

**ORIGINAL ARTICLE****ORAL HYGIENE IN CHEMOTHERAPY PATIENTS: CONSTRUCTION AND VALIDATION OF AN EDUCATIONAL VIDEO****HIGIENE BUCAL DE PACIENTES EM QUIMIOTERAPIA: CONSTRUÇÃO E VALIDAÇÃO DE UM VÍDEO EDUCATIVO****HIGIENE BUCAL DE PACIENTES EN QUIMIOTERAPIA: CONSTRUCCIÓN Y VALIDACIÓN DE UN VIDEO EDUCATIVO**

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ABSTRACT

Objective: to describe the development and validation process of an educational video about oral hygiene for chemotherapy patients. **Method:** descriptive study. The construction of the video was elaborated in three phases: pre-production, production and post-production. A script was validated by five experts in care to chemotherapy patients and three of them also assessed the video for the audiovisual quality of the material and understanding of the content presented. Approval for the research project was obtained for the Research Ethics Committee, Protocol 5696/2010. **Results:** in two phases, the scores of the expert validation were equal or superior to 80%. The adjustments the experts requested in the language were accepted. In the patients' assessment about the understanding of the video, the score was 9.83. **Conclusion:** the steps adopted in the construction and validation of the video proposed were appropriate and can be used in other themes.

Descriptors: Nursing Care; Education; Oral Hygiene.

RESUMO

Objetivo: descrever o processo de desenvolvimento e validação de um vídeo educativo sobre higienização bucal para pacientes em tratamento quimioterápico. **Método:** estudo descritivo. A construção do vídeo foi elaborada em três etapas: pré-produção, produção e pós-produção. Um roteiro foi validado por cinco peritos na assistência a pacientes submetidos à quimioterapia e três deles também procederam a avaliação do vídeo em relação à qualidade audiovisual do material e compreensão do conteúdo apresentado. O projeto de pesquisa foi aprovado pelo Comitê de Ética em Pesquisa, Protocolo 5696/2010. **Resultados:** em duas etapas, os escores da validação pelos peritos foram iguais ou superiores a 80%. Os ajustes solicitados pelos peritos quanto à linguagem foram acolhidos. Na avaliação por parte dos pacientes quanto à compreensão do vídeo obteve-se escore de 9,83. **Conclusão:** os passos adotados no percurso de construção e validação do vídeo proposto mostraram-se adequados e passíveis de serem utilizados em outras temáticas. **Descritores:** Cuidados de Enfermagem; Educação; Higiene Bucal.

RESUMEN

Objetivo: describir el proceso de desarrollo y validación de un vídeo educativo sobre higienización oral para pacientes en tratamiento quimioterapéutico. **Método:** estudio descriptivo. La construcción del vídeo fue elaborada en tres etapas: preproducción, producción y postproducción. Un guión fue validado por cinco peritos en la atención a pacientes sometidos a quimioterapia y tres entre ellos también evaluaron el video con relación a la calidad audiovisual del material y la comprensión del contenido presentado. El proyecto de investigación fue aprobado por el Comité de Ética en Investigación, Protocolo 5696/2010. **Resultados:** En dos fases, las notas de la validación por especialistas fueron iguales o superiores a 80%. Los ajustes solicitados por los especialistas en el lenguaje fueron aceptados. En la evaluación de los pacientes sobre la comprensión del video, fue alcanzada la nota de 9,83. **Conclusión:** los pasos adoptados en el recorrido de construcción y validación del video propuesto se mostraron adecuados y posibles de utilización en otras temáticas. **Descritores:** Cuidados de Enfermería; Educación; Higiene Bucal.

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INTRODUCTION

It is extremely important for people to be aware of the possible complications and the need for correct hygiene of the oral cavity with a view to their prevention. The human oral cavity is colonized by a wide range of bacterial species, more than any other anatomical area. More than 700 species have been identified.¹ These microorganisms not only cause local alterations, but can also spread from the oral cavity to the blood stream.

