹³⁾ The search for such professionals was conducted among professors of the specialization course in urgencies and emergencies of a public university of the state of Pernambuco and included names of other professionals with the desired profile suggested by these professors. They were contacted via email in November 2014.

The instrument was developed with 21 items (Table 1) in which the experts should record the assessment of the educational material by means of one of the five options available to be marked, ranging from totally disagree to totally agree. The items of the instrument covered the content, text, images, layout, motivation, and culture, and there was a request for a written record of suggestions in a space available in the instrument.

After face and content validation, and conclusion of the adjustments suggested by the experts, the amended educational material was assessed by teacher. The number of professors invited for this assessment was established by the same formula that determined the sample of experts, thus 22 teachers assessed the booklet. The names of the teachers of the Education Department of the city of Bom Jesus-PI were drawn through simple random sampling. The selected teachers were approached in person in the schools where they worked, and their assessment occurred with the use of an instrument adapted from the Suitability Assessment of Materials,⁽¹⁴⁾ with 19 questions (about the understanding of the text and the images) and a space to record their opinion and/or suggestion in relation to the booklet.

Data were analyzed in the Microsoft Excel software, and the Content Validity Index was calculated in three ways: I-CVI (Item-Level Content Validity Index) - related to the proportion of agreement among the experts in relation to each item; S-CVI/AVE (Scale-level Content Validity Index, Average Calculation Method) - it is the proportion of items that each expert agreed, related to each expert; and S-CVI (Scale-level Content Validity Index), which is the mean value of the S-CVI-AVE. In addition, the binomial

test was performed to compare whether the proportion of experts that agreed with the validity of the booklet was statistically equal or higher than 0.80 (value previously defined to validate an item).⁽¹⁵⁾ A level of significance of 5% was adopted for this test.

The recommendations of Resolution 466/12 were followed and this study was approved by the Research Ethics Committee of the Federal University of Pernambuco (protocol 930.697).

Results

The professionals that participated in the validation of the booklet had a nursing degree, and three of them were firefighters, in addition to being nurses. Ten worked as professors, and twelve worked as licensed practical nurses. Regarding their degrees, 18 had concluded a specialization course in urgency and emergency, 8 had a master's degree in nursing, and 5 had a PhD degree.

Sixteen participants had teaching experience in the area, 21 had completed courses on first aid procedures, and 20 had been instructors and/or professors in this type of courses.

Of the 21 items of the instrument, ten presented the options agree or totally agree marked by all the experts, seven had agreement of 95%, three presented 90% of agreement, and in one item there was 86% of agreement and the I-CVI was 0.96 (Table 1).

For 17 of the 22 experts, the S-CVI/AVE was 1 by their agreement with all the items of the booklet and for two experts it was 0.95. After the calculation of the mean value of the S-CVI/AVE, a S-CVI of 0.96 was obtained.

Four teachers that assessed the booklet had an undergraduate degree, seventeen had completed a specialization course, and one had a Master's degree. Nine teachers had more than six years of teaching experience.

The agreement index of the assessment by the teachers was 1.0. All of them pointed out that the text and content of the booklet were easy to under-

Table 1. Agreement of the experts in relation to the items of the booklet

Item	n(%)*		I-CVI**	p***
1. Content				
1.1 The content meets a possible situation for teachers.	22	100	1	1
1.2 Heads/subheads are divided consistently.	21	95.5	0.95	0.972
1.3 Highlighted parts deserve in fact to be highlighted.	21	95.5	0.95	0.972
1.4 The content meets the needs of the target audience.	21	95.5	0.95	0.972
1.5 There is logic in the sequence of the text.	20	90.9	0.90	0.863
1.6 The content is relevant to be informed to teachers.	22	100	1	1
1.7 The content is correct in the scientific perspective.	19	86.4	0.86	0.661
2. Language				
2.1 The writing is compatible with the target audience.	20		0.90	
2.2 The phrases are attractive and not boring.	22	100	1	1
2.3. There is clarity and objectivity in the text.	22	100	1	1
3. Illustrations				
3.1 The illustrations are consistent with the content.	21	95.5	0.95	0.972
3.2 The illustrations are easy to understand.	21	95.5	0.95	0.972
3.3 Legends help the reader to understand the images.	22	100	1	1
3.4 The number of images is sufficient to cover the content.	20		0.90	
4. Layout				
4.1 The font size and type favor the reading process.	21	95.5	0.95	0.972
4.2 The colors used in the text facilitate the reading.	21	95.5	0.95	0.972
4.3 The arrangement of the items on the pages is organized.	22	100	1	1
4.4 The number of pages and the size of the material are consistent.	22	100	1	1
5. Motivation				
5.1 The reader is encouraged by the content to keep reading.	22	100	1	1
5.2 The booklet is enlightening.	22	100	1	1
6. Culture				
6.1 The booklet meets the several profiles of teachers.	22	100	1	1
Mean			0.96	

