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CONSTRUCTION AND VALIDATION OF A BOOKLET FOR SELF-EFFICACY OF ZIKA VIRUS PREVENTION

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ABSTRACT

Objective: to describe the construction and validation of a booklet for the Zika virus prevention.
Method: this is a methodological research, carried out in four stages. In the first, the research project was elaborated. In the second stage, data were collected from an integrative review and a qualitative research using three focus groups. In the third stage, the booklet's content and script were developed. In the fourth stage, there was validation by expert judges and by the target audience, Unified Health System users.
Results: an illustrated, colorful booklet was built, containing comic books and informative texts. Twenty-three expert judges and 31 people participated in validation, Unified Health System users. In the first cycle of validation by judges, an overall Content Validity Index of 0.79 was obtained, and in the second, the index increased to 0.85. The average percentage of agreement of the target audience corresponded to 99%. In the final version, the booklet has 28 pages.
Conclusion: the validated booklet presents potential elements to improve Zika prevention and other arboviruses that have similar forms of prevention.

DESCRIPTORS: Zika virus. Educational technology. Validation studies. Nursing. Technology. Health education.

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CONSTRUÇÃO E VALIDAÇÃO DE UMA CARTILHA PARA AUTOEFICÁCIA DA PREVENÇÃO DO ZIKA VÍRUS

RESUMO

Objetivo: descrever a construção e validação de uma cartilha para prevenção do Zika vírus.
Método: trata-se de uma pesquisa metodológica, realizada em quatro etapas. Na primeira, elaborou-se o projeto de pesquisa. Na segunda etapa, realizou-se o levantamento de dados a partir de uma revisão integrativa e de uma pesquisa qualitativa utilizando três grupos focais. Na terceira etapa, desenvolveram-se o conteúdo e roteiro da cartilha. Na quarta etapa, ocorreu a validação por juízes especialistas e pelo público-alvo, usuários(as) do Sistema Único de Saúde da atenção primária.
Resultados: construiu-se uma cartilha ilustrada, colorida, contendo histórias em quadrinhos e textos informativos. Participaram da validação 23 juízes especialistas e 31 pessoas como público-alvo, usuários(as) do Sistema Único de Saúde da atenção primária. No primeiro ciclo de validação pelos juízes, obteve-se Índice de Validade de Conteúdo global de 0,79, e no segundo, o índice aumentou para 0,85. A média percentual de concordância do público-alvo correspondeu a 99%. Na versão final, a cartilha apresenta 28 páginas.
Conclusão: a cartilha validada apresenta elementos potenciais para melhorar a prevenção da Zika e das demais arboviroses que possuem formas de prevenção semelhantes.

DESCRITORES: Zika Vírus. Tecnologia educacional. Estudos de validação. Enfermagem. Tecnologia. Educação em saúde.

CONSTRUCCIÓN Y VALIDACIÓN DE UN FOLLETO PARA LA AUTOEFICACIA DE LA PREVENCIÓN DEL VIRUS ZIKA

RESUMEN

Objetivo: describir la construcción y validación de un folleto para la prevención del virus Zika.
Método: es una investigación metodológica, realizada en cuatro etapas. En el primero se elaboró el proyecto de investigación. En la segunda etapa, se recopilaron datos de una revisión integradora y una investigación cualitativa utilizando tres grupos focales. En la tercera etapa se desarrolló el contenido y el guión del cuadernillo. En la cuarta etapa, se llevó a cabo la validación por parte de jueces expertos y por el público objetivo, usuarios del Sistema Único de Salud de atención primaria.
Resultados: se elaboró un folleto ilustrado y colorido, que contiene cómics y textos informativos. En la validación participaron 23 jueces expertos y 31 personas como público objetivo, usuarios del Sistema Único de Salud de atención primaria. En el primer ciclo de validación por parte de los jueces, se obtuvo un Índice de Validez de Contenido general de 0,79, y en el segundo, el índice aumentó a 0,85. El porcentaje medio de acuerdo del público objetivo correspondió al 99%. En la versión final, el folleto tiene 28 páginas.
Conclusión: el folleto validado presenta elementos potenciales para mejorar la prevención del Zika y otros arbovirus que tienen formas similares de prevención.

DESCRIPTORES: Virus Zika. Tecnologia educacional. Estudios de validación. Enfermería. Tecnología. Educación en salud.

