Bathing newborns in a bucket: production and validity of an educational video

Banho do recém-nascido no balde: produção e validação de vídeo educativo

Baño del recién nacido en el cubo: producción y validación de video educativo

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Abstract

Objective: To construct and validate an educational video about bathing newborns in a bucket.

Methods: This is applied and methodological research, of technological production, developed in three phases: pre-production, production and post-production from December 2020 to February 2022. In pre-production, the script and storyboard were elaborated and staff recruitment and resources. In production, content validity and script and storyboarding appearance and recording of scenes and in post-production, scene editing and video composition. The validity process of the script, storyboard and edited video was carried out with PhD nurses, social communication professionals and the nursing team. The items objective, content, relevance, environment, verbal language, inclusion of topics, functionality, usability, efficiency, audiovisual technique, environment and procedure were assessed by a Likert scale and the agreement among judges analyzed from the Content Validity Index and Cronbach's alpha above 0.80.

Results: The educational video on how and why to bathe in a bucket was entitled "Good practices: bathing newborns in a bucket" and organized into three scenes: before bathing, during bathing, after bathing; lasting seven minutes and 48 seconds.

Conclusion: The video was developed and validated by nursing and social communication experts and may contribute to the actions developed in the field of neonatology as an adequate health education tool carried out by nurses for families who wish to adopt this type of bath.

Resumo

Objetivo: Construir e validar um vídeo educativo sobre o banho do recém-nascido no balde.

Métodos: Pesquisa aplicada e metodológica, de produção tecnológica, desenvolvida em três fases: pré-produção, produção e pós-produção durante os meses de dezembro de 2020 a fevereiro de 2022. Na pré-produção foi realizada a elaboração do roteiro/*script* e *storyboard* e recrutamento da equipe e recursos. Na produção, a validação de conteúdo e aparência do roteiro/*script* e *storyboard* e gravação das cenas e na pós-produção, a edição das cenas e composição do vídeo. O processo de validação do roteiro/script, *storyboard* e vídeo editado foi realizado com enfermeiros doutores, profissionais da área da comunicação social e equipe de enfermagem. Os itens, objetivo, conteúdo, relevância, ambiente, linguagem verbal, inclusão de tópicos, funcionalidade, usabilidade, eficiência, técnica audiovisual, ambiente e procedimento foram avaliados pela escala Likert e a concordância entre os juízes analisada a partir do Índice de Validade de Conteúdo e do Alfa de Cronbach acima de 0,80.

Resultados: O vídeo educativo de como e porque fazer banho no balde foi intitulado "Boas práticas: banho do recém-nascido no balde" e organizado em três cenas: antes do banho, durante o banho, após o banho; com duração de sete minutos e 48 segundos.

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Conflicts of interest: nothing to declare.

Conclusão: O vídeo foi desenvolvido e validado por especialistas em enfermagem e comunicação social e, poderá contribuir com as ações desenvolvidas no âmbito da neonatologia, como ferramenta adequada de educação em saúde realizada por enfermeiros para as famílias que desejam adotar esta modalidade de banho.

Resumen

Objetivo: Elaborar y validar un video educativo sobre el baño del recién nacido en el cubo.

Métodos: Investigación aplicada y metodológica, de producción tecnológica, desarrollada en tres fases: preproducción, producción y posproducción durante los meses de diciembre de 2020 a febrero de 2022. En la preproducción se realizó la elaboración del guion/*script* y del *storyboard* y el reclutamiento del equipo y recursos. En la producción, la validez de contenido y apariencia del guion/*script* y del *storyboard* y la grabación de las escenas. Y en la posproducción, la edición de las escenas y composición del video. El proceso de validación del guion/script, *storyboard* y video editado fue realizado con enfermeros doctores, profesionales del área de la comunicación social y un equipo de enfermería. Los ítems, el objetivo, el contenido, la relevancia, el ambiente, el lenguaje verbal, la inclusión de tópicos, la funcionalidad, la usabilidad, la eficiencia, la técnica audiovisual, el ambiente y el procedimiento fueron evaluados mediante la escala Likert, y la concordancia entre los jueces fue analizada a partir del Índice de Validez de Contenido y del Alfa de Cronbach superior a 0,80.

Resultados: El video educativo sobre cómo y por qué bañar en el cubo fue intitulado "Buenas prácticas: baño del recién-nacido en el cubo" y organizado en tres escenas: antes del baño, durante el baño y después del baño; con duración de 7 minutos y 48 segundos.

