Measuring instruments in cardiology adapted into Portuguese language of Brazil: a systematic review

INSTRUMENTOS DE MEDIDA EM CARDIOLOGIA ADAPTADOS PARA A LÍNGUA PORTUGUESA DO BRASIL: UMA REVISÃO SISTEMÁTICA

INSTRUMENTOS DE MEDIDA EN CARDIOLOGÍA ADAPTADOS A LA LENGUA PORTUGUESA DE BRASIL: UNA REVISIÓN SISTEMÁTICA

Marilia Estevam Cornélio[1], Neusa Maria Costa Alexandre[2], Thaís Moreira São-João[3]

ABSTRACT

This was a systematic review aimed at identifying and characterizing measuring instruments, developed in the context of cardiology, which were adapted into Portuguese language of Brazil. Systematic searches were performed in six databases. Information extracted included cultural adaptation process and measurement properties. To assess the methodological quality of studies, criteria based on international guidelines for cultural adaptation of instruments were used. Among the 114 articles found, 14 were eligible for review. Of these, most evaluated quality of life (35.7%) and health knowledge/learning (28.6%). Most studies followed all stages of the adaptation process recommended in the literature. With respect to measurement properties, internal consistency, verified by Cronbach's alpha, was the property reported in the majority of the studies, as well as construct and criterion validity. This study is expected to provide to the scientific community a critical evaluation of adapted questionnaires available in the context of cardiology.

DESCRIPTORS
Questionnaires
Translating
Validation studies
Cardiology
Review

RESUMO

Revisão sistemática com o objetivo de identificar e caracterizar instrumentos de medida desenvolvidos no contexto da cardiologia que foram adaptados para a língua portuguesa do Brasil. Buscas sistematizadas foram realizadas em seis bases de dados. Extraíram-se informações referentes ao processo de adaptação cultural e as propriedades de medida. Para avaliação da qualidade metodológica dos estudos, foram utilizados critérios com base em diretrizes internacionais para adaptação cultural de instrumentos. Dentre os 114 artigos levantados, 14 foram considerados elegíveis para a revisão. Desses, a maioria avaliava qualidade de vida (35,7%) e conhecimento/ aprendizagem em saúde (28,6%). A maioria dos estudos contemplou todas as etapas do processo de adaptação recomendadas pela literatura. Com relação às propriedades de medida, a consistência interna, verificada por meio do alfa de Cronbach, foi a propriedade relatada na maioria dos estudos, bem como as validades de constructo e critério. Com este estudo, espera-se disponibilizar para a comunidade científica uma avaliação criteriosa dos questionários adaptados disponíveis no contexto da cardiologia.

DESCRITORES
Questionários
Tradução
Estudos de validação
Cardiologia
Revisão

RESUMEN

Esta revisión sistemática tuvo como objetivo: identificar y caracterizar los instrumentos de medición desarrollados en el contexto de la cardiología que fueron adaptados a la lengua portuguesa de Brasil. Se llevaron a cabo búsquedas sistemáticas en seis bases de datos. Se extrajeron los datos sobre el proceso de adaptación cultural y las propiedades de medición. Para evaluar la calidad metodológica de los estudios, fueron utilizados criterios basados en las directrices internacionales para la adaptación cultural de instrumentos. Entre los 114 artículos encontrados, 14 fueron elegibles para su revisión. De los 14, la mayoría evaluaba la calidad de vida (35,7%) y los procesos de conocimiento / aprendizaje en salud (28,6%). La mayoría de los estudios incluyeron todas las etapas del proceso de adaptación recomendadas por la literatura. En relación a la medición de las propiedades, la consistencia interna, verificada por el alfa de Cronbach, fue la propiedad reportada en la mayoría de los estudios, así como la validez de constructo y la validez de criterio. Con este estudio, se espera brindar a la comunidad científica una cuidadosa evaluación de los cuestionarios adaptados disponibles en el contexto de la cardiología.

