





## **ELABORATION AND VALIDATION OF AN EDUCATIONAL VIDEO ON BLOOD PRESSURE MEASUREMENT IN SCREENING PROGRAMS**

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### **ABSTRACT**

**Objective:** to produce and validate an educational video on the procedure of indirect blood pressure measurement with the oscillometric technique to support actions of blood pressure screening programs in Brazil.

**Method:** a methodological study consisting in three stages: 1) pre-production of a script/storyboard; 2) content validation by a committee of 16 experts recruited according to their degrees and training in the area of interest of the study; and 3) final production, recording and edition of the educational video. For data collection, three validated instruments were used that allowed the video to be assessed as to its functionality, usability, efficiency, relevance, verbal language, audiovisual technique, environment, content and proposed objectives. The analysis of the quantitative variables was performed by calculating absolute and relative frequencies, and the categorical variables were measured using means and standard deviations. Items that obtained a CVI > 0.75 were considered valid.

**Results:** script validation was performed by eight experts and obtained a CVI of 0.93, while the technical assessment of the educational video and storyboard was performed by three experts and obtained a CVI of 0.97. After accepting the experts' suggestions, the educational video was produced and validated by eight experts, who considered the material valid for application (CVI = 0.94).

**Conclusion:** the educational video produced and validated in this study was characterized as an appropriate strategy for teaching the indirect measurement of blood pressure with the oscillometric technique among health professionals who volunteer to participate in blood pressure screening programs in Brazil.

**DESCRIPTORS:** Determination of blood pressure. Blood pressure. Hypertension. Screening programs. Education in Nursing. Interprofessional education. Teaching materials. Educational films and videos.

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# CONSTRUÇÃO E VALIDAÇÃO DE VÍDEO EDUCATIVO SOBRE MEDIDA DA PRESSÃO ARTERIAL EM PROGRAMAS DE RASTREAMENTO

## RESUMO

**Objetivo:** produzir e validar um vídeo educativo sobre o procedimento da medida indireta da pressão arterial com técnica oscilométrica para apoiar ações de programas de rastreamento da pressão arterial no Brasil.

**Método:** estudo metodológico composto por três etapas: 1) pré-produção de um roteiro/*storyboard*; 2) validação de conteúdo por um comitê de 16 especialistas recrutados conforme suas titulações e capacitações na área de interesse do estudo; 3) produção final, gravação e edição do vídeo educativo. Para a coleta dos dados foram utilizados três instrumentos validados que permitiram avaliar o vídeo quanto à sua funcionalidade, usabilidade, eficiência, relevância, linguagem verbal, técnica audiovisual, ambiente, conteúdo e objetivos propostos. A análise das variáveis quantitativas foi realizada por cálculo de frequências absolutas e relativas e as variáveis categóricas foram mensuradas por meio de média e de desvio padrão. Foram considerados válidos os itens que obtiveram IVC > 0,75.

**Resultados:** a validação do roteiro foi realizada por oito especialistas e obteve um IVC de 0,93, enquanto a avaliação técnica do vídeo educativo e do *storyboard* foi realizada por três especialistas e obteve um IVC de 0,97. Após acatadas as sugestões dos especialistas, o vídeo educativo foi produzido e validado por oito especialistas, os quais consideraram o material válido para aplicação (IVC= 0,94).

**Conclusão:** o vídeo educativo produzido e validado neste estudo foi caracterizado como estratégia adequada para o ensino da medida indireta da pressão arterial com técnica oscilométrica entre profissionais da saúde que se voluntariarem a participar de programas de rastreamento da pressão arterial no Brasil.

**DESCRITORES:** Determinação da pressão arterial. Pressão arterial. Hipertensão. Programas de rastreamento. Educação em enfermagem. Educação interprofissional. Materiais de ensino. Filme e vídeo educativo.

# PRODUCCIÓN Y VALIDACIÓN DE VIDEO EDUCATIVO SOBRE MEDIDA DE PRESSÃO ARTERIAL EN PROGRAMAS DE DETECCIÓN

## RESUMEN

**Objetivo:** producir y validar un video educativo sobre el procedimiento de medición indirecta de la presión arterial con técnica oscilométrica para apoyar las acciones de los programas de detección de la presión arterial en Brasil.