Conclusión: El video fue elaborado y validado por especialistas en enfermería y comunicación social y podrá contribuir con las acciones desarrolladas en el ámbito de la neonatología, como una herramienta adecuada de educación en salud realizada por enfermeros para las familias que desean adoptar esta modalidad de baño.

Introduction

Bathing newborns (NBs), by tradition, is carried out by immersion and in a bathtub, but other modalities such as bathing in a bucket, also known as an *ofuro* (a Japanese-style soaking bathtub) bath, have been used with the same principles. However, there are differences, the *ofuro* bath (hydrotherapy modality) is intended to promote babies' relaxation through warm water and bath in bucket body hygiene.[1,2]

The therapeutic practice of water is related to its physical, mechanical and thermal properties, and is recommended by the Brazilian National Policy for Integrative and Complementary Practices.[3] Warm water is able to decrease the sensitivity of nerve endings and increase peripheral circulation, leading to greater blood supply to the muscles, providing a feeling of well-being, reducing cortisol and energy expenditure.[4]

The use of a bucket in bath allows immersion in a vertical position in warm water, which is reminiscent of the intrauterine environment due to its limited space with walls.[1] In the intrauterine environment, NBs develop notions of body boundaries when moving in the amniotic fluid and touching the umbilical cord, placenta and uterine walls.[4] Recreating this space after birth through this procedure encompasses the concept of exterogestation, which considers the first 100 days of babies as an extension of pregnancy.[5] During this period, humanization practices, such as bathing with a bucket, which contribute to the adaptation of NBs to the extrauterine environment are recommended.[1]

Studies indicate that its use promotes comfort, relaxation, pain relief, tactile and kinesthetic stimulation, prevents cramps, improves sleep patterns and has been used by health professionals, mainly nurses and physiotherapists.[1,3,6] In this way, NBs who have their bath performed in a bucket will be able to enjoy its benefits beyond body hygiene.

There are limited studies that describe the standardization of this technique in a safe way.[2,7,8] In this sense, the development of an educational technology that adequately and audiovisually describes the technique of bathing NBs in a bucket and presents its many benefits can contribute as a health education tool for families who wish to adopt this bathing modality. Moreover, it can be used in the training of professionals and in permanent health education programs.[9]

In nursing, several videos have already been prepared and validated with the purpose of teaching self-care/care to the most diverse audiences.[10-12] User control to pause, rewind and advance are elements that provide efficiency to the teaching-learning process with the use of videos, even for those with insufficient literacy.[13] Therefore, the present study aimed to construct and validate an educational video about bathing NBs in a bucket.

Methods

This is applied and methodological research, of technological production, developed in three phases: pre-production, production and post-production.[14] In pre-production, script and storyboard elaboration, production team, physical, technological and human resource recruitment were carried out. In production, content validity and script and storyboard appearance were carried out with experts from December 2020 to May 2021, rehearsal with actors, recording of scenes on May 22, 2021, development of images, animations and narration/recording of audio on August 26, 2021. In post-production, the composition of all elements of the storyboard, in a continuous sequence of scenes with the inclusion of texts, carried out from June to August 2021. Afterwards, it was submitted to a second validity stage that took place from December 2021 to February 2022.

A search for national and international evidence was carried out to list the stages of bathing the bucket to be included in the script, in Medical Literature Analysis and Retrieval System Online (MEDLINE), through the search engine US National Library of Medicine National Institutes of Health (PubMed), Latin American and Caribbean Literature in Health Sciences (LILACS), through the Virtual Health Library (VHL), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Web of Science.

The Descriptors in Health Sciences (DeCS) and Medical Subject Headings (MeSH) were used: "baths" and "Infant, Newborn", associated by the Boolean AND operator and their respective synonyms by the OR operator. It was standardized in MEDLINE/PubMed and reproduced in other databases according to each one's specific criteria, namely: ("Infant, Newborn"[Mesh] OR (Infants, Newborn) OR (Newborn Infant) OR (Newborn Infants) OR (Newborns) OR (Newborn) OR (Neonate) OR (Neonates)) AND ("Baths"[Mesh] OR (Bath)). Six studies published between 2015 and 2022, which addressed care with immersion of NBs in a bucket, were included. Data were extracted into an Excel® spreadsheet and calculated for the construction of script scene/stage content.

The script, in addition to scenes/stages, included the target audience, objectives, setting, scenes/stages, dummy, team, equipment and materials. The storyboard for recording covered scene descriptions in drawings and shot plans and the storyboard for editing texts and audio aspects such as narration and background music.