DESCRIPTORES
Cuestionarios
Traducción
Estudios de validación
Cardiología
Revisión

[1] Post-doctoral student, Faculty of Nursing, Campinas University, Campinas, SP, Brazil. mariliacornelio@gmail.com [2] Associate Professor, Faculty of Nursing, Campinas University, Campinas, SP, Brazil. [3] Post-doctoral student, Faculty of Nursing, Campinas University, Campinas, SP, Brazil.

INTRODUCTION

The literature reveals that cardiovascular diseases (CVD) are the leading cause of death and disability in the world[1-2]. In Brazil, diseases of the circulatory system accounted for approximately 31% of all deaths in 2009[3].

It is estimated that over 80% of CVD deaths are associated with known risk factors that can be prevented, such as smoking, physical inactivity and poor nutrition[1]. However, prevention and treatment of these disorders often involve a complex scheme of lifestyle modification and the use of a wide range of medications, requiring a large investment of time for health professionals to promote awareness and patient adherence to recommendations, as well as the adoption of healthy behaviors.

In the context of CVD, the use of measuring instruments is an important resource in the development of exploratory research, whether diagnostic or experimental, for understanding the needs of individuals with these conditions and knowledge of health factors about which they wish to speak, as well as experimental designs that may be used as primary and secondary end-points[4].

The use of measuring instruments allows one to obtain standardized data and compare results between different populations of the world[5], and it is an economical and effective way to acquire reliable and valid outcome measures[6]. It also allows one to transform subjective measures of objective data that can be quantified and analyzed in addition to investigating the impact of health interventions, enabling comparisons with less expenditure of time and financial resources[6].

In exploratory research, a key step is the researcher's decision to use a previously developed instrument or to construct a specific tool to the completion of his study. Due to the complexity of the process of creating a new instrument and the existence of one that is already validated in another language to assess the same phenomenon, it is recommended to perform an adaptation of the tool to the desired culture[6].

Cultural adaptation should result in a reliable and valid instrument, similar to the original, which can be used as a reference in research in many participating countries, thus becoming a tool for the comparison of results obtained in different cultures[5]. However, the cultural adaptation of an instrument for use in a new country, culture and/or language requires a methodology to achieve equivalence between the original source and the target language[7].

This study aimed to identify questionnaires adapted into Portuguese language of Brazil used in the context of cardiology, to characterize the thematic areas of each, to assess the adaptation process that was adopted, and to describe the psychometric properties reported in the studies. This review is intended to provide insight to researchers and health professionals in identifying and choosing specific instruments for a particular study, in the context of cardiology.

METHOD

This was a literature research that can be defined as a systematic review. A systematic review is a rigorous methodology proposed to identify studies on a topic in question, through the application of systematic methods to search, and to evaluate the quality, validity and applicability of these studies in the context in which the changes will be implemented[8]. To meet the objectives of this study, we performed a systematic review based on the international protocol called PRISMA[9], which included the following methodological steps: 1) search strategies, 2) inclusion and exclusion criteria, 3) data extraction and assessment of methodological quality of eligible studies.

Search strategies

We conducted a systematic and sequential search in the following databases: *Thomson Reuters Web of Knowledge*, SCOPUS, *Cumulative Index to Nursing and Allied Health Literature* (CINAHL), Literature Latin American and Caribbean Health Sciences (LILACS), *Medline and Scientific Electronic Library Online* (SciELO). A combination of terms and/or keywords was used to ensure the maximum capture of articles (*cultural* OR *valid* OR *trad* OR *psychomet* OR *adapt*) *AND* (*questionnaire* OR *instrument* OR *scale*) *AND* (*card* OR *coronar* OR *heart* OR *hypertension*) *AND* (*Portuguese* OR *Brazil*).

After searching databases, two authors conducted a critical reading of the titles and review of the abstracts to identify relevant articles according to the inclusion criteria. Articles were classified as included, excluded or doubt. Those that generated doubts were evaluated by three researchers (two of them participated in the primary reading) to determine, by consensus, a final decision.

