Translation, cultural adaptation, and validation of the Screening For Occult Renal Disease (SCORED) questionnaire to Brazilian Portuguese

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This study was conducted in Núcleo Interdisciplinar de Ensino, Pesquisa e Tratamento em Nefrologia (NIEPEN), Universidade Federal de Juiz de Fora, and is part of the doctoral thesis of Edson Jose de Carvalho Magacho, to be presented.

ABSTRACT

Abstract: Screening Chronic Kidney Disease (CKD) allows early interventions, which may alter the natural course of the disease, including cardiovascular morbidity and mortality. Screening for Occult Renal Disease (SCORED) is questionnaire with nine questions with different weights, and predicts a 20% chance for CKD if a individual score ≥ 4 points. **Aim:** Translate to Portuguese, perform the adaptation to the Brazilian culture and validate the original version of SCORED questionnaire. **Methods:** Steps of the process: Translation from English into Brazilian Portuguese; back-translation into English; application to a population sample; and Proof-reading and completion. The translations and reviews were made by professionals experts in Portuguese and English. The questionnaire was applied to 306 participants and CKD was diagnosed as suggested by the NKF KDOQI™. **Results:** The participants mean age was 49 ± 13 years, 61% were women, 69% were white, and 68% had education below high school, 38.5% had hypertension, and 12.3% diabetics. The final Brazilian Portuguese version of the SCORED questionnaire was well understood. CKD was diagnosed in 20 (6.5%) of the participants. The Brazilian version of the SCORED questionnaire showed sensitivity of 80%, specificity of 65%, positive predictive value of 14%, negative predictive value of 97%, and accuracy of 66%. **Conclusion:** The steps used for the translation, transcultural adaptation, and validation allowed a Brazilian Portuguese version of the SCORED questionnaire which was well understood, acceptable and costless, characteristics that make it a useful tool in the identification of people that chance of having CKD.

Keywords: cross-cultural comparison, questionnaires, renal insufficiency, chronic.

INTRODUCTION

The new definition of chronic kidney disease (CKD) proposed by the American working group, the Kidney Disease Outcome Initiative of the National Kidney Foundation (KDOQI-NKF™), at the beginning of the last decade, identified CKD as a major public health problem. By definition,[1] any individual who presents, for ≥ 3 months, lesions of the renal parenchyma, clinically documented loss of protein, and/or blood in the urine, and/or glomerular filtration rate (GFR) of < 60 mL/min/1.73 m² has CKD. From this definition of CKD, nephrology has shifted its focus from renal replacement therapy (RRT; dialysis and transplantation) to preventive actions.

An important aspect of CKD is its asymptomatic presentation in the early stages, and the patient's consequent unawareness of their disease. This leads to a late demand of nephrology care, often when RRT is needed as a treatment to keep patients alive. Although RRT is commonly available in major Brazilian cities and in some states, patients have to travel great distances to receive treatment, or worse, migrate to urban centers that offer treatment[2]. In a country with continental dimensions such as Brazil, the diagnosis of renal functional failure as an indication for RRT in some regions remains a death sentence.

CKD can be screened in different ways, from simple reporting of GFR by laboratories during routine determination of serum creatinine, to structured actions, which include obtaining sociodemographic, clinical, and laboratory data from at-risk populations (diabetic and hypertensive)[1,3,4] as in the KEEP[5] study, or in the general population, as in the SeeKD study in Canada.[6] However, for various reasons, screening of CKD does not often occur in Brazil.

Recently, a questionnaire called the Screening for Occult Renal Disease (SCORED) was developed to predict the probability that an individual has CKD. The questionnaire was developed based on demographic, clinical, and laboratory data of the National Health and Nutrition Examination Surveys (NHANES), a cross-sectional analysis of the United States adult population during the periods of 1999-2000 and 2001-2002. The diagnosis of CKD was based on the functional definition of the disease, i.e., GFR < 60 mL/min/1.73 m^2. The prediction model was developed using univariate and multivariate associations between a group of risk factors and CKD. The optimal characteristics of the model were evaluated with internal measures. The external validation of the SCORED questionnaire was performed in the Atherosclerosis Risk in Communities Study (ARIC). Based on the SCORED questionnaire, individuals with ≥ 4 points had 1 in 5 probability of presenting CKD.[7]

Screening questionnaires or assessment tools developed in different cultures from those in which they will be applied require validation and transcultural adaptation.[8-10] To create a version that is equivalent between the original and translated versions of the questionnaire, the process of transcultural translation and validation requires a high methodological rigor consisting of translation, back translation, comparison with the original version, and revision of the tool by a committee of specialists.

