VALIDATION OF INSTRUMENT TO ASSESS COMMUNITY HEALTH CARE WORKERS KNOWLEDGE ABOUT DIABETES

VALIDAÇÃO DO INSTRUMENTO DE AVALIAÇÃO DO CONHECIMENTO DOS AGENTES COMUNITÁRIOS DE SAÚDE SOBRE DIABETES

VALIDACIÓN DE UN INSTRUMENTO DE EVALUACIÓN DE CONOCIMIENTO DE LOS AGENTES COMUNITARIOS DE SALUD SOBRE LA DIABETES

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ABSTRACT

Objective: to elaborate, adapt and validate the Diabetes knowledge assessment of community healthcare workers – Diabetes-CHW – to assess CHW knowledge about diabetes *mellitus*. **Methods:** methodological study developed in three stages: a) instrument construction; b) content validation and cultural adequacy with family doctors and CHWs, followed by assessment of suggestions by a committee of experts; c) Psychometric validation of the instrument from its application in a sample of 102 CHWs, through the e-Surv webtool. Internal consistency and reproducibility analyses were performed in the R statistical programming environment. **Results:** the 29 multiple-choice question instrument showed satisfactory internal consistency, with 0.732 Cronbach's alpha (95% CI 0.652; 0.802) and intraclass correlation coefficient of 0.70 (95% CI 0.59–0.79) between the test and retest scores. **Conclusion:** the diabetes-CHW instrument was validated and considered adequate to assess community healthcare workers' knowledge about DM.

Keywords: Diabetes *Mellitus*; Community Health Workers; Surveys and Questionnaires; Validation Studies.

RESUMO

Objetivo: elaborar, adequar culturalmente e validar o "conhecimento dos agentes comunitários de saúde (ACS) sobre diabetes" – diabetes-ACS – para avaliação do conhecimento dos ACS sobre diabetes mellitus. **Métodos:** estudo metodológico desenvolvido em três etapas: a) construção do instrumento; b) validação de conteúdo e adequação cultural com médicos de família e ACS, seguidas de avaliação das sugestões por comitê de especialistas; c) validação psicométrica do instrumento a partir de sua aplicação em uma amostra de 102 ACS, por meio da ferramenta e-Surv. As análises de consistência interna e reprodutibilidade foram realizadas no ambiente de programação estatística R. **Resultados:** o instrumento, constituído de 29 questões de múltipla escolha, apresentou consistência interna satisfatória, com alfa de Cronbach 0,732 (IC 95% 0,652; 0,802) e coeficiente de correlação intraclasse de 0,70 (IC 95% 0,59–0,79), entre os escores do teste e do reteste. **Conclusão:** considera-se adequado e validado o instrumento diabetes-ACS para avaliação de agentes comunitários de saúde.

Palavras-chave: Diabetes Mellitus; Agentes Comunitários de Saúde; Inquéritos e Questionários; Estudos de validação.

RESUMEN

Objetivo: elaborar, adaptar culturalmente y validar el "conocimiento de los agentes de salud comunitarios (ACS) sobre la diabetes" – diabetes-ACS – para evaluar el conocimiento de los ACS sobre la diabetes mellitus. *Métodos:* estudio metodológico desarrollado en tres etapas: a) construcción del instrumento; b) validación de contenido y adecuación cultural con médicos de familia y ACS, seguido de evaluación de sugerencias por parte de un comité de expertos; c) validación psicométrica del instrumento a partir de la aplicación en una muestra de 102 ACS, a través de la herramienta e-Surv.

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Los análisis de consistencia interna y reproducibilidad se realizaron en el entorno de programación estadística R. **Resultados:** el instrumento, que consta de 29 preguntas de opción múltiple, tuvo consistencia interna satisfactoria, con alfa de Cronbach 0,732 (IC 95% 0,652; 0,802) y coeficiente de correlación intraclase de 0,70 (IC del 95%: 0,59 a 0,79) entre los puntajes de prueba y retest. **Conclusión:** el instrumento diabetes-ACS se considera apropiado y validado para la evaluación de agentes comunitarios de salud.

