








BOOKLET FOR ASSESSING CONTACTS OF PEOPLE WITH TUBERCULOSIS: A VALIDATION STUDY

CARTILHA PARA AVALIAÇÃO DOS CONTATOS DE PESSOAS COM TUBERCULOSE: ESTUDO DE VALIDAÇÃO

CARTILLA PARA EVALUACIÓN DE CONTACTOS DE PERSONAS CON TUBERCULOSIS: ESTUDIO DE VALIDACIÓN

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Funding: Instituto Evandro Chagas (IEC).

Submitted on: 2023/07/06

Approved on: 2024/04/03

Responsible Editors:

 Jose Wicto Pereira Borges
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ABSTRACT

Objectives: to validate the content of a chart on the assessment of contacts of people with pulmonary tuberculosis. **Method:** methodological study carried out in Ananindeua, Pará, Brazil, between June and October 2021. The participants were 16 experts selected according to experience criteria who responded to an instrument organized with a seven-item Likert scale. The data was analyzed using descriptive statistics to obtain the Content Validation Index. **Results:** the first version of the booklet, its validation by expert judges and the description of the final version, which obtained a Content Validation Index of 74.75%, considered acceptable according to the literature. Based on the suggestions, the texts and images were restructured. The final version consists of 20 pages and highlights the signs and symptoms of the disease, the guidelines for collecting material for exploration, family life with the index case, the regionalized and humanized context between the health professional and the user. **Conclusion and implications for practice:** it was considered that the leaflet is suitable for facilitating contact assessment practices for people with tuberculosis and its content is made up of information that can contribute to greater adherence to treatment, new early diagnoses of the disease and breaking the chain of transmission of the disease.

Keywords: Tuberculosis; Educational Technology; Validation Study.

RESUMO

Objetivo: validar o conteúdo de uma cartilha sobre avaliação dos contatos de pessoas com tuberculose pulmonar. **Método:** estudo metodológico realizado em Ananindeua, Pará, Brasil, entre junho e outubro de 2021. Participaram 16 especialistas selecionados com base em critérios de expertise, que responderam a um instrumento organizado com escala de Likert de sete itens. Os dados foram analisados por meio de estatística descritiva para obter o Índice de Validação de Conteúdo. **Resultados:** foram apresentados em três tópicos: primeira versão da cartilha, validação por especialistas e descrição da versão final, que obteve um Índice de Validação de Conteúdo de 74,75%, considerado aceitável pela literatura. Com base nas sugestões, houve reestruturação de textos e imagens. A versão final ficou com 20 páginas e destaca sinais e sintomas da doença, orientações para coleta de material para exame, convívio familiar com o caso índice, contexto regionalizado e humanizado entre profissional de saúde e usuário. **Conclusão e implicações para a prática:** a cartilha foi considerada adequada para orientar as práticas de avaliação dos contatos de pessoas com tuberculose, e seu conteúdo é composto por informações que podem contribuir para uma maior adesão ao tratamento, diagnósticos precoces da doença e interrupção da cadeia de transmissão.

Palavras-chave: Tuberculose; Tecnologia Educacional; Estudo de Validação.

RESUMEN

Objetivos: validar el contenido de una cartilla sobre la evaluación de contactos de personas con tuberculosis pulmonar. **Método:** estudio metodológico desarrollado en Ananindeua, Pará, Brasil, realizado entre junio y octubre de 2021. Participaron 16 expertos seleccionados según criterios de experiencia que respondieron a un instrumento organizado con una escala Likert de siete ítems. Los datos fueron analizados mediante estadística descriptiva para obtener el Índice de Validación de Contenido. **Resultados:** se presentaron en tres temas: la primera versión del cuadernillo, la validación por parte de los jueces expertos y la descripción de la versión final, la cual obtuvo un Índice de Validación de Contenido del 74,75%, considerado aceptable según la literatura. A partir de las sugerencias, se reestructuraron los textos e imágenes. La versión final consta de 20 páginas y destaca los signos y síntomas de la enfermedad, las pautas para la recolección de material para la exploración, la convivencia familiar con el caso índice, el contexto regionalizado y humanizado entre el profesional de salud y el usuario. **Conclusión e implicaciones para la práctica:** se consideró que el folleto es apropiado para facilitar las prácticas de evaluación de contactos de personas con tuberculosis y su contenido está compuesto por información que puede contribuir a una mayor adherencia al tratamiento, a nuevos diagnósticos tempranos de la enfermedad y a romper la cadena de transmisión de la enfermedad.

Palabras clave: Tuberculosis; Tecnología Educacional; Estudio de Validación.

