TEXTO & CONTEXTO ENFERMAGEM
TEXT & CONTEXT NURSING TEXTO & CONTEXTO ENFERMERÍA

DEVELOPMENT AND VALIDITY OF AUDIOVISUAL TECHNOLOGY FOR MEDICATION PREPARATION AND ADMINISTRATION VIA FEEDING TUBE

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ABSTRACT

Objective: to develop and validate an audiovisual educational technology in the form of video to add scientific and practical knowledge to nursing professionals during oral medication preparation and administration via feeding tube.
Method: this is a methodological study based on the theoretical framework of Fleming, Reynolds and Wallace, held in Ribeirão Preto, São Paulo, Brazil, from September 2022 to August 2023. The population was made up of seven experts, three nurses, two pharmacists and two nutritionists. The study was developed in three phases: "Pre-production" – literature review and script preparation; "Production" – script validity and video recording; and "Post-production" – video validity. Material appearance and content were validated using the Delphi technique and a Content Validity Index greater than or equal to 70% (CVI ≥0.7).
Results: the video script/storyboard was developed and validated by seven experts, with 94.2% agreement. The video was validated and reached 99.2% agreement among experts in terms of functionality, usability, efficiency, audiovisual technique, environment and procedures. Experts suggested organizing the video into three parts, which involved general considerations related to feeding tubes (Video 1), nursing care related to preparation (Video 2) and medication administration in adult and elderly patients with a tube (Video 3).
Conclusion: the audiovisual educational technology developed in this study in the form of video can contribute to training high school and higher education professionals as well as students of vocational training and undergraduate courses in nursing.

DESCRIPTORS: Nursing Care. Validation Study. Instructional Film and Video. Enteral Nutrition. Pharmaceutical Preparations. Audiovisual Aids. Patient Safety.

HOW CITED: Oliveira PA, Pereira RA, Martins IC, Rigotti AR, Varallo FR, Zanetti MOB, Gimenes FRE. Development and validity of audiovisual technology for medication preparation and administration via feeding tube. Texto Contexto Enferm [Internet]. 2024 [cited YEAR MONTH DAY]; 33:e20230215. Available from: https://doi.org/10.1590/1980-265X-TCE-2023-0215en

DESENVOLVIMENTO E VALIDAÇÃO DE TECNOLOGIA AUDIOVISUAL PARA PREPARO E ADMINISTRAÇÃO DE MEDICAMENTOS VIA SONDA ENTERAL

RESUMO

Objetivo: desenvolver e validar uma tecnologia educativa audiovisual na forma de vídeo para agregar conhecimentos científicos e práticos aos profissionais de Enfermagem durante o preparo e a administração de medicamentos orais via sonda enteral.
Método: trata-se de um estudo metodológico, alicerçado no referencial teórico de Fleming, Reynolds e Wallace. Realizado em Ribeirão Preto, São Paulo, Brasil, de setembro de 2022 a agosto de 2023. A população foi composta por sete especialistas, sendo três enfermeiras, duas farmacêuticas e duas nutricionistas. Estudo desenvolvido em três fases: "Pré-produção" – revisão da literatura e elaboração do roteiro; "Produção" – validação do roteiro e gravação do vídeo; e, "Pós-produção" – validação do vídeo. A aparência e o conteúdo do material foram validados pela técnica Delphi e pelo Índice de Validade de Conteúdo maior ou igual a 70% (IVC ≥0,7).
Resultados: o roteiro/script/*storyboard* do vídeo foi desenvolvido e validado por sete especialistas, com 94,2% de concordância. O vídeo foi validado e atingiu 99,2% de concordância entre os especialistas nos quesitos funcionalidade, usabilidade, eficiência, técnica audiovisual, ambiente e procedimentos. Os especialistas sugeriram organizar o vídeo em três partes, as quais envolveram considerações gerais relacionadas às sondas enterais (Vídeo 1), cuidados de Enfermagem relacionados ao preparo (Vídeo 2) e à administração de medicamentos em pacientes adultos e idosos com sonda (Vídeo 3).
Conclusão: a tecnologia educativa audiovisual desenvolvida neste estudo na forma de vídeo pode contribuir com a capacitação de profissionais de nível médio e superior, bem como de estudantes dos cursos técnicos e de graduação em Enfermagem.

DESCRITORES: Cuidados de Enfermagem. Estudo de Validação. Filme e Vídeo Educativo. Nutrição Enteral. Preparações Farmacêuticas. Recursos Audiovisuais. Segurança do Paciente.