Participants in script and storyboard validity were 16 PhD nurses and three social communication experts. Those in the edited video were the 16 PhD nurses and three social communication experts in the first stage and 43 members of the nursing team.

The selection criteria for PhD nurses were those proposed by Fehring 1987, adapted and verified through the Brazilian National Council for Scientific and Technological Development (*Conselho Nacional de Desenvolvimento Científico e Tecnológico*) platform: master's degree in nursing (4 points); master's degree in nursing with dissertation in the area of interest of the study (1 point); PhD thesis in the study area (2 points); clinical experience of at least one year in the area of interest (1 point); certificate of clinical practice (specialization) in the area of interest of the study (2 points); publication relevant to the area of interest (2 points); and publication of an article on the subject in a reference journal (2 points). To be selected, a nurse had to obtain a minimum of five points and hold a PhD.[15]

For social communication experts, they included having an undergraduate degree in social communication, having experience with technical support, programming or networking, and having experience with video editing. For the members of the nursing team, they have been working in the maternal and child area for more than five years. Selection and recruitment were carried out using the snowball technique, which consists of nominating participants by the participants themselves successively.[16]

Contact with participants was made via e-mail. For each stage of the validity process, an instrument was developed in HyperText Markup Language (HTML) standard on Google Forms to be completed via the web in three parts: participant personal

and professional identification; script and storyboard or edited video; and general analysis based on the instruments.

The instruments used in the validity process were adapted from those proposed by Ferreira, developed in Brazil, and validated in terms of content by judges. The one who assessed the script and storyboard has six items and 20 subitems, such as objective, content, relevance, environment, verbal language and inclusion of topics;[17] the edited video, six items and 22 subitems, such as functionality, usability, efficiency, audiovisual technique, environment and procedure.[17] Each item was assessed based on a Likert scale for the weightings: totally agree, partially agree, agree, partially disagree and totally disagree.

The scenes were recorded, after script and storyboard validity, in a room in a house provided by one of the researchers, which had a double bed, a plastic bucket and a bench with a wide base. Before the official recording, rehearsals were carried out to review the script content and storyboard with those involved and to verify the positioning of equipment and actors. Adjustments were made to achieve the good quality of the technique, in addition to features such as 4k resolution and shot variations (medium, pin and close) for the same scene. The audio was recorded in a studio with acoustic insulation by one of the researchers.

The recording equipment was two Sony A6500 cameras with 35mm, 70-200mm and 16mm lenses, video tripod, led light and H6 zoom recorder with lapel. The program for editing the scenes was Final Cut Pro X, and for creating the animation for introduction and inclusion of moving texts, Adobe After Effects. Recording and editing were conducted by the researchers accompanied by professionals with experience in neonatology and audiovisual technicians.

Data were stored in a database in Excel® format extracted from Google forms. They were then imported into the Statistical Package for the Social Sciences (SPSS) version 21.0 and subjected to descriptive statistics for frequency and percentage analysis, position measurements (mean and median) and variability (standard deviation). The agreement among judges was analyzed based on the Content Validity Index (CVI) and Cronbach's alpha above 0.80.[18] Suggestions for adjustments were incorporated and the instrument was forwarded to participants when necessary.

The study followed the current ethical precepts in research and was registered on *Plataforma Brasil*, under CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 46390621.7.0000.8667 and approved by the UFTM Research Ethics Committee 4.856.26.

Results

Of the 16 nurse judges holding a PhD, 15 (93.7%) were female, 11 (68.7%) were from the state of Minas Gerais, two (12.4%) from São Paulo, one (6.3%) from Sergipe, one (6.3%) from Maranhão and one (6.3%) from Santa Catarina. Of these, ten (63.4%) worked in an undergraduate nursing course, three (18%) in Maternal and Child Units, two (12.4%) in teaching and research at a teaching hospital and one (6.2%) in a vocational course in nursing. Training time ranged from six to 35 years, with an average of 16.3 years. The three social communication experts were male and from the state of Minas Gerais, two (66.6%) worked with video recording and editing in an educational institution and one (33.4%) was a professor with a PhD. Of the 43 members of the nursing team, all were female and from the state of Minas Gerais, 33 (76.7%) were nurses and ten (23.3%) were nursing technicians. All working in Maternal and Child Units, 30 (69.7%) in rooming-in and 13 (30.3%) in intensive care. Working time ranged from five to 20 years, with an average of 11.4 years. The final version of the edited video lasted seven minutes and 48 seconds and was organized into three stages: stage 1 – before bathing; stage 2 – during bathing; stage 3 – after bathing (Figure 1). It is available at the link: https://youtu.be/i_rUaABhl2E.

