

PREDICTIVE SCALE OF HYPERTENSION COMPLICATIONS: CONTENT AND APPEARANCE VALIDITY

ESCALA PREDITIVA DE COMPLICAÇÕES DA HIPERTENSÃO: VALIDADE DE CONTEÚDO E APARÊNCIA

ESCALA DE PREDICCIÓN DE COMPLICACIONES DE LA HIPERTENSIÓN: VALIDEZ DE APARIENCIA Y DE CONTENIDO

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ABSTRACT

This is a quantitative methodological research that used the Delphi technique to validate the content and appearance of a prediction scale for complications of hypertension with actions for the management of care. Data collection took place from February to July 2015, in two rounds of questionnaires via Google Docs® and a consensus meeting. The participants were masters and doctors who were experts in systemic arterial hypertension. Data were analyzed using descriptive statistics and the Content Validity Index. In the first round of the validation process 15 (47%) participants were masters, 17 (53%) doctors and the agreement between them on the items of the scale was 87%; In the second, 13 (50%) masters, 13 (50%) doctors participated, and the agreement increased to 98%. At the consensus meeting, six experts discussed the suggestions provided in the second round. It is concluded that the prediction scale for complications of hypertension with actions for the management of care showed evidence of content validity, indicating that it can be used to measure the risk of developing complications and provide actions that enable the management of care.

Keywords: Validation Studies; Nursing; Chronic Disease; Hypertension.

RESUMO

Trata-se de pesquisa metodológica de natureza quantitativa que utilizou a técnica Delphi com o objetivo de validar o conteúdo e a aparência de uma escala de predição para complicações da hipertensão com ações para o gerenciamento do cuidado. A coleta de dados ocorreu no período de fevereiro a julho de 2015, em duas rodadas de questionários via Google Docs® e uma reunião de consenso. Os participantes foram mestres e doutores experts em hipertensão arterial sistêmica. Os dados foram analisados por meio de estatística descritiva e pelo índice de validade de conteúdo. Na primeira rodada do processo de validação, 15 (47%) participantes eram mestres, 17 (53%) doutores e a concordância entre eles sobre os itens da escala foi de 87%; na segunda participaram 13 (50%) mestres, 13 (50%) doutores e a concordância aumentou para 98%. Na reunião de consenso, seis experts discutiram as sugestões fornecidas na segunda rodada. Concluiu-se que a escala de predição para complicações da hipertensão com ações para o gerenciamento de cuidado mostrou evidências de validade de conteúdo, indicando que pode ser utilizada para medir o risco do desenvolvimento de complicações e fornecer ações que possibilitem o gerenciamento do cuidado.

Palavras-chave: Estudos de Validação; Enfermagem; Doença Crônica; Hipertensão.

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RESUMEN

Se trata de una investigación metodológica cuantitativa que utiliza la técnica Delphi con el fin de validar el contenido y la apariencia de una escala de predicción de complicaciones de la hipertensión con acciones para la gestión del cuidado. Los datos fueron recogidos de febrero a julio de 2015, en dos rondas de cuestionarios a través de Google Docs* y una reunión de consenso. Los participantes eran profesionales con máster y doctorado expertos en hipertensión. Los datos fueron analizados utilizando estadística descriptiva y el índice de validez de contenido. En la primera ronda del proceso de validación 15 (47%) de los participantes tenían máster, 17 (53%) doctorado y la concordancia entre ellos sobre los elementos de la escala fue de 87%; en la segunda parte 13 (50%) con máster, 13 (50%) con doctorado y la concordancia aumentó a 98%. En la reunión de consenso seis expertos discutieron las sugerencias dadas en la segunda ronda. Se llega a la conclusión que la escala de predicción de complicaciones de la hipertensión con acciones para la gestión del cuidado mostró evidencias de validez de contenido, lo cual indica que puede ser utilizada para medir el riesgo de desarrollo de complicaciones y proporcionar acciones que posibiliten la gestión del cuidado.

Palabras clave: Estudios de Validación; Enfermería; Enfermedad Crónica; Hipertensión.