To test this hypothesis, a study was undertaken to determine whether precarious oral hygiene or dental illnesses are risk factors for the development of bacteremia after tooth brushing and after dental extraction procedures. The results indicated that these conditions were significantly associated with the occurrence of bacteremia-related infectious endocarditis. In cases of generalized bleeding in the oral cavity after brushing, this risk increased eightfold.²

The relevance of correct oral hygiene is reinforced in situations in which the patients are submitted to chemotherapy, one of the treatment modalities for cancer patients. Despite its therapeutic effects against tumor cells, chemotherapy also comes with non-specific organic effects, especially in the gastrointestinal tract, which can aggravate pre-existing oral conditions³ or contribute to the emergence of further complications, and also interfere in the evolution of the cancer treatment.

When submitted to chemotherapy, these patients can present oral mucositis, which is one of the most frequent side effects of this treatment. Clinical manifestations include erythema, edema, ulcerative lesions and pain.⁴ Appropriate oral hygiene has been evidenced in the literature as a strategy that reduces the incidence and gravity of this complication,⁵⁻⁶ being one of the nursing interventions established in clinical practice for onco-hematological patients undergoing chemotherapy.⁷

Besides the direct action on the gastrointestinal tract, the immunosuppression deriving from the use of chemotherapeutic agents can facilitate the appearance of infections in the oral cavity, besides predisposing to the exacerbation of chronic oral and dental infections, which can complicate the evolution of the cancer treatment.³ It is known that the pre-existence of infectious foci and deficient oral hygiene increase the risk of oral infection during cancer treatment. Therefore, patients should

maintain a good oral hygiene level and be submitted to dental treatment.⁸⁻⁹

As regards the knowledge on and accomplishment of oral hygiene, a study that assessed the oral hygiene behavior of 61 adults attended at a public service identified that 34.4% brushed appropriately and that only 27.9% correctly performed the dental flossing technique.¹⁰ In another observational study, aimed at assessing the knowledge about oral hygiene in adult individuals attended at a Family Health Unit, 168 individuals were assessed, 66.6% of whom answered that a professional had already provided them with some information about oral health care. Although the majority had already received orientation, only 38.1% knew about bacterial plaque, 34.5% about tartar, 70.2% about dental caries, and 24.40% revealed knowledge about gingival illness. Among all individuals assessed, 80.3% affirmed knowing about the importance of appropriate oral hygiene, but only a small percentage of patients (19.55%) mentioned oral hygiene care as a strategy to prevent these complications. Through these data, the authors proposed the elaboration of educational programs for oral health promotion and prevention, with a view to training the population for self-care.¹¹

The complexity of the risks and contribution of oral hygiene justify the development of educational resources that support the actions undertaken in daily interactions with the health service users, especially those under chemotherapy treatment. In this context, the technological resources have been widely used, as they facilitate the daily work and even permit tasks that are considered impossible to be accomplished without large efforts.¹² Among the technological resources, educational videos and CD-ROMs are strategies that are increasingly employed.

The construction, validation and use of videos in nursing care have been reported in the literature as successful experiences.¹³⁻⁴ Therefore, the video was used as an educational strategy to teach oral hygiene to patients undergoing chemotherapy. Hence, the objective in this study was to describe the development and validation process of an educational video about oral hygiene for patients undergoing chemotherapy.

METHOD

A descriptive study was undertaken. As proposed in the literature¹⁵, the video was developed in three phases: preproduction, production and postproduction, as presented in Figure 1.



Phase I - Preproduction	Step 1:	Construction of the script based on the literature and the authors' clinical experience
	Step 2:	Validation of the script by experts
	Step 3:	Elaboration of the storyboard
Phase II - Production	Step 4:	Rehearsal with the actors
	Step 5:	Recording of the scenes
	Step 6:	Development of images and animations
	Step 7:	Narration
Phase III - Postproduction	Step 8:	Edition
	Step 9:	Validation of the video by experts

Figure 1. Presentation of development phases and steps of an educational video

In the preproduction phase, initially, the script was constructed, which is an important step to guide the production.¹⁵ Therefore, a scientific literature review was produced on the theme addressed in the video, in the databases MEDLINE and LILACS. The authors' clinical experience was also considered.

At the end of the construction, five experts in care delivery to chemotherapy patients validated the script. For this assessment, an instrument was elaborated, following the criteria proposed by López¹⁶: congruence analysis of the content, inclusion of topics related to the items addressed and verbal language. The experts qualified each of the criteria as desirable or not and existing or not in the script. In addition, space was provided for suggestions.