In the script, stage 1 consisted of five plans/care, stage 2 of eight and stage 3 of four, de-

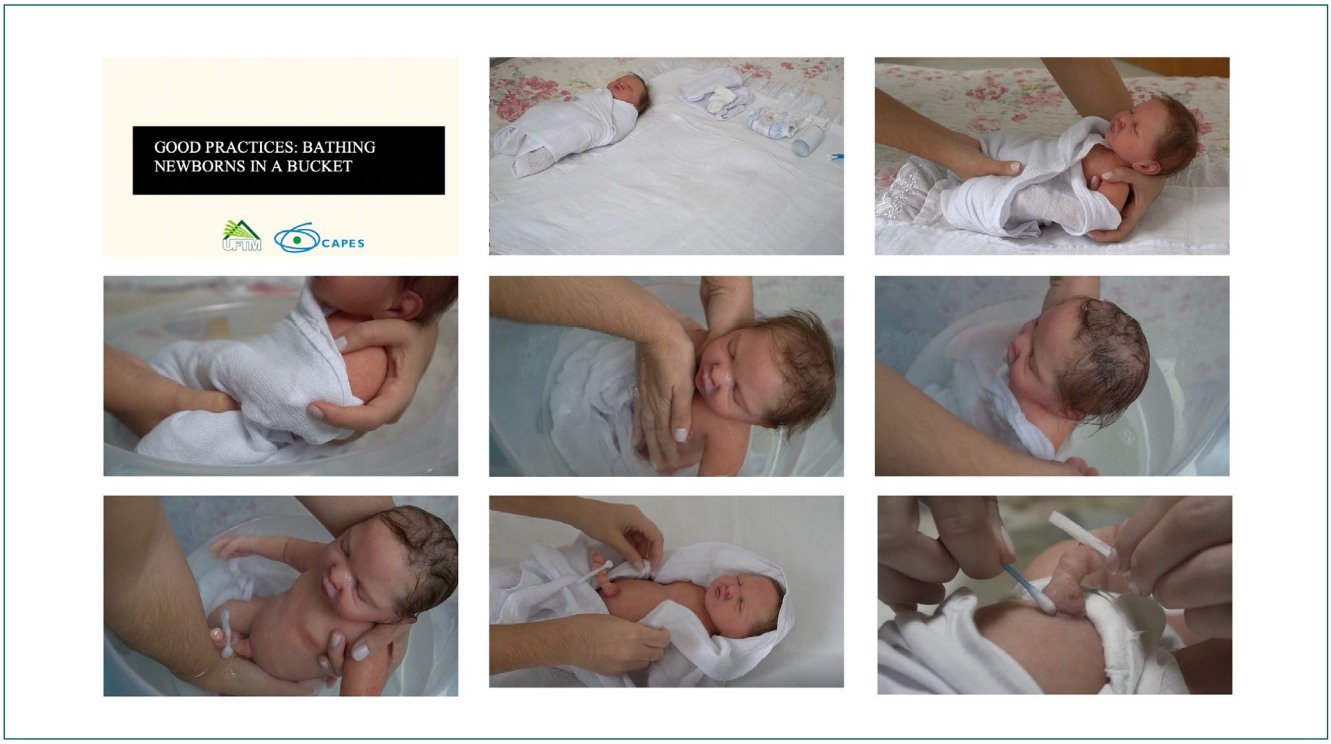

Figure 1. Images from the video "Good practices: bathing newborns in a bucket"

scribed according to the narrator's statements. In the storyboard for recording, the planning of actions in each scene was carried out through hand drawings made by one of the researchers. The storyboard for editing covered post-recording procedures. The instrumental music "Carefree" by public domain artist Kevin MacLeod was used to compose the video along with narration. Text formatting was described according to position, font and color, as in the following example: Title - GOOD PRACTICES: BATHING NEWBORNS IN A BUCKET [In the center of the screen, letters in Arial Black font, capital letters, green color 57684F]. Suggestions and changes to content validity and script and storyboard appearance by judges permeated between the bath technique and making language more accessible. The accepted scores were: reinforcing the sense of head rinsing in the frontal - occipital sense; dry nostrils and ears before placing babies in bucket; turn off air conditioning and fan; put babies to breastfeed when possible; and clean the bucket before and after use. In this first version, it was also suggested to clarify the language for parents and family members, so modifications were made to the entire text to facilitate understanding, without changing content. After modifications were made to the script and storyboard, it was forwarded to PhD nurses for a second round, there were no new suggestions and the second version was sent to judges in the area of social communication, without further considerations. The CVI and Cronbach's alpha of content validity and script and storyboard appearance are presented in Table 1.

