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RESEARCH

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Educational videos on tracheostomy care for informal caregivers of older people: content construction and validation

Vídeos educativos sobre cuidados com traqueostomia para cuidadores informais de idosos: construção e validação de conteúdo

Vídeos educativos sobre el cuidado de la traqueostomía para cuidadores informales de ancianos: construcción y validación del contenido

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ABSTRACT

Objective: to build and validate educational videos on tracheostomy care for informal caregivers of older people. **Method:** methodological research developed in three stages: exploratory phase, technology construction, and content validation. Eight experts participated in the study, answering a questionnaire in Google Forms® with 40 items related to objectives, structure/presentation, and relevance, between November 2023 and January 2024. The analysis was carried out by calculating the Content Validity Index, with items with agreement above 0.80 being considered valid. **Results:** three videos were created: Video 1: care for older people with tracheostomy at home – internal cleaning of the cannula, care of the peristomal skin, and changing compresses and handling and changing laces; Video 2: care for older people with tracheostomy at home – administration of inhalation and oxygen in the tracheostomy; Video 3: care for older people with tracheostomy at home – tracheostomy aspiration and complications. The overall Content Validity Index of the videos was 0.95. **Conclusion and implications for practice:** the content of the videos was considered valid in terms of objectives, relevance, and structure, and was considered an educational technology to assist informal caregivers of older people in tracheostomy care.

Keywords: Caregiver; Validation Study; Instructional Film and Video; Aged; Tracheostomy.

RESUMO

Objetivo: construir e validar vídeos educativos sobre cuidados com traqueostomia para cuidadores informais de idosos. **Método:** pesquisa metodológica desenvolvida em três etapas: fase exploratória, construção da tecnologia e validação de conteúdo. Participaram da validação oito especialistas que responderam a um questionário, no *GoogleForms®*, com 40 itens relacionados aos objetivos, estrutura/apresentação e relevância, no período entre novembro de 2023 e janeiro de 2024. A análise se deu por cálculo do Índice de Validade de Conteúdo, sendo considerados válidos os itens com concordância acima de 0,80. **Resultados:** foram construídos três vídeos: Vídeo 1: Cuidados em idosos com traqueostomia no domicílio – limpeza interna da cânula, cuidados com a pele periestoma e troca de compressas e manuseio e troca do cadarço; Vídeo 2: Cuidados em idosos com traqueostomia no domicílio – administração de inalação e oxigênio na traqueostomia; Vídeo 3: Cuidados em idosos com traqueostomia no domicílio –aspiração da traqueostomia e intercorrências. O Índice de Validade de Conteúdo global dos vídeos foi de 0,95. **Conclusão e implicações para a prática**: o conteúdo dos vídeos foi considerado válido em relação a objetivos, relevância e estrutura, sendo considerado uma tecnologia educativa para auxiliar os cuidadores informais de idosos nos cuidados com traqueostomia.

Palavras-chave: Cuidadores; Estudo de Validação; Filme e Vídeo Educativo; Idoso; Traqueostomia.

RESUMEN

Objetivo: elaborar y validar vídeos educativos sobre los cuidados de la traqueotomía para cuidadores informales de ancianos. **Método:** investigación metodológica realizada en tres etapas: fase exploratoria, construcción de la tecnología y validación del contenido. Ocho expertos participaron en la validación, respondiendo a un cuestionario en GoogleForms® con 40 ítems relacionados con objetivos, estructura/presentación y relevancia, entre noviembre de 2023 y enero de 2024. Se calculó el índice de validez de contenido y se consideraron válidos los ítems con una concordancia superior a 0,80. **Resultados:** se crearon tres vídeos: Vídeo 1: Cuidados de ancianos con traqueostomía en el hogar - limpieza interna de la cánula, cuidados de la piel periostomal y cambio de compresas y manipulación y cambio del cordón; Vídeo 2: Cuidados de ancianos con traqueostomía en el hogar - administración de inhalación y oxígeno en la traqueostomía; Vídeo 3: Cuidados de ancianos con traqueostomía en el hogar - aspiración de la traqueostomía y complicaciones. El índice global de validez del contenido de los vídeos fue de 0,95. **Conclusión e implicaciones a la práctica**: el contenido de los vídeos fue considerado válido en cuanto a sus objetivos, relevancia y estructura, y se consideran una tecnología educativa para ayudar a los cuidadores informales de ancianos con los cuidados de la traqueostomía.