*Percentage of agreement; **Item-Level Content Validity Index; ***Binomial test

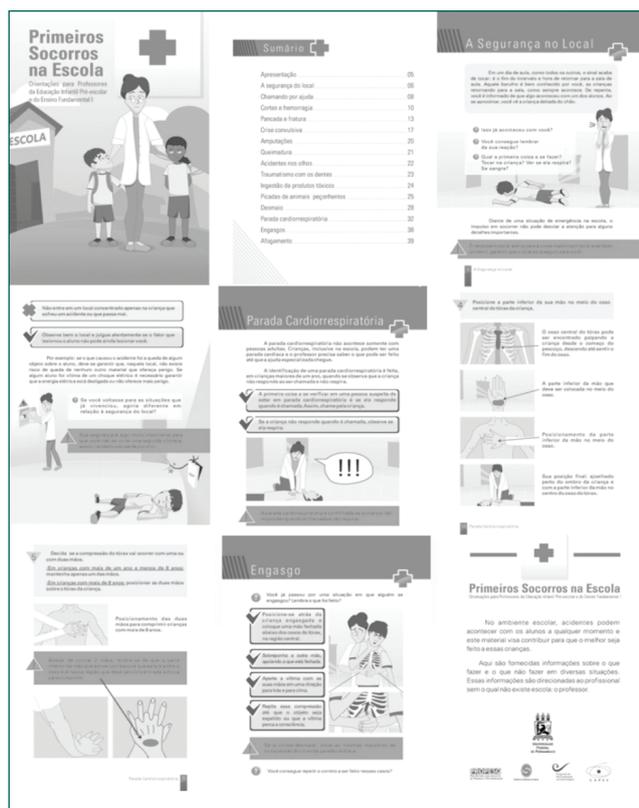


Figure 1. Some pages of the educational booklet on first aid in schools

stand and that there were an appropriate number of illustrations to help in the understanding of the information. The booklet was considered enlightening by all the participants.

The booklet consisted of 44 pages, including cover, back cover, technical sheet, coversheet, summary, and introduction page. Prior to the specific first aid-related topics there were two chapters addressing important issues regarding the professional performance in severe cases: the safety of the place and the proper manner to call for support. Then, the booklet presented the first aid procedures for 15 urgency and emergency situations (bleeding, blows, bone integrity problems, convulsive crisis, heat injuries, amputations, burns, traumatic eye injuries, dental avulsion, exogenous intoxication, accidents involving venomous animals, lowered level of consciousness, cardiorespiratory arrest, airway obstruction, and drowning). Finally, the booklet presented bibliographical references and a space for notes.

The text was written in a popular language, avoiding the use of technical terms. Some im-

portant phrases were emphasized by being inserted in a yellow table with an exclamation mark on the left margin. Phrases related to actions indicated for the relief of a particular injury were presented in green tables with a green “v” sign; contraindicated actions were inserted in red tables signed with a red “x”. Figure 1 shows some pages of the booklet.

Discussion

The exclusivity of the educational material for preschool and elementary I education teachers represent a limitation of this study. Another limitation consists in the lack of studies on the construction and validation of other technologies for teaching first aid procedures in schools or for laymen, which made it impossible to compare and discuss the results.