After validating the script, the storyboard was elaborated, whose goal is to direct the creative process in the further production steps. It was developed in a picture containing two columns. In the first column, the detailed description of the aspects the patient would see was presented, such as scenes, figures, pictures, animations and texts. The second column contains audio aspects, involving the narration and background music. The scenes were inserted in the picture in the chronological order of the script.

In the second phase, the production of the video, the scenes described in the preproduction were recorded¹⁵, besides the narration and selection of texts, figures, pictures and animations. In this phase, the participation of the technical team is fundamental for the sake of appropriate lighting, camera positioning and recording angles, with a view to a good production quality. The inclusion of experts on the theme is also fundamental to assess whether the images are precise for the postproduction phase.

The recording took place at a teaching laboratory of the institution where the study was developed, by two audiovisual technicians experienced in the construction of educational videos, who were affiliated with the same institution. As part of the team of experts on the theme, three authors

participated in the recordings and, based on the storyboard, coordinated this phase.

Initially, one actor performed the oral hygiene, who was a health professional. In view of the difficulty to visualize the entire internal oral cavity, a dentist also accomplished the technique on a large oral cavity mannequin. The filming of the mannequin better showed details like the brushing angle and the flossing.

Besides the recording of the procedure, pictures, drawing and 3D animations were used, elaborated by a specialized professional to demonstrate the topics related to possible oral alterations, the importance of oral hygiene in chemotherapy patients and the material needed. A radio presenter narrated the scenes.

The postproduction phase included the edition of the scenes recorded with the health professional and oral cavity mannequin, the inclusion of text, pictures, drawings, 3D animated figures and the audition. An audiovisual technician experienced in the construction of educational videos was responsible for its execution. For the edition, the software AVID Liquid Pro, version 7 was used.

After concluding the edition, the video was also submitted to validation by five experts in health and education, according to criteria proposed by López.¹⁶ To assess the educational video, the quality of the audiovisual technique employed was considered, the simulated environment, the characters' features and the execution of the oral hygiene technique. After the necessary adaptations, the final content was transferred to DVD (digital versatile disk).

To verify patients' understanding of the educational video, three patients hospitalized at a hematology clinic for chemotherapy opined on the educational material developed. They were part of the pilot study to assess the effect of this video as instructional material. Among other variables analyzed, those of interest at that time were the understanding of the content presented, the quality of the audiovisual material (quality of narration and images) and the



amount of times needed to present the video and obtain the information.

After the patients had watched the video, they were asked to score the assessment of the video as an oral hygiene learning strategy, as well as the number of times needed to apprehend the content.

In compliance with the Requirements of Resolution 196/96, the project was submitted to the Research Ethics Committee where the study was undertaken and approved under Process 5696/2010; also, in compliance with the relevant legislation, those involved in the video signed a form authorizing the use of their image and the experts and patients who assessed the instruments and the video signed the Informed Consent Form (ICF).

RESULTS

As mentioned, the script was constructed based on existing data in the scientific literature, including three main items: introduction on the main oral alterations and the importance of oral hygiene, presentation of the material used for oral hygiene and the brushing, flossing and rinsing technique.

The face and content validation of the script involved five experts in hematology and/or oncology. The experts, three of whom were women, had a mean age of 29.8 years (range from 18 to 32 years) and held an undergraduate degree in medicine (n = 2), nursing (n = 2) and dentistry (n = 1).

The mean time since graduation was 6.6 years and the mean length of activity in hematology and/or oncology 4.2 years. As regards graduate degrees, two were taking a medical residency program in hematology, one was an oncology specialist and a Master's

student in hematology and one held an M.Sc. and Ph.D. in oral rehabilitation.

As regards the congruence of the content, no suggestion was made. Concerning the inclusion of topics related to chemotherapy, the main oral alterations and oral hygiene steps, one of the experts suggested emphasizing the fact that flossing or brushing the tongue may be counterindicated in case of gingival bleeding and/or severe mucositis that affected the oral cavity. Another point mentioned was the need to emphasize that rinsing with 0.12% aqueous chlorhexidine gluconate should be upon professional indication only.

One of the experts also suggested reducing the introduction, removing the topics on the component structure of the oral cavity, succinctly mentioning the main possible complications. The suggestions were accepted and the script started by discussing the importance of correct hygiene and the contamination of the oral cavity.

