RESEARCH

Development and validity of an educational video on seizures for early childhood education teachers and staff[a]

Elaboração e validação de vídeo educativo sobre convulsão para professores e funcionários da educação infantil

Desarrollo y validación de un vídeo educativo sobre convulsiones para profesores y personal de educación infantil

Priscila da Silva Miranda da Gama[1] [ID]
Liliane Faria da Silva[1] [ID]
Emília Gallindo Cursino[1] [ID]
Fernanda Garcia Bezerra Góes[2] [ID]
Raquel Castro Santana[1] [ID]
Ana Carla Dantas Cavalcanti[1] [ID]

1.Universidade Federal Fluminense, Escola de Enfermagem Aurora de Afonso Costa. Niterói, RJ, Brasil.

2.Universidade Federal Fluminense. Campus Rio das Ostras. Rio das Ostras, RJ, Brasil.

ABSTRACT

Objective: to develop and validate educational video on seizures for early childhood education teachers and staff. **Method:** a methodological study, carried in the city of Niterói, in the state of Rio de Janeiro, between August 2021 and July 2022. Six stages were followed: 1) search for topics and content through interviews with 13 professionals; 2) theoretical study; 3) video production; 4) video validity with 17 expert judges; 5) video adaptation; 6) validity with 17 early childhood education professionals. The data from the interviews were processed using the software *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires*. Validity was performed using the Concordance Index, with each item considered valid if its value was greater than or equal to 70%. **Results**: the 2-minute and 10-second video portrayed first aid during a seizure. It was considered valid by expert judges. Of the 21 items assessed, 18 obtained 100% agreement, with a total Concordance Index of 98%. In professionals' assessment, 100% agreement was obtained on all items. **Conclusion and implications for practice**: video development and validity made it possible to design an educational technology guided by the needs of the scenario and its protagonists, making it a feasible resource for obtaining knowledge and safe seizure care.

Keywords: Seizures; Health Education; First Aid; Child Health; Educational Technology.

RESUMO

Objetivo: elaborar e validar vídeo educativo sobre convulsão para professores e funcionários da educação infantil. **Método:** estudo metodológico, realizado na cidade de Niterói, no estado do Rio de Janeiro, entre agosto de 2021 e julho de 2022. Seguiram-se seis etapas: 1) busca dos temas e conteúdos por meio de entrevistas com 13 profissionais; 2) estudo teórico; 3) elaboração do vídeo; 4) validação do vídeo com 17 juízes especialistas; 5) adequação do vídeo; 6) validação com 17 profissionais da educação infantil. Os dados procedentes das entrevistas foram processados no software *Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires*. A validação ocorreu pelo Índice de Concordância, sendo cada item considerado válido mediante valor maior ou igual a 70%. **Resultados:** o vídeo com duração de 2 minutos e 10 segundos retratou os primeiros socorros durante a convulsão. Foi considerado válido pelos juízes especialistas. Dos 21 itens avaliados, 18 obtiveram 100% de concordância, com Índice de Concordância total de 98%. Na avaliação dos profissionais, obteve-se 100% de concordância em todos os itens. **Conclusão e implicações para a prática:** a elaboração e validação do vídeo possibilitou conceber uma tecnologia educativa norteada pelas necessidades do cenário e de seus protagonistas, sendo um recurso factível para a obtenção do conhecimento e assistência segura na convulsão.

Palavras-chave: Convulsões; Educação em Saúde; Primeiros Socorros; Saúde da Criança; Tecnologia educacional.

RESUMEN

Objetivo: elaborar y validar vídeo educativo sobre convulsiones para profesores y personal de educación infantil. **Método:** estudio metodológico, realizado en ciudad de Niterói, estado de Río de Janeiro, entre agosto de 2021 y julio de 2022. Siguieron seis etapas: 1) búsqueda de temas y contenidos a través de entrevistas con 13 profesionales; 2) estudio teórico; 3) preparación del vídeo; 4) validación del video con 17 jueces expertos; 5) adecuación del vídeo; 6) validación con 17 profesionales de educación infantil. Los datos de las entrevistas fueron procesados en el *software Interface de R pour les Analyse Multidimensionnelles de Textes et de Questionnaires.* La validación se realizó mediante el Índice de Acuerdo, siendo cada ítem considerado válido con un valor mayor o igual al 70%. **Resultados:** el vídeo de 2 minutos y 10 segundos muestra los primeros auxilios durante la convulsión. Fue considerado válido por los jueces expertos. De los 21 ítems evaluados, 18 lograron un 100% de acuerdo, con un Índice de Acuerdo total del 98%. En la valoración de los profesionales se obtuvo un 100% de acuerdo en todos los ítems. **Conclusión e implicaciones para la práctica:** desarrollo y validación del vídeo permitieron diseñar una tecnología educativa guiada por las necesidades del escenario y protagonistas, convirtiéndolo en recurso factible para obtención de conocimientos y atención segura de las convulsiones.

Palabras-clave: Convulsiones; Educación en Salud; Primeros Auxilios; Salud Infantil; Tecnología Educacional.