INTRODUCTION

Systemic arterial hypertension (SAH) is a public health problem worldwide. In Brazil, it reaches 36 million adults, more than 60% of the elderly population, and contributes to an increased risk of cardiovascular and cerebrovascular diseases.¹

This disease has an impact on the quality of life of people affected and causing losses in work productivity and family income. Thus, it is necessary to obtain diagnosis, perform early treatment and follow-up appropriately to avoid or reduce the probability of the occurrence of associated complications.^{1,2}

These actions should be based primarily on multi-professional primary care teams, which have a link with the community and a fundamental role in strategies for prevention, diagnosis, monitoring, and control of hypertension.³ One of the ways of monitoring, controlling pressure and preventing complications of Hypertension in Primary care is risk classification and follow-up through care management.

According to the Ministry of Health, risk classification can provide benefits in planning treatment for people with hypertension, mainly because of different needs.⁴ Classifying these people into risk strata can provide the adequacy of care management actions with appropriate follow-up.

There is the risk classification proposed by the Ministry of Health in Brazil,⁵ whose main objective is to guide the treatment, but without indications of follow-up care according to the risk stratification. In that sense, the Prediction Scale for Complications of Hypertension with Actions for Care Management was developed in Curitiba, Paraná in 2015.⁶

The scale was constructed based on a study conducted with 387 people who had hypertension, and it is divided into two parts: risk classification for the development of complications and the actions for the management of care. The first part is composed of seven variables considered as predictors, obtaining statistical significance in the multivariate analysis. The score attributed to their presence or absence was based on the values of the odds ratio calculation.

The scale is composed of the following variables: age, gender, smoking, time of diagnosis, number of medications in use,

depression and risk classification in the health unit. This includes other factors such as diabetes mellitus, alcoholism, and associated clinical conditions, such as kidney and heart disease.⁶

The sum of the scores attributed to the presence or absence of these predictors factors classifies the patients in four degrees of risk for developing a complication: low (up to 50 points), moderate (51-67 points), high (68-83 points) and very high risk (above 82 points). Through this classification, the scale proposes actions for the management of care that were listed based on literature review. They vary according to the risk and include: nursing consultations and with other professionals, health education activities, home visits, goal setting and telephone contact.⁶

Considering the impact of hypertension, the importance of follow-up through the management of care based on risk classification as a way to avoid or delay the development of complications and considering that the scale proposed for this purpose has not yet undergone a validation process, the aim of this research was to validate the content and appearance of the Arterial Hypertension Compression Prediction Scale with Actions for Care Management.

METHOD

It is a methodological research of a quantitative nature using the Delphi technique, which is a systematized form of the judgment of information, destined to reach the consensus of opinions among the experts on a certain subject, through articulated validations in rounds of questionnaires, favored by anonymity.⁷

The identification of the sample was intentional, and the database National Council for Scientific and Technological Development of curricula registered in a Brazilian development agency was used.

Initially, a simple search was performed for the "topic (title or production keyword)" with the keyword "systemic arterial hypertension". After that, masters and doctors of Brazilian nationality were selected. For the professional performance, the selected filters were: Large area - "Health Sciences"; Area -

“Nursing”; Subarea - “All” and Specialties - “All”. In the “Preferences”, updated curricula were selected in the 12 months before the search, conducted in November 2014.

Thus, 560 masters and 377 doctors were identified, whose abstracts of the curricula were read with the intention of verifying if they acted with the themes chronic diseases and/or hypertension. Also, the existence of developed or developing projects related to SAH was verified, as well as publications of articles in this area in the last five years. Pre-selection included those who met at least two of these criteria.

From this analysis, 46 teachers and 41 doctors were selected, sending invitations to participate in the validation process. After sending the invitation, 25 doctors and 24 teachers expressed agreement to participate in the research.

Masters and Ph.Ds who scored equal or above six points were selected according to Fehring’s adapted criteria.⁸ One participant was excluded because he scored five (Table 1).

Table 1 - Inclusion criteria of specialists. Curitiba, PR, Brazil, 2015

Criteria	Score
Doctor of Nursing	5
Master’s in Nursing	4
Being a nurse of the basic health unit*	3
Being a specialist in clinical nursing	2
Working with chronic diseases and/or hypertension	2
Maximum score	Master: 11 Doctor: 12

Source: authors

*This criteria were established considering that the scale was developed with data from people with hypertension attended at basic health units and targeting these people.

The operation of the Delphi technique occurred between February and July 2015, through two rounds via email, through the Google Docs® system and a final consensus meeting via Skype® (Figure 1).

In both rounds, the email was sent to the experts with the Google Docs® link, containing: the free and informed consent term; the instrument of data collection; and a document with project information, the method/technique employed, information for participation in the consensus meeting and instructions for validation of the scale. After each round, a document with statistical analysis and feedback with explanations on the suggestions that were adhered to and justification for those who were not were sent to the experts.