**Método:** estudio metodológico compuesto por tres etapas: 1) preproducción de un guion / *storyboard*; 2) validación de contenido por un comité de 16 especialistas reclutados de acuerdo a sus títulos y calificaciones en el área de interés del estudio; 3) producción final, grabación y edición del video educativo. Para la recolección de datos se utilizaron tres instrumentos validados que permitieron evaluar el video en cuanto a su funcionalidad, usabilidad, eficiencia, relevancia, lenguaje verbal, técnica audiovisual, entorno, contenido y objetivos propuestos. El análisis de las variables cuantitativas se realizó mediante el cálculo de frecuencias absolutas y relativas y las variables categóricas se midieron mediante medias y desviaciones estándar. Se consideraron válidos los ítems que obtuvieron un IVC > 0,75.

**Resultados:** el guion fue validado por ocho especialistas y obtuvo un IVC de 0,93, mientras que la evaluación técnica del video educativo y *storyboard* realizada por tres especialistas obtuvo un IVC de 0,97. Después de aceptar las sugerencias de los especialistas, el video educativo fue producido y validado por ocho especialistas, quienes consideraron el material válido para su aplicación (IVC = 0,94).

**Conclusión:** el video educativo producido y validado en este estudio se caracterizó como una estrategia adecuada para la enseñanza de la medición indirecta de la presión arterial con técnica oscilométrica entre los profesionales de la salud que se ofrecen como voluntarios para participar en los programas de detección de la presión arterial en Brasil.

**DESCRIPTORES:** Determinación de la presión arterial. Presión arterial. Hipertensión. Programas de seguimiento. Educación en enfermería. Educación interprofesional. Material educativo. Película y video educativo.

## INTRODUCTION

Hypertension (HTN) is a chronic, non-communicable and asymptomatic disease, considered the main avoidable risk factor for the development of cardiovascular diseases and of chronic kidney disease<sup>1</sup>. It is estimated that HTN is responsible for 10 million deaths worldwide and that its financial burden accounts for more than 5% of the total expenses on health care in the country<sup>2-3</sup>. In Brazil, it affects 47% of the adult population, the control rates for this disease do not exceed 60%, and the prevalence of knowledge about Blood Pressure (BP) values is only 30% among the hypertensive individuals undergoing drug treatment<sup>4-5</sup>.

The low control of BP and the high mortality due to complications related to HTN drove the development of Blood Pressure Screening Programs (BPSPs) in low-, medium- and high-income communities, to collaborate with the early identification of HTN and increase awareness about the problems of the disease<sup>6-8</sup>.

BPSPs gained strength in Brazil between 2014 and 2016 when the World Hypertension League (WHL) established partnerships with public and private institutions focused on teaching, research and health care and disclosed promising, sustainable and low-cost methods, which could support the implementation of multinational campaigns carried out by volunteer researchers and applied to accessible samples of the population<sup>9-10</sup>.

Indirect BP measurement with an oscillometric device is the preferred method for identifying individuals with high BP values in the community, since it automatizes the auscultatory stage of the procedure, allows for the recording of several subsequent readings and calculates the mean of the BP values<sup>11</sup>. The use of this type of equipment, combined with educational strategies and training aimed at health professionals, can improve the quality of the BP measurement technique and contribute to the operationalization of the BPSPs<sup>12-13</sup>.

In order to promote the knowledge of health professionals about the oscillometric technique of BP and enable them to participate in the BPSPs in different communities around the world, the WHL developed educational resources, such as videos, training modules, data collection forms and service guidelines, published in electronic format and made available free of charge on its website ([www.whleague.org](http://www.whleague.org)). These are creative, interactive, dynamic and attractive contents capable of providing effective strategies for the prevention, management, treatment and control of HTN in the screening scenarios.

It is believed that the development of videos based on effective teaching-learning methodologies and in line with the WHL recommendations can contribute to the teaching of BP measurement and the dissemination of knowledge among health professionals who volunteer to participate in screenings carried out in different Brazilian municipalities.

Given the above, the objective of this study was to produce and validate an educational video on the procedure of indirect BP measurement with the oscillometric technique to support BPSP actions in Brazil.