INTRODUCTION

The Zika virus is an arbovirus that has become a concern of public authorities for unveiling a less mild infection than was initially believed. Arbovirus is responsible for causing fetal infection and Congenital Zika Virus Syndrome. In adults, the infection can induce Guillain-Barré syndrome. The picture of neurological complications, the ease of triggering epidemics, especially in regions that are endemic to other arboviruses, and the different possibilities of transmission of the virus, vector, transplacental and sexual make the fight against the disease a challenge[1–3].

In an attempt to quell the infection, science advances with the development of some vaccines, in preclinical and early stages. However, some problems faced are measured, such as the need to protect against Congenital Zika Virus Syndrome and the difficulty of designing and conducting efficacy trials in the context of a rapidly changing epidemic[4]. The use of chemical substances, such as larvicides and insecticides, as public health strategies to eliminate the forms of the mosquito that transmits the disease, unfortunately has also presented limitations, such as increased vector resistance[5–6].

Faced with the challenges of fighting strategies, both to the virus and its vector, the prevention of infection and, consequently, the reduction of its complications are restricted to individual and collective care for the environment, in order to eliminate mosquitoes' breeding sites as well as avoiding the ways in which the disease is transmitted[7].

Based on this premise, the development and improvement of environmental education strategies with the use of educational materials appropriate to the population's socioeconomic and cultural context are potential alternatives for combating Zika. The successes of educational strategies for combating vector diseases have already been reported in other studies, in which it was possible to verify a substantial increase in the understanding of diseases transmitted by vector in people who participated in interventions using printed educational technology, developed collectively, through partnership and population involvement[8].

Educational strategies to combat the mosquito also have limitations. To better understand them, researchers carried out a study to identify the main barriers to adherence to vector elimination measures, as vector combat actions have been developed for some time, considering that the same mosquito is also capable of transmitting other diseases of public relevance. Researchers showed that one of the factors related to low adherence to prevention recommendations is the lack of self-efficacy in the population[9]. Self-efficacy is seen as the belief that individuals have about their ability to successfully perform a given activity[10].

Albert Bandura has offered specific theoretical contributions applicable to the health area through studies addressing human behavior, one of which includes the self-efficacy construct. According to the author, self-efficacy beliefs can be developed from four main sources of information, considered fundamental elements in the transmission of information that strengthen or weaken individuals' beliefs about their own abilities. These four sources constitute the Self-Efficacy Theory assumptions, which are: 1) direct experience; 2) vicarious experience; 3) social (or verbal) persuasions; 4) physical and emotional states[10].

Given the repercussions of Zika for public health, facing the potential of educational interventions using educational materials prepared in a participatory manner and the needs to increase the population's self-efficacy for disease prevention, this study aimed to describe the construction and validation of a educational booklet for Zika prevention, using assumptions from the theory of self-efficacy.

METHOD

This is a methodological research carried out from 2016 to 2017 based on four stages, which were adapted according to the guidelines for the development of educational materials in health care[11].

In the first stage, the research project was prepared, which was submitted to the Research Ethics Committee (REC). In the second stage, data were collected based on an integrative review, to synthesize the existing scientific knowledge regarding the Zika virus[12]. In this same stage, a qualitative research was also carried out using three focus groups to identify which aspects of Zika the population considered important to contain in the booklet. Figure 1 shows the operationalization of the focus groups. “Key” people from the community and those representing groups at risk of infection were included.

In the third stage, the content and the script were developed with the description of the illustrations on the respective pages of the booklet. For the adequacy of language, writing, layout and design, guidelines for the construction of educational health materials were followed[13–14]. After text and script elaboration, the booklet was made by a graphic design professional.

In the fourth stage, the booklet was validated by expert judges, responsible for carrying out both content and form validation, evaluating the coherence of technical information regarding the disease and illustration appearance. After the adjustments suggested by judges, the booklet was submitted to the appearance validation by the target audience, Unified Health System (SUS - *Sistema Único de Saúde*) users. This process was intended to judge the items’ clarity, ease of reading, understanding and form of presentation, according to the public’s perception.

The focus groups and the stage of validation by the target audience were carried out in the urban area of a municipality belonging to the region of Inhamuns, Ceará, Brazil. This municipality is located in the Northeast and Zika epidemics were also recorded during the research period. The location was chosen due to the researchers’ easy access, considering the timeline for completing the research due to the lack of funding for its performance, since all the study expenses were borne by the researchers.