The aim of this study was to translate the SCORED questionnaire into Brazilian Portuguese, adapt it to Brazilian culture, and validate the original version of the questionnaire.

METHODS

The SCORED questionnaire was validated and adapted cross-culturally in 306 participants among the employees of the Federal University of Juiz de Fora and other volunteers who were willing to participate, after disclosure by institutional e-mail sent to the academic community and their families. Therefore, this was a convenience sample.

The interested parties spontaneously scheduled the date and time to participate in data collection and were instructed to arrive in a fasted state and bring an intermediate sample stream of the first morning urine, when they signed the consent form in accordance with Resolution 196/96 of the National Health Council.

DIAGNOSIS OF CKD

Any person who volunteered for the study, was older than 18 years of age, and was not aware of presenting CKD was included.

At baseline, participants were attended after 12 hours of fasting, blood samples were collected, and urine samples obtained by the technique of midstream urine, with previous guidance to both sexes to perform hygienic care of the external genitalia. Women were instructed not to collect urine 5 days before or after the menstrual period. They were then interviewed to collect demographic, medical history, and personal and family lifestyle data.

Serum creatinine was measured using the Kinetic Colorimetric method, urine was initially tested for proteinuria, and blood was tested with the immersion Bayer N-Multistix® strips. In the negative samples evaluated by immersion strips, albuminuria was measured by urinary albumin/creatinine ratio in the first sample of the day. Samples with positive urinary blood or hemoglobin detected by immersion strips were examined by phase contrast microscopy.

The diagnosis of CKD followed the criteria proposed by the KDOQI-NKF™.[1] The GFR was estimated from serum creatinine using the equation from the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) study.[11]

Three months after the initial evaluation, all subjects repeated the blood and urine laboratory tests and were subjected to further assessment of GFR, albuminuria, and hematuria.

VALIDATION AND TRANSCULTURAL ADAPTATION OF THE SCORED QUESTIONNAIRE

The translation of the SCORED questionnaire (Chart 1) from its original English language into Brazilian Portuguese was conducted by 2 independent qualified translators whose native language was Portuguese. The translators were informed about the objectives of the study and the 2 translations were compared, resulting in a first version of the questionnaire.

Thereafter, this first version (Chart 2) was back-translated into English by 2 other translators that were unaware of the English version and the objectives and concepts regarding the tool. This second version (Chart 3) was compared to the original version to confirm that they reflected the same items contained in the original version, thus confirming the consistency of the translation. Finally, a committee of 5 health professionals fluent in Portuguese and English reviewed the versions in relation to semantic, idiomatic, and conceptual equivalence. Semantic equivalence evaluated the grammar and vocabulary of words to determine whether the meaning is retained and whether there were difficulties in translation. The idiomatic equivalence looked for colloquialisms or idioms that are difficult to be translated and adapted. The conceptual equivalence was assessed to determine whether there was semantic equivalence with differing concepts due to the culture of each population.

STATISTICAL ANALYSIS

For the validation process, the sensitivity (rate of individuals with disease as defined by a gold standard, for which the questionnaire provides a correct answer), the specificity (ratio of individuals without the disease, defined by a gold standard, for which the questionnaire provides the correct answer), the positive predictive value (proportion of true positives using the gold standard among all positive test subjects using

CHART 1	ORIGINAL QUESTIONNAIRE SCREENING FOR OCCULT RENAL DISEASE (SCORED)

Do You Have Kidney Disease?

Take This Test and Know Your Score.

Find out if you might have silent chronic kidney disease now.

Check each statement that is true for you.

If a statement is not true or you are not sure, put a zero.

Then add up all the points for a total.

• Age:

1. I am between 50 and 59 years of age ....Yes 2 ____

2. I am between 60 and 69 years of age ....Yes 3 ____

3. I am 70 years old or older ....Yes 4 ____

4. I am a woman ....Yes 1 ____

5. I had/have anemia ....Yes 1 ____

6. I have high blood pressure ....Yes 1 ____

7. I am diabetic ....Yes 1 ____

8. I have a history of heart attack or stroke ....Yes 1 ____

9. I have a history of congestive heart failure or heart failure ....Yes 1 ____

10. I have circulation disease in my legs ....Yes 1 ____

11. I have protein in my urine ....Yes 1 ____

Total _____

If You Scored 4 or More Points:

You have a 1 in 5 chance of having chronic kidney disease. At your next office visit, a simple blood test should be checked. Only a professional health care provider can determine for sure if you have kidney disease.