Criteria for inclusion and exclusion

Articles in Portuguese and/or English, published between 1990 e 2013, were included to describe the process of cultural adaptation to Portuguese language of Brazil, with abstracts and full texts available in selected databases. We excluded those that did not follow the methodological process of cultural adaptation of instruments recommended by international guidelines[7] and those that were not placed in the context of cardiology.

Data extraction and assessment of methodological quality of eligible studies

The data were obtained using a standard form developed for the purpose of ensuring the homogeneous

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extraction of information from the items. Firstly, characterization data were extracted from the instruments, and after, data related to translation and cultural adaptation were obtained in order to evaluate the quality of these processes, and also data regarding the psychometric properties of each study.

To evaluate the translation and cultural adaptation process, the studies were classified according to the criteria described in the *Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures*[7], which include the following steps: translation, synthesis of translations , back translation, review by the expert committee, and pretesting. To do so, each step was classified as follows: positive (+), doubtful(?) and negative (-)[10] (Chart 1). The doubt

classification was attributed to the step which was performed in a questionable form, or, that was not performed according to the recommendations of the Guidelines[7], such as, for example, in the translation stage, the translators did not have as the native language that of the original instrument.

With regard to the psychometric properties of the instruments, it was decided to make a description of the tests performed and reported in the studies, since there is not yet a global consensus on the criteria for evaluation of the psychometric properties of instruments developed, adapted and validated, although there are initiatives for this purpose, such as the *Consensus-based Standards for the selection of Health Measurement Instruments* (COSMIN)[11].

Chart 1 - Guidelines for procedures of cultural adaptation of questionnaires[7,10]

Step	Description	Classification scheme
Translation	Two or more translators must translate the questionnaire independently. The native language of the translator should be the target language of the translation.	+ Translation by at least two independent translators; ? Questionable procedure for translation; - Translation done by only one translator; 0 No information about the translation process.
Synthesis	Translators must synthesize translations and produce a consensus version.	+ Synthesis performed; ? Questionable design; 0 No information about the synthesis, or translation was done by only one translator.
Back translation	Translators who have no knowledge of the original questionnaire should translate the consensus version of the translation back to the original language of the questionnaire.	+ Back translation conducted by at least two independent translators; ? Procedure of questionable back-translation; - Back translation done by a translator; 0 No information about the process of back-translation.
Analysis of the committee	The expert committee examine all versions of the questionnaire and develop the pre-final version of the questionnaire.	+ The existence of a committee of experts was clearly reported; ? Questionable design; 0 No information about the expert committee.
Pretesting of pre-final version	The pre-final version of the questionnaire should be tested on members of the target population.	+ Pre-test was performed; ? Questionable design; 0 No information on the pre-test

+ = Positive rating, - = negative rating, 0 = no information available; ? = Unclear.

The relevant psychometric properties are described below for the process of cultural adaptation as reported in the selected studies. The definitions of each property, in accordance with the international literature, were used[12]:

Internal consistency: measure of homogeneity of a (sub)scale of a questionnaire that indicates the degree to which items in a (sub)scale are related to each other, measuring the same concept (construct), assessed by means of the Cronbach's alpha coefficient;

Stability: known also by reproducibility, refers to the degree to which repeated measurements in stable individuals provide similar answers (test-retest) and is assessed by the Intraclass Correlation Coefficient (ICC) or via the Kappa coefficient (interobserver);

Construct validity: examines the extent to which each score of a specific questionnaire is related to other measures, so that it is consistent with the hypotheses related to the concepts being measured. It can be

performed by exploratory or confirmatory factor analysis, comparison tests between known groups, or correlation tests with scores of questionnaires to assess similar constructs as the target instrument;

Criterion validity: refers to the extent to which the scores of an instrument relates to a gold standard, commonly assessed by the correlation between the scores of the instrument and the values obtained with the gold standard tests.

