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Digital video library on the use of masks for the brazilian population: construction, validation and evaluation

Videoteca digital sobre o uso de máscara para a população brasileira: construção, validação e avaliação

Videoteca digital sobre el uso de mascarillas para la población brasileña: construcción, validación y evaluación

ABSTRACT

Objective: Develop a digital video library on the use of masks for the Brazilian population. **Method:** Methodological study developed in 2021 and 2022, in the following stages: search for themes, theoretical study, preparation of videos, validation of videos by experts, adequacy after validation, evaluation of the target audience, adequacy after evaluation of the target audience and availability. The Powtoon® program was used for the construction of the videos and the Video Software Development Company for editing. The Agreement Index was adopted with a minimum of 0.7. **Results:** The digital video library was development, consisting of nine explanatory videos. Validated by 12 experts, it presented a global average Agreement Index of 1.0. In the evaluation by 15 representatives of the target audience, the video library obtained satisfactory results in all aspects. **Final remarks:** Developed as an innovative educational technology to disseminate information about the use of masks by the population in the pandemic, the digital video library was considered adequate by experts and representatives of the target audience.
Descriptors: COVID-19; Validation study; Instructional film and video; Mask; Educational technology.

RESUMO

Objetivo: Desenvolver uma videoteca digital sobre o uso de máscara para a população brasileira. **Método:** Estudo metodológico desenvolvido em 2021 e 2022, nas seguintes etapas: busca dos temas, estudo teórico, elaboração dos vídeos, validação dos vídeos por especialistas, adequação após validação, avaliação do público-alvo, adequação após avaliação do público-alvo e disponibilização. Utilizou-se o programa Powtoon® para a construção dos vídeos e o Video Software Development Company para a edição. Adotou-se o Índice de Concordância com mínimo de 0,7. **Resultados:** A videoteca digital foi desenvolvida e composta por nove vídeos explicativos. Validada por 12 especialistas, apresentou Índice de Concordância médio global de 1,0. Na avaliação por 15 representantes do público-alvo, a videoteca obteve resultados satisfatórios em todos os aspectos. **Considerações finais:** Desenvolvida como uma inovadora tecnologia educacional para disseminar informações sobre o uso de máscaras pela população na pandemia, a videoteca digital foi considerada adequada por especialistas e representantes do público-alvo.
Descritores: Covid-19; Estudo de validação; Filme e vídeo educativo; Máscaras; Tecnologia educacional.

RESUMEN

Objetivo: Desarrollar una videoteca digital sobre el uso de mascarillas para la población brasileña. **Método:** Estudio metodológico desarrollado en 2021 y 2022, en las siguientes etapas: búsqueda de temas, estudio teórico, preparación de videos, validación de videos por expertos, adecuación después de validación, evaluación del público objetivo, adecuación después de la evaluación del público objetivo y disponibilidad. Se utilizó el programa Powtoon® para la construcción de los videos y el Video Software Development Company para la edición. El Índice de Acuerdo se adoptó con un mínimo de 0,7. **Resultados:** Se construyó la videoteca digital, compuesta por nueve videos explicativos. Validado por 12 expertos, presentó un Índice de Concordancia promedio global de 1.0. En la evaluación realizada por 15 representantes del público objetivo, la videoteca obtuvo resultados satisfactorios en todos los aspectos. **Consideraciones finales:** Desarrollada como una tecnología educativa innovadora para difundir información sobre el uso de mascarillas por parte de la población en la pandemia, la videoteca digital fue considerada adecuada por expertos y representantes del público objetivo.
Descriptores: Covid-19; Estudio de validación; Película y video educativos; Máscaras; Tecnología educacional.

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INTRODUCTION

The practice of wearing masks during the pandemic has emerged as a low--cost public health intervention aimed at self-protection and the protection of others[1]. When implementing widespread mask use, it is crucial to clearly communicate the purpose, specifying when, where, how, and what type of mask should be used. The benefits should also be highlighted and it should be clarified that this adoption is part of a set of preventive measures. Information on proper and safe use, considering feasibility and acceptance, should also be disseminated[2].

However, factors that can be considered potential causes of decreased adherence, such as lack of knowledge, misconceptions about use, concerns about appearance, obstacles related to physical and social discomfort, confusion, and a reduced perception of susceptibility to coronavirus disease (COVID-19)[3]. The spread of fake news, especially those related to protective measures adopted to combat this disease, particularly the use of masks, can have negative consequences, encouraging neglect of mask use. Therefore, lack of awareness among the population represents a significant obstacle to adherence to the use of this protective equipment[4].