Palabras clave: Cuidadores; Estudio de Validación; Película y Vídeo Educativos; Anciano; Traqueostomía.

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INTRODUCTION

Tracheostomy (TQT) is a surgical intervention that involves opening the tracheal wall, connecting it to the external environment, which favors the permeability of the airway.[1] It is necessary when the person is suffering from prolonged respiratory failure, decreased level of consciousness, obstruction of the upper airway, weak respiratory muscles, or to provide a stable airway for people with extended tracheal intubation.[1,2]

Concomitant with serious situations, which can lead to the need for intensive care and the use of TQT, are the aging of the population and prevalent chronic conditions such as cardiovascular and chronic respiratory conditions, diabetes mellitus, and cancer.[3,4]

When complications occur and the older people's clinical health conditions worsen, leading to hospitalization, they usually go home after being discharged. It is in this context that the role of informal caregivers stands out, especially when older people use a tracheostomy, where care becomes even more complex, as they face difficulties in caring for the tracheostomy, hygiene, feeding, dressing/undressing and moving older people around.[5]

Thus, one of the ways to help them with their care is to implement standardized guidelines, using technologies to help them while still in hospital and which can be used at home.[6] To this end, nurses and nursing staff are key in this hospital-home transition.

Provided with educational technologies, they can train informal caregivers of older people to return home to broaden their knowledge, as well as clarify doubts and/or encourage them to adapt to the challenging health situations in which older people find themselves at the time.[7]

In order to help nurses and the nursing team to train informal caregivers of older people with tracheostomies, there are technological resources that favor the teaching-learning process. Among these resources are educational videos, games, and apps, which are effective because they facilitate understanding and provide opportunities to create skills and knowledge about care, making it possible to transform the lives of users, promoting autonomy and quality of life, and which are seen as one of the main instruments for promoting health.[8,9]

In this vein, audio-visual technologies, in the form of educational videos, favor the communication process with older people and caregivers, aiming for more assertive care actions. Among these, educational videos stand out as multidimensional communication material, favoring the expansion of knowledge through sound and visual methods, which make it easier for nurses to understand what they are being instructed to do.[10]

Regarding the effectiveness of the use of educational videos, a study[10] that sought to describe the use of this technology as a subsidy to prepare for hospital discharge of patients undergoing intestinal stoma surgery concludes that it facilitated the development of knowledge and skills for the care and self-care of the stoma and collecting equipment, and made it possible to contextualize essential information and guidelines for hospital discharge, favoring the return home and continuity of care.

In view of this, this study aimed to construct and validate the content of scripts and storyboards for educational videos on tracheostomy care for informal caregivers of older people.

METHOD

This methodological research was carried out in three stages: exploratory phase, technology construction, and content validation.[11-13] It was carried out at a public university in the interior of the state of Santa Catarina with nurses specialized in primary health care and in caring for older people using tracheostomies, from Brazil (n=6) and Portugal (n=2). This study is linked to the macro-research entitled "Development of technologies for Nurse Consultation in Health Care Networks", supported by CAPES/COFEN Notice no. 8/2021, approved by the research ethics committee of the university where the study was carried out, with opinion no. 5.047.628/2021.

Stage 1 - exploratory phase: this consisted of a narrative literature review using the Scientific Electronic Library Online (SCIELO), PubMed®, and SCOPUS databases and official Ministry of Health documents. A literature review was carried out to list the content of the videos. This stage was carried out between August and October 2023, considering the time period from 2013 to 2023, based on the guiding question: What care is needed to handle tracheostomies in older people at home? The literature search used descriptors in Portuguese and English with the following cross-references: Idoso AND Traqueostomia AND Enfermagem AND Assistência Domiciliar AND Tecnologia Educacional AND Filme e vídeo educativo; Aged AND Tracheostomy AND Nursing AND Home Nursing AND Educational Technology AND Instructional Film and Video. Studies were selected from the last ten years that dealt with older people with tracheostomies, care and management of this device, challenges of home care by informal caregivers, health education by nurses and educational technologies such as videos, with a view to listing the content to make up the videos on tracheostomy care at home.