DESARROLLO Y VALIDACIÓN DE TECNOLOGÍA AUDIOVISUAL PARA LA PREPARACIÓN Y ADMINISTRACIÓN DE MEDICAMENTOS VÍA SONDA ENTERAL

RESUMEN

Objetivo: desarrollar y validar una tecnología educativa audiovisual en forma de video para agregar conocimientos científicos y prácticos a los profesionales de enfermería durante la preparación y administración de medicamentos orales vía sonda enteral.
Método: se trata de un estudio metodológico, basado en el marco teórico de Fleming, Reynolds y Wallace. Realizado en Ribeirão Preto, São Paulo, Brasil, de septiembre de 2022 a agosto de 2023. La población estuvo compuesta por siete especialistas, tres enfermeros, dos farmacéuticos y dos nutricionistas. Estudio desarrollado en tres fases: "Preproducción" – revisión de literatura y preparación de guión; "Producción" – validación de guión y grabación de vídeo; y "Postproducción" – validación de vídeo. La apariencia y contenido del material fueron validados mediante la técnica Delphi y el Índice de Validez de Contenido mayor o igual al 70% (IVC ≥0,7).
Resultados: el guión/script/storyboard del vídeo fue desarrollado y validado por siete expertos, con un 94,2% de acuerdo. El vídeo fue validado y alcanzó un 99,2% de acuerdo entre expertos en cuanto a funcionalidad, usabilidad, eficiencia, técnica audiovisual, entorno y procedimientos. Los expertos sugirieron organizar el video en tres partes, que involucraron consideraciones generales relacionadas con las sondas enterales (Video 1), cuidados de enfermería relacionados con la preparación (Video 2) y administración de medicamentos en pacientes adultos y ancianos portadores de sonda (Video 3).
Conclusión: la tecnología educativa audiovisual desarrollada en este estudio en forma de video puede contribuir a la formación de profesionales de la educación secundaria y superior, así como de estudiantes de cursos técnicos y de pregrado en enfermería.

DESCRIPTORES: Atención de Enfermería. Estudio de Validación. Película y Vídeo Educativos. Nutrición Enteral. Preparaciones Farmacéuticas. Recursos Audiovisuales. Seguridad del Paciente.

INTRODUCTION

According to data from the American Society for Parenteral and Enteral Nutrition (ASPEN), approximately 245 thousand patients per year make temporary use of a feeding tube in a hospital setting and approximately 31 thousand use enteral access at home[1]. In Brazil, these data are not available; however, it is known that feeding tubes are widely used at all levels of care[2].

Enteral access devices enable administrating nutrients and/or medications in the gastrointestinal tract[3–4]. However, although medication administration via feeding tube offers benefits to patients, its practice involves healthcare risks[5–9], requiring scientific knowledge and mastery of practice, with a view to ensuring safety in drug therapy[5,9].

One of the greatest challenges in managing oral medications in patients who are fed exclusively through tubes is the fact that most of these medications are not formulated for this route[1,3,9–12]. For this reason, nursing professionals need to modify the pharmaceutical form to enable medication administration via tube[3,6,11]. Furthermore, there are divergences in the literature regarding safe practices in medication preparation and administration via tube[5,11], a problem that results in doubts and harm to the quality of care provided by the healthcare team, in addition to increasing the risk of preventable harm to patients[8,11].

The literature shows that educational videos, as an educational strategy, are capable of arousing users' interest, in addition to encouraging the teaching-learning process and increasing professionals' knowledge levels. However, there is a scarcity of this material on digital platforms[13–15].

Given the need to train and improve nursing professionals' knowledge with a view to preventing adverse events related to medication use, the present study was proposed with the objective of developing and validating an audiovisual educational technology in the form of video to add scientific knowledge and practical services to these professionals during medication preparation and administration via feeding tube.

METHOD

This is a study of the development of educational technology based on the foundations of methodological studies and based on the theoretical framework of Fleming, Reynolds, Wallace[13]. The project was approved by the Research Ethics Committee (REC) of a public university, in compliance with the guidelines of Resolutions 466/12 and 510/16 that deal with research with human beings. The study was carried out from September 2022 to August 2023.

The study population was made up of a group of seven experts and included three nurses, two pharmacists and two nutritionists, who were invited to participate in the process of validating the script/storyboard and validating the educational video appearance and content by using the Delphi technique[16].

The Delphi technique is used in content and/or tool validity processes, or in situations in which there is controversy in the literature on a certain subject. In this technique, a group of experts is brought together to establish a consensus among opinions using data collection instruments, preserving participant anonymity[16].

There is no consensus in the literature regarding the ideal number of experts for validating technologies; however, it is considered that "seven" is a sufficient number to provide reliability to these tools, and this number should not be less than five[17].