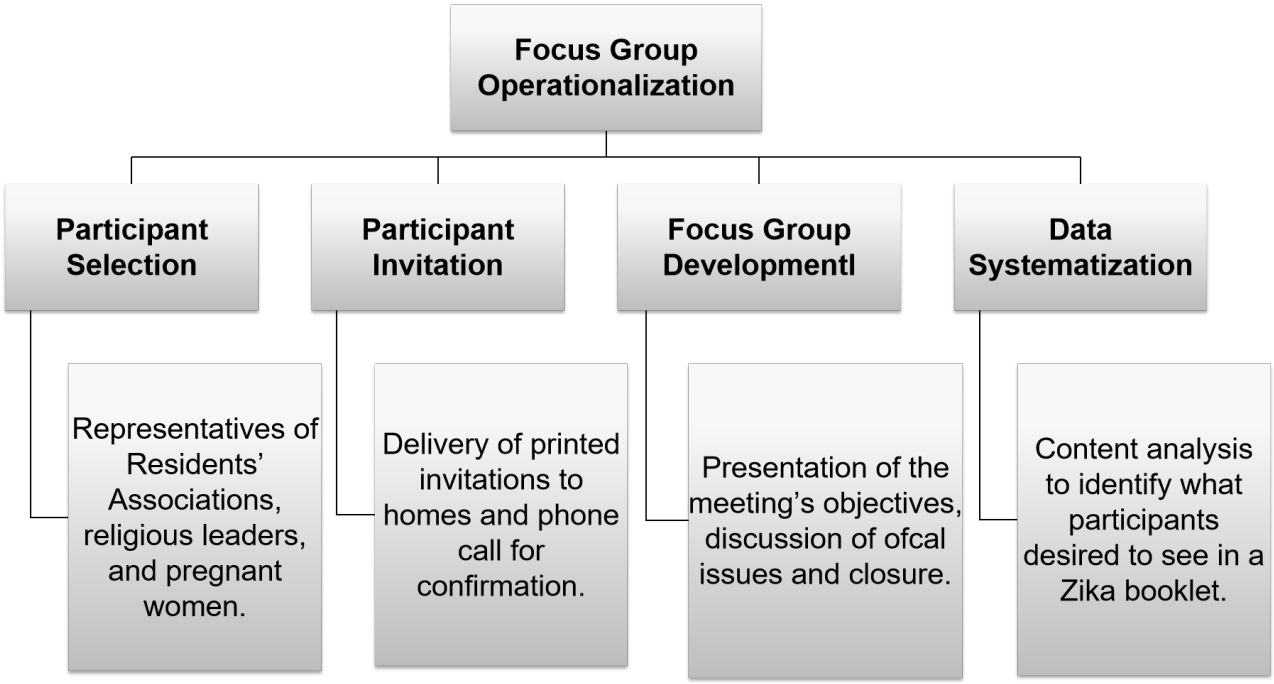

Figure 1 – Operationalization of focus groups. Crato, CE, Brazil, 2017.

To invite the target audience for validation, a Basic Unit of the municipality with a larger area was selected, since the greater number of people assisted by a unit would increase the number of people who could be invited to participate in the research. As for expert judges, professionals from different regions of Brazil were invited to meet the pre-established profile, minimum of seven points in the adapted Fehring classification system[15].

The items for judges' scores were as follows: published article, research projects, specialization/residency, master's, doctorate and/or post-doctorate in one of the following areas: environmental health, educational technologies, public/public health, infectious diseases and parasitic diseases, health promotion, arboviruses, behavioral theories, as well as having professional experience in building and validating educational technologies.

Validation by judges was performed in two cycles. With regard to the number of judges, the number of 6 to 20 twenty was adopted, both in the first and in the second. In the first cycle, 35 professionals were invited, and in the second, 61.

The strategies for identifying the judges were: 1) searching the Lattes Platform; 2) search for Brazilian authors in the studies included in the integrative review; 3) random search of Brazilian authors in articles published in journals of the Virtual Health Library; 4) snowball sampling; 5) request for contacts from graduate departments in related areas.

All judges were invited via email, by sending an invitation letter; those who agreed to participate received a kit containing the Self-Efficacy Theory synopsis, the booklet and the link to access the Google Docs questionnaire. A period of fifteen days was established for analyzing the booklet, filling out and sending the questionnaire. Judges who sent the validation questionnaire incomplete or after the deadline were excluded.