Although the World Health Organization (WHO) has declared the end of the Public Health Emergency of International Concern (PHEIC) related to COVID-19(5), the warning regarding the use of masks in the presence of respiratory symptoms or confirmed cases of the disease must continue. The National Health Surveillance Agency (Anvisa) updated recommendations for the use of masks, especially in situations involving individuals with symptoms or confirmed cases of the disease, those who have had contact with confirmed cases without proper or incorrect use of masks, or individuals in household contact with a confirmed case6. Recently, some Brazilian municipalities have reintroduced the use of masks in response to the increase in COVID-19 cases and the emergence of the new subvariant JN 2.5[7].

In this scenario, the availability of educational technologies plays a fundamental role, contributing significantly to expanding access to information and raising awareness among the target audience[8]. They provide easy access, regardless of location and time, allowing users to obtain relevant information at any time. Therefore, the creation of educational videos emerges as a viable and accessible strategy for sharing information, enabling continuous updates on the topic and meeting the needs of the population[9,10].

In the context of nursing, educational videos represent a valuable tool in promoting health education, contributing to critical development and generating behavioral changes[9]. Their use offers considerable advantages, being a flexible teaching tool that allows for self-management and repetition. Individuals have the freedom to watch from anywhere, at any time, pause, fast-forward, or rewind as needed, facilitating access and promoting active information processing, contributing to knowledge acquisition, benefiting from the dynamic presentation offered by videos[11].

It is noteworthy that Brazilian society did not have the habit of wearing masks as a preventive measure against respiratory diseases, making its implementation difficult during the COVID-19 pandemic[4]. Therefore, considering the Brazilian population's lack of familiarity with routine

mask use and the importance of knowledge to ensure adherence and correct use, clear guidance on the types, purpose, and proper handling of masks is crucial to minimize the transmission of COVID-19 and other respiratory diseases.

The use of educational technologies, using accessible language, represents a crucial tool for disseminating information and knowledge among the population, especially in the context of health education, aiming to raise awareness about the importance of wearing masks. In this sense, the digital video library emerges as a promising, novel, and innovative tool, bringing together videos in a single location to disseminate knowledge about prevention and protection practices against COVID-19, as well as other respiratory diseases. The objective of the study was to develop a digital video library on mask use for the Brazilian population.

METHOD

This methodological study focused on the validation and evaluation of a health education technology, specifically a digital video library developed in 2021 and 2022. The study is part of the project "Multinational Study on the Practice of Face Mask Use among the general public during the COVID-19 Pandemic".

Its implementation involved three phases: 1. Pre-production (theme search and theoretical study); 2. Production (development of educational videos). 3. Post-production (expert validation, adaptation after expert validation, evaluation by target audience representatives, adaptation after target audience evaluation, and availability)[11].

Pre-production: The first phase consisted of a topic search, which involved a survey of educational materials on the correct use of masks. Scientific articles available in databases were identified and evaluated using descriptors such as "COVID-19," "masks," "educational technology," and "health knowledge, attitudes, and practices". Furthermore, research was conducted on the free video-sharing website YouTube (www.youtube.com.br) using the descriptors "Mask Use" and "COVID-19 Pandemic".

Next, a theoretical study of the selected materials was conducted, guiding the production of storyboards (scripts) and the creation of educational videos. These scripts were developed based on scientific evidence, in addition to publications from health authorities such as the WHO, the Centers for Disease Control and Prevention (DCP), and the Ministry of Health (MH).

Production: In the second stage, to produce the video library, the videos were created through a bibliographical survey. Based on the search for themes and theoretical studies, topics on the theme were selected to support the production of animated videos, using the free online program Powtoon®. After creation, editing was performed using the desktop version of the Video Software Development Company (VSDC®).

Post-production: in the third stage, experts in the field validated the videos. The inclusion criteria were nurses or healthcare professionals with experience in infectious diseases and/or the use of protective equipment. Professionals in exclusively administrative and/or management roles were excluded. Selection was carried out using the snowball sampling method or through resumes submitted on the Lattes Platform of the Coordination for the Im-

provement of Higher Education Personnel (CAPES), using the following filters: academic background/degree, professional experience, and presence in the research group directory.