Palabras clave: Diabetes Mellitus; Agentes Comunitarios de Salud; Encuestas y Cuestionarios; Estudios de Validación.

INTRODUCTION

Diabetes *mellitus* (DM) is a global epidemic affecting a population estimated to reach 471 million by 2035. About 80% of these individuals live in developing countries, where there is an increasing incidence in younger age groups. Hypertension (AH), obesity and dyslipidemia are comorbidities frequently associated with DM which increase cardiovascular risk, thus allowing for a shared approach.^{1,2}

Among strategies adopted in order to enhance the life quality of people with DM are educating people about DM and associated diseases, promoting changes in behavior regarding healthy eating and physical activity, and encouraging people with DM to develop self-care practices, including regular follow-ups.

In Brazil, the Family Health Strategy-FHS (*Estratégias de Saúde da Família*-ESF) implements a National Policy For Primary Care settings which monitors and develops human resources towards care provision to people with non-communicable chronic diseases.⁴⁻⁶ The position of Community healthcare worker (CHW) was implemented in 1970 and is today part of the FHS.⁵⁻⁷ As CHWs are members of the communities which they supervise, they have contact with the population in their homes, and they can communicate with these communities, their activity is seen as a form of extension of healthcare service,⁸ which can be drawn upon in order to enhance the educational practices directed to DM healthcare, relying on CHW's contributions to multidisciplinary teams and their promotion of healthcare education through shared experience and attentive listening.

Given the importance of CHWs' role and the lack of a means to assess their knowledge about DM, an instrument was felt to be needed so as to gather information on CHWs' knowledge and promote their education on related topics, aiming at enhancing the work these professionals carry out within households and their participation in multidisciplinary teams targeting healthcare education.

The aim of the study herein reported was to elaborate, culturally adapt, and validate the instrument "CHWs knowledge on diabetes" (Diabetes – CHW).

METHOD

This is a methodological study carried out in the city of *Belo Horizonte-*MG. The project was approved by the Ethics and Research Committee Involving Human Beings of the *Instituto de Ensino e Pesquisa in Santa Casa de Belo Horizonte* (decision Number. 1,138,026) and *Prefeitura de Belo Horizonte* (decision Number. 1,390,864), 1.177.817, 2015. Agreement to participate in the study was recorded by using a Free Informed Consent Form available in the initial webpage of the electronic questionnaire in the web tool e-Surv.

An expert committee with four family and community doctors, one endocrinologist, one linguist, one statistician, and two nurses carried out the assessment of stages one through four (elaboration and cultural adequacy). Due to the specificity of the CHW role, meetings and group discussions with CHWs were held in order to select and calibrate the language each of the items, to ensure the instrument would be clearly understood by CHWs (Figure 1).

STAGE 1

A family and community doctor and an endocrinologist, members of the Expert Committee, carried out a review of available literature on the laws that regulate the CHWs' duties and recommendations on their work found in manuals issued by the Ministry of Health and in particular guidelines.^{4,5,8-12}

Once the overall conceptual structure was established, the instrument was designed as made up by two sections: a first section focusing on CHWs' sociodemographic profile, characteristics of their work and CHWs' perception of their duties; and a second section aimed at assessing CHWs' knowledge about key aspects of DM and associated care expected to be performed as part of their work. Items about hypertension, a frequent comorbidity, were included drawing on the fact that it is a duty of CHWs to monitor both DM and hypertension with a view to a more efficient management of treatment and prevention of cardiovascular risk.

During this stage, it was decided that the instrument should be designed in order to be self-administered. After drafting candidate items, those that best captured CHWs' role as members of a multidisciplinary DM care team were selected, which yielded a first version of the instrument (V1).

STAGES 2 TO 4

Content validation and cultural adaptation comprised three face-to-face tests with 15 CHWs, described as stages 2, 3 and 4, which yielded versions 2 to 4 (V2-V4) of the instrument.



Figure 1 - Stages in the instrument elaboration and validation process.

The meetings with CHWs were held at two different steps in the validation and adaptation process. First, each participant read the whole instrument individually; secondly, they discussed it with the researchers in order to assess that items were clear, accurate, relevant and properly arranged.