Suggestions and changes to edited video appearance validity were: inserting audio in the initial texts containing the recommendations and including the phrase "Watch that the baby's face is not in contact with the water and NEVER leave the baby alone in the bucket". After modifications were made, the edited video was forwarded to the judges for a second round, there were no new suggestions and the second version was sent to social communication experts and the nursing team, without further consideration. The CVI and Cronbach's alpha of edited video appearance validity are presented in Table 2.

Table 1. Content validity and script and storyboard appearance

Items	Round 1 (n=16) CVI	Round 2 (n=10) CVI	Round 1 (n=03) CVI
Objectives			
Objectives are consistent with the practice of bathing NBs	0.93	1.00	1.00
Objectives are consistent with the objectives proposed in the research	0.96	1.00	1.00
Objectives are suitable to be carried out	0.96	1.00	1.00
Content			
Content presented in the script corresponds to the objectives proposed in the work	0.93	0.94	1.00
Content facilitates the teaching-learning process on the subject	0.97	0.94	1.00
Content allows the understanding of the theme	0.97	0.96	1.00
Content follows a logical sequence	0.97	1.00	1.00
Content incorporates all the necessary stages for bathing NBs	0.97	0.98	1.00
Content has all the materials needed for bathing NBs	0.97	0.96	1.00
The information that the script presented is correct	0.93	1.00	1.00
Relevance			
Images and scenes illustrate important aspects for bathing NBs	0.95	1.00	1.00
Images and scenes are relevant for bathing NBs to be of high quality	0.97	0.98	1.00
Images and scenes allow transfer and generalization of learned content to different contexts	0.97	0.96	1.00
Environment			
Setting is suitable for video transmission	0.96	1.00	1.00
Setting is suitable for learning the theme	0.96	1.00	1.00
Verbal language			
Verbal language used in script is accessible to the target audience	0.95	0.96	1.00
Verbal language is easy to assimilate	0.96	1.00	1.00
Inclusion of topics			
Objective of the educational video	0.96	1.00	1.00
Objective of bath in NBs	0.97	0.98	1.00
Proper sequence and care before, during and after bathing	0.97	1.00	1.00
Cronbach's alpha	0.99	0.99	1.00

Table 2. Edited video appearance validity

Items	Round 1 n(16) CVI	Round 2 n(16) CVI	Round 1 n(3) CVI	Round 1 n(43) CVI
Functionality				
The video presents itself as an adequate tool for the purpose for which it is intended	1.00	1.00	0.90	0.96
The video makes it possible to generate positive results in the teaching-learning process on the theme	1.00	1.00	0.90	0.96
Usability				
Video is easy to use	1.00	1.00	0.90	0.95
It is easy to learn the theoretical concepts used and their applications	0.98	1.00	0.85	0.96
Allows users to easily apply the concepts worked on in hospital practice	0.96	0.98	0.90	0.94
Efficiency				
Video duration (time used) is adequate for the user to learn the content	1.00	1.00	0.90	0.96
The number of scenes is consistent with the time proposed for the video	1.00	1.00	0.95	0.95
Audiovisual technique				
Lighting is adequate for observation of practice	1.00	1.00	0.85	0.96
The narrator's tone and voice are clear and appropriate	1.00	1.00	0.90	0.96
Video narration is used efficiently and understandable to the clientele	1.00	1.00	0.95	0.96
It is possible to return to any part of the scenes when desired	1.00	1.00	0.90	0.96
Environment				
The video reflects the daily routine of hospital practice	1.00	1.00	0.90	0.96
The laboratory environment did not interfere with the fidelity of the bath procedure in NBs	0.95	1.00	0.90	0.93
Procedures				
Objectives of the educational video	0.98	0.98	0.90	0.95
Importance of bathing NBs and maternal bonding during bathing	0.93	0.98	0.95	0.95
There was a complete presentation of materials used in the procedure	0.98	1.00	0.80	0.95
The NB bath procedure stages are adequate and could be identified	0.91	1.00	0.98	0.96
Cronbach's alpha	1.00	1.00	0.99	0.99

Discussion

The construction and validity of teaching tools, such as educational videos, has become more frequent in nursing.[10,11,19] The use of this tool has integrated health education actions, permanent education and teaching, improving the acquisition of skills and practical performance.[20-22] In this context, validity proposes to carefully and rigorously assess the material to be developed, so participants must be experts in the investigated topic.[10] In this study, judges were from different Brazilian regions, which facilitated an analysis of the country's cultural differences for better video compression.