Corresponding author:
Priscila da Silva Miranda da Gama.
E-mail: priscilamiranda@id.uff.br

INTRODUCTION

Approximately 50 million people worldwide have epilepsy, which causes seizures.[1] The age groups most affected by this condition include children in early childhood and adolescents.[2] Children with epilepsy are considered Children with Special Healthcare Needs (CSHCN) because they are clinically fragile and more susceptible to individual, programmatic, and social vulnerabilities. They face increasing levels of functional limitations, comorbidities, and complexity, in addition to requiring specific healthcare services. Among the different care demands of CSHCN, those who are epileptic have, for instance, needs for medication care, due to continuous use of anticonvulsants.[3]

Schools play an essential role in integrating CSHCN into society and need to provide an inclusive and supportive environment, which is especially vital for children with epilepsy, who face additional challenges in their educational and social journey. In cases of seizures, for instance, there are essential, specific and immediate precautions to be taken, such as positioning the child appropriately, timing seizure duration and characteristics, removing nearby objects, loosening tight clothing and protecting the head. Commonly propagated erroneous attitudes, such as putting objects in the mouth, offering liquids and unrolling the tongue, are harmful and can cause secondary injuries.[4] A systematic review, with meta-analysis, found that people's awareness of the etiology of this disease is unsatisfactory, and essential care is not known to everyone who often inserts objects into a person's mouth during a convulsive episode.[5] Therefore, there is a significant gap in knowledge about epilepsy on the part of society, including among educators.

Due to the unpredictability of seizures in children, which can occur at any time and in different settings, schools should be places where professionals have adequate knowledge about seizures and the essential care to manage these situations. However, the literature indicates that the topic is still rarely discussed among teachers and staff, and few professionals have first aid training to deal with this eventuality.[6]

However, episodes of seizures have repercussions in the social and psychological spheres related to stigma and prejudice, resulting from the population's inadequate knowledge about seizure etiology, since some believe that they are contagious or linked to psychological disorders or spiritual possessions. These concepts have repercussions on children's social life, limiting, for instance, play with other children.[5]

Therefore, a lack of understanding about epilepsy can lead not only to inadequate responses during seizures, but also to increased stigma and social exclusion of these children. However, schools are a favorable place to disseminate knowledge about the subject and, therefore, provide prevention and health promotion actions.[7] Therefore, health education in school settings is important in order to promote a safe and welcoming environment, increasing awareness and knowledge among students, teachers and staff. In this regard, health education practices have the potential to generate changes, providing improvements in knowledge among those involved, which tend to reflect in providing more appropriate care.[8]

Early childhood education represents the beginning of a child's education in school settings, serving children aged 0 to 5 years, and includes daycare centers and preschools. In this setting, children learn through discovery and play, which focuses on child development in the cognitive, affective and interpersonal dimensions.[9] Considering that educational technologies have been incorporated into health education practices, educational videos stand out for facilitating access to knowledge, allowing it to be watched several times, as necessary, clarifying doubts at any time and having great potential for dissemination.[10] A study conducted with teachers in training used an educational video and a booklet that explained aspects related to epilepsy, including its management, medications used and repercussions on cognitive, psychological and social aspects. The video, lasting 10.5 minutes, proved to be effective in sharing knowledge, whereas the booklet did not provide significant additional gains.[11]

However, no studies were found that address the production and validity of educational videos developed specifically from the perspective of teachers and early childhood education professionals, which represents a knowledge gap. When developing an educational technology, it is essential to understand the context's needs and allow participants to express their learning demands, which legitimizes the knowledge construction process. Therefore, presenting the process of developing and validating an educational technology of this nature is crucial to fill the gap identified in the literature.

Thus, this study aimed to develop and validate an educational video on seizures aimed at early childhood education teachers and staff.

METHOD

This is a methodological study, product of a master's dissertation carried out at a university in the state of Rio de Janeiro, developed according to the assumptions established for developing an educational technology, carried out in six stages, namely: 1st) search for topics and contents; 2nd) theoretical study; 3rd) video development; 4th) validity with expert judges; 5th) video adaptation; and 6th) validity with the target audience.[12]

Stage 1 - Search for topics and content

This stage was conducted through semi-structured interviews conducted by the first author with 13 teachers and staff members who work at an early childhood education institution located in the city of Niterói, in the state of Rio de Janeiro, Brazil. This institution serves children aged between 2 and 5 years old, totaling 57. In this setting, teaching, research and extension activities are developed, with health promotion and prevention actions involving the fields of nursing and nutrition. Teachers and staff members who worked in early childhood education at the institution were included. Those who were on leave or vacation

as well as interns and researchers were excluded because they performed specific actions at the institution and were not always involved in routine activities.

Invitations were sent to professionals individually via email, detailing the research and the method by which the Informed Consent Form (ICF) would be signed. For participants who responded within 15 days, an interview was scheduled on the day and time of their choice, as desired by the professional, through Google Meet® (a video communication service developed by Google®). This method was chosen due to the COVID-19 pandemic, when it was essential to maintain social distancing.[13]

At the beginning of the research, the school had 33 professionals on its technical staff (eight pedagogues, two coordinators, two principals, one psychologist, one administrative assistant, one educational agent, four student mediators, two social workers, one nutritionist, three librarians, one doorman, two janitors and one nurse). The fields of arts, capoeira, physical education and music were composed of one teacher each. By means of a draw, 16 professionals were invited to participate in this stage; this number represented more than 50% of the research universe, which did not make data analysis unfeasible.[14] Moreover, the other professionals were invited to participate in video validity (sixth stage of research). Of the 16 invited, 13 agreed to participate in the interviews, which had an average duration of 42 minutes.

The first part of the script consisted of closed-ended questions to characterize participants. The second part contained open-ended questions such as: have you ever witnessed an accident or situation in which a child needed care at school? If so, what did you witness? Tell me about your knowledge of child care services. Tell me how you acted or would act when providing child care. What are the topics and content that you believe should be included in an educational video about care for this child? The interviews were recorded with participants' prior authorization for later transcription, processing, and analysis of text *corpus*.[15]

All content was transcribed in full, organized and prepared for processing in the IRaMuTeQ software, an acronym *for Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires*, which must achieve a minimum of 75% in its analyses, which indicates that there was adequate use of content. This software performs lexical analyses of the textual content produced, expressing the most and least cited vocabularies. The Descending Hierarchical Classification (DHC) was chosen as a method for processing and analyzing the data, since separation into classes with proximities and distances expressed in a dendrogram contributes to understanding the study objective.[15]

To guarantee participant anonymity, they were named after Brazilian writers (Monteiro Lobato and Cecília Meireles, among others).