Participants' feedback was then discussed by the Expert Committee, who considered all relevant comments and redrafted those items that obtained less than 80% agreement. The subsequently redrafted items were tested on a newly selected group of professionals, until no need for further redrafting was needed and version 4 (V4) was considered culturally adequate to be subjected to psychometric validation.

STAGE 5

At this stage, a digital version was prepared on the web platform e-Surv. Ten CHWs used tablets to access the instrument web version to test its usability and assess each item and its multiple choice of answers to verify if they had been clearly formulated and could be easily comprehended.

STAGE 6

To assess the instrument reliability a test-retest to a sample of 102 CHWs was carried out. The targeted healthcare units were selected by convenience within three districts in the city of *Belo Horizonte*: the East district, the *Pampulha* district, and the Northwest district. The assessment was carried out in two phases: CHWs took part in an initial "test" and were later requested to take a re-test 15 days afterwards. CHWs answered the questionnaire on the web platform e-Surv and their data was extracted for statistical analysis.

Absolute and relative frequencies were used to describe the sample characteristics and the proportion of correct answers in the instrument items. Internal consistency and reproducibility were verified to analyze the reliability of the construct. Cronbach's alpha (CA) was used to assess the internal consistency of the instrument.^{13,14}

The instrument reproducibility was evaluated through the test-retest (temporal stability), computing the intraclass correlation coefficient (ICC), which was considered to be satisfactory when ICC> 0.7. The percentage of agreement for responses at test and retest was also computed as an auxiliary measure, defined as the ratio between the number of individuals who chose the same answer (regardless of being correct or incorrect) at both test and retest and the total number of individuals. The significance level adopted for the statistical tests was 5%. The collected data were stored with an identifier code in a spreadsheet, imported for analysis in the statistical programming environment R.¹⁴

RESULTS

127 CHWs participated in our study (15 of them in the written version adaptation stage; 10 in the web version adaptation, and 102 in the validation stage) (Table 1).

	Adaptation	Validation					
Variables	Stages 2 to 4 n (%) N=15	Stage 5 n (%) N=10	Stage 6 n (%) N=102				
Sex							
Female	14 (93)	9 (90)	94 (92)				
Male	1 (7)	1 (10)	8 (8)				
Education							
Elementary School	0 (0)	4 (40)	15 (15)				
High school	11 (73)	5 (50)	81 (79)				
Higher Education	4 (27)	1 (10)	6 (6)				
Time in CHW position (years)							
3 to 5	2 (13)	2 (20)	21 (21)				
6 to 10	7 (47)	1 (10)	34 (33)				
over 10	6 (40)	7 (70)	47 (46)				

Table 1 - Profile of CHWs in the instrument adaptation and validation stages. *Belo Horizonte,* MG, Brazil, 2016

ELABORATION, CONTENT VALIDATION AND ADAPTATION

The elaboration and adaptation stages yielded four versions (V1-V4). V1 was designed as made up by part 1 comprising 20 items on socio-demographics and CHW role assessment and part 2 having 13 questions on CHWs' knowledge assessment.

Items reported as not being sufficiently clear or relevant by participants were reviewed along the stages from V1 to V3; four items in V2 were excluded since participants' agreement was below 80%. V3 presented two items demanding redrafting so that V4 could be obtained, the latter considered culturally adequate, no further redrafting needed (Table 2).

Table	2	-	ltems	reviewed	along	the	process	of	elaboration	and
adaptation. Belo Horizonte, MG, Brazil, 2016										

Initial number of questions (Part 1/Part 2)	33 (20/13)	33 (20/13)	29 (17/12)	29 (17/12)
Number of questions requiring redrafting or exclusion (Part 1/Part 2)	22 (10/12)	16 (6/10)	3 (2/1)	0
Suggestions deemed necessary by the Expert Committee	20	12	0	NA
Items excluded due to agreement below 80%	0	4	0	NA
Final number of questions (Part 1/Part 2)	33 (20/13)	29 (17/12)	29 (17/12)	29 (17/12)

 $V{=}$ version; Part 1: socio-demographic and CHW role assessment; Part 2: knowledge assessment; NA: not applicable.

