ABSTRACT

Objectives: To report on the translation procedures and psychometric properties of the DISCERN tool in Brazilian Portuguese.

Methods: Three persons translated the DISCERN in English to Brazilian Portuguese. A committee of experts and community representatives evaluated the quality of the three versions in two online voting rounds. Two native speakers back-translated the questionnaire to English. We compared these versions to the original DISCERN and made small adjustments. The final Brazilian Portuguese version of DISCERN was tested twice by journalism students to evaluate the quality of a text about smoking cessation treatments. We evaluated participants' health literacy with the SAHL-PA tool, assessed the internal consistency of the translated questionnaire with the Cronbach test and its reproducibility with the intraclass correlation coefficient (ICC). We then investigated the relationship between DISCERN with SAHL-PA scores and demographic variables.

Results: The participants (n = 126) had no difficulty in using the questionnaire. Cronbach's alpha was 0.865 (95% confidence interval, CI, of 0,826 to 0,898), and the ICC between the two evaluations was 0.845 (CI: 0,717 to 0,912). The mean health literacy of the participants was adequate. There was no correlation between the DISCERN score with SAHL-PA score, age or gender ($p > 0.05$).

Conclusions: The Brazilian Portuguese version of the DISCERN questionnaire has excellent internal consistency and good reproducibility. The evaluators' age, gender or health literacy did not interfere with the score resulting from the evaluation of the quality of the text.

INTRODUCTION

People are continually receiving or seeking information or advice about health habits, behaviours or interventions (treatments, prevention measures), either passively or actively, conducting searches on the Internet, libraries etc. [1–3]. Information is crucial for any choice related to health, from brushing teeth to choosing complex cancer treatments [1,4], and the quality of this information is crucial to best inform decisions. Adherence to treatment is an active process in which the patient or health consumer weights risks and benefits to take a decision [5–7]. Good communication is part of this process [1], therefore it is important to use objective tools to evaluate the quality of health information available to patients [1,3,8], even considering that other factors may interfere with the adherence to healthy habits or choices [5–7,9,10].

There are many tools to evaluate texts about health [11–13]. However, most publications do not provide clear information about how these instruments were developed or validated and few provide information about their psychometric properties [11]. DISCERN is a validated instrument designed to provide citizens with a way of evaluating the quality of written material on health available on the internet or in printed form [8]. Over the last 20 years, this instrument has been used to evaluate texts for patients on numerous health issues or areas, applied by the end-users themselves or by patient associations, medical societies, and health professionals [11,14–17].

The DISCERN tool has been translated and validated in Spanish [18] and German [19]. There are no tools to evaluate objectively assess the quality of health texts in Brazilian Portuguese. We report on the procedures used to translate the DISCERN tool to Brazilian Portuguese and the evaluation of its psychometric properties. A secondary objective of the study was to investigate

the association between the participants' quality evaluation scores with their demographic characteristics and health literacy scores.

METHODS

Study design, setting and ethics

We conducted this cross-sectional study in São Paulo, Brazil in 2017-2018. The institutional review board of São Paulo Federal University (UNIFESP) approved the study protocol. Study participants signed informed consent forms. We obtained permission to translate and validate the DISCERN tool from its developers [8](personal communication available upon request). In this paper, we followed the best available reporting guidelines, mainly STROBE [20].

Characteristics of the original version

DISCERN is a questionnaire developed by researchers from Oxford (UK) and the British Library to evaluate the quality of written consumer health information [8]. It does not intend to evaluate the respondent, but instead, the object of evaluation is a text on health issues: newspaper articles, website publications, leaflets designed for patients, etc. Anyone (patients, community leaders, health professionals, policy makers, journalists) can use it as a guide to evaluate the quality of any text with health information. DISCERN does not intend to assess the layout, attractiveness or graphical characteristics of the publication, but only the quality of text printed or published.

The instrument (http://www.discern.org.uk/discern_instrument.php) consists of 16 questions divided into three sections. The first section (first 8 questions) assesses the reliability of the information or trustworthiness of the information source. The second (next 7 questions) assesses how good is the information on treatment choices. Section 3 consists of one last question (the 16th) rating the overall quality of the text.

For each question, the respondent may choose between one of five possible scores: score 1 indicates a total lack of quality while score 5 indicates a total compliance with the item assessed. Therefore, the minimum and maximum total scores are 16 (indicating a low-quality product) and 80, respectively. There are no established a cut-offs for what would be considered a "good text" [8].

For each question, the DISCERN instrument provides “hints” or guidance phrases to help the user to evaluate the specific text feature. The translation procedures described herein involved the 16 main questions, the 16 hints, the section names and the possible response alternatives (for example, "no," "yes" or "low" and "high"), totalling 39 modules of translation.

