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Production and validation of the short film *Pés que te quero*®: educational technology for people with diabetes

Produção e validação do curta-metragem Pés que te quero®: tecnologia educacional para pessoas com diabetes

Producción y validación del cortometraje Pies que te quiero®: tecnología educacional para personas con diabetes

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ABSTRACT

Objective: To describe the production and validation of short film type educational technology for the prevention of diabetic foot ulcers. **Methods:** A methodological study focused on the validation of a short film. The construction of the film was carried out in three stages: pre-production, production, and post-production. Thirty-seven evaluators undertook the internal validation, divided into two groups of 31 proficient nurses and six from the communication area. Fifteen people with diabetes mellitus performed the external validation. **Result:** The nursing proficient validated the script with a total content validity index of 0.95, with internal reliability of 0.849 conferred by Cronbach's Alpha. Communication specialists validated with a content validity index of 0.97; and target audience with 0.95 (clarity) and 0.97 (relevance). **Conclusion**: The study showed that the short film is a valid and reliable educational technology to promote foot care to people with diabetes *mellitus*.
Descriptors: Diabetic Foot; Diabetes Mellitus; Education Technology; Validation Studies; Self Care.

RESUMO

Objetivo: descrever a produção e validação de tecnologia educacional do tipo curta-metragem para prevenção de úlceras do pé diabético. **Métodos:** estudo metodológico, com foco na validação de filme curta-metragem. A construção do filme foi executada em três etapas: pré-produção, produção e pós-produção. Empreendeu-se a validação interna com 37 avaliadores divididos em dois grupos: 31 proficientes enfermeiros, seis da área de comunicação. A validação externa foi realizada por 15 pessoas com Diabetes Mellitus. **Resultados:** os proficientes da enfermagem validaram o roteiro com Índice de Validade de Conteúdo (IVC) total de 0,95, com confiabilidade interna de 0,849 conferido pelo alfa de Cronbach, proficientes da comunicação validaram com IVC de 0,97 e público-alvo com 0,95 (clareza) e 0,97 (relevância). **Conclusão**: o curta-metragem se configurou como tecnologia educativa válida e confiável para promover o autocuidado com os pés às pessoas com Diabetes Mellitus.
Descritores: Pé Diabético; Diabetes Mellitus; Tecnologia Educacional; Estudos de Validação; Autocuidado.

RESUMEN

Objetivo: Describir la producción y validación de tecnología educacional del tipo cortometraje para prevención de úlceras del pie diabético. **Métodos:** Estudio metodológico, con enfoque en la validación del cortometraje. La construcción de la película fue ejecutada en tres etapas: preproducción, producción y postproducción. Se emprendió la validación interna con 37 evaluadores divididos en dos grupos: 31 proficientes enfermeros y 6 del área de comunicación. La validación externa fue realizada por 15 personas con diabetes *mellitus*. **Resultados:** Los proficientes de la enfermería validaron el guión con Índice de Validez de Contenido total de 0,95, con confiabilidad interna de 0,849 conferido por el alfa de Cronbach; proficientes de la comunicación validaron con *Índice de Validez de* Contenido de 0,97; y público objeto, con 0,95 (claridad) y 0,97 (relevancia). **Conclusión**: El cortometraje se configuró como tecnología educativa válida y confiable para promover el autocuidado con los pies a las personas con diabetes *mellitus*.
Descriptores: Pie Diabético; Diabetes Mellitus; Tecnología Educacional; Estudio de Validación; Autocuidado.

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INTRODUCTION

People with diabetic foot ulcers (DFU) have a high risk for amputation, a condition that considerably decreases the life expectancy of these individuals. Male sex, smoking, history of previous ulceration in the feet, osteomyelitis, and changes in muscle mass index (MMI) are factors strongly associated with amputation of limbs with DFU[1].

The annual direct treatment costs of these injuries in Brazil are more than US$ 361 million, using 0.31% from the Public Health System (SUS). These costs include hospital admissions, outpatient appointments, home care, and rehabilitation. The real expenses extrapolate the financial quantity invested by the SUS, significantly compromising the finances of hospital institutions[2].