How to cite this article:

Garcez JCD, Elhusny CO, Sousa IRF, Costa GF, Ambé AAM, Teixeira E, Lima KVB. Booklet for assessing contacts of people with Tuberculosis: A Validation Study. REME - Rev Min Enferm [Internet]. 2024[cited ____]; 28: e-1544. Available from: <https://doi.org/10.35699/2316-9389.2024.46453>

INTRODUCTION

Tuberculosis (TB) is an infectious disease with a high mortality rate; however, with prompt and consistent treatment, patients have a high chance of recovery. Established in 1999, the National Tuberculosis Control Program in Brazil aims to combat the disease and reduce its prevalence⁽¹⁾. The program evaluates its impact through epidemiological and operational indicators, including incidence, mortality, cure and abandonment rates, control of contact between TB and HIV patients, directly observed treatment, diagnostic and follow-up tests, and management of cases requiring retreatment⁽²⁾.

Global TB control recommendations stress the importance of actively identifying individuals with respiratory symptoms and evaluating contacts of those diagnosed with pulmonary TB. This strategy aims for early diagnosis and immediate interruption of the transmission chain⁽³⁾. Contacts of the index case, either new or recurrent, must be evaluated and monitored as they risk developing latent *Mycobacterium tuberculosis* infection, characterized by the presence of the infection without clinical symptoms⁽⁴⁾.

Despite recommendations from the Brazilian Ministry of Health for thorough examination of TB contacts, health professionals often struggle with detection and assessment, leading to low contact assessment and even lower rates of treatment for latent *Mycobacterium tuberculosis* infection^(2,5,6).

Implementing various strategies, in addition to those already in place for tuberculosis control programs, can contribute to improving outcomes. One such strategy could involve the development of products or processes across different technological levels to facilitate behavioral change. For example, care-educational technologies, widely utilized in public health research, aim to bridge care and education in health professionals' practice⁽⁷⁾.

An epidemiological study in a hyperendemic municipality in the Amazon has demonstrated significant gaps in the health surveillance program and quality indicators. The findings include limited access to sputum smear microscopy for diagnosis, scarce availability of specific tests like culture and rapid molecular testing, low adherence to sputum smear microscopy for monitoring case progression during treatment, absence of data on drug susceptibility testing, and incomplete collection of essential variables for TB surveillance.

Cure rates were observed to range from 28.7% to 70.1%, with treatment abandonment rates between 7.3% and 11.8% and disease mortality rates from 0% to 1.6%. The prevalence of drug-resistant tuberculosis varied from 0% to 0.9%. Furthermore, patient transfer rates to other

municipalities were noted to be between 4.9% and 12.5%, and contact assessment fell below the national average^(8,9).

An integrative literature review suggested that strategies for evaluating contact with diagnosed TB patients largely depend on self-identification by the contacts themselves. The studies underscore the pivotal role of health professionals in contact tracing, the importance of assessing TB contacts for disease control, and the responsibilities of health professionals to the public and the broader community. It was determined that professionals require additional knowledge to enhance their practices and ensure effective identification and investigation of TB contacts⁽¹⁰⁾.

Based on the epidemiological study and literature review findings, themes and content for a booklet titled "I'm a tuberculosis contact, what should I do now?" were developed. Considering the above and the potential of using the booklet to mediate contact assessment practices for individuals with tuberculosis, this study sought to validate the booklet's content regarding tuberculosis contact assessment.

METHOD

This methodological study, which is a type of content validation, was conducted between June and October 2021. Methodological studies aim to develop, validate, and evaluate research tools and methods. For this study, content validation was chosen and performed using expert judges (EJ)⁽¹¹⁾.

The inclusion criteria for the expert judges included having a thesis or dissertation in the area of interest; participating in a research group in the area of interest; possessing an undergraduate or specialization monograph in the area of interest; having teaching or practical experience in the area of interest; publishing an article in a Qualis B1 journal or higher in the area of interest; supervising work in the area of interest; and participating in evaluation boards for work in the area of interest. Specialists who met two or more of these criteria were selected. The exclusion criteria applied were to those who did not return the questionnaire within the established time limit of up to 30 days.

The initial selection began with a contact list of nationally recognized experts (8 judges). After applying the inclusion criteria, all were found to meet the required minimum points. The Snowball technique was used, which creates reference chains by having each participant recommend other qualified individuals⁽¹²⁾.

Judges were contacted via cell phone and sent an invitation letter, as physical contact was limited in 2021

due to the SARS-CoV-2 pandemic. The letter requested nominations for other experts in the subject, leading to the identification of additional judges⁽¹¹⁾, who also met the necessary criteria after evaluation, thus expanding the sample to 19 judges. These judges received an e-mail with a link to an electronic form created using Microsoft applications for both the informed consent form and an evaluation instrument. The first version of the booklet, in PDF format, was also attached to the same e-mail.

Consequently, the experts completed the evaluation virtually by filling out the form. Given that three judges did not return the instrument, a total of 16 experts participated in the study. This number aligns with the literature, which suggests a minimum of five and a maximum of ten experts for participation in validation processes⁽¹³⁾.