Data collection was performed by an instrument composed of two parts: the first one characterizing the participants, containing sociodemographic, professional and academic variables. The second part was the general evaluation of the scale items, in which the expert evaluated the instrument’s appearance, applicability, concept, language and if the content was adequate to what the instrument intends to measure.

For these evaluations, a four-point ordinal categorical scale was used, ranging from “not adequate” to “very adequate”. For the data analysis, scores 1 and 2 were grouped into “not adequate” and three and four in “adequate”.

The content validity index (CVI) was used to verify the consensus, which was calculated for each item and the whole instrument.⁹ Adequate values of at least 70% were considered.⁷ Cronbach’s alpha was calculated to ensure the reliability of the instrument answered by the experts during the validation process.

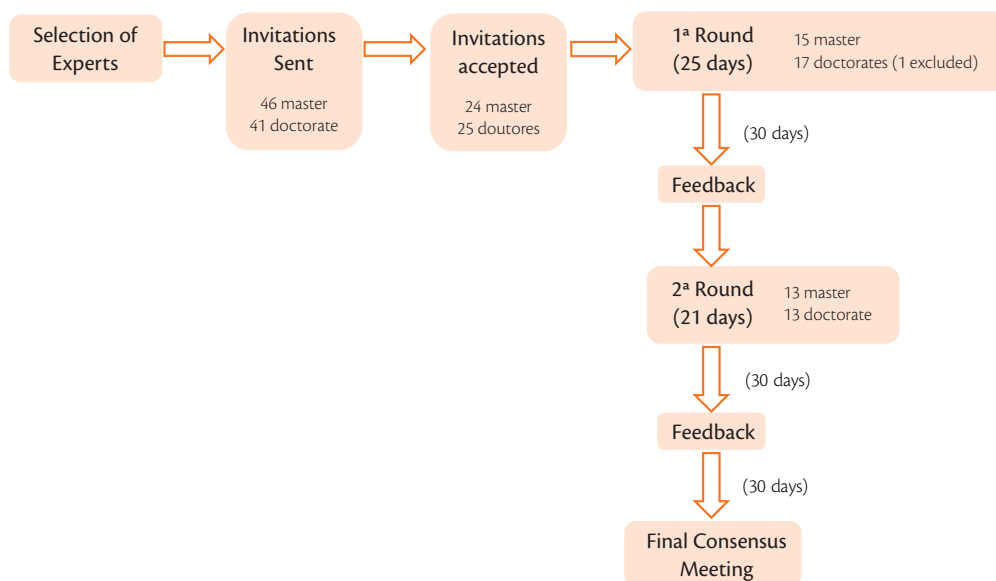


Figure 1 - Operationalization of the Delphi Technique. Curitiba, PR, Brazil, 2015. Source: authors.

The analyses were processed using the Statistical Package for Social Sciences SPSS® v.20.0 program with the assistance of a statistical professional for this purpose.

This research was approved by the Ethics Committee of the Health Sciences Sector of the Federal University of Paraná under opinion 848.878 and complies with the principles of Resolution 466/2012.

RESULTS

The characterization of the experts who were part of the research in both rounds is shown in Table 2.

Regarding the content and appearance validation process, the results of the agreement between the experts in the first and second rounds are found in Table 3. In the first round, the instrument applied to the experts obtained Cronbach's alpha of 0.80, indicating good internal consistency, and the overall CVI for the scale was 87%, indicating that the experts agreed on their suitability, but chose to perform the second round so the items could be evaluated after the suggested modifications.

In the second round, the instrument for data collection obtained Cronbach's alpha of 0.76 and the CVI scale of 98%, indicating content validity higher than the first round, after the suggested modifications.

The suggestions in the first round of the Delphi technique were mainly regarding the appearance of the scale, presentation and colors, how to write some items and adding a statement with instructions for completing the scale. The suggestions for writing the acronym in full, using the "major" or "minor" symbols, increasing the size of the footer letters, merging some cells to make the scale better visually, modifying the way of writing some items facilitating comprehension and including instructions for completing the scale.