RESULTS

A search in the databases identified 114 articles. After reading the titles, abstracts and considering the inclusion and exclusion criteria, 14 articles were included in the systematic review on cultural adaptation to Portuguese language of Brazil of instruments developed in the context of cardiology (Figure 1). The exclusion of studies occurred for the following reasons: duplication of articles in databases (n=23), instruments outside the context of cardiology (n=15), items that were not related to the adaptation of instruments (n=61), and one article on adaptation to Portuguese language of Portugal.
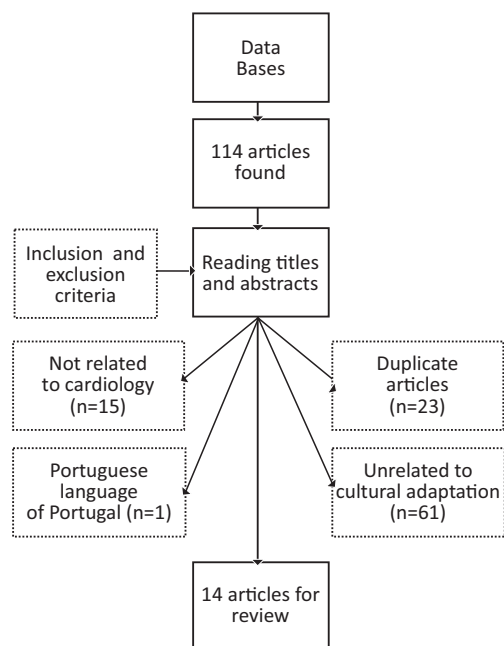

Figure 1 - Flowchart of articles found and evaluated after applying the criteria for inclusion and exclusion

Of the 14 instruments identified, all were recent in terms of the year of publication (beginning in the year 2006), and most were originally developed in the decades of the 1990s and 2000s. The country of origin for eight of them was the United States of America.

Regarding the purpose, five (35.7%) assessed quality of life, four (28.6 %) assessed health knowledge/learning processes, two (14.3%) assessed determinants of health-related behaviors; two (14,3%) symptom/functional capacity; and one (7.1%) estimated the frequency of self-care (Chart 2).

The evaluation of the cultural adaptation process is described in Chart 3. The results indicate that most of the adaptation were performed according to the established criteria, having been classified as positive in at least three of the five steps recommended in the literature[7]. However, in the adaptation of the DASS[13] instrument, the stage of review by the committee of experts was performed before performing the back-translations.

In the adaptation of the Bulpitt and Fletcher Quality of Life Instrument for Hypertensives[20], the translation stage was conducted by two native speakers from the country of origin of the instrument, but there was no information about the synthesis of the translations. In MINICHAL[23], the back-translation was performed only by a translator. In adapting the CBRS[26] instrument, the back-translation was also performed only by a translator and there was no information on the pre-test.

With regard to the psychometric properties of the adapted instruments, Chart 4 shows that at least one property was tested on each instrument. The internal consistency, stability, construct validity and criterion validity were the properties assessed in most studies.

The internal consistency, evaluated by means of Cronbach's alpha, was observed in all instruments except for the VSAQ[14], MDI[15], and *Disease Knowledge and Self-Care Questionnaire for Heart Failure Patients*[21], in which such properties were not applicable, and the Bulpitt and Fletcher Quality of Life Instrument for Hypertensives[20], in which there was no information.

Stability, known as reproducibility in some studies, was evaluated in five instruments by means of Kappa index, with values above 0.60[14-15,18-19,21], and by means of Intraclass Correlation Coefficient (ICC) on three instruments, also with values above 0.60[17,22,26]. There were no reports of stability analysis in three studies[13,20,23].

The validation process was described in only six articles[13,20,23-26]. Construct validity was assessed in the DASS[13], Bulpitt and Fletcher Quality of Life Instrument for Hypertensives[20], MINICHAL[23], MICRO-Q[24], AQUAREL[25], and CRBS[26] instruments, and exploratory factor analysis was performed in four of these[13,23-24,26]. Criterion validity, following the description and the name contained in the selected articles, was assessed in four instruments: Bulpitt and Fletcher Quality of Life Instrument for Hypertensives[20], MINICHAL[23], AQUAREL[25] and CRBS[26].