The use of IRaMuTeQ was appropriate at this stage, given its ability to perform robust qualitative analyses on diverse texts, in this case, interviews. This tool enabled identifying emerging patterns in the textual data, allowing a detailed understanding of topics and content to compose the educational video. In addition, the software allowed separating textual segments into classes, facilitating a hierarchical analysis that organized the data in a structured and systematic manner. Together with the software, analysis was carried out based on the current literature on the subject.[15]

Stage 2 - Theoretical study: video scientific basis

To carry out the theoretical study, consultations were carried out with manuals, scientific articles, and guidelines that portrayed the fundamental aspects of care in situations of seizure to support the scientific construction of an educational video with the topics and contents that were pointed out by participants.

Through the Coordination for the Improvement of Higher Education Personnel (CAPES - *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*) Journal Portal, through access to the Federated Academic Community (CAFe - *Comunidade Acadêmica Federada*), a search was carried out in the Virtual Health Library (VHL), using the following search strategy: (epilepsy) OR (seizure OR seizures) AND (first aid) AND (school teachers) AND (schools OR school).

It was decided to use descriptors in English in order to broaden the search. Original articles published between 2018 and 2022 that were related to the study topic were selected. Those whose participants were intern teachers and who did not work in elementary or high school were excluded. Thus, four studies were selected and the Clinical Protocol and Therapeutic Guidelines for Epilepsy and the Mobile Care Service (SAMU - *Serviço de Atendimento Móvel*) Manual of the city of São Paulo were added, a manual that describes how laypeople should act in first aid assistance.[16-21]

Stage 3: Educational video development

The third stage consists of preparing the video. Scripts were developed in the form of a storyboard in four columns, namely: order of scenes; voice-over narration, corresponding to what would be said by the narrator; lettering, which corresponds to the written text that would be displayed in the scene; scene description; and scene print, which is the representation of the image that would be conveyed, making it possible to view each scene of the educational video and make any necessary adjustments.

This script was previously analyzed by the first author, and the research team, which was composed of the first author and two doctors with expertise in child health, made adjustments before the video was made. It was later sent to a company hired to produce the video in two-dimensional (2D) format. Since some scenes contained specific information that is known to healthcare professionals, the first author adopted a strategy to facilitate the videomaker's understanding by attaching examples of images to folders that contextualized the desired scenes, which promoted agility in video production and lower cost. Throughout the process, the first author and the company maintained a dialogue about

video production. It was decided to use image animation to make the video more attractive and to bring it closer to the daily lives of professionals who work with young children, in which drawings and playfulness make up their work.

The Cognitive Theory of Multimedia Learning was used as a theoretical framework, which articulates previous knowledge with the new knowledge that will be conveyed. Its constitution is based on 12 principles that guide the elaboration, principle of coherence, signaling, redundancy, spatial contiguity, temporal contiguity, segmentation, pre-training, modality, multimedia, personalization, voice and image. Thus, the educational resource in multimedia promotes auditory and visual stimulation, which favors a better understanding of the exposed content.[22]

Stage 4: Validity with expert judges

In the fourth stage, the educational video was validated by expert judges, including child health nurses, with expertise in emergency care and school health, pediatricians and social communicators. All judges needed to achieve a minimum score of five points in the criteria adapted to the research.[23] They are: doctoral degree (4 points); master's degree (3 points); publication in the topic of interest (2 points); professional practice in the area of interest of the study for at least five years (2 points); and participation in an event in the area of interest (1 point).

It is recommended that six to 20 judges participate for the technology to be considered valid.[24] Judges were recruited by searching the Brazilian National Council for Scientific and Technological Development (CNPq - *Conselho Nacional de Desenvolvimento Científico e Tecnológico*) *Lattes* Platform using keywords associated with "snowball" sampling, characterized by a non-probabilistic sampling in which judges indicated or referenced other participants.

An invitation was sent to 88 judges, and 17 responded to the email within 15 days. The researcher sent the video link and the validated assessment instrument, which aims to validate the educational video content. It was compiled in Google Forms®, consisting of fields that allowed participants to be characterized, instructions for filling it out, and content assessment chunks consisting of objectives, structure and presentation, and relevance.[12] This instrument has 21 items, measured by a Likert-type scale, consisting of scores ranging from 1 to 4, being (1) totally adequate (TA), (2), adequate (A), (3), partially adequate (PA), and (4), inadequate (I), including spaces available in each chunk for judges to describe their requests and compliments; thus, each judge could express the degree of agreement with each item.[12]

Stage 5: Educational video adaptation

In the fifth stage, the educational video was adapted. Thus, the answers that were marked as 1 (TA) and 2 (A) were divided by the total number of answers, resulting in the Concordance Index (CI) among judges. This index needed to obtain a value greater than or equal to 70% to be considered valid. For items marked as

3 (PA) and 4 (I), it was essential to justify this answer, in addition to assessing whether to remove or replace the aspects indicated in the video. To preserve judges' identity, they were identified by the letter "J" and an alphanumeric number, according to the order of participation (J1, J2, J3, ...).

Stage 6: Validity with the target audience

In the sixth stage, the remaining school professionals (teachers and staff) who did not participate in the interview, representing the target audience, were invited. Teachers and staff who were permanent and contracted and who worked in early childhood education were included. Those who were on leave or vacation as well as those who participated in the first stage of the study (interview) were excluded.

An invitation was sent individually by email, explaining the research, accompanied by the ICF. The guests who expressed interest in participating and responded to the email within 15 days were sent the video and the validity instrument.[12] However, of the 22 invitations sent, one of the guests did not respond, 21 agreed to receive the materials, but only 15 completed assessment within the designated time.