## METHOD

This is a methodological and descriptive study developed through three stages: pre-production (stage 1), validation (stage 2) and production (stage 3).

### Stage 1 - Pre-production

The educational video entitled "Blood pressure screening in Brazil: Indirect blood pressure measurement - automatic device" was produced based on the elaboration of a script that included the description of five essential topics, based on national and international guidelines for HTN and BP screening<sup>14-17</sup>:

- 1) Objective of the video: to demonstrate the standardized technique of indirect BP measurement by the oscillometric method to support BPSp actions in Brazil;
- 2) Purpose of the BPSps: to identify high BP values in different Brazilian municipalities;
- 3) Definition of HTN, epidemiology of the disease and its health problems affecting the population;
- 4) Stages of the BP measurement procedure with oscillometric equipment: preparation of the environment and of the patient, and BP measurement;
- 5) Guidance on modifiable and non-modifiable risk factors of HTN: inadequate diet, lack of physical activity, stress, smoking, excessive alcohol consumption, family history, race and age.

From the elaboration of this script, a storyboard (graphical construction that shows the topics of some audiovisual content) was developed in order to describe the content covered in each scene of the video, by determining the characteristics of audio, narration, images, scenes and photographs.

## Stage 2 - Validation

The script was validated by five experts in the areas of BP measurement and HTN and the storyboard was validated by three experts in communication, with experience in research and production of educational videos in the health area. The selection of the experts took place according to the application of Fehring's criteria<sup>18</sup>.

Each of the experts was invited to participate in the study by means of an invitation letter, sent via e-mail, along with the Free and Informed Consent Form (FICF), which was completed and signed in case of acceptance.

The script and storyboard validation process took place through the adaptation of two data collection instruments proposed by Campoy<sup>19</sup>, developed in the national scenario and validated by a committee of experts regarding technical and content adequacy. The data collection instrument that assessed the script consisted of six items and 20 questions:

- 1) Objectives (3 questions) - They are coherent with the professional practice and with the research proposal, and are adequate to be implemented;
- 2) Content (7 questions) - It corresponds to the objectives proposed in the study, facilitates the teaching-learning process, allows understanding the theme, follows a logical sequence, incorporates the steps for carrying out the BP measurement, has all the necessary materials for the effectiveness of this measure, and presents correct information;
- 3) Relevance (3 questions) - It shows images/scenes that illustrate important aspects of the BP measurement, are relevant to the practice, and allow for the transfer and generalization of the content learned to different contexts;
- 4) Environment (2 questions) - The scenario is adapted to image capture and learning;
- 5) Verbal language (2 questions) - It is accessible to the target audience and easily assimilated;
- 6) Topic inclusion (3 questions) - Objectives of the video, objectives of the BP measurement, and description of the stages of the BP measurement procedure were included.

To validate the storyboard, the experts assessed three items and eleven questions:

- 1) Functionality (2 questions) - It proposes understandable interventions to perform the indirect BP measurement, and has the potential to generate positive results;
- 2) Usability (3 questions) - It allows learning concepts and their applications, allows learning the indirect BP measurement, and helps the user in a clear and efficient way;
- 3) Efficiency (6 questions) - It proposes adequate time for learning, presents a number of scenes that is coherent with the time of the video, meets the objectives of the video regarding the number and characterization of characters, presents efficient and comprehensible communication between the characters, clearly describes the materials, and presents clear language (audio/narration).

The script and storyboard were assessed using a five-point *Likert* scale to classify the agreement level: strongly agree, agree, disagree, strongly disagree, and I don't know<sup>20</sup>.

### Stage 3 - Production

The video was produced from the post-validation script/storyboard. Simulated scenes were created, with the participation of two characters, one representing the health professional and the other, the patient. Two actors were previously invited to participate in the study and signed the FICF.

The figures were acquired in a free, copyright-free online image bank, as well as the incidental music, also known as "background music". The narration was voluntary and the editing of video, photos, figures, audio and animations was carried out by the authors through the *Wondershare Filmora* program, with independent acquisition. Recording took place in the simulation and practice laboratory of a public university in São Paulo.