If You Scored 0-3 Points

You probably do not have kidney disease now, but at least once a year, you should take this survey.

the questionnaire), negative predictive value (proportion of true negative subjects using the gold standard test and whose questionnaire is negative), and accuracy (proportion of true positives and negatives in relation to all possible outcomes)[12] of the SCORED questionnaire regarding the diagnosis of CKD[1] were calculated.

CHART 2	TRANSLATED QUESTIONNAIRE - FIRST VERSION TRIAGEM PARA DOENÇA RENAL OCULTA (SCORE)

Você tem doença renal?

Faça este teste e descubra sua pontuação.

Descubra agora se você pode ter doença renal crônica silenciosa.

Verifique cada afirmativa que é verdadeira para você.

Se uma afirmativa não é verdadeira ou você não tem certeza, coloque zero.

Daí, adicione todos os pontos para o total.

• Idade:

1. Eu tenho entre 50 e 59 anos de idade
....Sim 2 ____

2. Eu tenho entre 60 e 69 anos de idade
....Sim 3 ____

3. Eu tenho 70 anos de idade ou mais
....Sim 4 ____

4. Eu sou mulher ....Sim 1 ____

5. Eu tive/tenho anemia ....Sim 1 ____

6. Eu tenho pressão alta ....Sim 1 ____

7. Eu sou diabético ....Sim 1 ____

8. Eu tenho histórico de ataque cardíaco ou derrame
....Sim 1 ____

9. Eu tenho histórico de insuficiência cardíaca congestiva ou insuficiência cardíaca ....Sim 1 ____

10. Eu tenho doença circulatória em minhas pernas
....Sim 1 ____

11. Eu tenho proteína em minha urina
....Sim 1 ____

Total_____

Se você marcou 4 ou mais pontos:

Você tem 1 chance em 5 de ter doença renal crônica.

Na sua próxima visita a um médico, um simples exame de sangue deve ser pedido. Somente um profissional de saúde pode determinar com certeza se você tem doença renal.

Se você marcou 0-3 pontos:

Você, provavelmente, não tem uma doença renal agora, mas, pelo menos uma vez por ano, você deve fazer esta pesquisa.

CHART 3	QUESTIONNAIRE RETRANSLATED - SECOND VERSION SCREENING FOR OCCULT RENAL DISEASE (SCORED)

Do You Have Kidney Disease?

Take this Test and Know your Score.

Find out if you have silent chronic disease now.

Check each statement that is true for you.

If a statement is not true or you are not sure, put a zero.

Then, add up all of the points for a total.

Age Pts

1. I am between 50 and 59 years of age
....Yes 2 ___

2. I am between 60 and 69 years of age
....Yes 3 ___

3. I am 70 years of age or older
....Yes 4 ___

4. I am a woman ....Yes 1 ___

5. I had/have anemia ....Yes 1 ___

6. I have high blood pressure ....Yes 1 ___

7. I am diabetic ....Yes 1 ___

8. I have a history of heart attack or stroke
....Yes 1 ___

9. I have a history of congestive heart failure or heart failure..Yes 1___

10. I have circulation disease in my legs
....Yes 1___

11. I have protein in my urine
....Yes 1___

Total Points: ___

If You Scored 4 or More Points

You have a 1 in 5 chance of having chronic kidney disease.

At your next office visit, a simple blood test should be checked. Only a professional health care provider can determine for sure if you have kidney disease.

If You Scored 0-3 Points

You probably do not have kidney disease now, but at least once a year, you should take this survey.

had Diabetes Mellitus. CKD was diagnosed in 20 (6.4%) of the participants using the same criteria for disease definition adopted in the original article on the SCORED questionnaire, i.e., GFR < 60 mL/min/1.73 m². The mean serum creatinine level was 1.18 ± 0.18 mg/dL in participants with CKD and 0.98 ± 0.17 mg/dL in those who

RESULTS

The 306 study participants had a mean age 49 ± 13 years, of which 61% were women, 69% were white, 68% had up to a secondary school education level, 38.5% had hypertension, and 12.3%

did not have the disease. The mean GFR in those with or without CKD was 53 ± 4 and 81 ± 15 mL/min/1.73 m², respectively.