Table 2 - Distribution of research participants according to gender, titration and activities developed. Curitiba, PR, Brazil, 2015

Variables		Round 1		Round 2	
		n	%	n	%
Gender	Female	26	81.3	19	73.1
	Male	6	18.7	7	26.9
Titration	Master	15	46.9	13	50.0
	Doctor	17	53.1	13	50.0
Nurse researcher doing research	Yes	28	87.5	24	92.3
	No	4	12.5	2	7.7
Nurse who works specifically with researches	Yes	4	12.5	4	15.4
	No	28	87.5	22	84.6
Nurse working in nursing	Yes	9	28.1	6	23.1
	No	23	71.9	20	76.9

Source: the authors.

Table 3 - Expert judgment for the scale in the first and second round of the validation process. Curitiba, PR, Brazil, 2015

Items Evaluated	Round 1		Round 2	
	Answer n=32 (%)		Answer n=26 (%)	
	Not adequate	Adequate	Not adequate	Adequate
Instrument appearance	3 (9.4)	29 (90.6)	–	26 (100)
Clarity of the instrument	6 (18.8)	26 (81.3)	1 (3.8)	25 (96.2)
Ease of application of the instrument	–	32 (100)	–	26 (100)
Instrument content	6 (18.8)	26 (81.3)	1 (3.8)	25 (96.2)
Predictor Factor "Age"	2 (6.3)	30 (93.8)	1 (3.8)	25 (96.2)
Predictor factor "Gender"	3 (9.4)	29 (90.6)	–	26 (100)
Predictor factor "Smoking"	4 (12.5)	28 (87.5)	2 (7.7)	24 (92.3)
Predictor factor "Diagnostic time"	–	32 (100)	–	–
Predictor factor "Risk classification in the health unit"	9 (28.1)	23 (71.9)	–	26 (100)
Predictor Factor "Number of drugs in use"	6 (18.8)	26 (81.3)	1 (3.8)	25 (96.2)
Predictor Factor "Depression"	4 (12.5)	28 (87.5)	–	26 (100)
Care actions for low risk hypertensive patients	2 (6.3)	30 (93.8)	1 (3.8)	25 (96.2)
Care actions for moderate-risk hypertensive patients	4 (12.5)	28 (87.5)	1 (3.8)	25 (96.2)
Care actions for high risk hypertensive patients	7 (21.9)	25 (78.1)	–	26 (100)
Care actions for very high risk hypertensive patients	5 (15.6)	27 (84.4)	–	26 (100)

* This item was not evaluated in the second round, since it was validated with 100% consensus among experts and received no suggestions.

Source: authors.

In the actions for the management of the care, the experts suggested changing the number of activities of education in health, consultations, home visits and telephone contact. The changes followed in this part of the scale were related to how to write some terms and for the actions of high and very high risk was added the telephone contact and specified the number of home visits.

In the second round, there was reduction in the number of suggestions and these were mainly related to appearance, scale organization, clarification of items and color. Two suggestions were accepted: the inclusion of a thicker grid line to separate the variables and a change in the way the scale statement was written. Suggestions related to color according to the risk stratum were addressed at the consensus meeting.

For the care actions of the scale in the second round, the experts had suggestions in the moderate, high and very high risk for the development of complications, consisting in attempting to reduce home visits with increased risk and modifications in the writing.

The consensus meeting was held to close the validation and approval process for the final version of the scale. Participants of this stage were six experts via Skype®; An abstract was presented comparing the original version and the version after the second round of the validation process, with the possibility that each expert could make his contributions should he deem it necessary. At that time, the suggestion was made to modify the word "average" referring to the classification of risk in the health unit, in the last category of the first part of the scale, to "moderate", standardizing the language.

Another issue discussed at the meeting was the color of the scale, suggesting by an expert in the second round to maintain the blue color of the original version and another that used orange to represent the high risk. Thus, during the discussion, the experts chose to change the color of the scale to blue, in the low risk; green to moderate; orange to high and red to very high risk, generating the validated version of the prediction scale "Ulbrich and Mantovani" (Figure 2).

DISCUSSION

The items on the appearance and clarity of the scale were validated with 90.6 and 81.3%, respectively, in the first round and 100 and 96.2% respectively in the second, showing that the scale is adequate for the presentation, understanding of content and ease of reading.

All the experts agreed on the ease of application of the instrument in both rounds, confirming that the scale may contribute to the care of hypertensive patients. Regarding the content of the instrument, 81.3% of the experts agreed on their adequacy in the first round and 96.2% in the second, demonstrating that the scale is capable of measuring what is pro-

posed, assessing the risk for the occurrence of associated complications to SAH by the presence or absence of risk factors.