All experts met the parameters of the Fehring model, with a minimum score of five points established, with the following scoring logic: PhD degree (4), master's degree (3), publication in an indexed journal on the topic of interest (2), specialization in the topic of interest (2), clinical practice in the area of interest for at least 5 years (2), participation in a scientific event in the last 2 years on the topic of interest (1)[12].

The evaluation instrument was converted online via Google Forms, and experts were invited to participate via email messages containing a link to the data collection form and the Informed Consent Form (ICF). Individual information (gender, age, use of masks during the COVID-19 pandemic) and professional information (profession, postgraduate degree, time since graduation, professional experience, publications on the topic, and participation in scientific events) were collected.

The instrument used to evaluate the video library was adapted for this study from a validated instrument for educational videos[13], which consists of six elements: a) functionality: it refers to the technology's ability to meet its intended purpose; b) usability: it relates to the manner of use and the concepts; c) efficiency: execution time and duration; d) audiovisual technique: quality and narration; e) environment: it reflects the theme and setting; f) procedure: clear and concise objectives, with room for suggestions, if any. For this type of research, the literature recommends a number between six and 20 participants, as well as for each group

of evaluators[14]. Twenty experts were invited, but only 12 accepted the invitation and were considered for this stage of the study.

Subsequently, a quantitative analysis of the responses was performed using the Concordance Index (CI), and the videos were subsequently adapted according to the experts' suggestions.

The target audience, recruited through the researchers' social media channels, evaluated the videos. Inclusion criteria included individuals residing in Brazil, over 18 years of age, and with internet access; foreigners residing in Brazil were excluded. The evaluation form for the target audience was also made available online through invitations sent via a link via social media. This link contained the data collection instrument, as well as the informed consent form. Individual information such as gender, age, and education level was collected. The evaluation instrument used for the target audience differs from that used by experts, having been developed and validated for this purpose[15] and consists of five domains: a) objectives: it refers to the goals to be achieved through the use of the technology; b) organization: how the instructions are presented; c) video style: it refers to linguistic and comprehension characteristics; d) appearance: it refers to characteristics that measure the significance of the technology; e) motivation: This is related to the technology's ability to have an impact[15].

Twenty people were invited, considering a satisfactory number of six to 20 participants[14]. However, only 15 people from the target audience accepted the invitation to participate in the study, which is an appropriate number for the type of evaluation, as described above.

Finally, the data obtained was analyzed, and the videos were then adapted according to the suggestions of the target audience representatives. The videos were made available on YouTube and various social media platforms, such as Facebook, Instagram, Twitter, and WhatsApp®, to provide free access to the material.

The data were analyzed according to the forms used for validation with experts and evaluation with the target audience representatives. The responses from the instruments were transferred to an Excel for Windows® spreadsheet and analyzed quantitatively, assigning the following values: inadequate (1), partially inadequate (2), partially adequate (3), and completely adequate (4). The CI analysis was conducted with values ranging from zero to one. The CI was calculated by adding the responses classified as three or four and dividing by the total number of responses. To establish validity, a CI of 0.78 or greater (78%) was adopted[16]. Therefore, revisions were made to items that did not meet this target[15,17].

The project was approved by the Research Ethics Committee (CAAE: 46754421.3.0000.5243; Opinion number: 4,765,911) in compliance with Resolution number 510/2016 of the National Health Council. On the instrument's home page, participants had access to the informed consent form, and only those who selected the "accept" option, indicating free and informed consent, responded to the form.

RESULTS

The digital video library was developed and comprised of nine explanatory videos on mask use, incorporating recommendations and evidence from health authorities. The topics were selected based on a search for themes and theoretical studies, addressing the COVID-19 pandemic and mask use, its use in children, its intended use, its importance for self-protection and the protection of others, and the different types of masks, such as cloth masks, surgical masks, and N95 masks.

To produce the digital video library, specific scripts were developed for each topic, based on relevant scientific findings. These scripts included a description of each scene, character lines, written text within the scenes, and illustrations created by a graphic designer. A question-and-answer dynamic was used to make the videos more interactive. After developing the scripts, the videos were produced using the available tools, animated characters, and illustrations created exclusively for this project. The videos were then edited.

Twelve (100%) experts, female and nurses, participated in the video library validation. Regarding professional qualifications, eight (66.7%) held PhD degree; three (25.0%) held specializations; and one (8.3%) held a master's degree. Regarding the publication of scientific articles on standard precautions, seven (58.3%) reported having published articles. Regarding the use of masks during the COVID-19 pandemic, five (41.7%) responded affirmatively. All experts reported having participated in scientific events focused on COVID-19 in the last year.