The choice and selection of experts were carried out by the researchers, considering different professional categories contained in the areas of interest and the previously known expertise of these professionals regarding the theme “safety in medication administration via feeding tube” and/or “nursing care with feeding tube” and/or “audiovisual technology development”, based on “snowball” sampling. Experts were selected and classified according to the “Expert Selection Criteria” authored by Guimarães *et al*.[18] (2016). This is a scale for validating nursing instruments in Brazil, which has a score of 0-11 points, with this score being able to be increased by an extra point for each additional year of experience in the thematic area. Furthermore, the scale provides a minimum score for participation as an expert of six points, which establishes greater reliability of results[18].

Recruitment was carried out using electronic invitations sent by email to experts, with a detailed description of the study objectives and methodology. Experts were invited to sign the Informed Consent Form (ICF) and to validate the video appearance and content using the “Educational video script/storyboard validity instrument” and the “Educational video validation instrument”, both written by Ferreira *et al*.[19] (2015). Everyone agreed to participate in the study. Data collection took place between November 2022 and May 2023.

This study took place in three phases. In phase I (pre-production), a literature review was carried out, which supported script construction owith the presentation of evidence about failures related to medication preparation and administration via feeding tube, techniques used by nursing professionals in relation to the practice in question and strategies used to improve this practice.

The literature survey for phase I development was carried out over a period of ten years (2013-2022) in the CINAHL, Embase, LILACS, PubMed and Scopus databases, which were defined as containing studies of interest in the area of comprehensive health care. The study selection criteria occurred in a stratified manner, by two independent authors and in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) flowchart[20]. Phase I was developed between September and November 2022.

In phase II (production), the “Educational video script/storyboard validity instrument” was used to validate content using descriptive statistics based on a Likert-type scale, with five response options: “strongly agree”, “agree”, “disagree”, “strongly disagree” and “do not know”. Experts assessed the script/storyboard regarding objective, content, relevance, environment, verbal language and inclusion of topics. In the header of the form, the definition of each of the items mentioned was made available, and at the footer, an open field was provided for experts to present their criticisms and/or suggestions so that the material could be improved. This stage aimed to consider the content validated by the sum of the concepts “strongly agree” and/or “agree” based on a Content Validity Index greater than or equal to 70% (CVI ≥0.7).

Still in phase II, the educational video scenes and voiceover were recorded at the Nursing Practice Simulation Center (CSPE – *Centro de Simulação de Práticas de Enfermagem*) of a public university in the countryside of São Paulo during February and March 2023. The recording was carried out by researchers and professionals from the university’s Multimedia Creation and Production Service. The video editing and voiceover took place simultaneously, from March to May 2023, online and synchronously, by the same professionals, via Google Meet platform, making a total of nine meetings, with an average duration of two hours each. Phase II took place between November 2022 and May 2023.

In phase III (post-production), the video was validated by the same experts from the previous phase, this time using the "Educational video validity instrument", composed of a five-point Likert scale. The video was assessed regarding functionality, usability, efficiency, audiovisual technique, environment and procedure, also based on a Content Validity Index greater than or equal to 70% (CVI ≥0.7). This phase took place in May 2023.

Whenever the result of each sub-item was considered "unsatisfactory" by more than 30% of experts, the content should be reviewed by the researchers and submitted to a new validity stage. Researchers[19,21] used this criterion to validate audiovisual learning technologies in a satisfactory manner and maintain reliability.

The data obtained in phases II and III were entered into a Microsoft Excel Plus 2021 spreadsheet using double entry consistency analysis. Then, the data were imported into the SPSS (Statistical Package for the Social Sciences) version 21.0 for descriptive statistical analyzes (frequency and percentage), position measurement (mean) and variability (standard deviation).

RESULTS

A total of 3,333 scientific studies were found through the databases, 897 of which were duplicates and were excluded using the EndNote™ software. Thus, two authors independently screened 2,436 studies, of which only 74 were related to the topic in question, according to the reading of titles and abstracts. Of these, four documents were not available and were excluded. Therefore, a total of 70 documents were selected for full reading. Of these, 48 were excluded because they did not meet the eligibility criteria related to relevance to the topic.

The final sample comprised 22 studies that were related to best practices regarding medication preparation and/or administration via feeding tube by nursing professionals (Figure 1).

For phase I development (pre-production), studies resulting from the literature review were used, which supported the presentation of recent evidence about failures related to the practice in question, techniques used by nursing professionals in relation to oral medication preparation and administration via feeding tube and strategies used to improve procedures.