In this context, identifying the risk of developing DFU as well as implementing preventive actions, multidisciplinary care, and health education practices can minimize the involvement of ulcers by 44% to 85%, thus decreasing the risk of amputation[3].

National and international literature point out that low socioeconomic and low schooling levels are predictive factors for amputations due to complications from DFU[4-5]. Thus, it is evident that individuals with low education and financial and social limitations require differentiated attention and planning by health professionals concerning guidelines for self-care[6].

The presented reality shows that educational actions are fundamental to promote preventive behaviors and promote changes in care, such as foot hygiene, drying of interdigital spaces, skin hydration, among others, as they contribute to the prevention of foot injuries and, consequently, reduce amputation rates[7].

Educational activities - in various presentations (individual, group) and using many tools (operating groups, mobile devices, printed materials, and others) - have been effective for stimulating self-care, reducing the risk of development of DFU[8-9].

However, there are still few publications related to the production of short films in carrying out educational actions that aim to promote health to people at risk of diabetic foot. This type of material expresses the message briefly and cohesively. Its characteristics are the small number of pages that make up the script, as well as the minimal conception of time, maintaining an important feature: optimization of time for content dissemination[10].

Considering that the association of verbal and visual resources briefly enhances learning, compared only to written language, especially with the population with lower education and social status, videos and films are shown as impactful educational resources and with relevant implications in the development of cognitive and procedural skills[11]. This consideration, together with the reduced quantity of preventive films for DFU produced by nursing, motivated the elaboration and validation of the educational film to promote feet self-care of people with diabetes.

OBJECTIVE

To describe the production and validation of short film type educational technology for the prevention of diabetic foot ulcers.

METHODS

Ethical aspects

The Research Ethics Committee approved the study, following the ethical precepts of research with human beings presented in Resolution No. 466 of the National Health Council. The film was registered with the National Library Foundation (FBN)/Copyright Office (EDA) of the Ministry of Culture. It was also registered in a notary's office. Actors and extras who participated in the production of the short film signed an authorization term for the use of image and voice, following law nº 9.610/98.

Design, period and place of study

A methodological study, which sought to develop, evaluate and improve tools, and methodological strategies[12]. It was performed in two phases: educational film production, followed by validation of nursing and communication specialists, and target audience. The film production and validation took place between September 2015 and May 2016 in Fortaleza, State of Ceará (CE), Brazil.

Population or sample; criteria of inclusion and exclusion

The internal validation was carried out with thirty-one nursing specialists (all nurses) and with six proficient technicians in communication, graduated in Social Communication, Journalism/Cinema, Pedagogy, Dentistry, Mechanical Engineering, and Business Administration. The study identified the professionals for convenience by searching the Lattes platform (http://lattes.cnpq.br/). On the resume access page, the scholars clicked on the "search" option (http://buscatextual.cnpq.br/buscatextual/busca.do?metodo=apresentar) and "subject," where the terms "Diabetes Mellitus" and "educational technologies in health" were defined, selecting the basis "doctors." Soon after, they applied filters to the results by "professional performance," considering the large area "Health Sciences," the area of "Nursing," and subarea "Collective Health Nursing."

For the specialist group of the communication area, the study used the snowball sampling, in which, when it identified a professional who fit the predetermined criteria, it requested that he indicates others[12].

As a parameter to define "proficient," the study used the Fehring criteria[13] adapted, in which such professionals would need to acquire a score of 5 points, according to the following scale: be a doctor (4 points), have written thesis on the area of interest (2 points), hold a master's degree (3 points), have written a dissertation in the area of interest (2 points), publication of articles in the indexed journal in the area of interest (1 point), professional experience of at least five years in the area of interest (2 points/year), specialization in the area of interest (2 points). The area of interest for the nursing specialists was "assistance to the person with diabetes" and "educational technologies in health"; and, for the communication professionals, it was "video production."

The initial contact with the two proficient groups was through message, telephone contact (if available), or electronic mail (email),

in which, after accepting to participate in the study, they sent the forms for evaluation of the script, the script, and the Informed Consent Form by email.