The predictive variables in the scale: "age (years old)", "gender", "smoking", "time of medical diagnosis of hypertension (years)", "number of medications in use", "depression and risk classification in the health unit" were evaluated separately and all obtained agreement among the experts superior to 70%, leading to discuss the items in the scale with the data of the literature.

Regarding the gender and the age, the prediction scale shows that male patients over 55 years old are at higher risk for the development of complications. These predictors in the scale corroborate a study that identified the sociodemographic characteristics of hypertensive individuals in family health units in the Northeast and found that the mean age was 59.21 years old, 30% belonged to the age group from 51 to 60 years old, and 61.4 % were male.¹⁰ In a study of patients with acute myocardial infarction, the mean age was 58.2 ± 10.6 years old and 57 (64.7%) were male.¹¹ Acute myocardial infarction is one of the most frequent complications in the male mortality scenario, losing only when compared to external causes.¹²

Another factor is predisposing to the development of cardiovascular diseases, especially acute myocardial infarction and stroke, is smoking.¹³ When investigating the effects of smoking on blood pressure and hypertension, a study conducted in Turkey with 712 participants found that the number of cigarettes smoked per year was higher among former smokers (32 ± 15) and systolic and diastolic blood pressure values were lower when compared to smokers.¹⁴

The presence of the predictor factor "smoking" in the scale was considered valid by 87.5% of the experts in the first round and by 92.3% in the second. Disagreement among first-round experts about this item may have occurred because of the lack of understanding that smokers and former smokers were included in the same group for the statistical analysis of the survey that originated the scale, that is, they received the same score, clarified during the feedback.

Regarding the number of drugs, 81.3% of the specialists agreed on their adequacy in the first round and 96.2% in the second, corroborating a study carried out with 473 participants in a rural area of India to determine the factors involved in adherence to the treatment of hypertension, the adherence was greater among participants who used only one medication with frequency of once a day, compared to those who took four types of medications and the frequency of three or more times a day.¹⁵

It should be emphasized that blood pressure control and the prevention of complications are directly related to treatment adherence, which can be influenced by a number of factors, such as the chronicity of the disease, financial difficulties, a high number of prescribed medications, difficulty accessing the public health system, side effects of medications and the absence of symptoms, making control of pressure levels a challenge for health professionals, patients and family members.¹⁶⁻¹⁸

Fill in the scale with an "X" in the "Score" column according to the presence or absence of the predictor variables and then add the value in the "TOTAL SCORE" column. From the score, classify the patient into their risk stratum and follow up with the actions for the proposed care management.

Ulbrich and Mantovani Scale		
Predictor Variables	Category	Score
Age (years old)	Up to 55	0
	> 55	10
Gender	Female	0
	Male	12
Smoking	No	0
	Yes/Ex-smoker	11
Time of hypertension diagnosis (years)	Up to 10	0
	> 10	13
Number of drugs in use*	Up to 4	0
	> 4	22
Depression	Without diagnosis	0
	With diagnosis/doing treatment	14
Risk Classification Health Unit**	Low	0
	Moderate/high/very high	18
Total of points		

*All medicines used. ** When there is no risk classification in the Health Unit, the cardiovascular risk of Framinghamt is considered.

Score in the scale	Risk of complication	Probability of complications
Up to 50	Low	Less than 25%
51 to 67	Moderate	25% to 49,9%
68 to 82	High	50% to 74,9%
More than 82	Very high	75% or more

Actions for care management

Low Risk of Complication	<ul style="list-style-type: none"> - Medical and nursing consultations at least three times a year; - Home visits every six months; - Health Education activities scheduled at least every six months; - Annually reclassification.
Moderate Risk of Complication	<ul style="list-style-type: none"> - Medical and nursing consultations at least three times a year; - Home visits every six months; - Health Education activities scheduled at least every six months; - Annually Reclassification.
High Risk of Complication	<ul style="list-style-type: none"> - Medical and nursing consultations every three months and scheduling consultation with other professionals*; -Take phone contact if necessary; -Take two home visits annually and more if necessary; - Scoring of goals according to problems identified with multidisciplinary team; - Health Education activities scheduled at least four times a year; - Annually reclassification.
Very High Risk of Complication	<ul style="list-style-type: none"> - Medical and nursing consultations interspersed each month with the multidisciplinary consultation*; -Take phone contact if necessary; -Take two home visits annually and more if necessary; - Scoring of goals according to problems identified with multidisciplinary team; - Health Education activities scheduled at least four times a year; - Annually reclassification.