According to the items assessed in the script and storyboard, the video content must be aligned with the objectives that it intends to achieve and organized in a logical sequence that contributes to the teaching-learning process. In this regard, it is important to consider the realism of the proposed context to bring viewers closer to the scene. In scene planning, plans must be dynamic, containing details of the procedure from different angles. Moreover, the environment must contain real characteristics such as the procedure apparatus and furniture so that viewers can visualize and compare with their reality.[20-22]

The item efficiency, assessed in terms of post-editing validity, addresses video duration and the relationship between time and the number of scenes. Long videos can take away viewers' attention, as well as long scenes without changing plans, so it is recommended that the total duration does not exceed eight to 12 minutes.[13,23] Changing planes in the same scene contributes to the video becoming attractive and not tiring. Also, the video should be easy to use with efficient pause and rewind capabilities.[13,17]

The audiovisual technique used also influences viewers' interest, factors such as lighting, audio, tone and the narrator's voice must be attractive.[10] In the development of a video with real scenes or simulated scenarios, audiovisual resources must be used that will create a mental representation with lasting multisensory experiences capable of changing attitudes and behaviors of individuals.[10]

In script construction, a detailed description of the technique for bathing in a bucket was taken into account and care was taken to minimize the risks of hypothermia, falls and drowning. For hygiene, NBs' buttocks must be supported at the bottom of the bucket by holding them by the shoulders with the ears pressed between the executor handles to provide stability. Thus, it is possible that one of the performer's hands is free to perform the hygiene of the front and back of the NBs' body.[1]

NBs' entry and removal from the bucket is a key point, you must have one hand firmly on one arm and the other on the leg so that babies do not slip.[1] It should be noted that cleaning the face, as well as bathing in the bathtub, must be performed before placing NBs in the water with moistened cotton and that genitalia hygiene must be reinforced after removing the water, as the bucket offers limited access in these areas.[24]

Wrapping or swaddling was associated to minimize the behavioral stress of babies. Studies show that swaddling decreases crying, stress and agitation, making the bath more peaceful for NBs and parents, in addition to contributing to temperature maintenance. This combination is recommended in any type of bath in the first 20 to 30 days of NBs' life.[25-28]

Home videos found on online platforms show the *ofuro* bath technique and have inconsistencies that can increase these risks, such as placing the bucket on inappropriate surfaces such as a toilet or benches/chairs with a narrow base.[28] That is why it is important to develop content and tools based on scientific evidence.[9,21,22]

NBs do not show visible dirt and sweat, bathing during this period is more to offer comfort, parents who opt for this bath must be trained and acquire the appropriate materials for safety.[24] Bathing in a bucket can be performed from NBs' first day of life with little or no soap to prevent it from becoming slippery.[1] There are specific bucket sizes for each stage of development, so infants and children can benefit from the principles of this bath.[1] The presence of devices, ostomies and malformations without continuity of the skin contraindicate immersion in a bucket.[4]

For the nursing team to train the family, it also needs to receive the necessary training, as this bath

is not always taught during academic training. The video proposed in this study can contribute to this training and be used as a teaching tool in training and health education.

The limitation of this study refers to video content and appearance, which professionals deemed appropriate, there is a need to verify the usability of the tool developed with its target population, NB's family, which will be assessed in later studies as well as its impact.

Conclusion

The educational video developed and validated in this study, by nursing and social communication experts, can contribute to health education actions developed in the field of neonatology about bathing NBs and can be disseminated on online digital platforms with wide access to dissemination. The scenes were divided into before, during and after the bath with plans narrated by one of the researchers and all items were assessed with CVI and Cronbach's alpha above 80%. Recording location and mannequin encourage curiosity, enthusiasm and desire to want to watch the video for resembling a real baby in a home environment were highlighted by experts. It is suggested the development of future researches that assess video effectiveness and applicability in educational actions aimed at parents/guardians.

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Collaborations

Silva MPC, Galli ACA, Fonseca LMM, Cordeiro ALPC, Ruiz MT, Rocha NHG, Rocha JBA and Contim D contributed to project design, data analysis and interpretation, writing of the article, relevant critical review of intellectual content and approval of the final version to be published.

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