The validation of the educational video was performed using an instrument proposed by Ferreira<sup>21</sup>, developed in Brazil and composed of six items and 22 questions that were validated in terms of face and content by a committee of experts, and later adapted for this study. Each question was assessed using a five-point *Likert* scale, with the following alternatives: strongly agree, agree, disagree, strongly disagree, or I don't know. The items and content of the instrument's questions are described below.

- 1) Functionality (2 questions) - It proposes understandable interventions to perform the indirect BP measurement, and has the potential to generate positive results;
- 2) Usability (3 questions) - It is easy to use, and allows learning the theoretical and practical concepts;
- 3) Efficiency (2 questions) - It has an adequate duration for learning the content and has consistency between the number of scenes and the time of the video;
- 4) Audiovisual technique (4 questions) - It presents adequate lighting for watching the scenes, adequacy regarding the narrator's tone and voice, understandable narration; the figures, images and animations contribute to the interactivity and efficiency of the video;
- 5) Environment (2 questions) - It reflects the practical reality, and does not interfere with the reliability of the indirect BP measurement;
- 6) Procedure (9 questions) - It is consistent with the objectives of the video; demonstrates the procedure according to reality; clarifies the purpose of the screening programs, as well as the purpose of the training and the objectives of the BP measurement procedure;

presents all the materials that must be used in the procedure; allows for the identification of all stages of the procedure; provides adequate and comprehensible general guidelines and regarding the risk factors of HTN.

The instrument was forwarded to five experts who assessed the content of the video and to another three who analyzed the technical production, totaling eight experts. The sample was selected for convenience and the number of these experts met the recommendations of the literature regarding the methodological process for the validation of research instruments<sup>22</sup>. Those experienced in the content were selected for being health professionals, working in institutions from different Brazilian states, members of research groups on the study theme and participants in the Brazilian Consulting Group on Blood Pressure Screening, with experience in the development and application of screening methods in different Brazilian regions. The technical committee was constituted by experts in communication, with experience in the production of videos, and by researchers with scientific production of videos in the health area. Each of these experts was classified according to Fehring's criteria<sup>18</sup> and should obtain at least five points on the scale to be included in the study: master in Nursing (4 points); master in Nursing with a degree in the area of interest of the study (1 point); doctoral thesis in this area of interest (2 points); clinical practice of at least one year on the topic of interest of the study (1 point); specialization in this topic of interest (2 points); publication of research relevant to the area of interest of the study (2 points); publication of an article relevant to this area (2 points), and publication of an article on the area of interest of the study (2 points).

This research was carried out from February 2017 to November 2018 and submitted to the Research Ethics Committee of the Ribeirão Preto College of Nursing at the University of São Paulo, according to the specifications of Resolution CNS 466/2012 and approved under opinion No.1,912,394/2017.

The study data were inserted by double typing in *Microsoft Excel* databases and later processed in the *Statistical Package for the Social Science* (SPSS) program, version 21.0. The descriptive analysis was performed by calculating absolute and relative frequencies for the qualitative variables and central tendencies (mean and median), while for the quantitative variables the variability test (minimum, maximum and standard deviation) was performed. The Content Validity Index (CVI) was calculated to assess the experts' agreement regarding the representativeness of each item of the data collection instruments applied in this study, and items that obtained a CVI > 0.75 were considered valid<sup>23</sup>.

## RESULTS

The group of experts who assessed the video script was constituted by five members, the group that assessed the storyboard consisted of three members, and the group that assessed the educational video was composed of eight experts. Of the total participants, 14 were female (87.5%), with a mean age of 35 years old ( $\pm 12.7$ ) and academic training time of 13.2 years ( $\pm 10.2$ ).

In relation to the experts who carried out the script assessment, most had a doctoral or postdoctoral degree (60.0%) in the areas of care for critical patients, medical-surgical clinic, cardiology and fundamental Nursing; 80.0% had at least one year of clinical practice, and all of them had already published articles with themes related to the study. As for the experts who assessed the storyboard, one of them had developed a master's dissertation with the production of an educational video (33.3%), another had a experts degree in marketing and documentaries (33.3%), and the third was a PhD in Nursing (33.3%). Finally, the majority of the group of experts who assessed the educational video had a Master's or PhD degree (87.5%), at least one year of Nursing care practice (75.0%), and scientific articles published in the area of interest of the study (75.0%). One of the participants was a graduate in social communication with professional performance in audiovisual teaching technology (12.5%).