Stage 2 - building the technology: this is where the scripts and storyboards were built. The scripts are characterized by the written part of the themes spoken about in the videos.[14] Each script was organized into three columns: text/audio describing the actors' lines; soundtrack; setting - framing and timing, with details of the setting and framing of the actors talking about the theme and timing of each scene. Subsequently, based on the scripts, the storyboards were constructed, which comprise the sequence of images for each scene, in chronological order, as a way of pre-visualizing the layout of the final product, i.e. the educational videos. The storyboards were based on the details mentioned and described in the scripts in terms of lines, audio, framing, scene timing and illustrated with images, which were taken in a setting created in the university's nursing practice laboratory that resembled the older people's home. The images were captured using a mobile phone and then organized using the Canva® graphic design platform.

Stage 3 - content validation: took place between November 2023 and January 2024. After the scripts and storyboards had

been constructed, they were sent to experts on the subject living in Brazil and Portugal for content validation. The inclusion criteria for the experts were: having at least six months of clinical care experience as a target audience (caregivers of older people); and/or having published work in journals and/or events on the construction and validation of educational care technologies (ECT) in the thematic area; and/or having a graduate degree (Lato Sensu or Stricto Sensu) in the subject; and/or being a member of a scientific society in the thematic area.[12,13] The exclusion criteria were not returning the answered content validation instrument within 30 days, after two attempts to contact them. The Brazilian experts were selected using the snowball technique,[15] the first was indicated by the coordinator of the Home Care Service in the municipality where the university is based, in the west of Santa Catarina, who, after replying, indicated another expert and so on.

After obtaining the list of e-mails, invitations were sent to 32 Brazilian professionals, six of whom agreed to participate and answered the questionnaire prepared in Google Forms, which contained four parts: 1) Informed Consent Form (ICF) for reading and agreement; 2) Expert characterization; 3) Instructions for filling in the content validation instrument; 4) Adapted content validation instrument[16] consisting of 40 questions related to objectives, structure, presentation, and relevance.

The Portuguese experts were recruited based on convenience, as there is a study partnership between the local university and the Higher Nursing School of Porto (ESEP). The two experts from Portugal were given the same questionnaire in person during a study mission to that country, as they are the creators of the IntentCare repository, which consists of educational videos for informal caregivers of older people. Considering the agreement between the universities and researchers, the videos developed in this study will be stored in the repository.

Thus, the validation was carried out by eight experts, which is in line with the literature that recommends 6 to 20 experts.[17]

The experts analyzed the scripts and storyboards of the educational videos, indicating the option that best corresponded to their opinion within the framework of the levels of agreement established on a four-point Likert scale where 1-agree, 2-strongly agree, 3-disagree, and 4- strongly disagree. All the items in the instrument contained a blank space for comments, if they answered "disagree" or "strongly disagree", to suggest improvements.

The data was analyzed by calculating the Content Validity Index (CVI), where a value of 0.80 was considered valid for each item. The CVI was calculated from the sum of answers 1 (agree) and 2 (strongly agree) for each question, divided by the total number of answers.[11] Once the data had been gathered, it was arranged and organized into relative and absolute frequencies in a Microsoft Excel® spreadsheet for descriptive data analysis. Considering that all the validated items scored more than 0.80 and that the experts' suggestions were accepted, there was no need for a new round.[11]

After validation and once the adjustments indicated by the experts were made, the videos were recorded with the support of an audio-visual production professional. The setting created in the laboratory was designed to resemble the main environments used to care for older people at home and included a researcher in the role of a nurse and a simulation doll representing the older person.

Once the videos were ready, the research team made corrections and indicated the need to record new scenes and include some lines. Effects such as photos, drawings, charts, and sound resources were also added to the videos. After the adjustments, the videos were approved by the researchers.

RESULTS

The narrative literature review carried out in the exploratory phase, with the aim of identifying the content of each video, identified 21 publications. The analysis of the information contained in the productions made it possible to group the content into the following themes: definition of tracheostomy, materials needed to carry out the care, organization of the environment and the older people, internal cleaning of the cannula, care of the peristomal skin, changing compresses, handling and changing the lace, administration of inhalation and oxygen in the tracheostomy, aspiration of the tracheostomy, and complications.

Figure 1 shows the storyboard images of the three educational videos.

The content of the videos was validated by eight experts in the field of older people's health, six of whom (75%) were nurses and two (25%) physicians. Of these, five (62%) had a specialist degree, two (25%) had a doctorate, and one (12.5%) had an undergraduate degree. As for the length of their degree, four (50%) had received it 10 years ago or more, one (12.5%) nine to ten years, one (12.5%) seven to eight years, one (12.5%) three to four years, one (12.5%) one to two years, and one (12.5%) six months to one year ago.