CHWs reported finding some of the terms as being too technical or domain specific and suggested replacing them by

more colloquial ones as well as changes in the syntax of the wordings so as to improve understanding and make them more self-explanatory. Response scales were adapted for the purpose of data collection and analysis.

The four items in V1 that were excluded along the adaptation process were three questions in part 1, pertaining to household visit planning by CHWs (deemed to exceed the aims of the instrument); CHWs' advice on nutrition problems (deemed difficult to understand and exceeding the CHW duties as reported in two of the face-to-face tests; CHWs' form fulfillment during household visits (deemed to be inadequate as form fulfillment guidelines vary are dictated by each municipality in Brazil; and one item in part 2 assessing frequency of household visits by CHWs to people with diabetes, which was excluded as there is no consensus in the literature about the precise number of visits that should be paid.

CHOICE OF LEXICAL ITEMS FOR EASE OF UNDERSTANDING AND USE IN CHW GUIDELINES

The main changes suggested for V1 were using 'person with diabetes" instead of "patient" bearing on the restricted use of "patient" to name a person receiving or registered to receive medical treatment, Nursing care or tended by healthcare professionals within primary care programs.

The term "*Mellitus*" following the word "diabetes" was suggested to be excluded as it could be interpreted by CHWs as a type of diabetes. The expression "risk factors" common in healthcare texts proved difficult for CHWs to understand and it was replaced by "factors that increase risk." The word "role" was replaced by "duty" as the latter is the most frequently used to refer to the duties of CHWs.

INTERNAL CONSISTENCY AND INSTRUMENT REPRODUCIBILITY

Bearing on the fact that the instrument seeks to elicit information on CHWs' knowledge about diabetes and the most relevant aspects of hypertension as a comorbidity and that all items are directly or indirectly related between one another, is was considered as a single dimension instrument. Oiut of 29 questions, part 2 of the instrument was submitted to the validation process with 41 items, which were grouped into 12 questions. The general Cronbach's alpha (α) value for the instrument was 0.732 (95% CI 0.652 – 0.802), indicating high internal consistency. Cronbach's alpha was calculated by removing one question at a time to assess the influence of each item on the internal consistency of the instrument (Table 3).

ltem*	Test-Retest Correlation	Agreement (%)	Cronbach's Alpha if item is removed	95% CI for Alpha
Q1A	0.57	96.12	0.729	0.649 - 0.800
Q1B	0.32	81.70	0.730	0.650 - 0.800
Q1C	0.33	91.31	0.733	0.654 - 0.803
Q1D	0.57	76.89	0.721	0.638 - 0.793
Q1E	0.63	81.70	0.729	0.648 - 0.799
Q1F	0.51	76.89	0.723	0.640 - 0.795
Q2	0.55	77.85	0.741	0.665 - 0.809
Q3A	0.62	95.16	0.729	0.648 - 0.799
Q3B	0.34	82.66	0.727	0.646 - 0.798
Q3C	0.53	74.97	0.712	0.626 - 0.787
Q3D	0.56	90.35	0.724	0.642 - 0.796
Q3E	0.29	77.85	0.719	0.636 - 0.792
Q3F	0.47	73.05	0.718	0.634 - 0.791
Q4A	0.35	79.78	0.720	0.637 - 0.793
Q4B	0.41	70.17	0.716	0.631 - 0.790
Q4C	0.37	69.20	0.718	0.634 - 0.791
Q4D	0.64	92.27	0.720	0.636 - 0.792
Q4E	0.46	90.35	0.717	0.633 - 0.791
Q4F	0.5	74.97	0.709	0.622 - 0.785
Q4G	0.3	64.40	0.712	0.627 - 0.787
Q5	0.39	77.85	0.737	0.659 - 0.806
Q6A	0.49	96.12	0.733	0.654 - 0.803
Q6B	0.17	89.39	0.730	0.650 - 0.800
Q6C	0.39	86.51	0.723	0.641 - 0.795
Q6D	1	97.08	0.733	0.653 - 0.802
Q6E	1	80.74	0.728	0.647 - 0.799
Q6F	1	81.70	0.725	0.643 - 0.796
Q6G	1	72.09	0.719	0.635 - 0.792
Q7	1	89.39	0.734	0.655 - 0.803
Q8A	1	80.74	0.740	0.662 - 0.807
Q8B	1	61.51	0.731	0.651 - 0.801
Q8C	1	81.70	0.724	0.642 - 0.796
Q9A	1	72.09	0.731	0.651 - 0.801
Q9B	1	77.85	0.725	0.643 - 0.797
Q9C	1	80.74	0.728	0.647 - 0.799
Q9D	1	72.09	0.738	0.660 - 0.806
Q9E	1	74.97	0.735	0.657 - 0.804
Q9F	1	74.01	0.736	0.657 - 0.805
Q10	1	74.97	0.725	0.643 - 0.796
Q11	1	82.66	0.743	0.667 - 0.810
Q12	1	94.19	0.732	0.653 - 0.802