After the graphic design professional completed the changes accepted in validation by the judges, the booklet was submitted for validation by the target audience. We sought to include a of 30 to 40 people with different age groups and, preferably, with a low level of education, as they would have more capacity to identify messages in the booklet that might not be clear enough for the population with a low level of education. Children under 18 were excluded, people with visual and cognitive disabilities and those who were awaiting care at the basic unit with complaints of pain or discomfort during data collection.

The instrument of validation by expert judges contained a part for identifying the professionals and another part to judge the respective pages regarding language clarity, practical relevance, and theoretical relevance. A Likert-type scale was adopted in 5 levels of relevance (1. Not at all; 2. Only a little; 3. To some extent; 4. Rather much; 5. Very much) and the possibility of a single answer for each variable, with additional space for suggestions. Judges were identified with a letter J followed by a serial number.

The questionnaire data were organized in Microsoft Excel. For data analysis, the Content Validity Index (CVI) was adopted, calculated based on three mathematical equations: S-CVI/UA (proportion of items on a scale that reaches scores 4 and 5; I-CVI (Validity content of individual indexes); S-CVI/Ave (average of content validation indexes for all indexes of the scale). The item and the instruments as a whole that presented CVI greater than or equal to 0.78 were considered validated[16].

Items that received scores 1, 2 or 3 and CVI below the recommended were revised. Judges' suggestions regarding the texts and illustrations were analyzed and accepted or rejected, based on the integrative review's results,[12] on the Self-Eficacy Theory assumptions,[10] on the recommendations for the construction of educational materials[13–14] and on the information obtained in the focus groups.

As for validation by the target audience, those who agreed to participate received the printed booklet together with a validation instrument that allowed them to judge the respective pages as to clarity and relevance through “yes” or “no” answers. To measure the degree of relevance of the pages, a Likert-type scale containing 4 levels was also adopted (1. Irrelevant; 2. Not relevant; 3. Really relevant; 4. Very relevant).

Validation performed by them was calculated based on the percentage of agreement of the “yes” answers and the proportion of all answers on a Likert-type scale “3 - Really relevant” and 4 - “Very relevant” so that the items and the booklet as a whole that obtained a minimum agreement level of 75% would be considered valid.

RESULTS

The total number of participants in the three focus groups corresponded to 18. Participated in the group Representatives of Residents’ Associations (RRA), Religious Leaders (RL) and Pregnant Women (P), respectively n=7, n=6 and n=5. The average time for the three groups was 79 minutes.

The RL group presented age groups between 20 and 58 years old, mostly male (n=5) and with incomplete higher education (n=3), with incomes ranging from none to 4 minimum wages. The RRA group was composed only of women of Catholic religion, with ages ranging from 33 to 72 years old, most had completed high school (n=4) and the income ranged from less than one minimum wage to more than 2 wages. The group of pregnant women ranged in age from 22 to 31 years old, with different religions; in relation to education, only 2 had completed high school, most of their income came from informal work and with a maximum of 2 minimum wages.

According to their statements, participants expressed interest in knowing the origin of Zika, how arbovirus came to Brazil and how the disease is transmitted: *I am interested to know what the disease started here, how the person got sick. I was wondering what it started with!* (RRA6). They demonstrated that it would be important to explain the symptoms of Zika and the differences between other arboviruses transmitted by the same mosquito, as well as Zika treatment and prevention: *As the same mosquito transmits Dengue, Zika and Chikungunya, we often get mixed up with the symptoms of diseases, right?!* [...] *Mainly to address the symptoms, ways of prevention, even how the treatment is done* (RL2). [...] *so I want to know the difference between the symptoms and how to prevent it* (P3). *Perhaps something that informs you in this sense, to say what the disease is, its consequences, and how to treat it* (RL1). *What are we going to take? What medications are there for this?* (RRA5). *I would also like to know how the disease starts and especially the prevention* (RRA3).

Another signaled aspect concerns Zika complications: [...] *talk about this issue of the infection implications for pregnant women* (RL1). [...] *this is what we want to know, the consequences for children. I already saw that it can cause microcephaly, but what can cause more?* (P2).