After making the adjustments proposed by the reviewers in the script, the film was produced and subsequently validated by the target audience. Fifteen people did the external validation who lived with DM and performed care in a Primary Health Care Unit (UAPS) in Fortaleza (CE), Brazil. The researcher verbally invited these patients to participate in the study in July 2016 when they were waiting for care at the UAPS. The intervention took place in an afternoon for the group of 15 participants who agreed to participate. Then, participants signed the Informed Consent Form. For inclusion criterion for this group, the study used: being 18 years or older and having been diagnosed with diabetes for at least one year. It excluded people with severe cognitive impairment or hearing and visual impairment or who could not read or write.

Study protocol

The production of the film *Pés que te quero*® (In Portuguese, the word "*pés*" means "feet" and the title translates something like the strong and intense desire to take care of the feet) was carried out in three stages: pre-production, production, and post-production[14]. The pre-production stage consisted of the conception of the initial idea until the shooting. The content used in the pre-production was based on the International Working Group on the Diabetic Foot[15], International Diabetes Federation[16], as well as in the theory of Dorothea Orem[17], which focuses on the importance of self-care in the practices of individuals.

Four phases divide the pre-production: synopsis, screenplay, script, and storyboard[18]. The synopsis summarized the film content; the argument described what the participants' actions would be like in a synthetic way, but a little more detailed than the synopsis. The script detailed what film should produce, with understandable and more detailed guidelines, aiming to guide the production team in the filming. Initially, it was divided into 18 scenes spread over 31 pages to inform the reader about what the viewer would see in the film[18]. The organizers described the story and visual resources that would be used in the production of the scenes.

The Celtx®, a free personal computer program for the production of audiovisual scripts, built the scenario. The script of the film was directed through relevant information on the care and prevention of diabetic foot ulcers, appreciating the themes: foot inspection, correct nail cutting, hygiene, drying and moisturizing of the feet, drying of interdigital spaces, use of appropriate shoes, and socks, in addition to the relevance of always using them, necessary time of follow-up with health professionals and treatment of injuries.

The forms adopted for the evaluation of the film script with the variables to be judged by the specialists were based on valid instruments and widely used for validations in Brazil[19-20], in Likert scale format, with evaluative questions described as 1 – Excellent; 2 – Good; 3 – Regular; and 4-Poor.

The instrument used by the proficient nurses for validation assessed the variables: idea concept, objectives, dramatic construction, rhythm, characters, dramatic potential, dialogues, visual style, referring audience, production estimate, and analyst result. The evaluators of the communication area used the same variables evaluated by the nurses, except for "objectives," but they added the variables "functionality," "usability," and "efficiency."

After validation of the script, they elaborated the second version that guided for the production of the storyboard (sequential cartoon-like drawings) to direct in the creation of the other stages[18].

The film followed its production: production of the scenes set in pre-production, narration, selection of texts, figures, photos, and animations. The film took place in open places as well as inside the health units. Fifteen extras and three professional actors (two men and one woman) participated in the principal roles, and one of the researchers acted as a nurse.

The production team consisted of 18 professionals, who used two Canon 5D Mark II and III cameras, batteries, audio equipment, clapper board, mixer, recorder, directional microphone, Sennheiser lapel, among others.

After filming, the team followed to post-production, that is, video editing. A professional in this area carried out this stage, who edited and performed the final product through the video editing software Cut Pro X®. Once finished, the team recorded the film on DVD (digital versatile disk) and a memory stick.

After the post-production, the team performed an external validation with the target audience, which, after watching the short film, examined it using the evaluation form application. This instrument, produced on a Likert scale (with evaluating requirements equal to those of the specialists), assessed the clarity and relevance of the subjects discussed in the film.

Data analysis

For the internal and external validation, the team calculated the Content Validity Index (CVI) individually for each item evaluated and the total CVI of the instrument as well. The equation used to calculate the CVI was performed considering the number of evaluators who assigned the value of 3 or 4 to the item, divided by the number of evaluators. A value equal to or greater than 0.80 was admitted for the validation of the item[12].

Also, for internal validation, the Statistical Package for the Social Sciences (SPSS), version 23.0 (license No. 10101113007) calculated the Cronbach's Alpha to measure the internal consistency of the proficient responses, classified as: > 0.80 – almost perfect, < 0.80 to 0.61 – substantial; 0.60 to 0.41 – moderate; 0.40 to 0.21 – reasonable; and < 0.21 – small. Cronbach's Alpha was not calculated for communication specialists, given the small number of respondents. Items with Alpha greater than 0.5 were considered acceptable. The tables present the results.