The assessment by these experts as to the content of the script allowed evidencing that 76 of their answers were classified as “Strongly agree” (76.0%), 17 as “Agree” (17.0%) and 7 as “Disagree” (7.0%), which generated 93.0% of positive answers and a CVI of 0.93.

Three questions in the *objectives* item were classified as “Disagree” (20.0%), these being related to the coherence of the study objectives with the professional practice, with the research proposal and with the effectiveness of the educational strategy. For the *content* item, three questions were classified as “Disagree” and dealt with the association of the storyboard content with the research objectives, the understanding of the theme proposed in the video, and the assertiveness of the information conveyed to the viewer (8.6%). In relation to the *relevance* item, “I disagree” was marked for the question of generalization of the video content to different contexts (6.7%) (Table 1).

**Table 1** – Distribution of the experts ‘ answers to the items in the script content validation instrument for the creation of the educational video, according to the agreement rates, Ribeirão Preto-SP, 2018. (n=5)

Items	Strongly agree n (%)	Agree n (%)	Disagree n (%)	Strongly disagree n (%)	I don't know n (%)
<b>Objectives</b>					
They are coherent with the professional practice.	4 (80.0)	0 (0.0)	1 (20.0)	0 (0.0)	0 (0.0)
They are coherent with the research proposal.	4 (80.0)	0 (0.0)	1 (20.0)	0 (0.0)	0 (0.0)
They are adequate to be put into practice.	4 (80.0)	0 (0.0)	1 (20.0)	0 (0.0)	0 (0.0)
<b>Storyboard content</b>					
It corresponds to the objectives proposed in the work.	4 (80.0)	0 (0.0)	1 (20.0)	0 (0.0)	0 (0.0)
It facilitates the teaching-learning process.	4 (80.0)	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)
It allows understanding the topic.	4 (80.0)	0 (0.0)	1 (20.0)	0 (0.0)	0 (0.0)
It follows a logical sequence.	4 (80.0)	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)
It incorporates all the necessary steps to perform the blood pressure measurement.	4 (80.0)	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)
It has all the materials to measure blood pressure.	4 (80.0)	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)
The information presented in the storyboard is correct.	3 (60.0)	1 (20.0)	1 (20.0)	0 (0.0)	0 (0.0)
<b>Relevance of images and scenes</b>					
They illustrate important aspects for the practice of blood pressure measurement.	3 (60.0)	2 (40.0)	0 (0.0)	0 (0.0)	0 (0.0)
They are relevant so that the audience can practice blood pressure measurement.	3 (60.0)	2 (40.0)	0 (0.0)	0 (0.0)	0 (0.0)
They allow for the transfer and generalization of the content learned to different contexts.	3 (60.0)	1 (20.0)	1 (20.0)	0 (0.0)	0 (0.0)
<b>Environment - Scenario</b>					
It is suitable for capturing images for the video.	4 (80.0)	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)
It is suitable for learning the topic.	4 (80.0)	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)
<b>Storyboard verbal language</b>					
It is accessible to the target audience.	4 (80.0)	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)
It is easy to assimilate.	4 (80.0)	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)

**Table 1 – Cont.**

Items	Strongly agree n (%)	Agree n (%)	Disagree n (%)	Strongly disagree n (%)	I don't know n (%)
Topic inclusion					
Objectives of the educational video.	4 (80.0)	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)
Objectives of the blood pressure measurement.	4 (80.0)	1 (20.0)	3 (8.6)	0 (0.0)	0 (0.0)
Description of the stages in the blood pressure measurement procedure.	4 (80.0)	1 (20.0)	1 (6.7)	0 (0.0)	0 (0.0)

The technical assessment of the storyboard consisted in a total of 11 questions, of which six were classified as “Strongly agree” (57.6%), four as “Agree” (39.4%) and one as “Disagree” (3.0%), which generated a total of 97.0% positive answers and a CVI of 0.97. Only one question from the *efficiency* item, related to the number and characterization of the characters, was marked as “Disagree” (5.5%) (Table 2).