The validated instrument portrayed educational video content aspects in accessible and understandable language. It was divided into chunks containing objectives, writing style, appearance and motivation. As with judges, each chunk of this form was assessed using a Likert scale, consisting of scores ranging from 1 to 4, being (1) TA, (2) A, (3) PA and (4) I, and gaps, to describe opinions, requests, criticisms and compliments about the video.[12] For items marked with (3) PA and (4) I, it was essential to justify these responses. The assessment instrument was compiled in Google Forms®.

For the video to be considered valid, as was the case with judges, it was necessary to reach a value greater than or equal to 70%. This calculation was performed by adding the number of responses obtained for items 1 (TA) and 2 (A), divided by the total number of possible responses. In order to protect participant identity, they were named as "TA" (target audience), with successive numbers added to refer to the order of participation.

As this is research involving human beings, it was submitted to the Research Ethics Committee and was approved under Opinion 4,785,094 and Certificate of Presentation for Ethical Consideration (CAAE - *Certificado de Apresentação para Apreciação Ética*) 47530021.7.0000. 5243. The study was carried out between August 2021 and June 2022.

RESULTS

The results are presented following the stages of the development and validity of the educational video "*Cuidados de primeiros socorros à criança em situação de convulsão no ambiente escolar*" or "First aid care for children experiencing seizures in school settings" (free translation).

Stage 1 - Search for topics and content

Of the 13 participants in this stage, 11 (85%) were female and two (15%) were male. Seven (54%) were teachers; four

(30%) were student mediators; one (8%) was a librarian; and one (8%) was a nutritionist. As a result of the pandemic caused by COVID-19, some employees such as cooks, kitchen assistants, and general services were dismissed from the unit's professional staff and, for this reason, did not participate in this stage of data collection. Concerning age, the mean was 33 years, with a minimum of 24 years and a maximum of 58 years, which characterizes participants as young adults.

Professionals had worked at the unit for an average of four years, with a minimum of five months and a maximum of seven years. Only one (8%) participant reported having completed the full first aid course during her training as a martial arts teacher; one (8%) participant had taken a course focused on drowning as part of a fire department project when she was 14 years old, characterizing it as simple; and three (23%) participants stated that the course was held at a driving school.

Text *corpus* analysis in IRaMuTeQ resulted in an excellent utilization (86.7%), which occurred in 713 text segments (TS); the DHC divided the text *corpus* into two, being represented in the dendrogram as follows: class 2 corresponds to 25.5% of TS, this being the first division. The second division is class 1, corresponding to 28.1% of TS. There was a subdivision, thus originating classes 3 and class 4, which obtained utilizations of 23.7% and 27.7%, respectively. This makes it possible to understand that classes 1, 3 and 4 would have an association in semantic terms with each other, with a distance from class 2. With the analysis committed to the classes, a range of topics emerged, such as seizure, fall, choking, dental trauma, cardiorespiratory arrest, injuries and fall. In this article, we chose to discuss the educational video on seizures. In this subject, the contents mentioned were: care in the face of a seizure; what not to do; self-confidence in handling children in emergencies; and reception.

Stage 2 - Theoretical study: video scientific basis

The theoretical study undertaken in national and international literature made it possible to identify essential aspects for assisting children in situations of seizure.

A study conducted in Saudi Arabia with elementary school teachers focused on first aid management in epileptic seizures. The study showed that educational interventions significantly improved teachers' knowledge and minimized mistaken actions, such as putting gauze in a child's mouth. They began to understand that it is important to turn a child laterally and the need to transfer them to a hospital if the seizure persists for more than 5 minutes or if a child does not regain consciousness.[16]

Research in six daycare centers in Brazil, with teachers and staff who worked in early childhood education, where 16 hours of first aid training was carried out, using active learning methods, found significant improvements in several topics, such as seizures, thus minimizing the containment of children's movements during crises.[17]

A study carried out in Saudi Arabia with 426 teachers found that a large proportion of participants would put something in a child's mouth.[18]

A study conducted in Iran with 342 primary school teachers found that 99% of them had knowledge about epilepsy. Furthermore, 72.4% of them witnessed a seizure and, when witnessing a seizure, some tried to help, others did not know what to do and some did not help. Moving sharp objects away and loosening clothing were the most common actions, but turning the child to the side was not done by the majority, in addition to putting something in the child's mouth, which is extremely harmful. The release of sphincters was not recognized by some of the participants.[19]

Furthermore, as previously described, the protocol of clinical and therapeutic guidelines for epilepsy was used, which addresses different aspects of epilepsy in different age groups and its treatment. In conjunction, the SAMU Manual was used, which directs the successive actions that need to be undertaken by laypeople in first aid.[20,21]

This stage was important to support the content that covered what a seizure is as well as signs and symptoms, care in a seizure situation, attitudes that should not be taken, post-seizure care, the moment when referral to a healthcare service is necessary, communication to family members and post-seizure status.

Stage 3: Educational video creation

In order to promote professionals' understanding of the topic, the scenes in the video show everyday school life. Throughout the video, what should be done in this situation is represented as well as erroneous attitudes and stigmatizing aspects portrayed in the literature.

The teacher and the mediator present a confident (calm) face, and a diversity of children and adults were also represented, including black, white and physically disabled (also physically) children. The video had four versions, three between the research team and the contracted company and a subsequent one, after analysis by expert judges. Thus, the final time for this educational technology is 2 minutes and 10 seconds. Figure 1 shows some scenes from the video.

To provide multimedia learning, the 12 principles were met in this video: the principle of coherence was followed by representation of a music class, an activity that was present at the school where the study took place; during the class, a child had a seizure; the teacher and the student mediator provided the necessary care for the child. The principle of signaling with the use of prohibited symbols, to draw listeners' attention, was a resource used mainly in aspects about care that should not be taken during a seizure.