The groups’ participants also presented some elements considered relevant to make the booklet culturally accepted and attractive to readers. They suggested ways in which the booklet could be organized: *Let it be illustrated, in a way that facilitates understanding, because sometimes they may not read because of words that are not understood, sometimes the vocabulary is a higher level vocabulary* (RRA 5). *It would be interesting if there were figures, images that show how it should be done* (P3). *When there is small text, I read it, but when it is large text, I do not read it* (P3). *Both explaining with text and figure, because there are people who don’t know how to read, right?* (P2).

We opted for a colorful booklet, mixing a narrative narrative with didactic texts, inserting fictional characters. The texts and narratives were prepared with short sentences, using common words in the active voice, the font size was at least 14. Topics, titles, bold and bookmarks were included in the pages.

The first version of the booklet presented 28 pages in the format of A4 half-sheet (150x210 mm) configured in landscape. To use the Self-Efficacy Theory assumption, a direct experience, the booklet emphasized behaviors in which the characters were successful: a pregnant woman who performed the recommended care to prevent Zika, during pregnancy, was not infected by the virus and her child was born healthy.

In the assumption of vicarious experience, to increase readers' beliefs that they had the skills and abilities to successfully master activities, characters that represented SUS users with a positive outcome were included. In order for readers to enter the booklet's script, illustrations were included that depicted places similar to those existing in the target audience's location: streets, Basic Health Unit, Lacen, among others.

To use the assumption of social (or verbal) persuasions, the booklet was written in active voice, while many phrases highlighted proposed Zika prevention actions that are feasible, capable of being carried out by the reader. Under the assumption of physical and emotional states, situations were illustrated in which the population shows interest in learning and actively participating in Zika prevention actions.

The cover was illustrated for the reader to capture the main message, containing the title *Juntos somos capazes de evitar a Zika* ("Together we are able to avoid Zika"). The main characters involved in Zika prevention were represented by the pregnant woman, adult, child as well as by different health professionals.

In the first cycle of validation by the judges, 12 judges agreed to participate in the research, responding to the questionnaire in a timely manner. In the second cycle, 19 participated, of which 8 of them also participated in the first. 6 experts in graphic design were invited, of which 2 confirmed their participation, but none sent the questionnaire.

In total 23 Judges participated, mostly female 87% (N=20), a large part of northeastern Brazil, 56% (N=13), mainly from the state of Ceará, 31% (N=7). In relation to the undergraduate course, most were graduated in nursing 44% (N=10). With regard to postgraduate studies, with the exception of 1 (4%), all had attended or were studying for a doctorate, in addition 26% (N=6) had a post-doctoral degree.

Table 1 shows the values of the respective CVI obtained in two validation cycles. In the first cycle, the booklet obtained a minimum overall CVI of 0.78. After making the suggested changes, the result of the overall CVI in the second cycle corresponded to 0.85. In the first cycle, the variable "theoretical relevance" obtained an I-CVI lower than the value established for validation; however, in the second cycle the index increased to 0.86, a satisfactory value for validation.

In the first cycle, 13 pages obtained S-CVI/UA above 0.78 in the clarity of language aspect and in the second cycle, 14 of them. In terms of practical relevance, the number of pages with S-CVI/UA above 0.78 was 13 in the first cycle and 18 in the second. In the theoretical relevance aspect, in the first cycle, only 8 pages obtained S-CVI/UA above 0.78, while in the second cycle the number of pages doubled to 16.

Chart 1 presents some suggestions from the judges obtained in the validation process of both cycles, which were analyzed, accepted or not, according to the data obtained in the integrative review. At the end of the second validation cycle, the booklet remained with 28 pages, some of which were completely modified.

In Figure 2, there are illustrations representing some pages after validation. At the end of the second cycle, there was no need to modify the illustrations, only the texts on some pages were modified. After compiling the data, the material was divided into six topics with the following themes: 1) You are able to know what Zika is! 2) You can know how to get Zika! 3) You can know the symptoms of Zika! 4) Understand the complications of Zika! 5) You can improve from Zika! 6) You are able to avoid Zika!

Table 1 – Distribution of Content Validity Indexes of the respective validation cycles according to analysis by expert judges. Crato, CE, Brazil, 2017.