**Table 2 –** Distribution of the experts' answers to the items in the storyboard validation instrument for the creation of the educational video, according to the agreement rates, Ribeirão Preto-SP, 2018. (n=3)

Items	Strongly agree n (%)	Agree n (%)	Disagree n (%)	Strongly disagree n (%)	I don't know n (%)
Functionality					
The video script proposes understandable interventions to perform the blood pressure measurement procedure.	3 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
The video script has the potential to generate positive results.	3 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Usability					
It is easy to learn the concepts that will be used in the video and their applications.	1 (33.3)	2 (66.7)	0 (0.0)	0 (0.0)	0 (0.0)
The video will allow the user to learn the technique of blood pressure measurement.	2 (66.7)	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)
The video will assist the user in a clear and efficient way, without being tiring.	2 (66.7)	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)
Efficiency					
The time proposed is adequate for the user to learn the content.	2 (66.7)	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)
The number of scenes is coherent with the time proposed for the video.	2 (66.7)	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)
The number and characterization of the characters meet the proposed objective.	0 (0.0)	2 (66.7)	1 (33.3)	0 (0.0)	0 (0.0)
The communication between the characters takes place in an efficient and understandable way.	1 (33.3)	2 (66.7)	0 (0.0)	0 (0.0)	0 (0.0)
The description of the materials that will be used is clear.	2 (66.7)	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)
Language description (audio/narration, images/scenes, photographs) is clear.	1 (33.3)	2 (66.7)	0 (0.0)	0 (0.0)	0 (0.0)



The questions assessed as “Disagree” in the script assessment (7.0%) and in the storyboard assessment (3.0%) were reviewed and reformulated, which favored the elaboration of the educational video. The suggestions were accepted and referred to the changes in the writing of the text, inclusion of figures and animations.

The material produced from the experts’ considerations was forwarded to a new round of evaluations and obtained 94.4% of answers classified as “Strongly agree” or “Agree”, 5.1% as “Disagree” and 0.5% as “I don’t know”. The data obtained generated a CVI of 0.94 in the script and storyboard validation, which allowed characterizing the instruments as valid and useful for the development of the educational video.

Regarding the validation of this video, for the *functionality* item, only one answer was marked as “I don’t know” in the question about the possibility of the material generating positive results in the teaching-learning process, in the topic in question (6.2%). In the *usability* item, one question was classified as “Disagree” and asked about the viewer’s ease in learning the theoretical concepts used in the video (4.2%).

Regarding the *audiovisual technique* item, one expert marked “Disagree” in the question regarding the contribution of the figures, images and animations to the interactivity and efficiency of the educational material. In the *procedure* item, two participants marked “Disagree” for a question that dealt with the complete presentation of the materials needed to perform the BP measurement technique (25.0%), two experts disagreed that the technique was in accordance with reality (25.0%), one disagreed about the correct description of the stages of the procedure (12.5%), another disagreed about the appropriateness of the guidelines provided to the viewer (12.5%), and the last reviewer disagreed that the video presented the risk factors for HTN in a clear and understandable way (12.5%) (Table 3). Despite the disagreements presented by the experts on each question of the data collection instrument, each item was assessed with more than 90.0% in the “Strongly agree” or “Agree” concept, which generated a CVI of 0.94 and allowed considering the material as valid for application.

**Table 3** – Distribution of the experts’ answers to the items in the validation instrument for the educational video, according to the agreement rates, Ribeirão Preto-SP, 2018. (n=8)

Items	Strongly agree n (%)	Agree n (%)	Disagree n (%)	Strongly disagree n (%)	I don’t know n (%)
Video functionality					
It is presented as an adequate tool for the purpose for which it is intended.	8 (10.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
It allows generating positive results in the teaching-learning process on the theme.	6 (75.0)	1 (12.5)	0 (0.0)	0 (0.0)	1 (12.5)
Video usability					
It is easy to use.	8 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
It is easy to learn the theoretical concepts that will be used and their applications.	3 (37.5)	4 (50.0)	1 (12.5)	0 (0.0)	0 (0.0)
It allows the user to easily apply the concepts worked on in the practice.	6 (75.0)	2 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)
Video efficiency					
Its duration (time used) is adequate for the user to learn the content.	8 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
The number of scenes is coherent with the proposed time for the video.	6 (75.0)	2 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)