Table 1 describes each analysis category and the number of experts who judged each item as "inadequate and partially inadequate", "partially adequate and fully adequate," and, in addition, the total CI per item and the overall CI. It is noted that the validation of the digital vi-

deo library was satisfactory, as the overall mean CI reached 1.0 (100%), and all items evaluated achieved a CI of 1.0 (100%).

Table 1 - Expert evaluation of functionality, usability, efficiency, audiovisual technique, environment, and procedures (Rio das Ostras, RJ, Brazil, 2021-2022)

Item	Expert response options				CI of item
	1	2	3	4	
Regarding functionality Videos are presented as a suitable tool for their intended purpose.	–	–	1	11	1,0
The videos make it possible to generate positive results regarding the teaching-learning process for the correct use of masks.	–	–	1	11	1,0
Regarding usability Videos are easy to use.	–	–	4	8	1
The videos make it easier to learn the theoretical concepts about the use of masks and their applications.	–	–	3	9	1
The videos allow customers/users to easily apply the concepts covered in their daily mask use.	–	–	2	10	1
Regarding efficiency The length of the videos is adequate for the user to learn the content.	–	–	3	9	1
The screen time is consistent with the proposed time for the videos.	–	–	7	5	1
Regarding the audiovisual technique The quality of the video images is adequate for understanding the content.	–	–	4	8	1
You can return to previous screens whenever you want.	–	–	2	10	1
Regarding the environment The videos reflect the use of masks in people's daily lives during the COVID-19 pandemic.	–	–	3	9	1,0
Regarding the procedure The objectives of the videos on mask use are clear and well-structured.	–	–	1	11	1,0
The techniques and guidelines on using masks according to the types were correctly explained in the videos.	–	–	1	11	1
The purpose of encouraging the use of masks was presented in the videos.	–	–	1	11	1
The objectives for using the masks are clear and correct in the videos.	–	–	–	12	1,0
The ways to correctly handle the masks shown in the videos are adequate.	–	–	–	12	1,0
Global mean CI =1.0					

Source: Prepared by the authors.
Note: 1. Inadequate. 2. Partially inadequate. 3. Partially adequate. 4. Completely adequate.

The evaluation was considered satisfactory; however, the experts suggested improvements to make the material more complete, efficient, and accessible to the target audience. Box 1 lists the experts' suggestions and whether they were implemented. The contribution related to creating a video aimed at children could not be implemented, as there was already a video designed for children about mask use. However, other suggestions were implemented, particularly the inclusion of narration in the videos.

Box 1. Summary of the qualitative analysis of the changes suggested by the experts (Rio das Ostras, RJ, Brazil, 2021-2022)

Expert suggestions	Changes Addressed
I recommend making it clear which population you want to reach, as some terms may be unfamiliar and make it difficult to reach the population.	YES
To create a video about using masks aimed at children, so that children can also learn about the content.	NO
To improve usability and reach a greater number of people, I suggest that the videos be narrated, making it easier for those who have visual difficulties or are illiterate.	YES
I recommend taking your time to move from one slide to another. On some slides, anyone who reads them calmly and slowly will not be able to read everything.	YES
Reinforce the language with the target audience in mind.	YES
Place the names of the masks below the illustrations to better identify which ones they are.	YES
I suggest reviewing the words "underlying comorbidity" if the target audience is the lay population, to improve understanding.	YES

Source: Prepared by the authors.

Fifteen (100%) individuals participated in the target audience's evaluation of the video library. Of these, eight (53.3%) were female and seven (46.7%) were male. Regarding education level, seven (46.7%) had incomplete higher education; six (40.0%) had completed high school; one (6.7%) had completed higher education; and one (6.7%) had incomplete elementary education.

The evaluation instrument consisted of: objectives, organization, video style, appearance, and motivation. Regarding the objectives of the videos, all participants considered them "completely adequate". Regarding organization, three (20%) considered the video length "partially adequate," suggesting increasing the length. Regarding style, one (6.7%) considered the soundtrack "partially inadequate" for appearance and motivation; 15 (100%) considered "partially adequate and completely adequate". Furthermore, a change in the color of some videos was suggested, and all suggestions were met. Thus, all items were analyzed, with a CI per item ranging from 0.93 (93%) to 1 (100%). The overall mean CI reached 0.99 (99%).