During script/storyboard and educational video development, the authors sought to meet nursing professionals' needs regarding medication preparation and administration via feeding tube so that this process could be elucidated and safe for who participates in it – professional and patient. Terms familiar to these professionals were used during written content preparation, and, in the voiceover, a personal pronoun was used in the third person conjugation, "you", so that viewers could feel like they were participating in the video. To record the scenes, we chose a scenario that portrayed the reality of a hospital setting, in addition to the wealth of details to facilitate the viewers' understanding. These characteristics had the main objective of ensuring that, when watching the video, the target audience was able to familiarize themselves with the setting and, therefore, identify that the procedures carried out in the video are part of their daily lives.

In phase II (production), participants were characterized (Table 1), and the script/storyboard and validity instrument were sent via email to the seven experts.

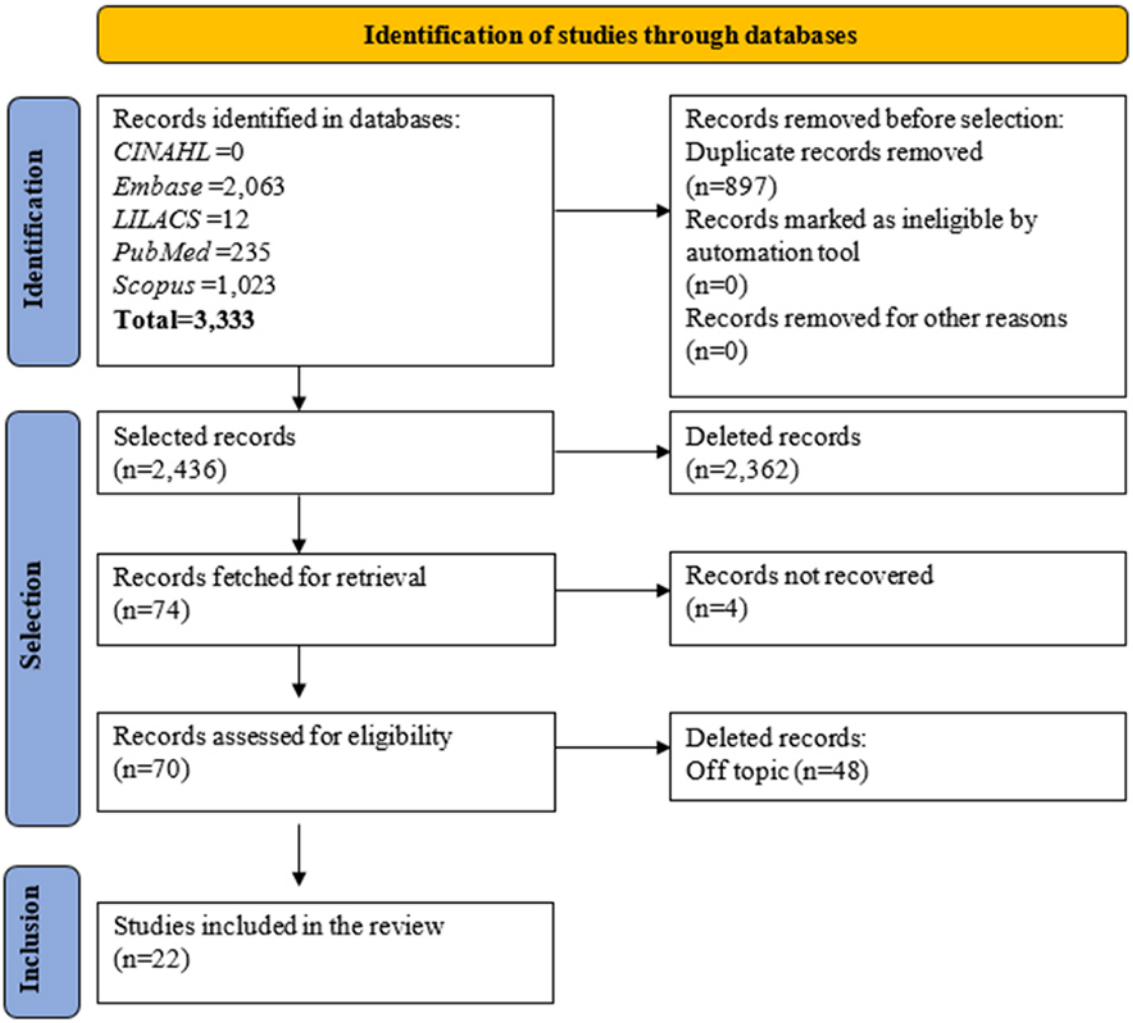

Figure 1 – PRISMA 2020 flowchart. Ribeirão Preto, SP, Brazil, 2023.
Source: Adapted from Page *et al.*[20] (2021).