The instrument used contains four blocks^(14,15): I - Objectives; II - Organization; III - Appearance and writing style; and IV - Motivation. The items are organized into three parts: participant identification data (expert judges), instructions for filling in the items, and the instrument to be evaluated. The Likert scale contains four marking options: totally adequate (TA), adequate (A), partially adequate (PA), and inadequate (I).

The data was entered into an Excel spreadsheet and a simple descriptive analysis was carried out to verify agreement, with the aim of identifying the content validation index (CVI), calculated from the sum of the TA and A markings divided by the total number of markings obtained⁽¹⁶⁾. The CVI adopted to determine validation was equal to or greater than 70%⁽¹⁶⁾.

In order to guarantee the ethical aspects of this research, the Norms of Research Involving Human Beings (Resolution 466/2012) of the National Health Council of the Ministry of Health were respected. The proposal was approved by the Human Research Ethics Committee of the Evandro Chagas Institute (CAAE 20821119.4.0000.0019, opinion number 4.172.679).

RESULTS

The results are presented in three sections: a description of the first version of the booklet, validation by expert judges, and a description of the final version of the booklet after adjustments.

Description of the first version

The first version comprises 13 pages. Its content is organized as follows: an overview of tuberculosis and its contacts, assessment of contacts at the health center, instructions on sputum collection, an explanation of the

tuberculin test, how to administer the test, and interpreting the test results.

Validation of educational

Technology Regarding the specialists (n=16), the majority were nurses (50%) with over 10 years of training and professional experience (81.25%). In their work areas, 56.25% served as teachers, while 43.75% worked in public health. Concerning their qualifications, 6.25% held a specialization degree, 37.5% had a master's degree, and 56.25% had a doctorate (Table 1).

Table 1 - Sociodemographic profile of the specialist judges. Booklet: "I'm a tuberculosis contact, now what should I do?" Ananindeua, Pará, Brazil, 2023.

Variáveis	N	%
Sex		
Male	5	31.25
Female	11	68.75
Training		
Nurse	8	50.00
Pharmacist	1	6.25
Physiotherapist	1	6.25
Doctor	3	18.75
Biologist	1	6.25
Sociologist	1	6.25
Public health and pharmaceutical technologist	1	6.25
Title		
PhD	9	56.25
Master's degree	6	37.50
Specialization	1	6.25
Length of professional career		
< 10 years	9	18.75
10–20 years	6	43.75
> 10 years	1	37.50
Area of activity		
Teaching	9	56.25
Public Health	7	43.75

As for content validation, the instrument was divided into 4 blocks. Block 1 - Objective" has 5 questions and 80 answers, with the following results: 24 (30%) Fully Adequate, 44 (55%) Adequate, 12 (15%) Partially Adequate and 0 (0%) Inadequate. The block achieved a CVI of 85%. In "Block 2 - Organization", 9 questions were asked and 144 responses were obtained, with the following results: 36 (25%) Totally Agree, 67 (47%) Agree,

41 (28%) Partially Adequate and 0 (0%) Inadequate. The block achieved a CVI of 72%. Block 3 - Appearance and writing style" has 5 questions and 80 answers, with the following results: 28 (35%) Totally Adequate, 29 (36%) Adequate, 23 (29%) Partially Adequate and 0 (0%) Inadequate. In "Block 4 - Motivation", 5 questions were asked and 80 answers were obtained, with the following results: 28 (35%) Fully Adequate, 29 (36%) Adequate, 23 (29%) Partially Adequate and 0 (0%) Inadequate. The block achieved a CVI of 71%. The overall CVI was 74.75% (Table 2). The percentage of agreement was 100%, as there were no inadequate evaluations.

After reviewing the suggestions, the expert judges scored them. These were then categorized based on the suggested actions, denoted by infinitive verbs such as: use, explain, change, and reinforce (Figure 1).

Among the main suggestions made by the expert judges were: the need to restructure the text and images to better represent the characters' facial expressions; the recommendation to revise the writing for greater accessibility; considerations regarding the font size used; the substitution of terms such as "expectorate" for "spit" to refer to the collection for sputum smear microscopy; adaptation to the guidelines of the Ministry of Health's Manual for tuberculosis control; an emphasis on the importance

of contact assessment and symptom identification; and the inclusion of information on why it is unnecessary to separate crockery and cutlery.

Description of the final version

After validation by the expert judges, corrections were made in accordance with the suggestions. The final version of the booklet spans 20 pages, including the cover and references. It features the following elements: cover, catalog, authors' names, introduction, information on tuberculosis and contact procedures, a narrative on taking family members to the clinic for contact assessment, tips for conducting a proper sputum test, details on disease transmission, an explanation of the tuberculin test and instructions for its administration and interpretation, contact assessment, references, and notes. Figure 2 illustrates the corrections made before and after.