The digital video library was completed (Figure 1), and the final version includes nine videos with the following titles and lengths: 1. "COVID-19 Pandemic and

the Use of Masks", lasting 2 minutes and 17 seconds. 2. "Mask Use during the COVID-19 Pandemic", lasting 2 minutes and 14 seconds. 3. "Mask Use in Children during the Pandemic", lasting 2 minutes and 21 seconds. 4. "What is the Purpose of Mask Use during the COVID-19 Pandemic?" lasting 1 minute and 41 seconds. 5. "The Importance of Masks for Self-Protection and the Protection of Others during the COVID-19 Pandemic", lasting 1 minute and 26 seconds. 6. "Types of Masks", lasting 2 minutes and 58 seconds. 7. "Cloth Mask", at 2 minutes and 35 seconds. 8. "Surgical Mask", at 1 minute and 56 seconds. 9. "N95 Mask", at 1 minute and 52 seconds.

The digital video library was made available on the YouTube platform (https://www.youtube.com/@PesquisaMultinacionalCNPq/featured), on the Multinational Research Project channel, and widely shared on social media, including WhatsApp® Messenger and Instagram.

Figure 1. Cover of the completed videos (Rio das Ostras, RJ, Brazil, 2021–2022)
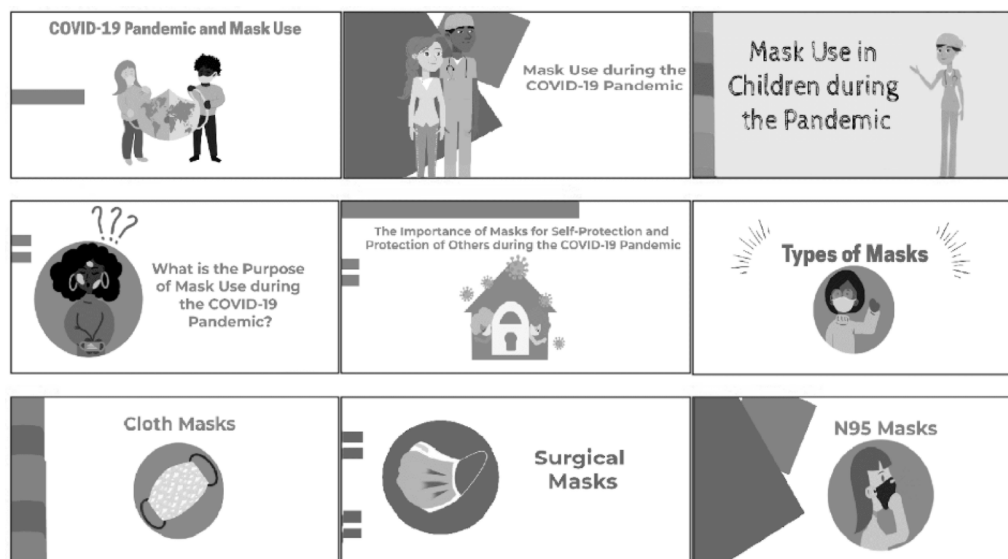
Source: Prepared by the authors.

DISCUSSION

The digital video library on mask use was developed, validated, and satisfactorily evaluated. The evaluation items achieved excellent scores in relation to the established criteria. Developed as an innovative educational technology aimed at disseminating information and promoting the correct use of masks by the Brazilian population, the video library was considered appropriate by both experts and representatives of the target audience. It is noteworthy that the application of educational technologies contributes to expanding access to information and facilitates the dissemination of knowledge, driving transformations in the teaching and learning process through innovative technological tools[9].

Educational videos have emerged as a widely used tool in promoting health education. The use of these videos in digital media demonstrates effectiveness in reaching the target audience, regardless of its location and time, providing relevant updates on the topic, positively impacting

the delivery of care[9]. Therefore, the creation of educational videos proves to be an effective, affordable, simple, and creative technique for promoting health and influencing behavioral changes, which aligns with the intent of the current study.

Additionally, it serves as an educational resource that establishes connections between everyday situations and the topic being addressed, using simple language and comprehensible images for the general public[9]. An illustrative example is the validated educational video on breast cancer in deaf women, which used associations relevant to the target audience's reality, contributing to self-care and health promotion actions[18]. Therefore, the importance of creating a new educational technology, presented in the form of a video library, addressing the use of masks in the pandemic context is highlighted. This initiative is crucial due to the existence of conflicting information on the topic, coupled with the spread of fake news, factors that have hindered the population's adherence to this preventive practice[4].