The content validation instrument for the scripts and storyboards consisted of 40 items, 38 of which were answered "agree" or "strongly agree". The items "the text is scientific" and "care with handling and changing the tracheostomy tube attachment" were answered "disagree" by one of the experts. The experts' suggestions were to include references in the scripts and storyboards and that the person helping to change the tracheostomy attachment should always wear non-sterile gloves to avoid contamination. The suggestion regarding the use of gloves by the person helping to change the tracheostomy attachment was accepted and adapted to the production process of the educational videos. The content of the scripts and storyboards was made up of references found in the literature review, which were not included in the document sent to the experts, so the suggestion about the references was not accepted.

It was unanimously confirmed that the experts "strongly agree" and "agree" with the relevance of videos for informal caregivers of older people and as a contributing tool in the nursing consultation with older people with tracheostomies and their informal caregivers in health education activities.

Table 1 shows the experts' agreement with the objectives, relevance, and structure of the educational videos.

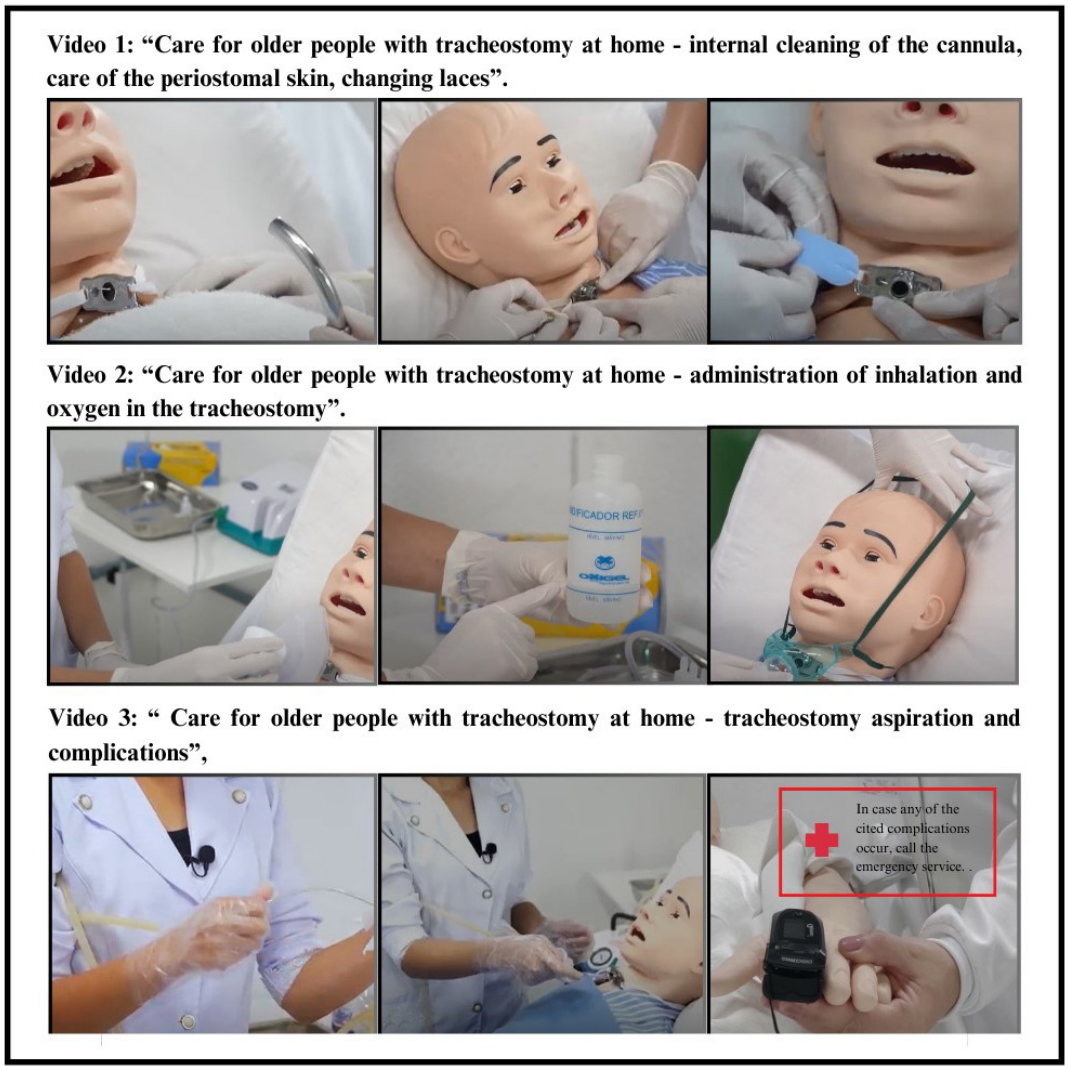

Figure 1. Images of the for the three educational videos.