In Figure 3, the term "spit" has been changed to "spit" in accordance with the Ministry of Health's TB control manual.

In Figure 4, the individuals with the disease were suggested to not need to separate their cutlery and plates, demystifying the mode of disease transmission.

In Figure 5, JE6 suggested explaining technical terms such as culture test and rapid molecular test, while JE14 suggested replacing the term "bacterium" with "bacillus," as described in Table 1.

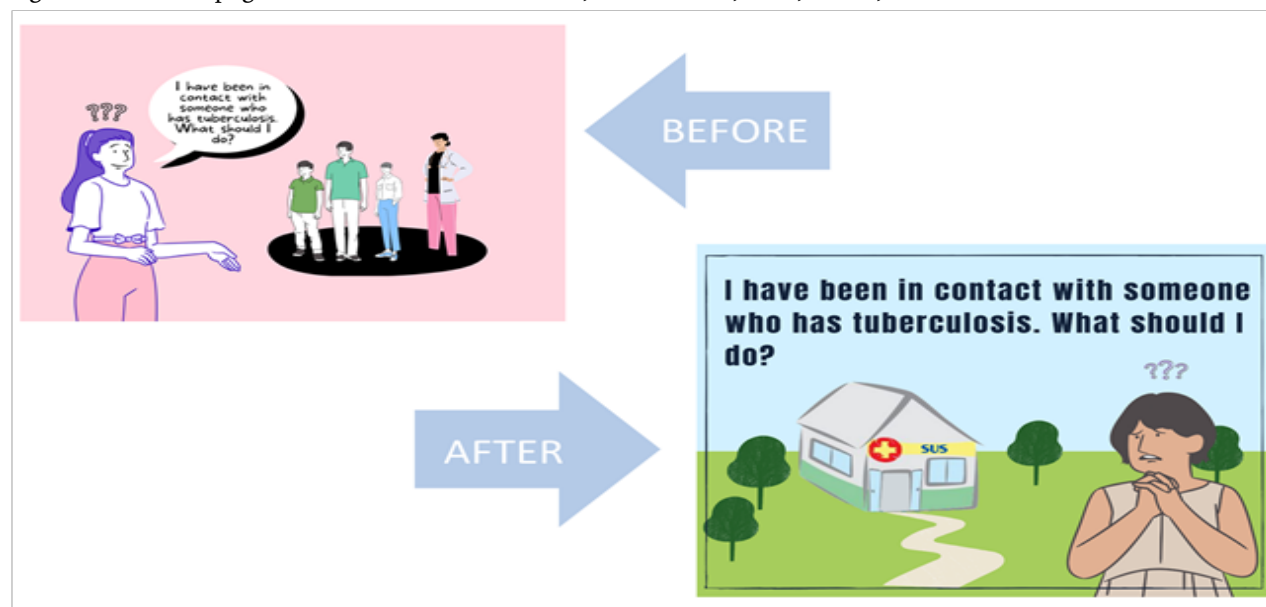
Table 2 - Content validation indices, by block and overall, according to the answers of the expert judges, Ananindeua, Pará, Brazil, 2023.

Blocks	Responses (%)	CVI* (%)	CVI* GENERAL (%)
1 - Objectives (evaluates the purpose of using the booklet)	30% (TA) ¹ 55% (A) ² 15% (PA) ³ 0% (I) ⁴	85%	74.75%
2 - Organization (assessed the overall organization, structure, coherence and formatting of the booklet)	25% (TA) ¹ 47% (A) ² 28% (PA) ³ 0% (I) ⁴	72%	
3 - Appearance and writing style (assessed the degree of meaning, comprehension and writing style of the booklet)	35% (TA) ¹ 36% (A) ² 29% (PA) ³ 0% (I) ⁴	71%	
4 - Motivation (assessed the booklet's ability to produce motivation and/or interest in its use by the target audience)	35% (TA) ¹ 36% (A) ² 29% (PA) ³ 0% (I) ⁴	71%	

Figure 1 - Experts' suggestions according to actions indicated for changes in the booklet, Ananindeua, Pará, Brazil, 2023.