All items assessed using the "Educational video script/storyboard validity instrument" and sub-items obtained a score above 70% (Table 2). Therefore, the content was considered validated and revalidity was not necessary. However, the experts made comments and suggestions for improving the content.

Table 1 – Expert characterization. Ribeirão Preto, SP, Brazil, 2023. (n=7)

Description	n (%)	Mean (SD*)
Sex		
Female	7 (100)	–
Male	–	–
Others	–	–
Age (years)	–	40.43 (6.0)
Training time (years)	–	17.43 (6.4)
Training		
Nursing	3 (42.9)	–
Pharmacy	2 (28.6)	–
Nutrition	2 (28.6)	–
Occupation area†		
Surgical clinic	–	–
Medical clinic	1 (8.3)	–
OEPNT‡ consultancy	1 (8.3)	–
Teaching	4 (33.3)	–
Multidisciplinary nutritional therapy team	2 (16.67)	–
Nursing management	1 (8.3)	–
Gynecology and obstetrics	1 (8.3)	–
Nutrition and dietetics service supervision	1 (8.3)	–
Adult Intensive Care Unit	1 (8.3)	–
Academic degree		
Undergraduate	–	–
Specialization	–	–
Master's	3 (42.9)	–
Doctoral	4 (57.1)	–
Post-doctoral	–	–
Experience with Continuing Education		
No	2 (28.6)	–
Yes	5 (71.4)	–

* SD: standard deviation; †area of expertise: some experts had more than one area of expertise; ‡OEPNT: Oral, Enteral and Parenteral Nutritional Therapy.

Table 2 – Educational video script validity according to experts. Ribeirão Preto, SP, Brazil, 2023. (n=7)

	SA*	A†	D‡	SD§	DNK‖	Validity
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
1. Objectives						
1.1. Coherence with nursing practice	6 (85.7)	1 (14.3)	–	–	–	7 (100)
1.2. Coherence with study objectives	6 (85.7)	1 (14.3)	–	–	–	7 (100)
1.3. Suitable for carrying out	5 (71.4)	2 (28.6)	–	–	–	7 (100)
Answers=21	17 (81.0)	4 (19.0)	–	–	–	21 (100)
2. Content						
2.1. Corresponds to study objectives	4 (57.1)	3 (42.9)	–	–	–	7 (100)

Table 2 – Cont.

	SA*	A†	D‡	SD§	DNK‖	Validity
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
2.2. Facilitates the teaching-learning process	5 (71.4)	1 (14.3)	1 (14.3)	–	–	6 (85.7)
2.3. Allows understanding of the topic	5 (71.4)	1 (14.3)	1 (14.3)	–	–	6 (85.7)
2.4. Follows a logical sequence	3 (42.9)	3 (42.9)	1 (14.3)	–	–	6 (85.7)
2.5. Incorporates the necessary steps	3 (42.9)	4 (57.1)	–	–	–	7 (100)
2.6. It has all the necessary materials	5 (71.4)	1 (14.3)	1 (14.3)	–	–	6 (85.7)
2.7. Information is reliable	5 (71.4)	1 (14.3)	1 (14.3)	–	–	6 (85.7)
Answers=49	30 (61.2)	14 (28.6)	5 (10.2)	–	–	44 (89.8)
3. Relevance (images and narrated scenes)						
3.1. Illustrate important aspects	4 (57.1)	3 (42.9)	–	–	–	7 (100)
3.2. Allow execution	5 (71.4)	2 (28.6)	–	–	–	7 (100)
3.3. Allows transfer of content	2 (28.6)	4 (57.1)	1 (14.3)	–	–	6 (85.7)
Answers=21	11 (52.4)	9 (42.9)	1 (14.3)	–	–	20 (95.2)
4. Environment						
4.1. Scenario is suitable for the video	7 (100)	–	–	–	–	7 (100)
4.2. Scenario is suitable for learning	7 (100)	–	–	–	–	7 (100)
Answers=14	14 (100)	–	–	–	–	14 (100)
5. Verbal language						
5.1. Accessible to the target audience	4 (57.1)	3 (42.9)	–	–	–	7 (100)
5.2. Easy assimilation	4 (57.1)	3 (42.9)	–	–	–	7 (100)
Answers=14	8 (57.1)	6 (42.9)	–	–	–	14 (100)
6. Inclusion of topics						
6.1. Video objectives	7 (100)	–	–	–	–	7 (100)
6.2. Brief history of feeding tube	4 (57.1)	1 (14.3)	1 (14.3)	–	1 (14.3)	5 (71.4)
6.3. Purpose of feeding tube	6 (85.7)	1 (14.3)	–	–	–	7 (100)
6.4. Objectives of administering medications via feeding tube	6 (85.7)	1 (14.3)	–	–	–	7 (100)
6.5. Description of procedure steps	4 (57.1)	2 (28.6)	1 (14.3)	–	–	6 (85.7)
Answers=35	27 (77.1)	5 (14.3)	2 (5.7)	–	1 (2.9)	32 (91.4)
Total (Answers=154)	**107 (69.5)**	**38 (24.7)**	**8 (5.2)**	**–**	**1 (0.6)**	**145 (94.2)**

*SA: strongly agree; †A: agree; ‡D: disagree; §SD: strongly disagree; ||DNK: do not know.