The first version of the SCORED questionnaire compared to the final version (Chart 2 and 4) was modified by the committee of experts when it was suggested that the expression "Then add up all the points for the total" should be used, instead of "From there add all points for the total." Furthermore, after each statement and the value assigned to each was described, the word "points" was added. The expert committee also changed item 8 from "I have a history of heart attack or stroke" to "I had a heart attack (myocardial infarction) or stroke/CVA." Question 10 was changed from "I have circulatory disease in my legs" to "I have circulation problems/circulatory disease in my legs." Finally, question 11 was changed from "I have protein in my urine" to "my examination showed that I have/had loss of protein in my urine".

The final version of the SCORED questionnaire in Brazilian Portuguese was not difficult to understand, according to the participants who were questioned after self-application of the questionnaire. We highlight that the time spent reading and responding was unlimited.

Table 1 presents the variables that comprise the SCORED questionnaire distributed among participants with and without CKD.

The Brazilian SCORED questionnaire had 80% sensitivity, 65% specificity, positive predictive value of 14%, negative predictive value of 97%, and 66% accuracy (Table 2 and 3).

DISCUSSION

From its beginnings as a specialty in the early 60s, nephrology has undergone major changes, particularly in the last 10 to 15 years. Initially, the focus of nephrology was RRT as an established treatment for patients who progressed to the more advanced stages with functional renal failure. This period coincided with the first great proliferation of RRT units, both in the public health system and in private practice. Brazilian nephrology quickly reached levels of international excellence. However, during this period, very little attention was paid to preventive measures to preserve kidney function.

CHART 4	THIRD VERSION - FINAL VERSION TRIAGEM PARA DOENÇA RENAL OCULTA

Você tem doença renal?

Faça este teste e descubra sua pontuação.

Descubra agora se você pode ter doença renal crônica silenciosa.

Verifique cada afirmativa que é verdadeira para você.

Se uma afirmativa não é verdadeira ou

você não tem certeza, coloque zero.

A seguir, some todos os pontos para o total.

1. Eu tenho entre 50 e 59 anos de idade .... (_) Sim (2 pontos)

2. Eu tenho entre 60 e 69 anos de idade .... (_) Sim (3 pontos)

3. Eu tenho 70 anos de idade ou mais .... (_) Sim (4 pontos)

4. Eu sou mulher ....(_) Sim (1 ponto)

5. Eu tive/tenho anemia ....(_) Sim (1 ponto)

6. Eu tenho pressão alta ....(_) Sim (1 ponto)

7. Eu sou diabético ....(_) Sim (1 ponto)

8. Eu tive um ataque cardíaco (infarto) ou derrame/AVC/AVE ....(_) Sim (1 ponto)

9. Eu tenho insuficiência cardíaca congestiva ou insuficiência cardíaca ....(_) Sim (1 ponto)

10. Eu tenho problema de circulação/doença circulatória em minhas pernas ....(_)Sim (1 ponto)

11. Meu exame mostrou que eu tenho perda de proteína na minha urina ....(_) Sim (1 ponto)

Total ____

Se você marcou 4 ou mais pontos:

Você tem 1 chance em 5 de ter doença renal crônica.

Na sua próxima visita a um médico, um simples exame de sangue deve ser pedido. Somente um profissional de saúde pode determinar com certeza se você tem doença renal.

Se você marcou 0-3 pontos:

Você, provavelmente, não tem uma doença renal agora, mas, pelo menos uma vez por ano, você deve fazer esta pesquisa

In the meantime, from the proposal and worldwide acceptance of the new definition and staging of CKD by the K-DOQI-NKF at the beginning of the last decade,[1] it became clear that the disease is more common than previously thought, to the point of being considered a public health problem.[13] Additionally, the

TABLE 1	VARIABLES THAT COMPRISE THE SCORE QUESTIONNAIRE DISTRIBUTED AMONG PARTICIPANTS WITH AND WITHOUT CKD	
Questionnaire variables SCORED	Confirmed CKD n = 20 (6.5%)	CKD not confirmed n = 286 (93.5%)
Age, years		
< 50, n (%)	2 (10)	132 (46.2)
50-59, n (%)	3 (15)	109 (38.1)
60-69, n (%)	11 (55)	36 (12.6)
≥ 70, n (%)	4 (20)	9 (3.1)
Female, n (%)	13 (65)	174 (60.8)
Anemia, n (%)	4 (20)	9 (3.1)
Arterial hypertension, n (%)	10 (50)	94 (32.9)
Diabetes Mellitus, n (%)	12 (60)	174 (60.8)
History of Cardiovascular Disease, n (%)	12 (60)	174 (60.8)
History of Congestive Heart Failure,n (%)	3 (15)	68 (23.8)
Peripheral Vascular Disease n (%)	3 (15)	68 (23.8)
Proteinuria, n (%)	10 (50)	94 (32.9)