Table 3 - Correlation between test and retest answers agreement percentage and Cronbach's alpha coefficient for the Diabetes CHW Instrument. Brazil, 2016

0.7

Total score

0.652 - 0.802

0.732

80.74**

The removal of questions 1 (c), 2, 5, 6 (a), 6 (d), 7, 8 (a), 9 (d), 9 (e), 9 (f), 11 and 12 provided values of absence α greater than the total α value, but in all items the value remained above 0.7, considered satisfactory. Thus, it was decided not to exclude the items, since this would implicate not eliciting important data and would impact assessment content.

The instrument reliability was assessed using the correlation between the responses of each test and the retest item (Table 3). Despite the low value of this coefficient in 14 of the 41 items analyzed (less than 0.5), 17 showed a perfect correlation (equal to 1), yielding a total value of 0.7. Agreement between responses in the test and retest reached high percentage in all items, with an average of 80.74% and permanently above 64%.

The instrument reproducibility was also assessed by calculating the intraclass correlation coefficient between the test and retest measurements (after two weeks), with the satisfactory agreement (ICC = 0.7; 95% CI 0.59-0.79). All participants spent between 20 and 25 minutes on testing and retesting.

DISCUSSION

Given the important role of CHWs within the Family Health Strategy (FHS) and their potential for dissemination within multidisciplinary care teams, the proposal to build a DM knowledge measurement instrument for this target population was seen as an opportunity to facilitate the recognition of potentialities and shortcomings in their duties.

All stages for the development of instruments in the healthcare area recommended in the literature were observed to ensure an adequate instrument.¹⁵⁻¹⁹ The participation of healthcare professionals, applied linguists, and statisticians was important to ensure a proper selection and organization of items, and the potential of data analysis in the testing stage.

The content of the questions and the answer options in the final version were considered easy to understand, in a language accessible to the target population. The total Cronbach's alpha value was 0.73 (95% CI 0.652-0.802), and the test-retest reliability measured by the intraclass correlation coefficient was 0.7 (95% CI 0.59-0.79). These results have satisfactory values in the literature for new instruments.²⁰ No studies that described the elaboration and validation of instruments for CHW were found so that results could be compared to our own.

The role of CHWs as educators was a fundamental point for the elaboration of the instrument. This is based on their role of monitoring, guiding, clarifying, and listening to the people they supervise.⁸ Within the Family Health Strategy (FHS), CHWs still play a minor in and could certainly aid in identifying patients at risk for DM and hypertension, dealing with missed appointments, providing advice on scheduling and physical activity, as well as how to handle household garbage and sharps disposal, among others. The items in the Diabetes-CHW instrument addresses all of these topics, which are fundamental to people's follow-up and do not exceed CHWs' duties.

To develop our instrument four written versions and a web one were produced, the instrument comprising two parts – socio-demographic and role assessment and knowledge assessment. The Expert Committee's decision for a web version, administered via the free web platform e-Surv was based on the widespread electronic access through a mobile phone by CHWs, and it proved successful and well-accepted, no difficulties being reported regarding access to the web questionnaire.

The decision to hold joint meetings between Family and Community Doctors, researchers and CHWs proved efficient to solve doubts and difficulties regarding understanding, clarity, and relevance of the questions, thus resulting in adaptation of words and expressions to make them adequate to CHWs, as recommended in the literature.²¹ The meetings were also an opportunity for the integration of Family Doctors and CHWs, prompting discussions about DM to ensure that the items in the instrument would not exceed CHWs' duties.