Regarding the principle of redundancy, it was decided not to use subtitles, however, those who prefer to use subtitles can use this resource, available on YouTube®. For the principle of spatial and temporal contiguity, we tried to present the related content, narration and images in the same corresponding scene. In other words, at the moment in which the care that needs to be

Figure 1. Images from the educational video entitled "First aid care for children experiencing seizures in school settings". Niterói, RJ, Brazil, 2022.
Source: scenes from the educational video, 2022.

performed was demonstrated, both what was narrated and the image presented the scene corresponding to that content. As for the principle of segmentation, the video content followed in chunks, starting with a common day at school, a child's seizure, essential care, actions that should not be performed, communication to family members, when to go to a health unit and the post-comital status. To comply with the principle of pre-training, the purpose of the video was clarified at the beginning of its presentation. The principle of multimedia modality occurred with the presentation of images and narration with a human voice. To comply with the principle of personalization, simple and popular language that was easy to understand was used. Narration was done with a human voice to comply with the principle of voice. For the principle of image, it was decided not to have an image of the narrator.

Stage 4: Validity with expert judges

The sample for this stage consisted of 17 expert judges, 13 (76.5%) nurses, two (11.8%) pediatricians and two (11.8%) social communicators. The majority of participants (14 - 82.4%) were women, and three (17.6%) were men. Concerning age, the mean was 36.9 years (Min = 28 years; Max = 60 years). As for length of professional experience, the mean was 14 years (Min = 6 years; Max = 30 years). In addition to this, 12 (70.5%) were from the state of Rio de Janeiro, and five (29.5%) were from other capitals of the country. Regarding judges' qualifications, six (35.3%) had a doctoral degree, nine (52.9%) had a master's degree, and two (11.8%) had a specialization in the areas of interest of the study.

Since judges' assessment instrument consists of 21 evaluative items, the maximum score achieved in the study would be 357 points (21 items x 17 judges), which would provide a CI of 100% if items 1 (TA) and 2 (A) were marked by all. In the video analyzed, the CI among judges was 97% (352 TA and A). Table 1 describes a summary of judges' assessment.

Stage 5: Educational video adaptation

Although the video had a percentage greater than 70% in the qualitative analysis undertaken, the aspects pointed out by

Table 1. Absolute frequency distribution of the level of agreement of expert judges in the assessment of the educational video on seizures and the Concordance Index of each assessment chunk. Niterói, RJ, Brazil, 2022 (n=17).

Video about seizure					
Items	**N=17**				
1. VIDEO OBJECTIVES	**TA***	**A†**	**PA‡**	**I§**	**CI‖**
1.1 – Is the information/content in the video consistent with the needs experienced daily by teachers and staff?	16	01	-	-	100%
1.2 - Is the information/content in the video important to teachers and staff?	16	01	-	-	100%
1.3 - Does the video invite and/or encourage changes in behavior and attitude among teachers and staff?	14	03	-	-	100%
1.4 - Can the video be shared in scientific circles as a strategy for education and health promotion?	14	03	-	-	100%
1.5 - Does the video meet the objectives of institutions that work with teachers and staff?	17	-	-	-	100%
Total chunk 1	**77**	**08**	**-**	**-**	**100%**
2. STRUCTURE AND PRESENTATION	**TA***	**A†**	**PA‡**	**I§**	**CI‖**
2.1 - Is the video appropriate for teachers and staff working in school settings, with the aim of promoting appropriate and safe assistance to children?	15	02	-	-	100%
2.2 - Are the messages presented in a clear and objective manner?	13	03	01	-	94%
2.3 - Is the information presented in the video scientifically correct?	15	02	-	-	100%
2.4 - Is the video appropriate for the sociocultural level of teachers and staff working in the school context?	14	03	-	-	100%
2.5 - Is there a logical sequence of content proposed in the video?	15	02	-	-	100%
2.6 - Is the information contained in the video well structured in terms of agreement and spelling?	16	01	-	-	100%
2.7 - Does the writing and speaking style correspond to the level of knowledge of teachers and staff?	16	01	-	-	100%
2.8 - Is the size of written content appropriate?	15	02	-	-	100%
2.9 - Are the illustrations in the video expressive and sufficient?	13	02	02	-	88%
2.10 - Is the video appropriate?	14	03	-	-	100%
2.11 - Is the video time appropriate?	15	01	01	-	94%
Total chunk 2	**161**	**22**	**04**	**-**	**97%**
3. RELEVANCE	**TA***	**A†**	**PA‡**	**I§**	**CI‖**
3.1 - Do the topics covered in the video portray key aspects that should be reinforced in the learning of first aid for teachers and staff working in a school context?	16	01	-	-	100%
3.2 - Does the video allow the transfer and generalization of learning to different contexts of education and health promotion?	14	03	-	-	100%
3.3 - Does the video propose the construction of knowledge?	16	01	-	-	100%
3.4 - Does the video address the subjects necessary for the knowledge of first aid for teachers and staff working in a school context?	16	01	-	-	100%
3.5 - Is the video suitable for use by any teacher and staff working in a school context?	15	02	-	-	100%
Total chunk 3	**77**	**08**	**0**	**-**	**100%**
Total rating	**315**	**38**	**05**	**-**	**98%**

Source: survey data, 2022.
Note: TA* - totally adequate; A† - adequate; PA‡ - partially adequate; I§ - inadequate; CI‖ - Concordance Index.

judges were analyzed with the aim of bringing improvements to the technology.

The video's positive aspects regarding objectivity, playfulness, clarity of the content presented, approach to cultural aspects present in society and composition of essential information for child care were cited by judges.

However, some suggestions could not be accepted due to technical feasibility, non-compliance with the research objective, and exceeding the video time. Chart 1 describes judges' suggestions, the aspects that were modified, and the respective justifications for those that were not met.

