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Video training proposal for cervical auscultation: content validation

Proposta de vídeo treinamento para ausculta cervical: validação de conteúdo

Propuesta de formación en vídeo para la auscultación cervical: validación de contenido

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Abstract

Purpose: to verify the agreement between evaluators regarding the content of a tutorial as a training proposal for performing cervical auscultation. **Method:** this is an observational, conceptual, quantitative study, comprising the validation structure of a health tutorial. The video tutorial was built in the 2D animation program, with the presentation of content through interaction with a customized virtual character. The tutorial consists of the presentation of concepts of the clinical evaluation of swallowing and cervical auscultation, exploring the acoustic characteristics of the sounds heard, identifying the sound amplification equipment used in its realization, as well as the positioning of the equipment in the cervical region and the demonstration of the application of the technique, lasting eight minutes. The collected data were analyzed using the content validity index, thus verifying the pertinence of each item, considering the 5-point Likert scale. The minimum agreement considered was 78% as a decision criterion on the pertinence of the instrument item. **Result:** the sample consisted of twelve specialists with a mean age of 34.4 years, with a predominance of females, with 75% of these residents in the southern region. The minimum content validation index found was 83.3%. **Conclusion:** the present study validated the content of a cervical auscultation tutorial, which includes the presentation of concepts and the demonstration of the technical application.

Keywords: Deglutition; Auscultation; Video-Audio Media; Swallowing Disorders; Speech, Language and Hearing Sciences.

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Resumo

Objetivo: verificar a concordância entre avaliadores quanto ao conteúdo de um tutorial como proposta de treinamento para a realização da ausculta cervical. **Método:** trata-se de um estudo observacional, de caráter conceitual, quantitativo, compreendendo a estrutura de validação de um tutorial em saúde. O vídeo tutorial foi construído no programa de animação 2D, com a apresentação do conteúdo através da interação com uma personagem virtual personalizada. O tutorial é composto pela apresentação de conceitos da avaliação clínica da deglutição e da ausculta cervical, explorando as características acústicas dos sons auscultados, a identificação dos equipamentos de amplificação sonora utilizados na sua realização, assim como, no posicionamento do equipamento na região cervical e da demonstração da aplicação da técnica, tendo uma duração de oito minutos. Os dados coletados foram analisados através do índice de validade de conteúdo, sendo verificado a pertinência de cada item, considerando a escala Likert de 5 pontos. A concordância mínima considerada foi de 78% como critério de decisão sobre a pertinência do item do instrumento. **Resultado:** a amostra foi composta por doze especialistas com média de idade de 34,4 anos, com predominância do sexo feminino, sendo 75% residentes na região sul. O índice de validação de conteúdo mínimo encontrado foi de 83,3%. **Conclusão:** o presente estudo validou o conteúdo do tutorial de ausculta cervical, que conta com a apresentação de conceitos e demonstração da aplicação técnica.

Palavras-chave: Deglutição; Auscultação; Mídia audiovisual, Transtorno de deglutição; Fonoaudiologia.

Resumen

Objetivo: Verificar la concordancia entre evaluadores respecto al contenido de una tutoría como propuesta formativa para la auscultación cervical. **Método:** se trata de un estudio observacional, conceptual, cuantitativo, que comprende la estructura de validación de un tutorial de salud. El video tutorial se integró en el programa de animación 2D, con la presentación del contenido a través de la interacción con un personaje virtual personalizado. El tutorial consiste en la presentación de conceptos de la evaluación clínica de la deglución y la auscultación cervical, explorando las características acústicas de los sonidos auscultados, la identificación del equipo de amplificación sonora utilizado en su realización, así como el posicionamiento del equipo en la región cervical y la demostración de la aplicación de la técnica, con una duración de ocho minutos. Los datos recolectados fueron analizados a través del índice de validez de contenido, y se verificó la pertinencia de cada ítem, considerando la escala Likert de 5 puntos. La concordancia mínima considerada fue del 78% como criterio para decidir sobre la pertinencia del ítem del instrumento. **Resultados:** la muestra estuvo constituida por doce especialistas con una edad promedio de 34,4 años, con predominio del sexo femenino, de los cuales el 75% residía en la región sur. El índice de validación de contenido mínimo encontrado fue del 83,3%. **Conclusión:** el presente estudio validó el contenido del tutorial de auscultación cervical, que incluye la presentación de conceptos y demostración de la aplicación técnica.

Palabras clave: Deglución; Auscultación; Medios Audiovisuales, Trastorno de la Deglución; Terapia de lenguaje.

Introduction

Cervical auscultation (CA) is a complementary functional exploration method in the assessment of dysphagia. It is considered non-invasive, easily accessible, and low-cost, and is regarded as a valuable tool due to its contribution of acoustic elements from swallowing sounds [1,2].

CA is performed using an amplification device, which may include a microphone, accelerometer, Doppler sonar, or digital stethoscope, with the common stethoscope being the most frequently used tool in clinical practice [3].