General translation procedures

We followed the five steps proposed by Guillemin et al. 1993 and other authors [21,22] for translations of instruments:

1) translation to Brazilian Portuguese,

2) evaluation by an expert committee (**Supplementary Table 1**),

3) semantics evaluation and consolidation of the translated version,

4) back-translation to English,

5) second semantics evaluation and adaptation of the final version.

We also added some specific procedures used in different translation and validation studies [23–28] (details **Supplementary Text 1**).

Evaluation of psychometric properties

Participants

To detect any serious problem in the comprehension of the questions, we first tested the translated DISCERN in two native Brazilian adults, both with high school education. Our goal was that participants could adequately understand at least 90% of the question [22]. These two people took 15-20 minutes to respond and reported that they were able to understand both the text and the items in the questionnaire totally.

For the evaluation of the psychometric properties of the translated DISCERN, we recruited participants who would use DISCERN to evaluate a text in Portuguese. To ensure homogeneity in the educational level of the participants, we invited only Portuguese native-speaking literate Brazilians with high school education. We used a convenience sample from two universities that agreed to collaborate (Pontifícia Universidade Católica de São Paulo and Cásper Líbero School). The participants were first-year journalism students in either of these universities. We excluded

foreign students, persons with a health degree (e.g. nurses, physiotherapists) who were doing a second graduate course, and students who did not have time to use the DISCERN questionnaire (around 20 minutes) during class.

The participants used the DISCERN questionnaire twice, with a four-week interval. On the first visit, the main researcher explained the objectives of the study, the importance of assessing the quality of texts about health and invited the students to collaborate by evaluating the quality of a text on smoking cessation treatments using DISCERN. The participants received printed copies of the Brazilian Portuguese DISCERN.

We explained that the lack of clarity in the writing of the questions could lead to modifications of the questionnaire and that they should stop and ask questions if they had any difficulty in understanding any of the questions [22,23,28–31]. We also asked them to write comments, critiques or suggestions in their individual questionnaire. We reinforced to the participants that what was being evaluated was the quality of the text, not their competencies. The students answered the questionnaire individually, without help. We established no response time limit.

Two weeks later, we asked the same participants to evaluate the same text again, so that we could assess the reproducibility of the translated tool [23,32].

The text evaluated by participants

The text assessed by the participants to test the DISCERN tool was a "plain language summary" (PLS) of a Cochrane review translated to Brazilian Portuguese and available in the Cochrane Library (CD009329). Cochrane's PLS present a summary of the results of a systematic review, to inform decisions about health interventions. PLS are intended for the general non-specialist audience and should, therefore, be understandable by lay people in general [33]. This text was selected because it was one of the most accessed PLS in the Cochrane Library in 2017 (personal communication).

Health literacy of participants

We used the same meetings to evaluate the health literacy of the participants using the Short Assessment of Health Literacy for Portuguese-Speaking Adults (SAHL- PA) validated for Portuguese [34]. The SAHL-PA questionnaire, in its short version, contains 18 questions and results in a score of 0 to 18. The individual who answers at least 15 items correctly is considered to have "good health literacy", i.e., the competency and motivation that are necessary to access, understand and apply health information in life [35]. For example, diabetic patients with SAHL-PA scores of up to 14 points; therefore, with "low health functional literacy" tend to present low glycemic control [36].

We invited the participants in this survey, after completing the DISCERN questionnaire, to also collaborate by responding to SAHL-PA. For SAHL-PA evaluation, we showed 18 sequential

boards containing three words each. The participant should relate the first word to one of the others, according to the meaning. For example, "osteoporosis" has to do with "bone" and not with "muscle" (the other word present in this board). The interviewer recorded the answers. This was transformed into SAHL-PA scores and registered as a variable.

Data analysis and variables

We transferred the written information about the participants characteristics and their answers to the 16 DISCERN questions into spreadsheets, in addition to the SAHL-PA scores. We present these data descriptively (percentages, means and standard deviations).

We assessed the internal consistency of the translated DISCERN using Cronbach's alpha. First, we calculated Cronbach's alpha for the whole tool, with a 95% confidence interval (CI), and then we calculated the coefficient after the removal of each question. An alpha of at least 0.70 was considered an indicator of internal consistency of the instrument [27,37], and a value below 0.20 would indicate the removal of the item or domain[28].

We assessed the reproducibility of the translated DISCERN using the intraclass correlation coefficient (ICC), with CI, using the answers from the participants who responded twice. We considered the ICC $\geq$ 0.61 as adequate (or "substantial")[27,37–39], although the original DISCERN authors were satisfied with k >= 0.40 [8].