At this stage, suggestions were related to the need to emphasize some steps in the medication preparation technique, the insertion of illustrative images, and the inclusion of standards and resolutions. The other suggestions related to language and use of repetitive speeches. Suggestions were accepted and the script was restructured, making a total of 45 scenes.

After validating the script/script/storyboard content, the scenes and voiceover were recorded/edited, and, subsequently, phase III, video validity, was carried out. After recording and editing, the video lasted 18 minutes and 37 seconds. Nursing procedures were developed clearly and slowly, contributing to the understanding of the techniques performed by the main character, who sought to represent a nurse. This role was played by one of the researchers.

To validate the video, the "Educational video validity instrument" was sent to the seven experts via email, along with the video link for exclusive access, which was via YouTube®. Once again, experts assessed all items and sub-items in the video with a score above 70% (Table 3), without the need for revalidity. However, as in the previous phase, suggestions were made by experts with the aim of improving the object of study.

Table 3 – Educational video validity according to experts, Ribeirão Preto, SP, Brazil, 2023. (n=7)

	SA*	A†	D‡	SD§	DNK‖	Validity
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
1. Functionality						
1.1. Tool meets the objectives	7 (100)	–	–	–	–	7 (100)
1.2. Generates learning results	7 (100)	–	–	–	–	7 (100)
Answers=14	14 (100)	–	–	–	–	14 (100)
2. Usability						
2.1. Easy to use	7 (100)	–	–	–	–	7 (100)
2.2. Easy to learn concepts and applications	5 (71.4)	2 (28.6)	–	–	–	7 (100)
2.3. Easy to apply concepts in practice	7 (100)	–	–	–	–	7 (100)
Answers=21	19 (90.5)	2 (9.5)	–	–	–	21 (100)
3. Efficiency						
3.1. Suitable duration for learning	4 (57.1)	2 (28.6)	1 (14.3)	–	–	6 (85.7)
3.2. Number of scenes consistent with time	4 (57.1)	3 (42.9)	–	–	–	7 (100)
Answers=14	8 (57.1)	5 (35.7)	1 (7.1)	–	–	13 (92.9)
4. Audiovisual technique						
4.1. Suitable lighting	7 (100)	–	–	–	–	7 (100)
4.2. Clear and suitable narrator's voice	7 (100)	–	–	–	–	7 (100)
4.3. Efficient and understandable narration	7 (100)	–	–	–	–	7 (100)
4.4. Easy return to any scene	6 (85.7)	1 (14.3)	–	–	–	7 (100)
Answers=28	27 (96.4)	1 (3.6)	–	–	–	28 (100)
5. Environment						
5.1. Reflects daily hospital practice	5 (71.4)	2 (28.6)	–	–	–	7 (100)
5.2. The laboratory did not interfere with fidelity	5 (71.4)	2 (28.6)	–	–	–	7 (100)
Answers=14	10 (71.4)	4 (28.6)	–	–	–	14 (100)

Table 3 – Cont.

	SA*	A†	D‡	SD§	DNK‖	Validity
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
6. Procedure						
6.1. Video objectives	7 (100)	–	–	–	–	7 (100)
6.2. Purpose of feeding tube	5 (71.4)	2 (28.6)	–	–	–	7 (100)
6.3. Nursing care	6 (85.7)	1 (14.3)	–	–	–	7 (100)
6.4. Presentation of the materials used	6 (85.7)	1 (14.3)	–	–	–	7 (100)
6.5. Suitable/easily identified steps	5 (71.4)	2 (28.6)	–	–	–	7 (100)
Answers=35	29 (82.9)	6 (17.1)	–	–	–	35 (100)
Total (Answers =126)	107 (84.9)	18 (14.3)	1 (0.2)	–	–	125 (99.2)

*SA: strongly agree; †A: agree; ‡D: disagree; §SD: strongly disagree; ||DNK: do not know.

Suggestions were related to the need to emphasize some steps in the technique for administering medications via tube, inclusion of scenes with different types of syringes for oral/enteral use, and exclusion of repetitive speeches.