What the verbal language is concerned, the experts suggested changes, such as replacing "blood stream" by "blood", "oral microorganisms" by "mouth bacteria", "appropriate form" by "correct form", "structures" by "parts", to give examples. The suggestions regarding the language were made to facilitate the patients' understanding of the content. The observations were considered and accepted in the review of the script used to construct the video.

After validating the script, the storyboard was elaborated. As an important and efficient tool to guide the elaboration of the other phases, for illustrative purposes, its initial part was displayed in figure 2.

Visual aspects	Audio
Image: background design - person carrying toothbrush and toothpaste Text: title - "Oral hygiene" and the icons "Introduction" and "Procedure" for the spectator to choose one of both	Background music
Image: Animation of a mouth distanced little by little Text: title "Oral Hygiene" Effect: the text appears, stays on the screen for a while and disappears	Narration: the objective of this educational video is to advise people undergoing treatment with chemotherapeutic drugs on the correct way to perform oral hygiene. Thus, information will be provided to help you improve your mouth care.
Animation: open mouth with mirror moving	Narration: cleaning the mouth is necessary for anyone to maintain his oral health.
Image: 3D drawing of mouth structures Effect: Zoom on the image and taking distance little by little	Narration: the appearance of problems like bacterial plaque, caries and gingival alterations can be prevented if hygiene is done correctly.
Animation: 3D design of the mouth slightly open and taking distance little by little, opens and a microscopic image is placed on the tongue, showing microorganisms, gradually increasing until occupying the full screen	Narration: most of these alterations happen due to the fact that the mouth presents different microorganisms with the bacteria.

Figure 2. Presentation of the storyboard developed for the first part of the video (start of the introduction).

Next, in the production phase, besides the recording, pictures and figures were selected and 3D animations were developed, representing the mouth and oral cavity. Some

examples are presented in figure 3. The final video takes eight minutes and 40 seconds.



Figure 3. 3D images for the educational video

After the editing, the educational video was submitted to validation by five experts, including five nurses who are active in clinical care and research in oncology, and one journalist who is experienced in popular education and holds a Master's degree in education.

Table 1 displays the aspects assessed. The experts qualified each of the items as desirable or not and existing or not in the development of the scenes. In addition, room was provided for suggestions.

One of the experts suggested including a resource to return to scenes. Therefore, on the initial screen, the icons "Introduction" and "Procedure" were introduced, which allows the public to return to the introductory aspects or the procedure as necessary. As the mean evaluation score of the educational video corresponded to 99%, it was considered validated by the experts.

Table 1. Distribution of items in the educational video assessed as desirable and existent by the experts (n = 5), Ribeirão Preto, 2012.

	Desirable (%)	Existent (%)
1. Aspects of audiovisual technique		
. Initial identification of content	100	100
. Lighting needed to observe the scenes	100	100
. Sound needed to listen to narrator's voice	100	100
. Possibility to return to any part of the scenes	100	80
2. Environment		
. Reflects the daily hospital practice	100	100
. Presence of all material needed to accomplish the procedure	100	100
. Simplification of reality at the laboratory does not interfere in the fidelity of the procedure	100	100
3. Characters		
. Language used corresponds to daily practice	100	100
. Procedures used reflect daily practice	100	100
. Narrator's voice is clear	100	100
4. Hygiene procedure		
. The content presented permits understanding:	100	100
- purpose of oral hygiene	100	100
- importance of oral hygiene	100	100
- indicated oral hygiene instruments	100	100
- steps of oral hygiene	100	100
- tooth brushing	100	100
- complementary oral hygiene measures	100	100
- complications		
. All material employed in the procedure is presented	100	80*
. The steps of the procedure are appropriate and can be identified	100	80*
. The video is based on contents published in the literature	100	80*

*One of the experts, from the field of journalism, decided not to issue a technical opinion on the procedure presented in the video.

Next, to assess the understanding of the video elaborated for chemotherapy patients, three subjects (one woman and two men) with onco-hematological diseases, with a mean age of 48.3 years, hospitalized for chemotherapy, assessed it. Two mentioned that the content had to be presented only once to apprehend the knowledge; while the other mentioned the difficulty to watch the placement of the

toothpaste on the toothbrush because of the color of these materials and the background used. To solve this problem, a new scene was included that amplified this image to permit a better visualization of the amount of toothpaste recommended. No considerations were presented regarding the audio. As regards the patients' assessment of the video as a learning strategy about oral hygiene,



their scores ranged between 9.5 and 10 (mean 9.83).