We then calculated Spearman correlations between DISCERN and SAHL-PA scores, for all the participants who responded DISCERN twice and also SAHL-PA, and between SAHL-PA and each DISCERN item. We did this to verify if there was any relationship between the quality evaluation of a text and the health literacy of the evaluator. We compared these two variables (the health literacy score and the DISCERN score) to sociodemographic data using the Student's t-test.

For tabulation of the data, we built a database on FileMaker (version 12.0), exporting data to spreadsheets (Microsoft Excel for Mac version 16.16.4). One person tabulated data from the printed questionnaires, and someone else checked data typing. The tests were performed with a significance level of 5%. We used the software IBM-SPSS for Windows version 20.0 for the analysis.

RESULTS

Translations evaluation

The first round of evaluation of the translations was finished with eight committee members voting on February 22, 2017. The second round finished on May, 10th, with five participants. A third round, involving only two members of the committee, and also finishing on May 10th, resolved issues in two questions.

During the first round of evaluation, there was a consensus in only one module from the 39 (the section name S2) (**Supplementary Table 2**). In all the 38 other modules, the votes varied considerably between T1, T2, T3 and many members suggested additional translations. The distribution of votes (scoring) was highly heterogeneous. The committee was divided regarding the best translation for 24 of the 39 modules. The evaluation of the most voted alternatives in these 24 modules showed that:

1) Not always the alternatives were correctly written or spelt and

2) Sometimes they had correct grammar, but they did not match the original sense and

3) Sometimes they were correct but contained long sentences or words that would not be comprehensible to a layperson with low literacy.

For these situations, a "T4" option, which aimed to solve the identified problems, was added to a new electronic form. **Supplementary Table 3** shows the evolution of voting from the first to the second round. This round resulted in a fifth version of the translations, T5.

We sent T5 version to back-translation, resulting in T6 and T7 in English, and compared them. Comparing T5, T6, T7 and the original DISCERN, the meaning was the same in all modules except for three, described in **Supplementary Text 2**. In the remaining 36 modules, the translators could convey the same message as the original DISCERN, and therefore we considered that T5, the Portuguese version, was adequate. The only differences between T6 and T7 in these 36 modules were the choice between two synonyms or the positioning of words in the sentence (because in English this can vary, for example: "date of publication" and "publication date" meaning the same thing). These issues were corrected and resulted in the T5 translation of DISCERN, shown in **Appendix 1**.

Psychometric evaluation

Participants

We applied the DISCERN and SAHL-PA to three groups of journalism students on August 25-28, September 1, 6, and 29 and October 4, 2017. These groups have 156 students enrolled, but not all were present at the visits or agreed to participate. The final number of participants was thus 126 students (less than 2% loss). None was health professional or foreigner.

A student could respond to the DISCERN questionnaire but not be available to respond to the SAHL-PA assessment individually to the interviewer. In several of these situations, we applied the SAHL-PA on the second visit. In some cases, the student responded to DISCERN on the first visit but was not present the second time; we used these data for internal consistency, but not for

ICC calculation. There were also situations in which the student was willing to respond to SAHL-PA only, without having completed DISCERN. **Figure 1** shows how journalism students participated in the various stages of this study. **Supplementary Text 3** shows the feedback from participants.

Table 1 shows the demographic characteristics of the participants. Most (n = 85, 67%) were women. Mean age was 27.5 years, ranging from 18 to 37; only 5 participants were ≥ 30 years.

Internal consistency and reproducibility

The Cronbach's alpha of the translated DISCERN was high: 0.865 (CI 0.826-0.898). **Table 2** shows that all questions of the translated DISCERN contributed similarly for the total score, with Cronbach's alpha coefficients close to each other, and all higher than 0.84.

The removal of one item did not interfere significantly with the total score. Although the variation in correlation coefficients was greater than with the Cronbach's alpha, no item had a coefficient close to 1 (this would show that the item was able to respond completely for the final result of the questionnaire). Questions 9 ("Does [the text] describe how each treatment works?") and 16 (an overall evaluation of the publication) were the ones with higher correlations with the total score of DISCERN (r = 0,723 and r = 0,711 respectively).

In the second visit, all students present in the classes agreed to assess the same text again with the translated DISCERN tool. Losses were due to absent students.

The overall CCI was 0.845, which represents an “almost perfect” reproducibility of the Brazilian Portuguese DISCERN (**Table 3)**. Each question had moderate to substantial reproducibility. Question 16 (overall quality) had the highest and Question 10 (benefits of each treatment) had the lowest CCI. The error between the evaluations (the dispersion of the items around the mean) was highest (1.15 points) for Question 5, that asks about the date when the text was produced. The total error of the DISCERN between the two evaluations was 4.68 points (from a total score of 80 points). A difference of 5 points between the first and the second evaluation by the same evaluator represents 6.25% of the total score.