Although the literature considers it a subjective evaluation method, as its results are intrinsically dependent on the evaluator's level of experience, the findings can be interpreted and described as lacking consensus among researchers [4]. This disagreement is observed from the use of the technique itself, the placement of the amplification instrument in the cervical region, to the interpretation of the auscultated sounds [1,5].

To ensure uniformity in performing and interpreting CA, it is essential to provide training for students, speech-language pathologists, and professionals involved in the clinical assessment of dysphagia, who use this method as a complementary element in their practice [6]. Therefore, the creation of a cervical auscultation video tutorial was conceptualized with the aim of contributing to the clinical training of speech-language professionals.

Through the use of digital resources, it is possible to overcome the limitations of traditional teaching, integrating sensory systems and enabling new approaches to knowledge. In this way, content can be presented dynamically and productively, reaching a larger number of people simultaneously [7].

The objective of this study is to validate the content of a video tutorial designed as a training proposal for performing cervical auscultation, by assessing the agreement among evaluators.

Method

This is an observational, conceptual, quantitative study, encompassing the validation structure of a health tutorial, initiated by a systematic literature review, followed by the creation of the items and response scale for evaluators, and the agreement on the feasibility of the tutorial content as a training proposal for performing CA.

This study was approved by the Research Ethics Committee of the proposing institution under the Certificate of Ethical Appreciation Presentation – CAAE 5.370.010, in compliance with the regulations set forth in MS/CNS Resolution No. 466, dated December 12, 2012, which approves the guidelines and regulatory standards for ethics in research.

The research was conducted in three stages: systematic literature review, planning and creation of the tutorial using animation software, and, after that, the content validation process was carried out.

The video tutorial was created using the 2D animation software Animaker®, presenting the content through interaction with a personalized virtual character. Its creation involved developing a script, defining key characteristics for the creation of the character, and structuring the content based on a systematic literature review. The video tutorial includes the presentation of concepts related to the clinical assessment of swallowing and cervical auscultation, exploring the acoustic characteristics of the auscultated sounds, identifying the amplification devices available in the literature and used for the procedure, as well as the positioning of the equipment in the cervical region and a demonstration of the technique application, with a duration of eight minutes.

For the validation stage, a questionnaire was formulated regarding the contribution of the tutorial to clinical speech-language practice. This questionnaire was sent to evaluators digitally, and the evaluation items were presented through the Google Forms application.

Speech-language pathologists with experience in bedside speech therapy who use CA in their clinical practice were included in the study, via email invitation. Forty professionals were invited to participate in the study via an email invitation. The speech-language pathologists who accepted to participate received an email containing a link to access the Google Forms application, where they found the informed consent form, the video tutorial for analysis, and the evaluation questionnaire. Exclusion criteria included failure to respond to the questionnaire or incomplete responses.

The evaluation questionnaire consisted of closed and open-ended questions regarding the structure, content, and relevance of the tutorial. In

the first part of the questionnaire, the judges were asked to analyze the following aspects of the video regarding its structure: video sequence, clear and direct language, scientific language, visual structure and presentation, and supplementary information for professionals not trained in CA. The second part focused on content: concepts and information content, identification of collection equipment, positioning in the cervical region, utility of the video tutorial for CA training, the possibility of initial training for CA, and clarity in identifying CA as a complementary examination. The third part addressed the relevance of the video tutorial: applicability in teaching, enhancement of scientific knowledge, and facilitation of the examination procedure. The fourth part consisted of an open-ended question for the judges' suggestions.

The responses from the Google Forms application were entered into a database for later statistical analysis. The collected data were analyzed using the Content Validity Index (CVI) [7], to assess the relevance of each item, considering the 5-point Likert scale [8]. The minimum agreement considered was 78% (combining the responses "agree" and "strongly agree") as the decision criterion for the pertinence of each item. In the case of six or more judges, a rate not lower than 78% is recommended to verify the validity of new instruments [9,10].

Quantitative variables were described using mean and standard deviation or median and range, depending on the data distribution. Categorical variables were described using absolute and relative frequencies. A significance level of 5% was adopted, and data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 28.0 for Windows.

Results

The sample consisted of twelve specialists, with an average age of 34.4 years (±10.5). The majority were female (91.7%) and resided in the southern region of the country (75%), with over five years of experience using AAC (83.3%), as shown in Table 1. The median time since their formation was 7.5 years, with a range from three months (0.25 years) to 36 years. The predominant academic background was postgraduate education (33.3%).

Table 1. Sample Characterization

Variables Values	**n= 12**
Age (years) – mean ± SD	34.4 ± 10.5
Gender – n (%)	
Male	1 (8.3)
Female	11 (91.7)
State – n (%)	
RS (Rio Grande do Sul)	9 (75.0)
SP (São Paulo)	2 (16.7)
RJ (Rio de Janeiro)	1 (8.3)
Training time (years) – median (min-max)	7.5 (0.25 to 36)
Academic background – n (%)	
Undergraduate	1 (8.3)
Postgraduate	4 (33.3)
Master's degree	3 (25.0)
Doctorate	3 (25.0)
Post-doctorate	1 (8.3)
Experience with cervical auscultation – n (%)	
Up to 1 year	1 (8.3)
From 2 to 5 years	1 (8.3)
More than 5 years	10 (83.3)

Legend: SD (standard deviation); RS (Rio Grande do Sul); SP (São Paulo); RJ (Rio de Janeiro).