Booklet pages S-CVI/UA*	First validation cycle			Second validation cycle		
	Language clarity	Practical pertinence	Theorical relevance	Language clarity	Practical pertinence	Theorical relevance
Cover	0.92	0.92	0.83	0.89	0.95	0.89
Summary	1	0.91	1	0.95	1	0.89
6	0.83	0.68	0.68	0.95	0.89	0.95
7	0.92	0.83	0.75	0.79	0.79	0.74
8	0.83	0.83	0.83	0.69	0.84	0.69
9	0.75	0.83	0.66	0.63	0.84	0.58
10	0.83	0.75	0.75	0.84	0.95	0.95
11	0.92	0.92	0.92	0.63	0.84	0.98
12	0.75	0.83	0.83	0.84	0.89	0.84
13	0.67	0.58	0.68	0.74	0.74	0.79
14	0.58	0.58	0.50	0.74	0.95	0.95
15	0.92	0.83	0.83	0.79	0.89	0.95
16	0.67	0.67	0.58	0.84	0.84	0.89
17	0.83	0.83	0.75	0.53	0.74	0.63
18	0.92	0.83	0.83	0.89	0.95	0.95
19	0.83	0.83	0.75	0.89	0.95	0.84
20	0.83	0.75	0.75	0.95	0.89	0.95
21	0.67	0.67	0.58	0.89	0.95	0.89
22	0.67	0.67	0.67	0.98	0.84	0.95
23	0.91	0.91	0.83	0.95	0.95	0.95
I- CVI†	0.81	0.78	0.75	0.82	0.88	0.86
S-VCI/Ave‡		0.78			0.85	

* Proportion of items on the scale that reached scores of 4 and 5; † Content validity of individual indexes; ‡ Average of content validation indexes for all indexes of the scale.

Chart 1 – Suggestions from expert judges who participated in the booklet validation. Crato, CE, Brazil, 2017.

Page	Judges' suggestions	Analysis
Summary	Do not use the word dangerous (J2); modify the tarpaulin over the tire and the loose bottle (J13)	Accepted
	Remove topic "How did Zika arrive in Brazil?" (J5)	Rejected
6	Include a conversation wheel (J3, J12); replace the blonde nurse with someone with dark skin and hair (J7); contemplate the diversity of the Brazilian population, including blacks (J16)	Accepted
7	Do not put numbers, as it outdates (J11); put the cycle on monkeys and human hosts (J16)	Accepted
	Remove the hypothesis of how the virus arrived (J14, J15, J20)	Rejected
8	Emphasis should be placed on breeding sites (J5); change the item title (J15, J13, J17)	Accepted
9	Modify the figure of patients (J5, J7); include extrinsic incubation period (J16, J17)	Accepted
	Change the title of "You are able to avoid Zika" (J13)	Rejected
10	Remove transmission through saliva (J2, J3, J8, J11, J5); reviewing the blood donation figure, is confused (J5); modify the title (J8, J14)	Accepted
11	Inform that usually the symptoms of Zika are mild (J3); modify "is more lenient", for better understanding (J1, J3, J15)	Accepted
	I suggest creating a new topic (J20)	Rejected

Chart 1 – Cont.

Page	Judges' suggestions	Analysis
12	Highlight the expression "that itch" (J10)	Accepted
	Only laboratory and not Lacen should appear (J13)	Rejected
13	Emphasize the search for FHS not only when sick (J4); modify the nurse's countenance, she is very happy for gravity (J15)	Accepted
	Reinforce the search for services only in complications (J18)	Rejected
14	Put other changes on the baby's face with microcephaly (J4); I suggest putting a family image (J8)	Accepted
15	I suggest putting something in the script that refers to prevention (J3); I suggest adding "specialized clinics" in the text (J13, J18)	Accepted
16	I suggest removing Guillain-Barré Syndrome and rare complications (J2); describe signs of worsening and the need to seek health services (J5); specify "cut your nails" (J13, J15)	Accepted
17	Encourage society to monitor manholes (J1); hold health and government authorities accountable (J1, J2); I suggest an image aimed at cleaning and avoiding water accumulation (J3)	Accepted
18	Clarify the need to control outbreaks in neighboring houses (J5); specify that the reservoir is from the refrigerator (J12)	Accepted
19	Deconstruct the culture of seeking unity only in the face of health problems (J4)	Accepted
20	Review page approach (J1)	Accepted
21	Remember the most important thing: avoid mosquito proliferation (J3)	Accepted
22	Bring a figure of the whole body of pregnant women (J12); cover care for all people (J18)	Accepted
23	Remove travel information (J3, J7); leaving the decision not to donate blood to the population (J3)	Accepted

Figure 2 – Representative illustration of the cover, layout and characters of the booklet "Together we are able to avoid Zika". Crato, CE, Brazil, 2017.