After validating the content of the scripts and storyboards and making the suggested adjustments, the three videos were produced:

Video 1: Care for older people with tracheostomy at home – internal cleaning of the cannula, care of the peristomal skin, changing compresses, and handling and changing laces - access link - https://www.youtube.com/watch?v=na3Jw6tZGdI

Video 2: Care for older people with tracheostomy at home – administration of inhalation and oxygen in the tracheostomy - access link - https://www.youtube.com/watch?v=uUQqe1niN2I&t=18s

Video 3: Care for older people with tracheostomy at home – tracheostomy aspiration and complications - access link - https://www.youtube.com/watch?v=CjmReLhKAoo&t=1s

DISCUSSION

Developing educational videos on tracheostomy care for informal caregivers of older people corroborates the National Health Policy for Older People (PNSPI, as per its acronym in Portuguese), which aims to provide adequate and dignified care for older people, especially those who, for a number of reasons, aging has brought with it diseases and illnesses, which can trigger serious shortcomings in their lives.[18] The aim of the educational videos is to provide informal caregivers with guidance on how to safely and correctly care for older people with tracheostomies, in order to avoid unfavorable consequences for their health.

Similarly, a care-educational technology for informal caregivers also addresses some of the weaknesses highlighted in the PNSPI, such as the scarcity of socio-educational resources aimed at the health of older people, the lack of qualified support for older people and their families between discharge from hospital and going home, and the low number of home care services, situations which lead family members to take on the care, even if they are not technically qualified to do so. The development

Table 1 - Absolute frequency distribution of the level of agreement of the experts (n=8) and Content Validation Index (CVI) for each item in the validation instrument for the educational video scripts/storyboards. Chapecó, Brazil, 2024.

Objectives					
Variable	SA	A	D	SD	CVI
1) The content of the scripts and storyboards facilitates the teaching-learning process on tracheostomy care.	6	2	0	0	1.00
2) The content of the scripts and storyboards allows for understanding and clarification of doubts about tracheostomy care at home.	7	1	0	0	1.00
3) The content covered in the scripts and storyboards is enough to guide general tracheostomy care at home.	5	3	0	0	1.00
4) The content of the scripts and storyboards presented is scientific.	6	1	1	0	0.87
5) The content of the video scripts and storyboards is suitable for increasing informal caregivers' knowledge of tracheostomy care at home.	6	2	0	0	1.00
Relevance					
1) The content of the videos includes information to support nurses in educational processes for the target audience (informal caregivers of older people).	7	1	0	0	1.00
2) The content of the videos encourages the use of this technology in practice.	6	2	0	0	1.00
3) The content of the videos is relevant and current.	8	0	0	0	1.00
4) The idea behind the videos is interesting and useful.	7	1	0	0	1.00
Structure					
1) The content of the videos is presented in appropriate language and relates to the target audience (informal caregivers of older people).	5	3	0	0	1.00
2) The content of the videos follows a logical sequence.	7	1	0	0	1.00
3) The information in the videos is objective, necessary, relevant, clear, and enlightening.	5	3	0	0	1.00
4) The way the scenes are presented follows the chronological sequence of the procedures.	5	3	0	0	1.00
5) The images and framing are appropriate.	7	1	0	0	1.00
6) The profile of the characters corresponds to real life.	6	2	0	0	1.00
7) The characterization/figure of the characters is appropriate.	7	1	0	0	1.00
8) The dialog is appropriate and easy to understand.	6	2	0	0	1.00
9) The narrator's speech is used efficiently and understandably.	6	2	0	0	1.00
10) The story of the character Vitor (fictitious name of the older person) presented in scene 2 is close to the reality of an older person using a tracheostomy.	6	2	0	0	1.00
Overall CVI					0.95

SA=strongly agree, A=agree, D=disagree, SD=strongly disagree

of educational videos corroborates the National Policy for Science, Technology and Innovation in Health, which mentions the importance of investing resources in research that develops self-care technologies and highlights the health of older people as a priority for studies.[18,19]

In view of the aging process in Brazil and, consequently, functional dependence due to chronic conditions, there is a need for caregivers, who are usually family members or someone in the dependent older people's close circle, to take care of them. This caregiver is often faced with difficulties such as family and social conflicts, but especially a lack of understanding about the disease and the techniques involved in caring for older people.[19] In addition, it is necessary to consider that many caregivers of older people are also old, have minimal education and, in many situations, are illiterate, which compromises their understanding of care. Thus, an explanatory video makes the

orientation process more effective by adding explanations and demonstrating how to do it and, consequently, the understanding of the necessary care.