Stage 6: Validity with the target audience

After adjustments were made to the video, analysis was carried out with the target audience. At this stage, 15 professionals participated, the majority of whom were women (11; 73%). Concerning age, the mean was 33.5 years (Min = 22 years; Max = 58 years).

In relation to professional performance: two (13%) were librarians; two (13%) were student mediators; two (13%) were teachers; one (7%) was a janitor; one (7%) was an educational agent; one (7%) was a cook; one (7%) was a doorman; one (7%) was a general services assistant; one (7%) was a psychologist; two (7%) were social workers; and one (7%) was an administrative assistant. It is noted that the study had a heterogeneous participation of professionals who make up early childhood education, which allows understanding different assessments.

As for the length they had worked at the school, the mean was five years (Min: 4 months; Max: 23 years), which represents an experienced team, with some years of work at the institution. Regarding additional training, five (33%) had graduate degrees in information science, social work, education, gerontology and children's literature; one (7%) had additional training as an educational agent; one (7%) had additional training as a security guard; and two (13%) were studying for a degree in pedagogy.

Each participant analyzed all 26 items for each video, for a total of 390 responses (15 participants x 26 items), in their entirety (100%), for items 1 (TA) and 2 (A). Thus, assessment resulted in a CI of 100% (388 TA and 2 A). Table 2 describes the quantitative assessment undertaken by the target audience.

In the assessment carried out by the target audience, participants spoke about how productive, clear and instructive the video was. One participant suggested that the video should be reported in the 1'4" period, which addresses the length of time a seizure usually lasts, the importance of explaining only that one must wait for the seizure to pass. This aspect was not changed, because some seizures can last for a long time, which can cause cognitive repercussions in children. Therefore, explaining the length of time a seizure lasts aims to provide the team with the necessary tools for atypical cases and, in this way, prevent possible harm resulting from improper care; therefore, the video was not changed.

Thus, the video is available on YouTube®, with access via the link https://youtu.be/L6ejqjc5brU and QR Code.
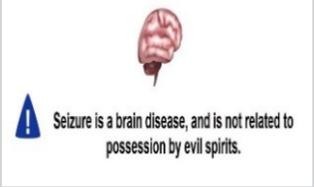

DISCUSSION

This study aimed to develop and validate an educational video on seizures entitled "First aid care for children experiencing seizures in school settings", composed of a theoretical framework that favors knowledge promotion and learning,[22] something that has been done in technology development research.[10] This study had as its guiding axis to understand the school context's needs by listening to participants, who exposed their learning needs on the subject of seizures.

The video begins with a scene from everyday school life, in which a child has a seizure during a music class. The teacher and the student mediator jointly provide first aid to the child. Since health problems are unpredictable and can occur at any time, representing something from the daily lives of these professionals was a way of providing insight and meaning into what they may experience during school.[25] Co-responsibility for child care in school setting needs to be assimilated by the team as a comprehensive part of the work carried out by these professionals, as well as understanding that the knowledge to act in this situation, in an assertive manner, provides safe care, as erroneous actions can cause harm to children's integrity.[26]

It is understood that the school is made up of all the professionals who are there and, in the video, both are responsible for child care. Therefore, in addition to the teacher, who is present in most studies, in this scenario[4,6,16,18,19], the student mediator was included, both working together in first aid care. However, such care needs to be known to the entire school community.[8,11]

In the present study, few participants had knowledge about first aid. Some only knew a few topics, such as drowning, but none of the participants had learned about seizures. This finding supports other studies,[6,27] such as the one conducted in Saudi Arabia,[27] which identified how professionals who witnessed a seizure were not trained. Not knowing what to do makes the team worried and nervous, making it easier for erroneous actions to

Chart 1. Summary of qualitative analysis of the changes proposed by expert judges in the video about seizures. Niterói, RJ, Brazil, 2022 (n=17).

Assessment of the educational video on seizures				
Judges' suggestions regarding structure and presentation	**Modification**	**Justification**	**Previous illustration**	**Current illustration**
[...] at times, written instructions appeared and, at the same time, the interlocutor was speaking. The writing was different from what was being spoken.	Yes	Dividing attention between two pieces of information may result in a lack of adequate understanding of the topic being portrayed. (Figure 2, 3 and 4)	 Figure 2.	 Figure 3. Figure 4
The teacher and the student mediator are smiling as they witness the seizure. I believe that, to make it more realistic, their facial expressions could change to one of concern, seriousness, or distress.	No	The teacher and student mediator's expression is to provide peace of mind to the child, an aspect highlighted by participants as necessary in first aid assistance.	Not applicable.	Not applicable.
I suggest explaining in the video why it is important to protect and turn the child's head to the side during a seizure.	No	The aim is to provide an understanding of the care required in a seizure situation. Detailed explanations would increase the time required for this technology.	Not applicable.	Not applicable.
Report the incident to the parents/guardians. If the child is taking medication, it may be necessary to see a doctor to adjust the medication doses.	Yes	Those responsible for children need to be informed in advance of events involving the child's health situation. This information was added through voiceover.	Inserted in narration format.	
In the image that talks about Lucas' Law, justify or center the text.	Yes	With the aim of promoting a design relevant to the video.		
A child who is having a seizure does not have a clear expression of not feeling well.	Yes	The child's face has been modified to convey that he or she is not feeling well.		
Judges' suggestion regarding relevance	**Modification**	**Justification**	**Previous illustration**	**Current illustration**
[...] mentioned the signs and symptoms of seizure itself, but the post-comital stage can scare education professionals; I suggest adding.	Yes	This information was added because it is believed that this prior knowledge can efficiently equip these professionals.	This scene was inserted.	

Source: survey data, 2022.