The minimum Content Validity Index (CVI) found was 83.3%, which exceeds the minimum required agreement of 78%. It was established that there was unanimous agreement on all items evaluated, as seen in Table 2.

Table 2. Data on the Content Validity Index (CVI)

Variables	Agree/Strongly Agree (CVI) n (%)
1st Part – Structure	
Video sequence	11 (91.7)
The language is clear and direct	12 (100)
The language is scientific	11 (91.7)
Adequate structure and visual presentation	11 (91.7)
Provides complementary information for professionals not trained in cervical auscultation	10 (83.3)
2nd Part – Content	
The concepts and content of the information are correct	10 (83.3)
Identification of the collection equipment is correct	12 (100)
Positioning in the cervical region is appropriate	11 (91.7)
The video will be useful for AC training	10 (83.3)
Enables initial training for AC	11 (91.7)
Clearly indicates it is a complementary exam	11 (91.7)
3rd Part – Relevance	
Applicable in teaching	11 (91.7)
Adds knowledge	12 (100)
Facilitates the exam performance	11 (91.7)

Legend: AC (cervical auscultation)

Given the achieved agreement, no restructuring of the tutorial was necessary, and it remained as presented to the evaluators, with a duration of approximately eight minutes. A QR code was incorporated into the structure to facilitate its dissemination across computer networks.

Discussion

The content validation process involves the assessment of an instrument by various evaluators who are experts in the field. The evaluators analyze aspects such as content, proposed objectives, and the retention of items [7,10].

The items for this instrument were based on a systematic literature review conducted by the authors, which demonstrated that AAC data has the potential to improve the accuracy of screening and early detection of dysphagia risk.

The specialists who participated in the content validation process had an average age of 34.4 years, with the majority being female, aligning with data from recently published validation studies, which found that 90% of the judge sample was female [11].

Regarding the geographical location of the professionals, there was a predominance from the southern and southeastern regions of the country, which can be linked to data from the Federal Speech Therapy Council for the year 2023, which shows a concentration of professionals in these regions. Regarding academic qualifications, the majority of the judges held postgraduate degrees, and more than 80% had over five years of experience using AAC in their clinical practice [12].

The validation process occurred in two stages: the judges first watched the tutorial video and then responded to the validation questionnaire.

The quantitative analysis of the judges' responses revealed that the issues concerning the structure, content, and relevance of the material evaluated presented a significant CVI, and were deemed clear and appropriate for inclusion in the final version of the tutorial. The item with the most divergence was related to the positioning of the

amplification instrument in the cervical region, as judges noted the differences in this positioning for adults, children, and neonates. According to the literature, the point with the best signal-to-noise ratio is at the lateral edge of the trachea, immediately below the cricoid cartilagem [2], but anatomical differences should be considered.

It is essential to focus on the evaluation process of health education materials, ensuring they are structured cohesively, are coherent, and employ compatible language. It is important that a clinical evaluation tool maintains focus on the target subject, avoiding any ambiguity for the user in the final product [13,14].

In response to the judges' suggestions, the following adjustments were noted: adjusting the background music volume, synchronizing the narration with the video, including the application of the technique for pediatric and neonatal populations or creating a separate tutorial for these populations, and presenting different sounds of AAC. The judges' suggestions were considered and analyzed in line with the objectives of this study. Synchronization of the narration with the video was adjusted, and the background music volume was modified. Due to the anatomical and physiological differences between neonatal, pediatric, and adult populations, as well as the presentation of various auscultated sounds, it is believed that a more significant adjustment to the tutorial would be necessary to address this suggestion, which would considerably affect the video's duration and, consequently, the learners' attention.

According to the literature, the evaluation of an instrument by expert examiners is essential and should be a key step in the content validation process [15,16]. Therefore, the AAC tutorial video demonstrated relevance, with its content validated by field specialists in a single phase, showing a level of agreement higher than that established in the literature [17,18].

Conclusion

This study validated the content of a cervical auscultation tutorial, which includes the presentation of concepts and a demonstration of the technique, with a duration of eight minutes.

The creation of this video tutorial involved the authors' training in digital media, and its development can contribute to the training of students and speech-language pathologists, as well as other healthcare professionals, in the clinical evaluation of dysphagia using this method.

It is believed that the continuation of this research is necessary, with the application of this digital resource to the target population, to assess its effectiveness and applicability in teaching. The tutorial will be made available to the professional and academic community via QR code access (Appendix).

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Appendix

Tutorial de Ausculta Cervical

QRcode