The development of the video scripts was guided by the concern to use language accessible to the target audience, as well as to address topics clearly and understandably, as clarity of information is essential in the development of educational materials. Furthermore, the literature suggests that the duration should not exceed 15 minutes, as shorter videos are more likely to be accessed, favoring greater viewing[10,19]. Thus, the videos developed for the digital video library respected this limit, with the longest being 2 minutes and 35 seconds.

The validation and evaluation process for educational technologies is relevant as a scientific product designed to test their applicability in various nursing care contexts. This procedure not only provides greater reliability to the material, validated by experts and evaluated by the target audience, as per the present study, but also contributes to the positive change in the context for which it is intended[20]. Furthermore, it ensures that the material produced does not contain incorrect or incomplete information, avoiding potential misunderstandings, as educational videos play a facilitating role in conveying information to the population[13,21].

The experts' evaluation of the digital video library, addressing the use of masks, was considered fully satisfactory in the categories of functionality, usability, efficiency, audiovisual technique, environment, and procedure. The participation of experts in an educational video validation study is essential to add detailed and relevant information for improving the final version of the developed educational technology[22].

In the space provided for suggestions, the experts expressed that the material produced was excellent, highlighting the clarity in addressing the topic. It is important to note that the space for suggestions allows participants to share their opinions, offering valuable insights beyond the structured criteria of the instrument used, thus enriching the study[20].

Although the results were satisfactory, the language was adapted to make it more accessible, and captions were added to the illustrations to improve the clarity of the material. Also noteworthy is the inclusion of narration in the videos, aiming to facilitate comprehension for those who cannot read and promote greater accessibility to the content covered. This improvement process is similar to that con-

ducted in another study on the production and validation of an educational video to encourage breastfeeding, in which suggestions were welcomed, resulting in modifications until the final version of the video was obtained[10,20].

According to the assessment of the target audience representatives, the digital video library was considered satisfactory in all aspects, including objectives, organization, style, appearance, and motivation. It is noteworthy that the use of illustrations facilitates the understanding of the content, providing a visual representation that connects with the population's daily life[10]. Thus, the present study met this demand.

However, although considered satisfactory, the target audience representatives expressed observations regarding the colors present in some videos and suggested that the duration could be longer. These observations are valuable, and adjustments were made, drawing inspiration from previous studies, such as the development and validation of educational video content for children with hypertension, in which changes to the visuals and color palette were implemented to improve viewing and comprehension of the content[23].

The assimilation of the content in the videos is facilitated by the narration, illustrations, and sound, elements that provide greater understanding of the topic addressed. Validation research on audiovisual technologies highlights that images combined with clear and accessible language promote greater understanding, contributing to awareness, motivation, and reaffirmation of the conveyed message[10,20].

Content conveyed through audiovisual technology has the potential to raise awareness among the target audience and should be understandable by anyone[20]. Therefore, the importance of validating and evaluating these materials is reinforced, considering that they are fundamental tools for disseminating information and health guidance to the population on the topics covered[14,24], as demonstrated in the current study.

Finally, it is emphasized that the provision of a validated technology, such as a digital video library, can have a profound and lasting impact on society, especially regarding the transformative potential for people's understanding of the risks inherent to respiratory diseases, such as COVID-19, and the adoption of healthier and safer habits, such as wearing masks for both self-protection and the protection of others.

FINAL CONSIDERATIONS

The digital video library on mask use for the Brazilian population was developed with excellent results, demonstrating the potential of this educational technology for addressing the use and management of masks among the Brazilian population. Furthermore, this technology presents an innovative and unprecedented character by addressing in an accessible, clear, and objective manner, using common language, a topic that generated many questions among the population during the COVID-19 pandemic. This is due to the difficulty in adherence among the population, since mask use was not part of daily life in Brazil, and the spread of fake news contributed to the discrepancy between information.

Therefore, the need to clearly guide the population on the types, purpose, and management of masks becomes evident,

with the goal of minimizing the transmission of COVID-19 and other respiratory diseases. The use of accessible educational technologies, such as the video library presented, plays a crucial role in this process. It is worth noting that the material features accessible language, through video narration and images that illustrate the content.

Regarding the study's limitations, since this is a digital video library, it's important to consider potential access difficulties for individuals unfamiliar with digital tools. The need for an internet connection to access the content also poses a limitation, as not all users have constant access to the internet.

Therefore, it is important to conduct studies aimed at assessing the applicability of educational videos, especially those on the use of masks, verifying their acceptance and impact on correct adherence in different population groups.

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