RESULTS

At the time of pre-production, the argumentative advance of the film was based on a fictional perspective, in which any resemblance to facts would be a mere coincidence.

In the film, the central characters were John, Mary, Joseph, and an assistant nurse, Ana. The scenes take place in six locations in the municipalities of Senador Pompeu and Fortaleza, Ceará, Brazil. The meeting of João and Maria took place, initially, at the *Bar da Amizade*. João is 55 years old and has been living with diabetes for 15 years; he is single and enjoys singing country music weekly.

At the end of one of the concerts, John and Mary meet. She also has no partner, is 65 years old, and has had diabetes since she was 41. She is a retired civil servant and cannot control glycemic indices. From this first meeting, Mary and John start dating. In an attempt to live better with the disease and reduce complications, the couple tries to undertake new habits and together seek guidance with a nurse in the basic unit.

They are part of an educational group developed in the basic unit and coordinated by Nurse Ana, which systematically addresses, in meetings, preventive care with the feet of people living with diabetes.

The character José also participates in the fiction. He is a construction worker, 57 years old, diagnosed with DM 12 years ago. He already has a loss of protective sensation in the feet and, at the moment, has a wound on the foot that arose when he stepped on a nail. For this reason, José also seeks care with nurse Ana.

Thus, the film demonstrates how the characters modify habits and adopt preventive behaviors about the feet, achieving a better quality of life and lower risk of developing DFU (Figure 1).

Figure 1 – Movie Pictures *Pés que te quero*®, Fortaleza, Ceará, Brazil, 2016

After the pre-production stage, nursing and communication specialists evaluated the script. The first group consisted of 28 (90.3%) women, aged between 27 and 61 years (mean [x] = 42 years ± 10.27). They had an average experience of 10.9 years in the required areas, and all had experience in the area of elaboration and validation of educational technologies. To qualify the technology under diverse and representative views of the national scenario, 19 (61.2%) the specialists were from the Northeast Region; 9 (29%) from the Southeast Region; and 3 (9.6%) from the South Region. There were no responses from evaluators from the other regions.

In the group of specialists of the communication area, the mean was 49.8 years (±9.5); four (66.6%) were male. They were graduated in several areas, but had a postgraduate degree in Marketing, or experience in film direction, in addition to having worked in production and film scripts, as well as television advertisements. Table 1 presents the validation results.

Most of the items evaluated showed 100% agreement between both groups. The script of the short educational film was considered valid by the proficient participants (CVI 0.95 and 0.97).

The reliability conferred by the total Cronbach's Alpha was 0.849, indicating high internal consistency. In the production Estimate category, Cronbach's Alpha was not calculated, as there was only one variable.

The items Non-tiring rhythm (CVI 0.77), Dynamism of scenes (CVI 0.33), There are repetitions of scenario/environment (CVI 0.55), and Scenes reflect stereotypes/discrimination (CVI 0.67) were not considered valid.

The team explored the reviewers' suggestions for modification in the script of the film. Regarding the long scenes and dialogues (scenes 8 and 10 of the final version), some were reduced to become shorter and more objective. The specialists considered it relevant to insert a new scene before scene 10 to make the script more attractive and accessible. They added a scene with the character couple dancing a Country Music at the *Bar da Amizade* to add dynamism.

Table 1 – Content Validity Index and Cronbach's alpha of the evaluated categories of the film script *Pés que te quero*®, Fortaleza, Ceará, Brazil, 2016