Table 2. Absolute frequency distribution of the target audience's level of agreement in the assessment of the educational video on seizures and the Concordance Index of each chunk of the validity instrument. Niterói, RJ, Brazil, 2022 (n=15).

Video about seizure					
Items	**N= 15**				
1. Video objectives	**TA***	**A†**	**PA‡**	**I§**	**CI‖**
1 - Does the video meet the objectives of teachers and staff?	15	-	-	-	
1.2 - Can the video help teachers and staff in their daily lives to provide first aid care to children in the school context?	14	01	-	-	100%
1.3 - Is the video suitable for use by any professional who works with children in the educational segment of early childhood education?	15	-	-	-	100%
Total chunk 1	**44**	**01**	**0**	**0**	**100%**
2. Organization	**TA***	**A†**	**PA‡**	**I§**	**CI‖**
2.1 - Is the video attractive and does it reflect the content of your material?	15	-	-	-	100%
2.2 - Is the written content appropriate for the scenes?	15	-	-	-	100%
2.3 - Does the video have a logical sequence?	15	-	-	-	100%
2.4 - Is there a connection between the information in the video?	15	-	-	-	100%
2.5 - Is the video appropriate for teachers and staff?	15	-	-	-	100%
2.6 - Is the video time appropriate?	14	01	-	-	100%
2.7 - Do the topics covered represent important aspects of first aid care?	15	-	-	-	100%
Total chunk 2	**104**	**01**	**0**	**0**	**100%**
3. Video style	**TA***	**A†**	**PA‡**	**I§**	**CI‖**
3.1 - Is writing style appropriate?	15	-	-	-	100%
3.2 - Is the text interesting? Is the tone of the video friendly?	15	-	-	-	100%
3.3 - Is the vocabulary accessible?	15	-	-	-	100%
3.4 - Is the topic of each scene associated with the corresponding text?	15	-	-	-	100%
3.5 - Is the text in the video clear?	15	-	-	-	100%
3.6 - Does the speaking style in the video match the level of knowledge of teachers and staff?	15	-	-	-	100%
Total chunk 3	**90**	**0**	**0**	**0**	**100%**
4. Appearance	**TA***	**A†**	**PA‡**	**I§**	**CI‖**
4.1 - Do the scenes in the video appear to be organized?	15	-	-	-	100%
4.2 - Are the images simple?	15	-	-	-	100%
4.3 - Are the images complementing the texts?	15	-	-	-	100%
4.4 - Are the images expressive and sufficient for the purpose of the video?	15	-	-	-	100%
Total chunk 4	**60**	**0**	**0**	**0**	**100%**
5. Motivation	**TA***	**A†**	**PA‡**	**I§**	**CI‖**
5.1 - Is the video appropriate for you (teachers and staff)?	15	-	-	-	100%
5.2 - Is the video content presented in a logical manner?	15	-	-	-	100%
5.3 - Does the text promote interaction. Does it suggest actions?	15	-	-	-	100%
5.4 - Does the video address topics that are necessary for the daily lives of teachers and staff?	15	-	-	-	100
5.5 - Does the video invite/instigate changes in behavior and attitude?	15	-	-	-	100%
5.6 - Does the video provide knowledge for you (teachers and staff)?	15	-	-	-	100%
Total chunk 5	**90**	**0**	**0**	**0**	**100%**
Total rating	**388**	**02**	**0**	**0**	**100%**

Source: survey data, 2022.
Note: TA* - totally adequate; A† - adequate; PA‡ - partially adequate; I§ - inadequate; CI‖ - Concordance Index.

occur. It was found that knowledge is an inducer for effective practice, as was identified in a study in Ethiopia, conducted with elementary school teachers.[26]

Therefore, the video provides basic care in first aid situations, which involve moving objects away from a child, turning a child's body to the side, supporting the head, not holding back rhythmic movements, loosening clothing, removing adornments such as watches and bracelets, recording seizure time, not inserting objects into the mouth or offering liquids, and observing other signs and symptoms that may occur during a seizure[16-21]. Some studies have shown that these precautions are not carried out by professionals, in addition to the need to insert objects into the mouth, such as spoons, gauze, towels and offer liquids, which is wrong and can cause other health problems for children.[4,5,18-26] These aspects were clarified in the video, as it is understood that just as it is necessary to know what should be done, improper actions also need to be propagated.

Another aspect considered sensitive was seizure etiology, which is a neurological disease recognized for being serious and chronic, little assimilated by society, which associates its cause with aspects linked to beliefs, due to clinical manifestation, which leads to stigmatizing actions.[5,26] A systematic review identified that the aspect of unsatisfactory awareness, including the etiology of this disease and encompassing negative attitudes towards marriage, children and jobs, was considered by a significant portion of participants.[5]

In this study, during the interview, the team brought up topics and content, in addition to first aid care in a seizure situation, such as the content of reception and self-confidence, as essential factors in this care. Reception provides children with comfort so that this experience is as traumatic as possible. The self-confidence to be able to deal with something that is not within their training repertoire represents a challenge for the team. The confidence skill has been emphasized in research[28,29] as necessary for this population, in order to have appropriate management in the event of complications. Once the team's self-confidence increases, it impacts agile and efficient care.[28,29] These contents permeate the national curriculum base for early childhood education, which understands children as beings who have rights and require ethical care.[30] The video produced is articulated with meanings that represent this population. Understanding these aspects was only possible due to the listening process carried out previously, which enabled creating a video with representations of this audience.

Audiovisual language is something that is on the rise in today's society, characterized by different modes of communication. This language uses image and sound resources and, in this way, provides harmony to this combination.[31] Research found that audiovisual resources were the means by which most teachers obtained information about first aid during seizures,[19] which demonstrates that this type of technology arouses interest among participants, as ease of access contributes to its use and dissemination.