Thus, 31 people participated in validation by the target audience. Participants' ages ranged from 20 to 72 years, the gender was predominantly female 83.9% (N=26). Half, 51.5% (N=16), attended high school, 12.9% (N=4) did not finish high school, while 16.1% (N=5) only studied elementary school. A large part, 54.8% (N=17), had a family income of less than one minimum wage and 38.7% (N=12) had an income of between 1 and 2 wages.

Table 2 shows the agreement percentages obtained during data collection. Regarding "clarity", the average agreement was 100%, while "relevance" obtained a 99% agreement percentage; in relation to the "degree of relevance", the percentage of agreement was 98%.

Few changes were recorded, all referring only to the text. Several positive comments were obtained measuring the importance of the themes included in the material, their appearance, clarity of texts and illustrations.

Table 2 – Results of percentages of agreement obtained by the target audience in the booklet validation. Crato, CE, Brazil, 2017. (N=31)

Booklet page	Clarity		Relevance		Relevance degree	
	N	%*	N	%*	N	%*
Cover	31	100	31	100	31	100
Summary	31	100	31	100	31	96.8
6	31	100	31	96.8	31	93.6
7	31	96.8	31	93.5	31	90.3
8	31	100	31	100	31	100
9	31	100	31	100	31	96.8
10	31	100	31	100	31	96.8
11	31	100	31	100	31	93.6
12	31	100	31	96.8	31	96.8
13	31	100	31	100	31	100
14	31	100	31	100	31	100
15	31	100	31	100	31	100
16	31	100	31	100	31	96.8
17	31	100	31	100	31	96.8
18	31	100	31	100	31	100
19	31	100	31	100	31	100
20	31	100	31	100	31	100
21	31	100	31	96.8	31	96.8
22	31	96.8	31	96.8	31	96.8
23	31	100	31	100	31	100
Total †	100%		99%		98%	
Mean of variables			99%			

* Agreement percentage; † Average page percentage agreement.

DISCUSSION

Educational technologies must be built from the theoretical approach, as they are able to provide a predictable framework for planning actions more likely to succeed, have a model to replicate an intervention and propose a systematic process[12]. Like the booklet developed in this study, other nurses also built and validated educational materials based on the Self-Efficacy Theory assumptions, signaling that this construct is an alternative to guide the development of educational materials in the health field[17–19].

The educational booklet "Together we are able to avoid Zika" was validated by a significant number of judges, 23 experts, with a high level of knowledge regarding the topic addressed, since the majority held a doctoral degree in related fields. From the results of validation, it appears that the judges were judicious about the aspects judged, considering the minimum CVI of 0.78 obtained in the first cycle. The changes made, as suggested, in the illustrations, texts and script, caused CVI in the second cycle to be raised to 0.85.

It is believed that the result of the first cycle may be justified by the fact that Zika, during the research period, is an emerging arbovirus, since the first autochthonous case was registered in 2015 and its repercussion for children during pregnancy was only reported later[20]. This statement confirms the findings of an integrative review carried out in the data collection stage, during the booklet construction, in which divergences were found regarding aspects of the disease, especially regarding Zika transmission and complications.

The suggestions in the second cycle were made predominantly by those who did not participate in the first, considering that most of the previous suggestions were accepted, contributing to increased validation indexes in the second cycle. The strategy of including new judges in a second stage of validation could contribute significantly to booklet improvement.

The realization of a second round of validation by experts has also been adopted by other authors in materials validation surveys, the method raises validation scores and, consequently, the material quality. A content validation study of a checklist is cited to assess training with clinical simulation of septic patient care, in which the authors adopted CVI and also carried out two rounds of evaluation by the experts[21].

The use of CVI in methodological studies for the validation of educational booklets in the health field has been widespread. There is a growing need for reliable educational materials that can contribute to health education actions by nursing and other professionals. It is evident that some researchers carried out booklet validation including exclusively expert judges, a booklet for promoting healthy eating among diabetic patients is cited, which obtained a CVI of 0.96 and a booklet for HIV/AID prevention in older adults, validated with an overall CVI of 0.95 by 9 judges[22–23].