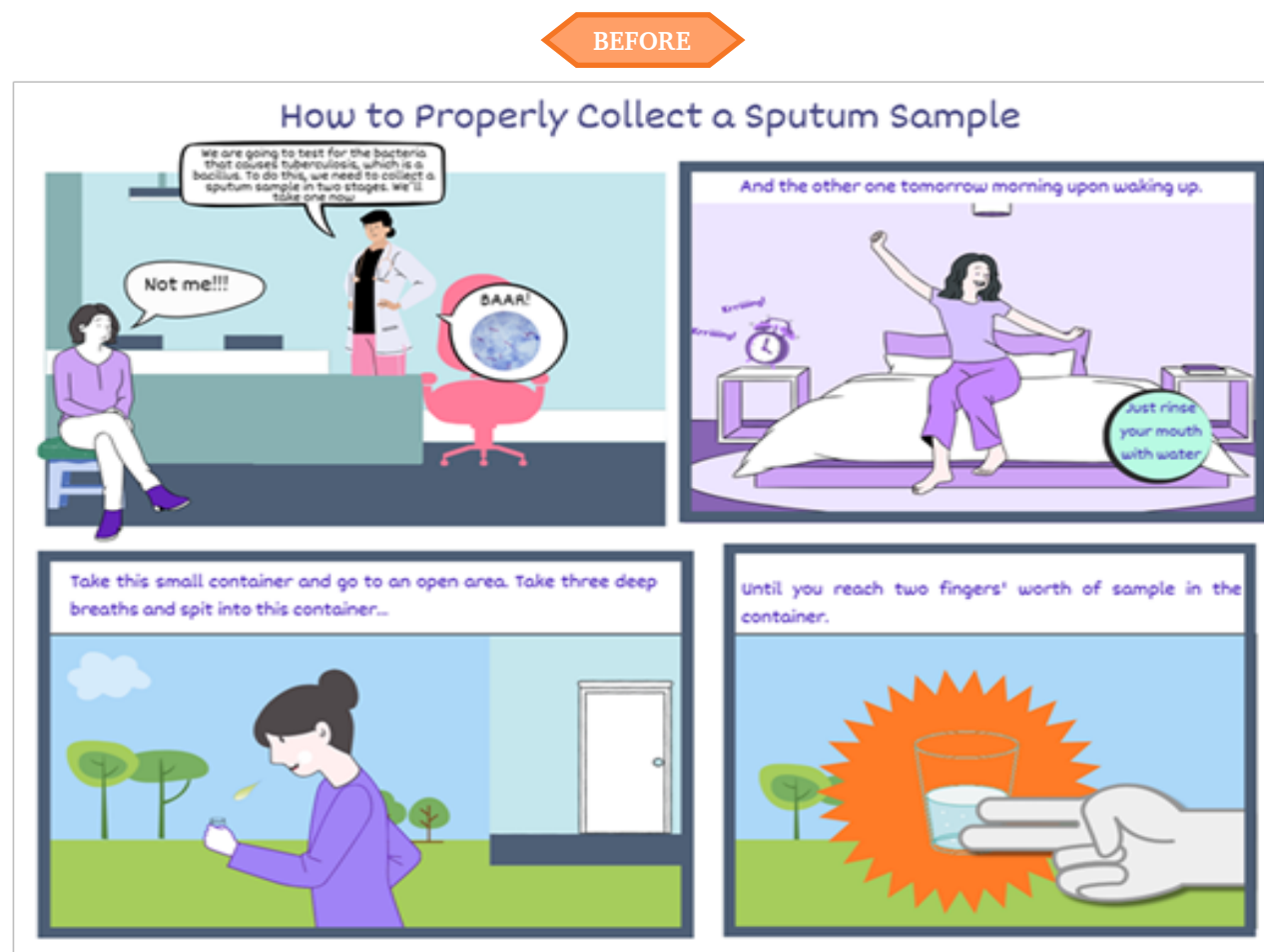
Ação	Sugestão
Use	More accessible language (JE13 - DOCTOR) Same font size (JE6 and JE7 - NURSES; JE13 - MEDICS) Same characters (JE7 - NURSE) Drawings with better outlines and the same pattern (JE11 - BIOLOGIST).
Explain	Technical terms, such as culture and TRM (JE6 - NURSE).
Change	4 weeks for 3 weeks of coughing (JE6 - NURSE); The term "spit" for "spit" into the collection bottle (JE6, JE14- NURSES, JE16 - PHARMACISTS); The term bacteria for bacillus (JE14 - NURSE)
Reinforce	Some characteristics of the symptoms and transmission of the disease (JE11 - BIOLOGIST)

Figure 2 - Booklet pages before and after validation, Ananindeua, Pará, Brazil, 2023.



Source: The authors, 2023.