**Table 3 – Cont.**

<b>Items</b>	<b>Strongly agree n (%)</b>	<b>Agree n (%)</b>	<b>Disagree n (%)</b>	<b>Strongly disagree n (%)</b>	<b>I don't know n (%)</b>
<b>Audiovisual technique</b>					
The lighting is suitable for watching the scenes.	6 (75.0)	2 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)
The narrator's tone and voice are clear and adequate.	7 (87.5)	1 (12.5)	0 (0.0)	0 (0.0)	0 (0.0)
The narration is used efficiently and is understandable for the audience.	8 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
The figures, images and animations used contribute to interactivity and efficiency.	3 (37.5)	4 (50.0)	1 (12.5)	0 (0.0)	0 (0.0)
The laboratory environment did not interfere with the fidelity of the blood pressure measurement procedure.	7 (87.5)	1 (12.5)	0 (0.0)	0 (0.0)	0 (0.0)
<b>Procedure</b>					
Objectives of the educational video.	8 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
The application of the blood pressure measurement technique matches reality.	3 (37.5)	3 (37.5)	2 (25.0)	0 (0.0)	0 (0.0)
The purpose of performing Blood Pressure Screening was clear and understandable.	5 (62.5)	3 (37.5)	0 (0.0)	0 (0.0)	0 (0.0)
The purpose of implementing the Training Program was clear and understandable.	4 (50.0)	4 (50.0)	0 (0.0)	0 (0.0)	0 (0.0)
The objectives of the blood pressure measurement procedure were clear.	6 (75.0)	2 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)
There was a complete presentation of the materials used in the procedure.	5 (62.5)	1 (12.5)	2 (25.0)	0 (0.0)	0 (0.0)
The stages of the procedure are adequate and could be identified.	5 (62.5)	2 (25.0)	1 (12.5)	0 (0.0)	0 (0.0)
The guidelines are adequate and understandable.	6 (75.0)	1 (12.5)	1 (12.5)	0 (0.0)	0 (0.0)
The risk factors are clear and understandable.	6 (75.0)	1 (12.5)	1 (12.5)	0 (0.0)	0 (0.0)

The final version of the educational video produced lasts 5 minutes and 54 seconds and exposes a narration about: the definition of the BPSPs and their importance for the early diagnosis and control of BP values in the community; the definition of HTN and the epidemiological data of the disease in Brazil; the stages of the correct indirect BP measurement procedure using the oscillometric method (Figure 1); the presentation of the materials needed to perform the BP measurement technique; the interpretation of the BP values obtained in the procedure; the guidelines that must be provided to the screening participants in relation to the prevention of HTN, knowledge of the cardiovascular risk factors and changes in lifestyle. The final product is available for access at: <https://www.youtube.com/watch?v=ifguaeWjW-A&feature=youtu.be>.



**Figure 1** – Image of the educational video narrating the stages of the indirect blood pressure measurement procedure using the oscillometric technique. Ribeirão Preto-SP, Brazil, 2018.

## DISCUSSION

This study aimed to produce and validate an educational video on the procedure of indirect BP measurement with the oscillometric technique to support BPSP actions in Brazil.

The results evidenced high levels of agreement by the experts regarding the content produced (93.0%) and the audiovisual technique applied to the video (97.0%), which allowed considering the product as valid for the training and qualification of health professionals interested in participating in BP screening in different Brazilian communities.

The content production process was based not only on national and international HTN guidelines, but also on statements by specialist societies of international scope, about the importance of the BPSPs for the control of BP values, their impact on reducing mortality due to cardiovascular diseases, and the urgent need for governmental support and provision of resources capable of subsidizing the development of these programs and collaborating with the formation of screening teams<sup>24-25</sup>.

The BPSPs carried out in our country allowed identifying flaws in the teaching-learning process of health professionals regarding the performance of the indirect BP measurement technique. For more than 20 years, researchers have evidenced that certain stages of the procedure are not performed correctly by the health professionals, especially those involved with choosing the cuff, interpreting the *Korotkoff* sounds, and orienting the patient's body position<sup>26</sup>.

Given these findings, the video content developed in this study sought to include the methods for standardizing indirect BP measurement with the use of oscillometric devices, which are able to automatize the procedure, simplify the technique, and minimize errors related to the observer and the equipment<sup>13,25</sup>.