As in this study, there are other publications that included both experts and the target audience in the validation process of educational booklets, in addition to also adopting CVI[24–25]. In a survey to build and validate a booklet for the prevention of vertical transmission of HIV, in which 30 people participated as a target audience and 9 expert judges, the booklet obtained an overall CVI of 0.87 by judges and the level of agreement among the public. target ranged from 98.1% to 100%[26]. In the validation of a booklet for the prevention of overweight in adolescents, the authors included 15 judges and 36 adolescents as the target audience and obtained an agreement level of 82% and the average CVI obtained by the content judges was 0.87[27].

When analyzing judges' suggestions in this study, those that reinforce health prevention and promotion were taken into account. Some suggestions were rejected, as presented in Chart 1, in view of being at odds with the theoretical frameworks adopted in the study, presented in the method. It is noteworthy that the booklet was illustrated portraying desirable situations and behavior on the part of readers, so contrary suggestions were not accepted. In addition, content that had been suggested by

the focus group participants and that the judges requested to exclude was also not accepted, it was considered a priority to include content of interest to the community at the expense of that of the judges.

Suggestions for grammatical corrections were accepted. It is recommended that educational materials be subjected to proofreading so that it can improve validation indexes. Suggestions for changes that referred to a more dialogical approach, respecting the horizontal care model between SUS professionals and users, were accepted. In this context, there is a need to readjust the teaching processes of nursing, as well as educational materials, so that they contemplate this new paradigm.

In the first validation cycle, there was a need to make many adjustments to the booklet, both in the script and in the illustrations; however, changes after the second validation cycle were prevalent in the topics. Textual changes were made to make the information more understandable to readers. We sought to illustrate the textual information containing practical situations.

As for validation by the target audience, it is noteworthy that, unlike the results obtained by validation by judges, they validated the booklet with high values, one variable even obtained a maximum level of agreement of 100%. The average percentage of agreement for the items judged by the target audience was 99%, which represents an excellent level of agreement among the participants, indicating a high quality of the booklet. The target population also made suggestions, which were analyzed and accepted according to the study's references, which resulted in the final version of the booklet.

It is considered that the results obtained by the target audience in this study are related to the participation of the community, from the focus groups, in the second stage of the research, in which it was possible to identify the topics of interest and the way in which the booklet could be used. make it more attractive, elaborated, therefore, in a participatory way. It is also mentioned, in addition to the methods used prior to the booklet validation by the target audience, judicious validation of experts. The qualitative results of assessment of this public are found in literature[28].

It is inferred that the educational booklet "Together we are able to avoid Zika" is a validated nursing technology containing a simple language, layout and attractive design, which can be used in health education by different professionals and in different contexts, favoring self-efficacy, autonomy and population empowerment around Zika prevention actions.

It is cited as a challenge to develop educational material containing elements that awaken in the reader autonomy and empowerment, with a constructivist approach and that does not reproduce the traditional mechanistic and biomedical model of health care. Traditional teaching models are already naturalized to teaching and research practices, rethinking strategies to deconstruct this model requires time, effort, dedication and innovative approaches, which sometimes require continued training, perspicacity, and persistence.

It is pointed out as a study limitation non-adherence of the participation of professionals in Graphic Design to carry out validation. It is suggested to develop educational materials with a similar approach, aimed at families with children diagnosed with the Congenital Zika Virus Syndrome. These families experience the disease with greater intensity, anxiety, anguish and depression, demanding special attention and care from the nursing staff, from prenatal to puerperium[29].

CONCLUSION

The booklet "Together we are able to avoid Zika" was validated by the judges with an overall CVI of 0.85, and by the target audience with a 99% agreement percentage. The booklet developed from the Self-Efficacy Theory assumptions presents potential elements to improve Zika prevention and other arboviruses that have similar forms of prevention.

The contributions of this study are based on the creation of new knowledge for nursing, consolidating the scientific knowledge of the profession and subsidizing educational practices. Moreover, they have relevance in the field of health care with the environment, especially in primary care, for strengthening actions around environmental health. It is recommended to disseminate the booklet in different regions of Brazil and in different contexts. Also, conducting experimental studies to measure the booklet's effectiveness.

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NOTES

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APPROVAL OF ETHICS COMMITTEE IN RESEARCH

The study was approved by the Research Ethics Committee of *Universidade Regional do Cariri* (URCA), Opinion 1,914,412 and CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 62843316.1.0000.5055.

CONFLICT OF INTEREST

There is no conflict of interest.

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