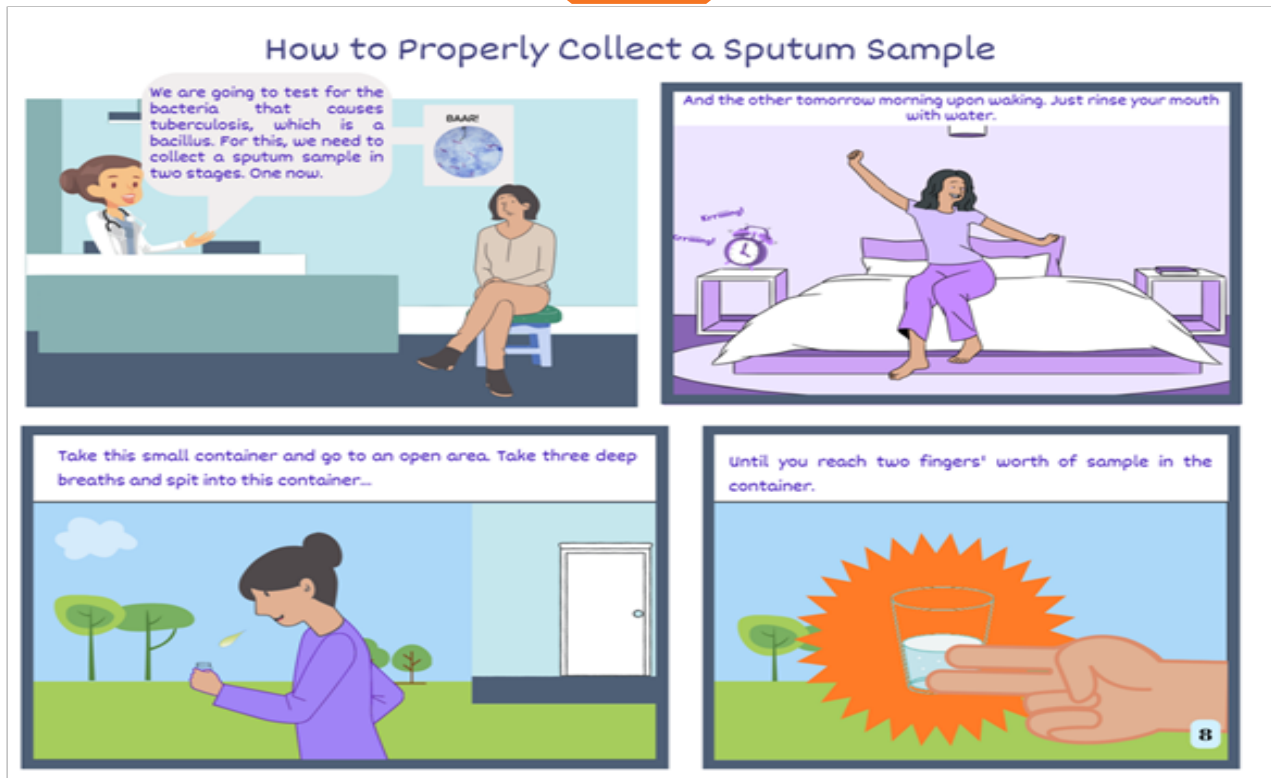
Figure 3 - How to perform a good sputum examination, first version and final version after validation, 2023.



Source: The authors, 2023.

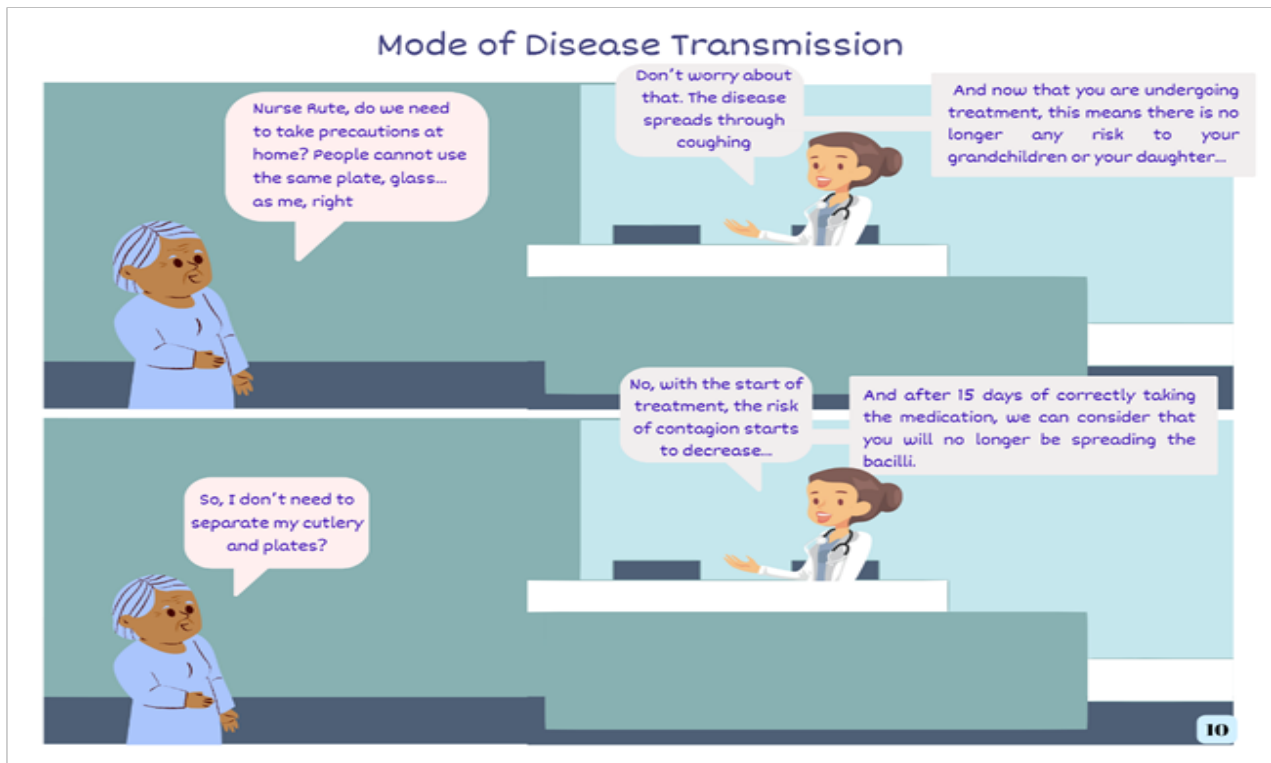
Figure 3 - How to perform a good sputum examination, first version and final version after validation, 2023.