For V1, we relied on manuals and protocols directed to CHWs to extract terms for item formulation; interestingly, this version was the one that most demanded term substitution and language adaptation. It was concluded that the available materials to guide the work of the CHWs in monitoring people with DM and comorbidities make use of a language that is not adequately calibrated to these professionals. In V2 and V3, additional changes were requested to facilitate CHWs' understanding. The exclusion of four questions was based on their having obtained an agreement of less than 80% among the CHWs, who considered that the questions exceeded their duties and that they addressed issues that could lead to erroneous decisions, such as questions related to nutrition. V4 was considered to be fully comprehensible, and no further changes were requested.

CONCLUSION

The results showed that the analytical procedures adopted in this study adequately identified the empirical structure of the construct and that the instrument is valid and reliable to express knowledge in the target group. The topics addressed were deemed relevant by the experts, as some of them, such diabetes sharps disposal and promotion of screening of people at risk can be efficiently carried out by CHWs household visits.

The use of the instrument Diabetes-CHW may thus aid municipalities to plan and implement more effective continuing education, contributing to focused training and promoting the inclusion of CHWs in multidisciplinary healthcare teams for people with DM. A limitation of our study is the lack of available comparable instruments s othat our results can be compared.

This research yielded an accessible instrument that can be administered via e web interface, and which is culturally adequate and validated to be used to assess knowledge about diabetes and associated care.

REFERENCES

- International Diabetes Federation (IDF). IDF Diabetes Atlas. 7th ed. 2015[cited 2016 Dec 12]. Available from: https://www.idf.org/e-library/ epidemiology-research/diabetes-atlas.html
- Weber MA, Schiffrin EL, White WB, Mann S, Lindholm LH, Kenerson JG, et al. Clinical practice guidelines for the management of hypertension in the community a statement by the American Society of Hypertension and the International Society of Hypertension. J Clin Hypertens. 2014[cited 2016 Dec 12];32(1):3-15. Available from: https://onlinelibrary.wiley.com/doi/ full/10.1111/jch.12237
- Costa JA, Balga RSM, Alfenas RCG, Cotta RMM. Health promotion and diabetes: discussing the adherence and motivation of diabetics that participate in health programs. Ciênc Saúde Colet. 2011[cited 2016 Dec 12];16(3):2001-9. Available from: http://www.scielo.br/scielo.php?script=sci_ arttext&pid=S1413-81232011000300034&lng=en&nrm=iso&tlng=en
- 4. Ministério da Saúde (BR). Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Estratégias para o cuidado da pessoa com doença crônica: diabetes *mellitus*. Cad Atenção Básica. 2013[cited 2016 Dec 12];36:160. Available from: http://189.28.128.100/dab/docs/portaldab/publicacoes/ caderno_36.pdf
- 5. Ministério da Saúde (BR). Lei n. 11.350, de 5 de Outubro de 2006. Regulamenta o § 5º do art. 198 da Constituição, dispõe sobre o aproveitamento de pessoal amparado pelo parágrafo único do art. 2º da Emenda Constitucional nº 51, de 14 de fevereiro de 2006, e dá outras providências[cited 2016 Dec 12]. Available from: http://www.planalto.gov. br/ccivil_03/_Ato2004-2006/2006/Lei/L11350.htm
- Waidman MA, Costa B, Paiano M. Community health agents' perceptions and practice in mental health. Rev Esc Enferm USP. 2012[cited 2016 Dec 12];46(5):1170-7. Available from: https://www.ncbi.nlm.nih.gov/ pubmed/23223734
- Ministério da Saúde (BR). Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Memórias da saúde da família no Brasil. Brasília: Ministério da Saúde; 2010[cited 2016 Dec 12]. Available from: http://bvsms.saude.gov. br/bvs/publicacoes/memorias_saude_familia_brasil.pdf
- Ministério da Saúde (BR). Secretária de Atenção à Saúde. Departamento de Atenção Básica. O trabalho do agente comunitário de saúde. Brasília: Ministério da Saúde; 2009[cited 2016 Dec 12]. Available from: http://189.28.128.100/dab/docs/publicacoes/geral/manual_acs.pdf
- Secretaria do Estado de Saúde (MG). Linha-guia de hipertensão arterial sistêmica, diabetes mellitus e doença renal crônica; 3: 200. 2013[cited 2016