DISCUSSION

It is important to highlight that, to produce a video, two moments should be considered, the conception (creation) and the accomplishment.¹⁷ In line with this approach, the video developed in this study involved three phases (preproduction, production and postproduction) and nine steps, as presented in the literature. In addition, other criteria should be considered, such as: content, technical-esthetic aspects, pedagogical proposal, monitoring material and target public.¹⁸

The validation of the script was considered a fundamental step for the validation phase of the video as, after attending to the experts' considerations in the first validation phase, only one suggestion was provided with regard to the audiovisual aspect. In addition, this permitted reducing the costs in the validation phase of the video, as no new scenes had to be recorded and no modifications were needed in the narration and images, which also contributed to save the professionals' time.

It was also highlighted that the lack of suggestions by the experts regarding the audiovisual aspects (initial content identification, lighting needed to observe the scenes, narration, environment and characters) may be related to the experience of the technical team that participated in this project, as well as of the experts in the development of other educational videos.¹⁹⁻²⁰ Having a specialized technical team working with the expert team is considered as a fundamental factor for the production quality¹⁵, as reinforced by the results obtained in this study.

These aspects probably contributed to the satisfactory assessment (mean 9.83) of the video as a learning strategy, assessed in this study by subjects with similar characteristics to the target population of the video.

In a study that assessed the oral hygiene behavior of 61 adults attended at a public service, it was identified that 34.4% brushed appropriately and that only 27.9% correctly executed the flossing technique.¹⁰ In another observational study, aimed at assessing the knowledge about oral hygiene among adult individuals attended at a Family Health service, 168 individuals were assessed, of whom 66.6% answered they had already received some information from a professional about oral health care. Although the majority had already received orientation, only 38.1%

knew about bacterial plaque, 34.5% about tartar, 70.2% about dental caries and 24.40% revealed knowing what gingival disease is. Among the individuals assessed, 80.3% affirmed that they knew about the importance of appropriate oral hygiene, but only a small percentage of patients (19.55%) mentioned oral hygiene care as a strategy to prevent these complications. Based on these data, the authors propose the elaboration of educational programs for oral health promotion and prevention, with a view to training the population for self-care.¹¹

Researchers assessed oral health knowledge and attitudes of education and health professionals working in a health care program. It could be affirmed that the attitudes towards oral health and hygiene are not always coherent with the knowledge the professionals express, nor even with the knowledge they should have. The data were compared with the oral hygiene habits of the children at the kindergarten under analysis, and showed that, among the 67 professionals interviewed, 97.0% affirmed that oral health can interfere in general health, but only 37.3% answered correctly about this interference. As regards caries prevention, 92.5% affirmed knowing the methods to avoid it and 81.3% indicated oral hygiene as a way to prevent caries. In comparison with the oral hygiene habits of the children observed in the study, however, it was perceived that this practice is not always performed.²¹

These data reinforce the need to educate the general population about oral hygiene. A large part of the population realizes or was oriented about the importance and performance of appropriate oral hygiene verbally or in writing. Nevertheless, the need for new strategies is observed with a view to a change of attitudes, as the health professionals play a fundamental role in the education, orientation and encouragement of healthy oral hygiene habits.

Videos have been evidenced in the literature as a promising knowledge acquisition strategy, playing a relevant educational role. This information technology resource is indicated as a factor that stimulates and attracts the attention of those involved, encouraged by the moving images and sound, which are efficient resources that help to capture the information.²²

There is an urgent need to orient patients submitted to chemotherapy treatment about appropriate oral hygiene, as oral infections and/or bad hygiene conditions can entail the risk of worsening systemic and local



complications originating in the oncology treatment.

The construction of an educational video is a technological resource health professionals can use to provide information/orientations about appropriate oral hygiene for cancer patients submitted to oncology treatment.

Therefore, it is concluded that the steps adopted in the construction and validation of the video about oral hygiene for chemotherapy patients were appropriate and can be used with distinct themes. Thus, the intent is to contribute to health professionals with support to elaborate videos as an educational resource. The video was submitted to expert validation but a study is needed to assess its impact in clinical practice.

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