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Chart 2 - Description of the questionnaires developed in the context of cardiology and adapted into Portuguese language of Brazil

Instrument	Authors and year of adaptation	Authors, year and the place of origin of the instrument	Purpose of the instrument	Subject
Veterans Specific Activity Questionnaire (VSAQ)[14]	Domingues et al., 2011	Myers et al., 1994 USA	Determine the threshold level of physical activity by triggering cardiovascular symptoms	Cardiac
Modified Dyspnea Index (MDI)[15]	Miura et al., 2012	Stoller et al., 1986 USA	Assess the impact or limitation imposed by dyspnea	Cardiac patients complaining of dyspnoea dyspnea
Cardiac Patient Learning Needs Inventory (CPLNI)[16]	Galdeano et al., 2012	Gerard e Peterson, 1984 USA	Identify the learning needs of cardiac patients in relation to disease cardiac patients in relation to disease	Subjects admitted to the cardiology ward or coronary care unit the cardiology or coronary care unit
European Heart Failure Self-care Behavior Scale (EHFScBS)[17]	Feijó et al., 2012	Jaarsma et al., 2003 Europe	Assess self-care in patients with heart failure	Patients with heart failure of any etiology
Nurses' Knowledge of heart Failure Education Principles (NKHF)[18]	Klein et al., 2012	Albert et al., 2002 USA	Assess the knowledge of nurses about heart failure nurses about heart failure	Nurses
Dietary Sodium Restriction Questionnaire (DSRQ)[19]	d'Almeida et al., 2012	Bentley et al., 2009 USA	Identify factors affecting adherence to the diet with low sodium adherence to the diet with low sodium	Patients with heart failure
Duke Anticoagulation Satisfaction Scale (DASS)[13]	Pelegrino et al., 2011	Samsa et al., 2004 USA	Measuring quality of life and satisfaction of patients on oral anticoagulants treatment	Patients on oral anticoagulants treatment
Evaluation Instrument for Quality of Life for Hypertensives of Bulpitt and Fletcher[20]	Gusmão e Pierin, 2009	Bulpitt e Fletcher, 1990 England	Evaluate the impact of hypertension on quality of life	Hypertensive and normotensive normotensive patients in outpatient treatment
Disease Knowledge and Self-Care Questionnaire for Heart Failure Patients[21]	Rabelo et al., 2011	Artinian et al., 2002 USA	Assessment of knowledge of disease and self disease and self-care in patients with heart failure	Patients with heart failure
Minnesota Living with Heart Failure Questionnaire (MLHFQ)[22]	Carvalho et al., 2009	Rector et al., 1997 USA	Measuring quality of life in subjects with heart failure	Patients with heart failure
Mini-Cuestionario de Calidad Vida em hipertensión Arterial (MINICHAL)[23]	Schulz et al., 2008	Badia et al., 2002 Spain	Assessing quality of life related to health in hypertensive patients	Hypertensive and normotensive subjects
Maugerl CaRdiac preventiOn-Questionnaire (MICRO-Q)[24]	Ghisi et al., 2010	Sommaruga et al., 2003 Italy	Assess the level of knowledge regarding secondary prevention in patients with coronary artery disease	Patients with coronary artery disease
Assessment of QUAlity of life and RELated events (AQUAREL)[25]	Oliveira et al., 2006	Stofmeel et al., 2001 Netherland	Assessing quality of life in patients with pacemakers	Patients with pacemaker
Cardiac Rehabilitation Barriers Scale (CRBS)[26]	Ghisi et al., 2012	Shanmugasegaram et al., 2011 Canada	Assess the perception of the barriers to participation and adherence to cardiac rehabilitation programs	Subjects with any disease or comorbidity that requires treatment by cardiac rehabilitation

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Chart 3 - Analysis of adaptations of measuring instruments developed in the context of cardiology into Portuguese language of Brazil

Instrument	Translation	Synthesis	Back translation	Committee of experts	Pre-test
VSAQ	+	+	+	+	+
MDI	+	+	+	+	+
CPLNI	+	+	+	+	+