Categories evaluated by proficient nurses	CVI*	Alpha**	Categories evaluated by communication specialists	CVI*
Idea concept		0.754	**Idea concept**	
Relevant/current thematic content	1.00		Objective-appropriate thematic content	1.00
Content according to the desired goals	1.00		Idea helps learning	1.00
Objectives consistent with clinical practice	1.00		Achievable idea	1.00
Correct exposed premises	1.00		Utility of the script	1.00
Understandable information	0.96		Attractiveness of the script	1.00
Sufficient information	0.90			
Meets the objectives of institutions	0.96			
Suitable for professional use	1.00			
Proposes behavior changes	1.00			
Proposes improvement in knowledge	1.00			
Dramatic construction		0.738	**Dramatic construction**	
Starting point has impact	0.96		Starting point has impact	1.00
Interest of the script grows	1.00		Interest of the script grows	1.00
Scenes reflect stereotypes/discrimination	0.67		Sufficient number of scenes and duration time	1.00
The film motivates/stimulates	1.00		Pleasant presentation of the script	1.00
Pace		0.692	**Pace**	
Scenes motivate next ones	1.00		Dynamism of environments	1.00
Non-tiring rhythm	0.77		Dynamism of scenes	0.33
			Forms of presentation of scenes are suitable	1.00

To be continued

Table 1 (concluded)

Categories evaluated by proficient nurses	CVI*	Alpha**	Categories evaluated by communication specialists	CVI*
Character		0.707	**Character**	
Empathy of the characters	1.00		Original character profile	1.00
Enough characters and situations	0.83		Enough characters and situations	1.00
Characters remind of reality	0.90		Characters remind of reality	1.00
Dramatic potential		0.525	**Dramatic potential**	
There is emotion in the script	0.96		There is emotion in the script	1.00
There is surprise in the script	0.87		There is surprise in the script	1.00
Dialogues		0.737	**Dialogues**	
Dialogues have naturalness	1.00		Each intervention motivates the next	1.00
Characters with adequate vocabulary	0.96		There is acceleration of action until climax	1.00
Vocabulary uses common words	0.90			
Active voice employment	1.00			
There is a conclusion	0.96			
Relevant conclusion	1.00			
Visual style		-	**Visual style**	
Scenes reflect important aspects	1.00		There are scenario/environment repetitions	0.50
			Suitable images	1.00
			Overall structure is creative	1.00
Referring audience		0.717	**Referring audience**	
Content is related to the target audience	1.00		The content has a direct relationship with the target audience	1.00
Identification of the target audience with the problem exposed	1.00		Identification of the target audience with the problem exposed	1.00
There is compatibility of the language with the target audience	0.96		There is compatibility of the language with the target audience	1.00
Production estimate		-	**Production estimate**	
Possibility of the product turning audiovisual	1.00		Evaluation of the production estimate	1.00
Objectives		0.748	**Feature**	
Obvious objectives	0.96		The film proposes to encourage self-care to prevent complications	1.00
Consistent objectives	1.00		Film generates positive results	1.00
Feasible objectives	0.90		**Usability**	
Sufficient number of dinners	0.90		Easy to learn the concepts used and their applications	1.00
			Easy to use film on basic units	1.00
			Provides help in a clear way	
			Provides comprehensive help	1.00
			Provides help without being tiring	1.00
			Efficiency	
			Suitable proposed time	1.00
			Number of scenes consistent with the proposed time in the film	1.00
			Characterization of the characters meets the proposed goal	1.00
IVC* geral	0.95	.849	IVC* geral	0.97

**Content validity index; **Cronbach's Alpha.*

Table 2 – Content Validity Index of the subjects represented in the scenes, according to the target audience analysis, Fortaleza, Ceará, Brazil, 2016

Subject	CVI* (Clarity)	CVI* (Relevance)
Foot hygiene	1.00	1.00
Drying of the feet after bathing	1.00	1.00
Drying of interdigital spaces	1.00	1.00
Hydration of the feet	1.00	1.00
Placing feet in hot water	0.80	1.00
Daily examination of the feet	1.00	1.00
Use of therapeutic footwear	0.93	1.00
Analysis of footwear before wearing it	1.00	1.00
The importance of walking shoes	0.93	1.00
Wearing socks	0.88	0.80
Nail cutting	1.00	1.00
Treatment of lesions (Mycoses, cracks, Calluses, blisters, ingrown nails)	0.86	0.86
CVI* total	0.95	0.97

**Content Validity Index.*

Concerning the repetition of the scenarios, the changes of locations could compromise the sequence of the scenes. The teams also considered the logistics of the locations as impediments to not making changes in the recording environments. There was also a suggestion to replace the word "diabetic" with the terminology "people with diabetes," which was readily accepted.