NOTE: At least three actions for each level must be met;

*Case manager is justified in the last two classifications.

Figure 2 - Prediction scale for arterial hypertension disorders with actions to manage care after validating content and appearance. Curitiba, PR, Brazil, 2015. Source: authors.

The 18.8% disagreement over the “number of drugs” item in the first round may have occurred, as the experts expressed doubts on the type of drugs the scale was referring. In the feedback, it was clarified that they were all used by the patient, not only those to control the pressure, generating more agreement in the second round.

The “time of diagnosis” is another variable present in the prediction scale, which had 100% agreement between the experts. It influences adherence to treatment, as shown in a study conducted with adult diabetics in Pará. This study verified a significant correlation between the time of diagnosis and adherence to treatment. It was suggested that the longer the patient was diagnosed, the lesser adherence, raising glycated hemoglobin levels and facilitating the development of complications.¹⁹

Regarding the variable “depression”, it was validated by 87.5% of the experts in the first round and 100% in the second, corroborating a study carried out with 4,352 South Africans to verify the association between SAH and depression, finding that 53.3% of hypertensives were over 50 years old, 72% were women, 42% were smokers or former smokers, 52.5% had previously one to two traumatic events during their lives, 11.9% reported three to four and 18.5% five or more events.²⁰

Mood manifestations, such as anxiety and depression, are related to the development of inappropriate behaviors for people with heart disease, such as compulsive eating, smoking, not engaging in physical activity, ingesting alcohol, and not adherence to treatment.²¹

The result of the first round for the item “depression” may have been a reflection of the existence of few studies that correlate the variables depression and complications of SAH, as well as the doubts that many experts expressed about this association, minimized in the second round, after the explanations provided in the feedback.

The variable “health risk classification” was considered adequate by 71.9% of the specialists in the first round and by 100% in the second round. This classification directs the therapy in a general way. Therefore, its presence was considered important on the scale, especially in the second round, as it may aid in the prediction of complications.

Risk classification can provide health professionals with facilities for conducting therapy, essentially because people have different needs that vary according to risk. Also, knowing the stratification of each patient helps the primary care teams to tailor care actions, both individual and collective, using the available resources appropriately.²²

Regarding the actions for the management of the care, they were divided according to the classification of risk. The actions for low, moderate, high and very high risk were validated with 93.8, 87.5, 78.1 and 84.4% of the agreement among the

experts, respectively, in the first round. In the second round, the actions for low and moderate risk had agreement of 96.2% and those of high and very high-risk, of 100%.

Care management is a process of managing a health condition that aims to improve clinical and care through management, care and education interventions.²³ This strategy can be used as a way to reduce the impact of complications caused by chronic diseases, especially of SAH. In the scale, care management is composed of health education activities, goal setting, home visits, telephone contact, nursing consultations and with other professionals.

As a member of the health team, the nurse plays an important role in the follow-up of the patient with SAH. He acts as a health educator in hypertensive, family and community groups; he is responsible for developing the nursing consultation, allowing dialogue, reception; and he encourages the patient to adhere to both pharmacological and non-pharmacological treatment.²⁴

Periodic monitoring of patients with hypertension to inform them about the disease and treatment through health education activities, home visits, or telephone contact is necessary to avoid complications. Adherence to the treatment of hypertension is complex, requiring the constant involvement and active participation of patients aiming at prevention and health promotion.²⁵

It is believed that feedback after each round may have helped experts to review their answers and reflect on the explanations provided for each question, helping to increase the CVI in the second round.

The limitation of this study was due to the difficulty that the experts had in understanding that the scale comes from a study with hypertensive population⁶ and the score of each variable was based on statistical analysis. Thus, some suggestions of changes provided by the experts, mainly in these scores, could not be complied.

CONCLUSIONS

The predictive scale for HAS complications with care management actions demonstrated evidence for the validity of content and appearance, indicating that it may be applied to hypertensive patients.

It can be used as a health technology to meet the recommendations of the Ministry of Health and assist in the monitoring and management of care for patients with hypertension to minimize or delay the development of complications. It is an innovative tool, which allows to know the patient and at what level of risk he is, helping decision making with actions aimed at pressure control.

Other research will be carried out to validate the other psychometric properties of the scale and to verify the effectiveness of its use, whether it may have an impact on the de-

velopment of long-term complications, and provides improvement in the care and follow-up of patients with hypertension.

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