Instrument	Translation	Synthesis	Back translation	Committee of experts	Pre-test
EHFScBS	+	+	+	+	+
NKHF	+	+	+	+	+
DSRQ	+	+	+	+	+
DASS	+	+	+	?	+
Instrumento de Bulpitt e Fletcher	?	0	+	+	+
Disease Knowledge and Self-Care Questionnaire for Heart Failure Patients	+	+	+	+	+
MLHFQ	+	+	+	+	+
MINICHAL	+	+	-	+	+
MICRO-Q	+	+	+	+	+
AQUAREL	+	+	+	+	+
CRBS	+	+	-	+	0

+ = Positive rating, - = negative rating, 0 = no information available; ? = Unclear

Chart 4 - Description of the psychometric properties of the versions of instruments developed in the context of cardiology in Portuguese language of Brazil

Instrument	Internal consistency		Stability		Construct validity		Criterion validity	
	Statistical test	Result	Statistical test	Result	Statistical test	Result	Statistical test	Result
VSAQ	N/A*	-	Kappa	0.86 (p<0.01)	Not reported		Not reported	
MDI	N/A	-	Kappa	0.96 (p<0.001)	Not reported		Not reported	
CPLNI	Cronbach's alpha	0,96	Student t-test	p>0.05	Not reported		Not reported	
EHFScBS	Cronbach's alpha	0,61-0,70	ICC†	0.87	Not reported		Not reported	
NKHF	Cronbach's alpha	0,70	Kappa	≥0.70 Q4, Q5 e Q11≤0.4	Not reported		Not reported	
DSRQ	Cronbach's alpha	0,77	Kappa	≥0.62	Not reported		Not reported	
DASS	Cronbach's alpha	0,79	Not reported		Pearson EFA‡	r≥ -0.22 (p<0.01) >3 components	Not reported	
Bulpitt &Fletcher Instrument	Not reported		Not reported		Chi-square	p<0.05	Correlation	Significantin some areas
Disease Knowledge and Self-Care Questionnaire for Heart Failure Patients	N/A		Kappa	>0.60 Q7: 0.40	Not reported		Not reported	
MLHFQ	Cronbach's alpha	0.97	ICC	0.97 (p<0.01)	Not reported		Not reported	

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Instrument	Internal consistency		Stability		Construct validity		Criterion validity	
	Statistical test	Result	Statistical test	Result	Statistical test	Result	Statistical test	Result
MINICHAL	Cronbach's alpha	0.88-0.86	Not reported		EFA	2 components	Student t-test	p<0.001
MICRO-Q	Cronbach's alpha	0.64	Spearman's rho	r: 0.10 – 0.65	EFA	6 components	Not reported	
AQUAREL	Cronbach's alpha	0.68-0.85	Student t-test, Pearson's correlation	p>0.5 r:0.81 (p<0.01)	Correlação de Pearson teste de Tukey	r: 0.25-0.68 p<0.01	Correlation	p>0.54
CRBS	Cronbach's alpha	0.88	ICC	0.68	EFA	5 components	Student t-test	p<0.001

*N/A: not applicable; † ICC: intraclass correlation coefficient; ‡ EFA: exploratory factor analysis.

DISCUSSION

This systematic review aimed at identifying questionnaires developed in the context of cardiology which were adapted into Portuguese language of Brazil and characterizing them in terms of their purpose, target population and cultural adaptation process, and describe their measurement properties.

In total, 14 articles developed in the cardiology context were selected in which the adaptation process was described. Of these, most were developed to assess quality of life related to adverse conditions, such as hypertension, heart failure, use of a pacemaker, and oral anticoagulants. Most studies included all stages of the adaptation process recommended by literature. The others followed at least three of the five recommended steps. With respect to measurement properties, internal consistency, verified by means of Cronbach's alpha, was reported in all but four articles - three of them did not apply and it was not reported in a single study. Stability was not reported in only three studies. The construct and criterion validity were verified and reported in most articles.