In the item "efficiency", which referred to the performance and resources related to the video's time, three of the seven experts highlighted the long duration, which could weaken the use of the video, as some professionals could feel discouraged from watching the video or become distracted when following it. Experts also highlighted that short videos tend to be searched more frequently by viewers and suggested fragmenting the material. Therefore, the researchers chose to accept the suggestion. That said, some scenes and the voiceover needed to be re-recorded. To maintain fidelity, the same setting was used for re-recording, and thus the video was divided into three independent and complementary final products: Video 1 – Feeding tubes and general considerations for medication administration (duration of 7 minutes and 1 second, containing 20 scenes); Video 2 – Medication preparation for administration via feeding tube (duration of 10 minutes and 1 second, containing 28 scenes); and Video 3 – Medication administration via feeding tube (duration of 5 minutes and 14 seconds, containing 15 scenes). The scenes and voiceover from the video were re-recorded in just one meeting and edited again during June, July and August 2023, in seven meetings via Google Meet, with an average duration of two hours each, for subsequent availability of the videos on digital platform.

The final version of the videos is available on YouTube®, the channel of the public university under study, and can be accessed free of charge through the links: https://youtu.be/0VATwQWLexU?si=HSBVa6ZMLtknuvCz (Feeding tubes and general considerations for medication administration – Video 1); https://youtu.be/0K6bpVtnAo0?si=RvO0AyoW9MMz0uMd (Medication preparation for administration via feeding tube – Video 2); https://youtu.be/BlgxTYcoxxo?si=kouTwxN7zDUXATFv (Medication administration via feeding tube – Video 3).

DISCUSSION

On April 1, 2013, the Brazilian National Patient Safety Program (PNSP – *Programa Nacional de Segurança do Paciente*) was established with the main objective of "contributing to qualification of health care in all health establishments in the national territory", promoting and supporting initiatives aimed at safety in assistance[22]. However, the challenge persists and is part of the reality of health services.

Previous studies[5–7,11,23] indicate that failures related to medication preparation and administration via tubes are present in health institutions and are responsible for subtherapeutic effects of medications, in addition to toxicity and losses of enteral nutrition devices due to obstruction, with a consequent increase in the demand for hours of healthcare professionals at the bedside, hospital costs, patient exposure to the risk of repeating the procedure and delays in health outcomes. These data reinforce the need for strategies to achieve better health outcomes to be implemented. These literature findings led to the development of this study, since the health context in Brazil is going through fragile moments in all temporal circumstances as a result of a developing country that, nevertheless, needs to offer its population safer health care.

Research[5,24] indicates that nursing professionals' knowledge on the subject is still insufficient. The need to expand nurses' knowledge is evident, as, in addition to caring, this professional is also an educator[8,23], as they are responsible for disseminating the knowledge acquired to other professionals on the team, acting as a learning multiplier. Furthermore, the digital learning context allows for greater reach of the target audience, in addition to expanding the development of safe, evidence-based practices focused on patient safety.

Using educational technologies with the purpose of promoting updated knowledge to health professionals has been a satisfactory, although recent, practice, supporting the scarcity of studies related to the development of audiovisual technologies in the literature.

To prepare a robust script capable of supporting video construction, national[4] and international guidelines[10], resolutions[25–26], among other relevant studies[1,3,6,8–9,11–12,23,27] developed by experts in the subject were used, which pointed out fundamental nursing care in the practice of medication preparation and administration via tube. They were: recognition by nurses of medications with pharmacodynamics and pharmacokinetics compatible for administration via tube; knowledge of the distal positioning of the tube as well as ensuring the stability of this positioning; use of porcelain mortar and pestle to grind medications; medication preparation and administration individually with a view to preventing interactions; dissolving/diluting medications with sterile water in a satisfactory volume; washing the tube before and after diet and medication administration as well as between one medication and another; maintaining a diet break before and after medication administration, in order to prevent drug-nutrient interactions; use of an Oralpack or standard ENFit™ syringe, with preference for a parenteral syringe with a slip nozzle, in the absence of those; among other care.

Research results[5,8,24,27] have shown that educational programs and activities are capable of substantially improving and even subsidizing the practices developed by nursing professionals with the guarantee of safe and effective care for patients.

In line with the previous statement, research developed in a secondary hospital in the state of São Paulo, Brazil, sought to analyze the impact before and after implementing a quality improvement program aimed at medication preparation and administration via feeding tube[27]. The authors identified that crushing enteral-release tablets and mixing more than one medication during preparation decreased from 54.9% to 26.2% after implementing the strategy. Likewise, washing the tube between the administration of one medication and another increased from 8.2% to 66.3%. This evidence proved to be significant for the results related to the quality of care provided to patients admitted to the aforementioned hospital.