AFTER



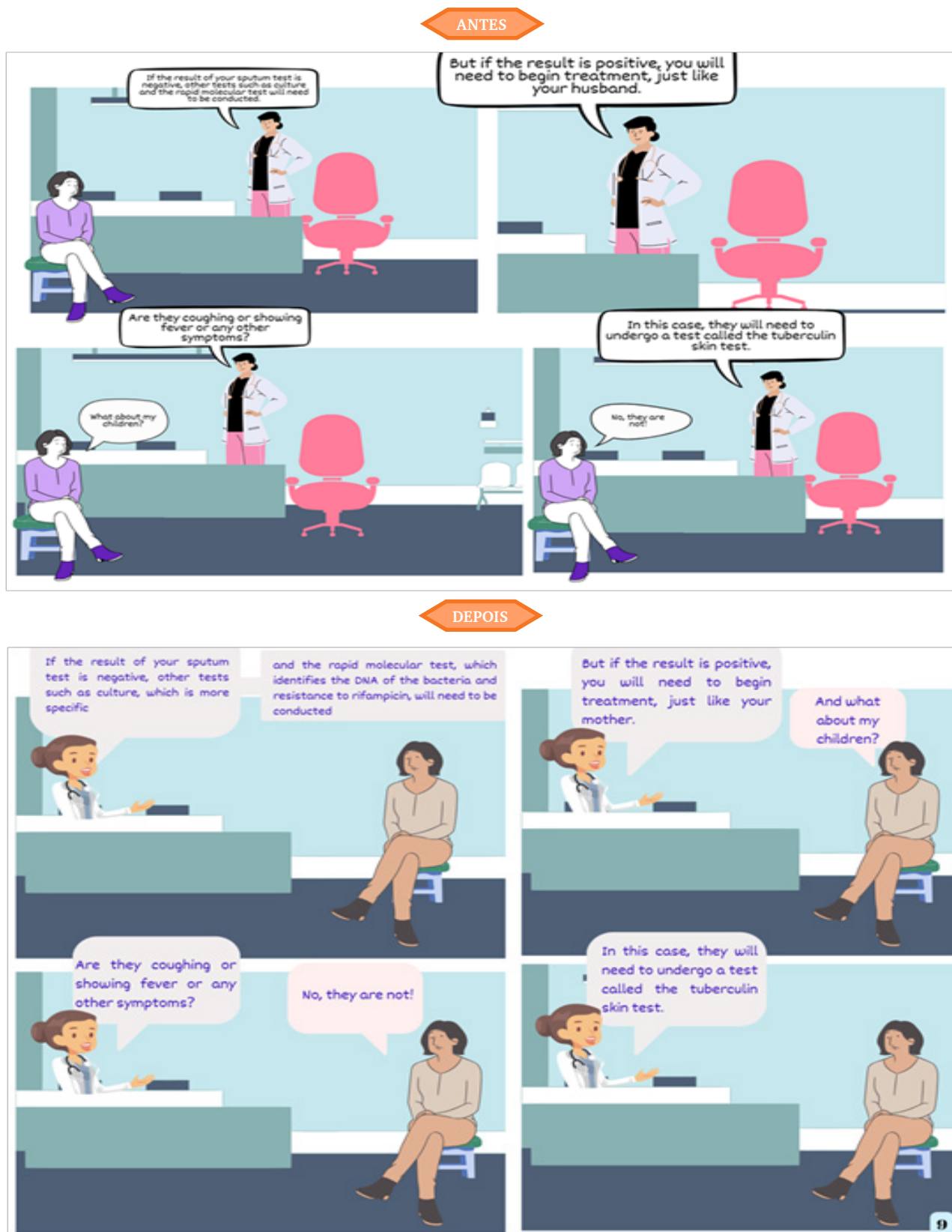
Source: The authors, 2023.