The fact that most of the instruments identified in this review is related to the assessment of quality of life in several cardiac diseases was not surprising, since cardiovascular conditions are, in their majority, chronic diseases that, in addition to having a high prevalence and incidence in the population, have an important impact on the physical, psychological and social aspects of the subject.

Data concerned to the evaluation of the adaptation process indicate that most of the studies used a consistent methodological basis, following the steps of translation, synthesis, back translation, review by the expert committee, and pretesting. The criteria used to assess the adaptation process in this review are well described in protocols and manuals[7] and have been used in conducting systematic reviews of measuring instruments in different contexts, such as assessment of pain[10] and shoulder dysfunction[27].

The use of a methodology for the adaptation process can support the achievement of structural, linguistic and cultural equivalence of health-related instruments. The development of equivalent versions of the same questionnaire decreases the likelihood of the creation of a large number of new instruments in the literature, and facilitates the comparison of information between studies in different countries and cultures.

However, regardless of the selected methodology for the cultural adaptation of an instrument, the articles that deal with this subject should provide more detailed information about the adaptation process adopted and the steps performed; so, researchers will have more elements to evaluate the process and the evidence of the suitability of the adapted instrument to the target language[6-7].

Regarding the measurement properties of the instruments, it was observed that these varied among the studies identified in this review. Internal consistency was the property most tested and the majority of the studies presented Cronbach's alpha values above 0.70, which, according to the literature[12], shows good internal consistency.

The stability was evaluated in 11 studies: five used Kappa index, three ICC, and the other three, correlation coefficients of Pearson or Spearman. According to international recommendations for instrument validation, stability, called by some researchers as reproducibility, and agreement by others, can be assessed over time(test-retest), by different people on the same occasion(inter-observers) or by the same person on different occasions (intraobserver).

The ICC is a statistical test for analysis of stability, and is indicated when the instrument presents quantitative variables[12]. This coefficient is adequate to measure the homogeneity of two or more measures, is calculated using a variance ratio, and is interpreted as the proportion of total variability attributed to the measured object[28]. For ordinal measures, the Kappa

index of agreement is employed, which is a measure of intra-and inter-observer agreement that measures the degree of agreement between respondents and generally ranges from zero to one (although negative numbers are possible). Values approaching one indicate better reliability; values near or less than zero suggest that the agreement is attributable to chance[29].

The construct and criterion validity were evaluated in most studies, although in different ways and using different statistical tests. For construct validity, exploratory factor analysis was used in most of the articles examined. Factor analysis is a statistical technique used to demonstrate the pattern of responses of a number of items that cannot be explained either by a lower number of underlying factors, or is indicated to assess the dimensionality of the construct of the instrument[30]. Construct validity can be further accomplished through the comparison of scores between known groups to differentiate the relevant variables[11].

Criterion validity refers to the extent to which a measurement relates to a gold standard, which is generally a measure of the target construct that is widely accepted in the literature as a measure of the criterion[11]. In this review, only the AQUAREL validation[25] showed that criterion validity was properly performed. In the context of self-report measures of health status, such as the evaluation of

quality of life, criterion validity is rarely used, since there is still an available gold standard measure[11].

Data from this review provided an overview of the availability of measuring tools developed in the context of cardiology which were adapted into Portuguese language of Brazil, making it possible to choose the best questionnaire for the study of a particular cardiac pathology geared to a specific population.

CONCLUSION

This systematic review of questionnaires developed in the context of cardiology which were adapted into Portuguese language of Brazil showed that, among the studies identified, most assessed quality of life and health knowledge/learning processes. Most accomplished partially or completely the international criteria of the cultural adaptation process for instruments, having presented properties for satisfactory measures.

Hopefully, the results of this study make available to the scientific community a thorough evaluation of the questionnaires adapted into Portuguese language of Brazil to study factors related to cardiology, in order to help researchers and health professionals in the selection of instruments for this field of research.

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Correspondence address to: Marilia Estevam Cornélio
Cidade Universitária "Zeferino Vaz"
Rua Tessália Vieira de Camargo, 126
CEP 13083-887 – Campinas, SP, Brazil