Another research developed[24] analyzed nurses' knowledge in seven Intensive Care Units of a hospital located in Jorda, regarding medication administrations via tube, based on pre- and post-educational intervention tests carried out by a pharmacist. Before the intervention, 76.7% of nurses had insufficient knowledge. After the activity, they achieved 48% more knowledge in each domain observed, suggesting the positive effect of educational practices with these professionals.

In line with other research[14–15,19,21,28] that also sought developing audiovisual technologies, the object of this study was prepared following the steps described by Fleming, Reynolds, Wallace[13] (2009), ensuring the quality and reliability of the videos to scientific findings, in accordance with nursing professionals' practical context. Furthermore, this study demonstrated compliance with the methodology used by other authors[14] in script/storyboard construction, as the best scientific evidence on the subject was selected, ensuring a reliable result for the intended audience.

The exhibition of video classes as a pedagogical practice is widely used with a significant difference in the teaching-learning process, as it has shown positive results in academics' and professionals' daily development [13–15,28]. The dynamics of using videos as teaching material allows learners to better absorb the content, recognizing their difficulties and improving their skills[15,21], especially in nursing, in which videos have been an excellent alternative[14–15,28]. It is observed that with this resource it is possible to reproduce practical training and expand the scope of access to scientific information, contributing to new territories previously unexplored.

However, it is important to highlight that developing audiovisual technology is a complex task, which requires researchers to be interested in the topic and technology as well as involvement, time and patience, as the stages can be prolonged and exhausting. This situation is due to the fact that the entire process demands, in scientific research, writing scripts, scheduling rooms and professionals for filming/voiceover, and editing, this last stage being very slow, as it takes weeks to edit scenes/audios that make up just a few minutes of the final video.

Furthermore, it is worth highlighting that the validity of these instruments by experts is fundamental, as the validity process provides greater reliability to the study[29–30], making it possible to infer that the results obtained in the videos developed replicate and truly represent the reality experienced by nursing professionals[29]. The present study supports the assertion, since, as presented in the results, based on script/script/storyboard validity and the relevant adjustments, according to experts' suggestions, the script/script/storyboard presented an approval percentage of 94.2% of the validity rate, also reflecting the 99.2% approval rate of the final video presented to experts, even before the suggestions raised for audiovisual technology were fulfilled. This result highlighted the improvement of content resulting from the assessment and validity process and once again reinforces the essentiality of this resource in technology construction.

It is suggested that further studies seek to assess the results resulting from nursing professionals' access to educational videos on preparing and administering medications via tube so that it is possible to affirm and measure the benefits, which was identified as a limitation of this study. As audiovisual technologies are capable of providing satisfactory results in improving skills, it is also important that more are developed in favor of an innovative and permanent update for nursing professionals.

CONCLUSION

The educational videos developed were created and validated for the context of nursing care practice. The methodological criteria of the reference used were strictly followed, giving the final product a quality result, in addition to being satisfactory, based on expert assessment and validity.

The videos were proposed with a view to updating nursing professionals who provide assistance to adult and elderly patients using a feeding tube to administer medications. However, due to its authenticity and intelligibility, this material can also be used by students of vocational training and undergraduate courses in nursing.

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NOTES

ORIGIN OF THE ARTICLE

Article extracted from the dissertation – *Preparo e administração de medicamentos via sonda enteral: desenvolvimento de vídeo educativo*, to be presented to the Professional Master's Graduate Program in Technology and Innovation in Nursing, *Escola de Enfermagem de Ribeirão Preto*, *Universidade de São Paulo*, in 2024.

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ACKNOWLEDGMENT

We would like to thank the team at the Center for Simulation of Nursing Practices at the *Escola de Enfermagem de Ribeirão Preto* at the *Universidade de São Paulo* for providing the laboratory and materials to conduct the study and the Multimedia Creation and Production Service at the *Escola de Enfermagem de Ribeirão Preto* at the *Universidade de São Paulo* team for their assistance, from recording the scenes/voiceover to editing and making all the content available.

APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Approved by the Ethics Committee in Research of the *Escola de Enfermagem de Ribeirão Preto* at the *Universidade de São Paulo*, Opinion 5.676.664/2022, Certificate of Presentation for Ethical Consideration 61222822.2.0000.5393.

CONFLICT OF INTEREST

There is no conflict of interest.

TRANSLATED BY

Letícia Belasco.

HISTORICAL

Received: August 24, 2023.
Approved: May 06, 2024.

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