The validity process provided educational material that was assessed by professionals with expertise in the area and who were able to add knowledge by contributing to improving the technology.[29] In this study, the validity process involved professionals from various areas who study and publish on the subject, and it was validated with a high CI among judges and the target audience. The high index presupposes that the construct produced obtained agreement in most aspects. It is observed that this phenomenon also occurred in another study that developed and validated an educational video on obstetric cardiopulmonary arrest,[10] since, in judges' assessment, it obtained 99% in content validity and 99% in the target audience's assessment, consisting of nursing students.

Judges considered the video to be playful and attractive, and considered aspects involving language, with the aim of providing clarity of the knowledge and techniques that are presented to an audience considered to be lay. Language is an aspect considered sensitive in validity studies, and the need for clarity and accessibility is often highlighted, as language adequacy favors sharing the intended message and, thus, achieving the desired objective, which in this study was to provide knowledge about the subject, as the structure of complex and elaborate sentences does not provide clarification to listeners and can cause confusion.[32]

Among the contributions made by judges in the space provided, some were not incorporated, due to not being the study objective, due to technical unfeasibility and because they would have extended the video time too much. The literature recommends that instructional videos should not exceed 15 minutes. The video produced lasted 2 minutes and 8 seconds, which is essential to convey the intended message and not cause distraction.[23] It is noted that very long videos have a low chance of being watched until the end and, therefore, information is not conveyed cohesively.[33]

However, some observations were included in the research, and among them, a post-convulsive status stands out, in which some children, after a seizure, may present, for instance, sphincter release, headache and drowsiness. This status can cause strangeness and unnecessary interventions, as it is little known to the population. This was evidenced by an investigation in which the team was unaware of it.[19] Another suggestion that was also added is to inform the family members of the incident with the child so that they can report what happened and understand whether the child has the pathology or has used medication, among other aspects. This has been considered a challenge for the school team, as evidenced by a study conducted in Brazil.[34] The team is afraid to report incidents that occur at school due to the interpretation of negligence that some family members may have in relation to this institution. However, this needs to be addressed, since these problems can occur at any time and in any context.

School team participation in validity was essential, as participants experience this context in their daily lives, and having their assessment in the study provided assertiveness and understanding regarding objective achievement. There was a suggestion by one participant to report that one should

wait for the seizure to pass, however, it was not added, because seizure duration is a relevant factor to be estimated that has been guided in training. When this period persists, it can cause neurological damage. Research identified that this aspect was one of the participants' greatest mistakes, which demonstrates how appropriate this information is.[16]

Chronic health conditions have become a reality in school life. It is reported that one in four children has chronic health conditions, which will certainly lead to the management of these conditions. The school team, despite being committed to the educational process, also needs to be on the front line of this care.[35] The technology produced in this study has the potential to contribute to acquiring knowledge and can be used in continuing education actions with the target audience, as its construction was based on a theoretical framework that facilitates learning[22] as well as on recent scientific evidence.

CONCLUSION AND IMPLICATIONS FOR PRACTICE

The educational video "First aid care for children experiencing seizures in school settings" was considered valid by expert judges and the target audience, with content validity rates of 98% and 100%, respectively. Therefore, it can be used by teachers and staff and other professionals who wish to learn about first aid for seizures.

It can be inferred that this educational video has the potential to favor the teaching-learning process, due to some aspects, such as its construction process, which was based on the needs pointed out by participants. Understanding the challenges of those who are immersed in the educational reality made it possible to bring relevant aspects to the educational video, which would not be possible without the prior listening undertaken. Judges and the target audience considered the video to be playful, attractive and objective, relevant aspects to maintain this type of technology.

Therefore, video has great potential to be a facilitating technology for acquiring knowledge in health education processes and, in this way, contribute to adequate and safe care, minimizing errors resulting from the lack of this knowledge. It is suggested that new educational technologies be developed that address other topics, since the needs for knowledge in first aid are diverse due to a range of occurrences that can occur in schools. It is recommended that future studies test the technology applicability in order to analyze whether knowledge was acquired.

Due to limitations caused by the COVID-19 pandemic, the school had to interrupt its in-person activities; as a result, some employees were dismissed from their professional staff and were unable to participate in the first stage (interview) of the study. Therefore, it was not possible to assess the learning needs of this group.

AUTHOR'S CONTRIBUTIONS

Study design. Priscila da Silva Miranda da Gama. Liliane Faria da Silva.

Data collection. Priscila da Silva Miranda da Gama.

Data analysis. Priscila da Silva Miranda da Gama. Liliane Faria da Silva. Emília Gallindo Cursino.

Interpretation of results. Priscila da Silva Miranda da Gama. Liliane Faria da Silva. Emília Gallindo Cursino. Fernanda Garcia Bezerra Góes. Raquel Castro Santana. Ana Carla Dantas Cavalcanti.

Manuscript writing and critical review. Priscila da Silva Miranda da Gama. Liliane Faria da Silva. Emília Gallindo Cursino. Fernanda Garcia Bezerra Góes. Raquel Castro Santana. Ana Carla Dantas Cavalcanti.

Approval of the final version of the article. Priscila da Silva Miranda da Gama. Liliane Faria da Silva. Emília Gallindo Cursino. Fernanda Garcia Bezerra Góes. Raquel Castro Santana. Ana Carla Dantas Cavalcanti.

Responsibility for all aspects of content and integrity of published article. Priscila da Silva Miranda da Gama. Liliane Faria da Silva. Emília Gallindo Cursino. Fernanda Garcia Bezerra Góes. Raquel Castro Santana. Ana Carla Dantas Cavalcanti.

ASSOCIATED EDITOR

Candida Primo Caniçali ⓘ

SCIENTIFIC EDITOR

Ivone Evangelista Cabral ⓘ

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