TABLE 2	PROCESS VALIDATION OF THE BRAZILIAN PORTUGUESE VERSION OF THE QUESTIONNAIRE		
SCORED questionnaire	CKD		Total
	Present	Absent	
≥ 4 pontos	16	98	114
< 4pontos	4	188	192
Total	20	286	306

asymptomatic evolution of CKD, particularly in its early stages, makes diagnosis difficult and favors the loss of renal function, development of complications, and greater morbidity and mortality.[14]

The identification of patients with CKD should be simple given the wide availability and low cost of the determination of serum creatinine level, the main biomarker used for estimating GFR, the functional component of the new definition of the disease. Unfortunately, this is

not the case, as even at-risk individuals at not screened for CKD.[15-18] For example, in a survey conducted in the HIPERDIA Minas program in Juiz de Fora offered to Health Service users with hypertension and high cardiovascular risk, type 1 or type 2 diabetes with poor glycemic control, and patients with 3B and 5 stages of CKD, 49% of patients referred by the Family Health Program with the indication of hypertension or diabetes had CKD, with an average GFR of 42 mL/min/1.73 m^2.[19]

These observations provide an explanation for the low patient knowledge of CKD,[20,21] even among family members of those in RRT,[22] and the referral, unfortunately still common, to a nephrologist with an immediate indication for dialysis or transplantation.

The identification of individuals with CKD, particularly in early stages, offers several benefits, from interventions that delay or potentially prevent the progression of disease[23] to implementation of educational activities aimed at motivating and increasing patient compliance regarding their disease. Various CKD screening strategies exist, which range from simple methods such as the use of questionnaires[7] and estimation of GFR from serum creatinine levels,[1] to more complex strategies that use sociodemographic data, physical examinations, and laboratory tests (blood and urine) in patients at high risk[24] and those in the general population.[6] The SCORED questionnaire is one of these strategies. It is based on a small number of demographic and medical characteristics that are scored so that values ≥ 4 points enable identification of 1 in 5 individuals with CKD.

In this study, we generated a Brazilian Portuguese version of the SCORED questionnaire. To do so, we followed all of the recommended steps for the process of translation and transcultural adaptation.[10] We observed that the Brazilian version of the SCORED questionnaire

TABLE 3	PROCESS VALIDATION OF THE BRAZILIAN PORTUGUESE VERSION OF QUESTINÁRIO SCORED. SENSITIVITY, SPECIFICITY, AND PREDICTIVE VALUE NEGATIVE PREDICTIVE VALUE AND ACCURACY				
Diagnostic criteria	Sensibility	Specificity	Positive predictive value	Negative predictive value	Accuracy
Glomerular Filtration Rate % (IC)	80 (0.56-0.94)	65 (0.60-0.73)	14 (0.8-0.21)	97 (0.95-0.99)	66 (0.61-0.72)

was easily applied, with good acceptance and understanding by respondents, as age, hypertension, Diabetes Mellitus, cardiovascular disease, proteinuria, and anemia are terms frequently used and recognized by the general public and among health professionals.

Similar to the results observed by Muntner *et al.*,[7] the specificity and positive predictive value of the Brazilian version of the SCORED table were also admittedly low. Only 14% of subjects with scores ≥ 4 had CKD. On the other hand, the wide availability and low financial cost of creatinine determination (which allows estimation of GFR, a confirmatory test used in the diagnosis of CKD), as well as the high rate of sensitivity (80%) and negative predictive value (97%) allow us to conclude that this is a tool to be considered for the identification of individuals with CKD, particularly in its asymptomatic presentation.

CONCLUSION

We have developed a Brazilian Portuguese version of the SCORED questionnaire and validated it using the current criteria for diagnosis of CKD. The small number of questions used in the questionnaire, the use of expressions often employed in the health system, and the simplicity in the adopted scoring system render the Brazilian version of the SCORED questionnaire a helpful tool to be used in different contexts, for example, in waiting rooms for health services and CKD prevention campaigns such as the PREVINA-SE campaign.

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