After validation, the production was carried out with the recording of the film, generating the short film with 12 scenes presented in 24 minutes and 7 seconds, entitled *Pés que te quero*®. The post-production stage was performed by the film screening for 15 people with DM. They had a mean age of 57.26 years, nine (60%) were female, eight (53.3%) did not complete elementary school, fourteen (93.3%) were married, eight (53.3%) were housewives. Regarding family income, the average gain was R$ 880.00. The time of diagnosis of diabetes varied, on average, by 8.9 years.

The group evaluated the film concerning clarity and relevance to give the film external validity (Table 2).

DISCUSSION

The production of films with educational objectives generates learning and development of skills that favor changes in the reality of the students[18]. Technological products are a reality in nursing practice, and a fictional film is a playful tool with innovative potential due to the multiple value and utility in nursing education practice. In addition, such a resource can reach a broad and diverse audience, despite the social organization of individuals and educational level[21].

Studies point out that the construction of educational videos are good educational resources used by nursing, covering several areas: bed bath techniques[22], aftercare-surgical procedures[23], care

for people living with an ostomy[24-25], teaching in undergraduate courses[26], foot reflexology[27], among others. Researchers from the State of Ceará infer that, by producing video as an emancipatory technology, nursing innovates in care practices and provides essential tools. These, when added to the use of qualified health professionals, can favor the preparation of the public target for self-care in various situations[28].

The stages of pre-production, production, and post-production guide nursing in the elaboration of videos and are convenient procedures for the preparation of clear, objective, and adequate audiovisual material, standing out as an efficient path to be followed for the production of educational films[28].

Regarding the non-validation of the items of the Rhythm category, 18 scenes were part of the initial script, distributed over 35 pages. The guidelines for the construction of films in the health area are scarce, but a study on the production of video for use in Online Education (EaD) points out that educational audiovisual resources should be as brief as possible because the attention of the viewer tends to decrease with each minute that the video is prolonged[29].

As for the repetition of scenarios, it is important to consider in film production not only the attractiveness of the scenes and geographical elements but also the presentation of an environment close to the reality of the target audience[21].

The questioning about the use of the term "diabetic" to refer to people living with diabetes was pertinent, considering that the main international entities that study diabetes, such as the American Diabetes Association (ADA) and the International Diabetes Federation (IDF), recommend to not use this term to refer to people with diabetes[30]. Considering that the disease does not define the individual, the expression "person living with diabetes" was chosen as the most appropriate word to be used in the script.

The content of educational products must consider the characteristics of the target audience and their social and economic condition. The vocabulary and images need to be adequate for understanding and favor the memory of the discussion to promote the adoption of disregarded practices and changes[31].

Educational products aimed at health education and self-care for patients with diabetes have been created and validated by specialists, consolidating the need for detailed examination by different professionals, aiming to qualify the final product. The validation of specialists from several areas and by the target audience favors the production of resources directed to the needs of people with diabetes *mellitus*, thus contributing to adequacy and improvement by incorporating knowledge and values into the technology produced[31].

Study limitations

A possible limiting factor of this study was the failure to perform a second round of evaluation of the roadmap after the changes made.

Contributions to the fields of Nursing, Health or Public Policy

We believe that the detailing of the short film production can facilitate and direct the creation of other educational films by nursing. In addition, producing and validating a short film made it possible to develop an attractive educational resource aimed at the prevention of diabetic foot ulcers. The team hopes that the film can be widely publicized and contribute positively to the promotion of self-care directed to the feet of people living with diabetes, reverberating in the decrease in the incidence of DFU and positively impacting the indicators related to this complication.

CONCLUSION

The movie *Pés que te quero*® was produced following the steps of pre-production, production, and posproduction. Nursing and communication professionals validated the film script with CVI of 0.95 and 0.97, respectively. The target audience validation made it possible to evaluate the film concerning the clarity (CVI = 0.95) and relevance (CVI = 0.97) of the subjects addressed, thus consecrating the film as a valid resource and suitable to be used in educational practices and favorable to the promotion of self-care with the feet of people living with diabetes.

SUPPLEMENTARY MATERIAL

https://doi.org/10.48331/scielodata.6RDDAH, SciELO Data.

http://www.uece.br/ppcclis/wp-content/uploads/sites/55/2019/12/LUCIANA.pdf

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