The indirect BP measurement performed in the context of screening is necessary to identify individuals with altered BP ( $\geq 140/90$  mmHg) and refer them to the health service, so that they can be diagnosed and treated early<sup>27</sup>. However, an incorrect measurement can compromise the clinical evaluation and the guidelines provided to the person being screened, as well as impair the

epidemiological analysis of a given population sample. A number of research studies carried out in the global scenario showed that differences of 5 mmHg in the measurement of systolic blood pressure can modify the prevalence of HTN by up to 30% and lead to incorrect classifications of the disease in 84 million individuals<sup>11,28</sup>.

Automatic equipment has cuffs marked with guidelines that allow the observer to choose the appropriate size more easily after performing the measurement of the brachial circumference. In addition to this advantage, oscillometric equipment is portable, easy to handle, does not need electricity for its operation, is easy to acquire, and has precision when used according to the recommendations provided by experts<sup>11,13</sup>. Such evidence suggests that the application of the oscillometric technique in BPSP is essential for the agility and quality of the procedure in mass population approaches<sup>13</sup>.

The process of technical and content validation of the educational video proposed in this study maintained methodological rigor in all its stages, from the elaboration of the script and storyboard to the production of the video itself. The invited experts had knowledge and skills derived from practical and professional experiences, expressive academic degrees and experience in research and/or publication of scientific articles relevant to the subject matter in question. The experts committee was able to associate the abstract and non-quantifiable concepts of the study with measurable indicators proposed in the data collection instruments. In this way, they identified the importance and dimension of each item assessed as relevant or not to the phenomenon of interest and allowed for the production of educational material relevant to health education.

Among the educational technologies, videos stand out as an active resource, which simplifies learning, favors the transmission of knowledge and the attainment of competences and skills<sup>19</sup>. Within this technology, audiovisual resources allow for a clear understanding and for the construction of a critical and reflective opinion on the subject matter addressed<sup>29-30</sup>. The assessment of the audiovisual technique applied to the educational video obtained 97.0% agreement from the experts at the end of the validation process, which allowed concluding that the material has favorable technological quality and is consistent with the purpose of the submitted proposal.

Although the video displays clear and objective language and was considered relevant to the implementation of the BPSPs in Brazil, some limitations can be considered in this study. The educational video was produced in the Portuguese language written and spoken in Brazil, without the inclusion of subtitles for other languages; in addition to that, it does not have resources for teaching people with hearing loss. After recording and editing the video, the test-retest was not performed, which may have compromised the inclusion of suggestions made by the experts along the validation process. Finally, the material did not undergo semantic validation and was not applied to the target audience.

## CONCLUSION

The educational video produced and validated in this study was considered an adequate strategy for teaching indirect BP measurement with the oscillometric technique to health professionals who volunteer to participate in BPSPs in Brazil, so as to standardize the approach to the population and favor the improvement, sustainability and quality of screening tests performed on expressive population samples.

The material developed is open access and can collaborate with the development of future research studies related to HTN, with the training of health professionals in the care context, with the promotion of knowledge among undergraduate and graduate students, or it can even be used as a strategy for prevention and health promotion in hypertensive individuals in different Brazilian communities. This video can also be useful to guide the lay population on how to perform the technique of indirect BP measurement with oscillometric equipment, on the purpose of the BPSPs, the importance of controlling BP values and maintaining a healthy lifestyle.

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## NOTES

### ORIGIN OF THE ARTICLE

Extracted from the Course Conclusion Paper - Blood pressure screening in Brazil: Elaboration of a video on good practices for indirect blood pressure measurement - automatic device, presented to the General and Specialized Nursing Department, *Escola de Enfermagem de Ribeirão Preto, Universidade de São Paulo*, in 2018.

### CONTRIBUTION OF AUTHORITY

Study desing: Caetano GM, Veiga EV.

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Data analysis and interpretation: Caetano GM, Veiga EV, Daniel ACQG.

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Review and final approval of the final version: Daniel ACQG, Caetano GM, Veiga EV, Costa BCP.

### APPROVAL OF ETHICS COMMITTEE IN RESEARCH

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### CONFLICT OF INTEREST

There is no conflict of interests.

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