Figure 4 - Mode of disease transmission, after validation, 2023.



Source: The authors, 2023.

Figure 4 - Explanation and alteration of technical terms, following the suggestion by JE, 2023.



Source: The authors, 2023.

DISCUSSION

The choice of topic and the type of technology used is justified by the significant number of cases in which contacts are not assessed due to the difficulty health professionals face in identifying and assessing them. It is up to the health professional to mediate the need for contact assessment through the use of this material⁽⁶⁾.

A study⁽¹⁸⁾ supports the observation that the number of contact assessments remains low compared to the number of tuberculosis records, perpetuating the under-reporting of TB cases among patients' contacts. Although most nurses are trained for this task, the recording is still incipient compared to the targets set by the Ministry to control the disease.

The booklet-type educational technology model was selected because it is simple and understandable for people from various socio-economic backgrounds. The booklet dynamically presents content, using texts, images, and colorful illustrations suitable for the target audience. The language is clear, objective, and combines reliable information with attractive visuals⁽¹⁹⁾.

The material's length, in terms of page number, should be brief, following the Northern Paraná State University Library manual, which recommends a maximum of 14 pages, including post-textual elements. According to the study⁽¹⁹⁾, there are no specific universal standards for creating this type of material, but publishers can adopt their own standards for product standardization.

The section related to the technology's objectives, goals, and aims received the highest score of the four blocks evaluated, indicating that the booklet has well-defined and achievable objectives. However, the item 'Promotes a change in behavior or attitude' scored below the cutoff point. According to the judges, this is because behavior change promotion depends not only on the tool but also on the professional's approach to using it. One judge also raised questions about the target audience and the booklet's development necessity.

The study⁽¹⁷⁾ confirms that the professional-person approach to TB and creating a bond are critical to treatment adherence. This approach can influence the desire to start or continue treatment, depending on the professional skills developed.

In the second and third blocks, concerning presentation, organization, and writing style, the overall scores were 72 and 71, respectively, and these sections saw the most adjustments based on the judges' feedback. Items not meeting the cutoff point included the scientific accuracy of the presented information, the adequacy of title and topic sizes, the expressiveness and sufficiency of

illustrations, and the appropriateness of the number of pages.

The last block of the expert judges' evaluation focuses on the material's relevance, scoring slightly above the threshold. Items not meeting the cutoff point were covering necessary points for following up on tuberculosis contacts, covering necessary points about tests for tuberculosis contacts, and suitability for use by any health professional in educational activities.

Stigma remains a significant issue in tuberculosis, affecting the self-esteem of those with the disease and interfering with treatment adherence, further contributing to misinformation and perpetuating negative stereotypes⁽²⁰⁾. The causative agent of tuberculosis is spread through aerosol particles from droplets emitted during speaking, sneezing, or coughing, not through particles on clothing and utensils, thus challenging the outdated stigma about separating personal belongings of people with tuberculosis, as suggested by one of the judges⁽²¹⁾.

Evidence⁽²²⁾ has shown that people with TB feel ashamed and stigmatize the disease as something bad and disturbing, with the expression "dirty disease" being attributed to them. The study shows that, in relation to the study participants, they reveal that their family members moved away after discovering the disease or separated cutlery. The mystification of tuberculosis and the prejudice associated with it remain.

The judges also noted that the material was too long and should be reduced, as should the illustrations. Two of the judges had opposing views on the use of regional elements. While, for one, these elements can bring identification with the target audience, for the other, it reduces the possibility of using the material in other contexts and regions.

It was decided to present characters with different characteristics to bring representativeness to the booklet's different readerships but without using strictly regional elements.

CONCLUSION AND IMPLICATIONS FOR PRACTICE

The booklet demonstrated satisfactory content validity. It includes information that can aid in the early diagnosis of the disease and interrupt its transmission chain. This booklet-type resource makes information accessible on how health professionals, follow-up services, and even family members can identify and assess contacts. It is innovative and holds the potential to improve the relationship between health professionals, follow-up services, index cases, and TB contacts. It also may help to increase

the assessment of contacts and adherence to early treatment. The study's limitations include the absence of semantic validation with the target audience.

FUNDING

This work was funded by the Evandro Chagas Institute (ECI).

ACKNOWLEDGMENTS

To the Bacteriology and Mycology Section of the Evandro Chagas Institute (SABMI/ECI) for all the technical support..

CONFLICTS OF INTEREST

The authors declare no conflict of interest concerning the publication of this study, and the funders had no role in the study's design, in the collection, analysis, or interpretation of data, in the writing of the manuscript, or in the decision to publish the results.

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