The construction and validation of the educational booklet on first aid procedures in the school environment converges in the School Health Program, which aims at the promotion of health of students and points out the qualification of teachers as a resource to strengthen its actions.⁽¹⁶⁾ Also, it corroborates the National Policy for Reduction of Morbidity and Mortality by Accidents and Violence, as it contributes to the dissemination of information for teachers in relation to the appropriate actions to be adopted in cases of urgency and emergency.⁽¹⁷⁾

The relevance of the content of the booklet and its applicability to situations that may be faced by teachers obtained agreement by all the experts. Another study that validated a booklet on healthy eating for pregnant women also observed agreement among the experts on the applicability of the educational material.⁽¹⁸⁾ It is important that studies involving educational technologies investigate whether these technologies apply to the context in which they will be used, as although its content is valid and easy to understand, it is necessary that the technology is applicable so that its use is practicable.

The practicability of the use of educational booklets permeates the understanding of the

reader on the content presented in the material. Results of a study conducted in Sweden show that 29% of the educational material provided in 27 hospitals to patients undergoing colorectal cancer surgery were difficult to understand, and the authors point out that the investigation of the opinion of the target audience may contribute to obtaining educational materials that are more appropriate to the language of the reader.⁽¹⁹⁾ Regarding the understanding of the educational booklet, a study conducted in the eastern region of Africa assessing the impact of education in health in schools on the reduction of cases of schistosomiasis points out that 75% of the readers did not understand the information contained in an educational booklet.⁽²⁰⁾

These findings diverge from studies conducted in Brazil: in relation to the language of the booklet, in the present study the phrases were considered attractive, clear, and objective by all teachers. Similar results are observed in other studies that validated educational materials, and their target audience also assessed the language as clear and compatible with a good understanding.^(21,22) In view of such findings, this study highlights the relevance of the assessment of educational materials by their target audience as parts that are not compatible with the effectiveness of the communication may be identified and fixed.

The assessment performed by the teachers regarding the understanding of the images is similar to this study in relation to the construction and validation of an educational booklet on venous ulcer-related care procedures, in which the target audience was also questioned, pointing out that the images of the material were appropriate.⁽²³⁾ These findings corroborate the practicability of the illustrations in booklets and their contribution to make the information clear and attractive to readers. Therefore, well-illustrated educational booklets are presented as relevant resources to be used in the most diverse healthcare areas and specialization programs.

No unanimity was observed among the experts in relation to the compatibility of the text with the target audience. The two experts that disagreed in relation to this item suggested changes,

which were then implemented. In fact, such changes may have contributed so that all the teachers that assessed the booklet at a later moment considered it appropriate. It is important to mention that as more than 80% of the experts had agreed with the item, there was no obligatoriness in accepting/implementing the suggestions, but the subsequent unanimous approval by the teachers suggests that it is important to analyze suggestions that are reasonable and conducting changes in the educational material, even if the item to which the suggestions were indicated was approved by the established proportion of agreement among the other experts.

Most experts agreed that the content of the booklet was scientifically correct (I-CVI of 0.86). The I-CVI was higher than 0.8 and the S-CVI was 0.96, therefore the educational material was validated in relation to its face and content.

Conclusion

Previous knowledge and opinion of representatives of the target audience were considered in the construction of the booklet on first aid procedures. Face and content validation was obtained, and the material was assessed by the teachers as well-illustrated, easy to understand, and enlightening, consisting in a pedagogical tool to be used by nursing in education in health in schools and in the training of education professionals. The adopted stages and criteria and the theoretical framework used in the construction of the booklet were compatible with the attainment of a practicable educational material to be used and approved by the target audience. This fact may contribute to the methodological decision of professionals involved in health education to build educational technologies in a range of fields. The final version of the booklet was made available for electronic access at the Open University of the Brazilian National Health System of the Federal University of Pernambuco (UNA-SUS UFPE) for Latu Sensu Graduate students in Family Health. Despite the practicability of the use of the book evidenced

by its validation of content and assessment by the target audience, it is necessary that further studies be conducted in order to investigate the effectiveness of the material as a didactic resource, as well as the apprehension of knowledge of teachers based on its use.

Collaborations

Galindo Neto NM, Caetano JA, Barros LM, Silva TM and Vasconcelos EMR participated in the conception of the project, data analysis and interpretation, writing of the article, relevant critical review of its intellectual content, and final approval of the version to be published.

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