Among the procedures that caregivers have to take on is tracheostomy care, a situation that generates insecurity, doubts, and difficulties, especially when they are alone and without the support of the healthcare team.

A study[20] on educational action in the routine care of cancer patients with a metallic tracheostomy tube revealed that even some health professionals have doubts about the care of the device and a considerable percentage do not have the necessary understanding to carry out the care, as recommended in the literature.

In the context of the nursing team, nurses with higher education have outstanding skills in the process of guiding older people and their caregivers throughout the rehabilitation process.[21]

The validation process by the experts attested to the reliability of the videos to help nurses train informal caregivers of older people, as they found them easy to understand, having language suitable for the target audience, and a logical sequence. This corroborates a study[22] on the development and validation of audio-visual technology for families and people with colostomies due to cancer, which highlighted that teaching practices that stimulate curiosity and the attention of listeners, together with scientific information, methods, and techniques in a teaching-learning association in which they characterize care, favor the appropriate healing process.

The experts who validated the content of the educational videos agreed that the guidelines contained were adequate, understandable, relevant, and up-to-date in terms of general care with the tracheostomy tube, cleaning, changing dressings, skin care, administration of inhalation and oxygen in the tracheostomy, aspiration of the tracheostomy, management of complications such as obstruction of the cannula and accidental removal of the tracheostomy by the informal caregiver, but they emphasized the importance of caregivers always providing care only after training by the health team, since these are complex situations.

A study[23] carried out with the aim of identifying the difficulties experienced by patients and caregivers in the post-tracheostomy period, highlighted that, in order to prevent complications from the use of this device, it is essential to train caregivers in care, as they do not have the knowledge or skills. They also pointed out that the tracheostomy procedure is characterized by numerous changes in the patient's life, so it is extremely important to provide health education continuously at all times, including the pre- and post-operative periods, with the aim of better understanding the context, promoting the development of self-care and reducing complications. At the same time, means should be used to plan for discharge from hospital, equipping caregivers to manage the new health condition at home.

In general, in the post-operative period and at hospital discharge, care for patients with tracheostomies is offered in a fragmented way, as are instructions on how to care for them at home, even though this is essential. Thus, planning and structuring hospital discharge effectively will safeguard the continuity and safety of patients with tracheostomies, avoiding critical situations and new hospitalizations. This process must be longitudinal and involve patients, families, and society.[24]

The videos developed in this study were designed to help train informal caregivers to care for tracheostomies at home, and the validation process showed that they include information and guidance that is pertinent and collaborative for nurses during educational processes.

The content validation process is extremely important, as it is the deliberation of the representability of items that correspond to content based on the evaluation of experts in a particular area.[22]

Therefore, making educational videos available to informal caregivers of older people on tracheostomy care at home, validated by experts on this subject, is a strategy to promote the process of health education with a view to safe and quality care, since videos are easy to understand and share through the media, especially via instant messaging applications, collaborating in the process of caring for older people by informal caregivers.

CONCLUSION AND IMPLICATIONS FOR PRACTICE

The objective of constructing and validating the content of the scripts and storyboards by experts was satisfactorily achieved. Thus, they can be considered an educational technology with the potential to favor the teaching-learning process regarding tracheostomy care for older people at home by informal caregivers, as they are easy to understand due to the use of sounds and images, promoting the instrumentalization of quality care.

A limitation of this study is the fact that it did not evaluate the usability of the videos by the target audience, a stage that is expected to be completed after at least six months of use by informal caregivers.

Nevertheless, it is believed that the videos have the potential to be used in other scenarios, both nationally and internationally, due to their ease of access and the fact that they can be made available on platforms and repositories that are freely accessible to the public. Based on this study, further studies and constructs on the subject of care for older people could be developed and aimed at informal caregivers, with a view to equipping them to provide quality care.

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DATA AVAILABILITY RESEARCH

The content is available at https://l1nq.com/H0dv5

CONFLICTS OF INTEREST

There is no conflict of interest to declare.

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