Dec 12]. Available from: http://www.saude.mg.gov.br/sobre/publicacoes/ linha-guia-e-manuais

- Prefeitura Municipal de Belo Horizonte (MG). Protocolo de diabetes mellitus e atendimento em angiologia e cirurgia vascular. Belo Horizonte: PBH; 2011[cited 2016 Dec 12]. Available from: https://prefeitura.pbh.gov. br/sites/default/files/estrutura-de-governo/saude/2018/documentos/ publicacoes%20atencao%20saude/protocolo_diabetes_mellitus_ atendimento_angiologia_vascular.pdf
- Ministério da Saúde (BR). Secretária de Atenção à Saúde. Departamento de Atenção Básica. Política Nacional de Atenção Básica. Brasília: Ministério da Saúde; 2012[cited 2016 Dec 12]. Available from: http://189.28.128.100/dab/ docs/publicacoes/geral/pnab.pdf
- Ministério da Saúde (BR). Secretária de Atenção à Saúde. Departamento de Atenção Básica. Guia prático do agente comunitário de saúde. Brasília: Ministério da Saúde; 2009[cited 2016 Dec 12]. Available from: http://189.28.128.100/dab/docs/publicacoes/geral/guia_acs.pdf
- Cronbach LJ. Coefficient alpha and the internal structure of tests. Psychometrika. 1951[cited 2016 Dec 12];16:297-334. Available from: https:// pdfs.semanticscholar.org/e985/ac2e151903000cac310ffbc5b2cb4fbb9dd5.pdf
- Team RC. R: A language and environment for statistical computing. Vienna: R Foundation for Statistical Computing; 2016[cited 2016 Dec 12]. Available from: https://www.r-project.org
- Luppi I. Comentario a propósito de la presentación de la Dra. Elza Berquó. Reflexiones teórico metodológicas sobre la elaboración de cuestionarios de encuesta: una experiencia de integración de enfoques. Rev Bras Epidemiol. 2008[cited 2016 Dec 12];11(1):90-7. Available from: http://www.scielo.br/ scielo.php?script=sci_arttext&pid=S1415-790X2008000500009&lng=pt&n rm=iso&tlng=es
- Alexandre NMC, Coluci MZO. Content validity in the development and adaptation processes of measurement instruments. Ciênc Saúde Colet. 2011[cited 2016 Dec 12];16(7):3061-8. Available from: https://www.ncbi. nlm.nih.gov/pubmed/21808894
- Braga CG, Cruz DALM. Psychometric contributions to the assessment of psychosocial responses in nursing. Rev Esc Enferm USP. 2006[cited 2016 Dec 12];40(1):98-104. Available from: http://www.scielo.br/scielo. php?script=sci_arttext&pid=S0080-62342006000100014
- Pasquali L. Psicometria. Rev Esc Enferm USP. 2009[cited 2016 Dec 12];43:992-9. Available from: http://www.scielo.br/pdf/reeusp/v43nspe/a02v43ns.pdf
- Reichenheim ME, Moraes CL. Operacionalização de adaptação transcultural de instrumentos de aferição usados em epidemiologia. Rev Saúde Pública. 2007[cited 2016 Dec 12];41(4):665-73. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-89102007000400024&lng=en&nrm=iso&tlng=pt
- Tavakol M, Dennick R. Making sense of Cronbach's alpha. Int J Med Educ. 2011[cited 2016 Dec 12];2:53-5. Available from: https://www.ncbi.nlm.nih. gov/pmc/articles/PMC4205511/
- Borsa JC, Damásio BF, Bandeira DR. Adaptação e validação de instrumentos psicológicos entre culturas: algumas considerações. Paidéia. 2012[cited 2016 Dec 12];22:423-32. Available from: http://www.scielo.br/scielo. php?script=sci_arttext&pid=S0103-863X2012000300014