Relationship between the text quality evaluation and health literacy

The mean health literacy score of the 98 participants who answered the SAHL-PA questionnaire was 15.86 (± 1.62) points (considered "adequate"). However, 17 journalism students (17%) had inadequate health literacy, and only 18 participants (18%) answered all the questions correctly (**Supplementary Table 4**). The main difficulty the students faced was about the word "*icterícia*" ("jaundice"): many could not even pronounce it, and 50 out of 98 (51%) did not answer that question correctly. The word "*colite*" ("colitis") also seemed strange to many.

We investigated the relationship between the quality of the text, as assessed by participants using DISCERN, and their level of health literacy, through SAHL-PA. **Table 4** shows that there was no statistically significant correlation between SAHL-PA and each item or even the total

DISCERN score ($p > 0.05$), that is, there was no significant correlation between the text evaluation score and health literacy of the respondent.

Text quality evaluation and age, sex, and group

Participants' age or sex were not associated with their DISCERN score (**Supplementary Table 5).** DISCERN scores of Cásper Líbero school students were significantly higher than the scores of PUC students ($p < 0,001$). Scores from students attending nocturnal courses were also significantly higher than from students in morning courses ($p < 0,001$).

DISCUSSION

The Brazilian Portuguese translation of the DISCERN tool is an instrument that can adequately measure the quality of texts about health with good convergence between the items, good internal consistency and nearly perfect reproducibility (intraclass correlation coefficient 0.845) [24,32]. This translated version has excellent internal reliability [22,40] and good reproducibility. Our study participants reported no difficulties in using the tool, and no cultural issues that could impair the use of the translated questionnaire [22]. This translated version of the DISCERN is now freely available to any citizen, health professional or institution in Brazil to evaluate the quality of publications on health written for lay people.

We conducted the translation procedures of the instrument using bilingual collaborators of different backgrounds, to ensure diversity. However, for testing the psychometric properties of the translated DISCERN, we used a homogeneous group of individuals with the same educational level. Their assessment of the quality of the text did not depend on their own knowledge or experiences with health, that is, their health literacy, nor did the age of the evaluator influenced the DISCERN score. The variation in the DISCERN's scores between the two visits was very small, which means that, in general, the translated instrument was able to evaluate the same thing in the same way twice.

This study had several strong points, starting with our adherence to the available guidelines for translation and validation of instruments [21,30,41,42] and our attention to semantics (conceptual equivalence) [43] and linguistic features. We adopted additional procedures proposed in

published studies to avoid bias or to overcome difficulties. For instance, we used three instead of two initial translations [21,30,41,42]. This gave the evaluation committee more translation options and the possibility of merging several solutions found in two translations.

Based on our experience, it is recommended to always include a language professional in the evaluation committees for translation studies. In fact, grammatical mistakes, typos and word misuse were detected in all translated modules, even those produced by professionals. This certainly provided a more accurate final version of DISCERN than if no language professional had participated in the process. We did not find any recommendation on this in previous publications [21,30,41,42].

The participation of several people from different backgrounds and experiences in the translation evaluation committee was essential to complement the otherwise linguistic analysis. However, there are difficulties in joining specialists in consensus conferences, such as lack of time, competing agendas and even structural problems, such as a proper space for the meetings. In translation and instrument validation studies, the need for face-to-face meetings may result in the loss of many potential contributors. Our use of an electronic voting system allowed the committee members to give their input without the need for personal meetings. All participants answered quickly and reported no difficulty in responding to the online questionnaire.

The internal consistency of DISCERN in Portuguese was high (Cronbach's alpha 0.865), and the analysis of the correlation of each question with the whole showed a uniform set, in which the removal of one item slightly interferes with the internal consistency of the instrument. The only

two questions that, once taken from DISCERN, would contribute to a slight increase in this coefficient were questions 8 and 14. However, since the magnitude of the increase with the withdrawal of these questions from the questionnaire would be of less than a hundredth of a point, and given the possible loss resulting from its elimination, we decided to keep them in the translated version of DISCERN.

Question 8 may actually be a bit challenging for some respondents: "Does it refer to areas of uncertainty?" This question presupposes that there are always health issues for which there is doubt and that the text should address them. However, this is probably true in most times, but not all, and the respondents may have difficulty to imagine such situations. It should also be argued that, in small, focused texts and especially journalistic texts, there may be no space to deal with "open questions" or "questions that science has not yet answered" — because usually the press is interested in what already known or recently discovered, and less attention is given to what is uncertain. Nevertheless, given the small magnitude of the difference (alpha of 0.865 with this question and 0.874 without this question), we also decided to keep question 8 of the original DISCERN in English in the Portuguese version.

Question 14 addresses a similar problem: "Is it clear that there may be more than one treatment choice?" But there is not always more than one option available: the publication may be issuing something innovative — and this is a limitation of the original DISCERN, which has never been updated in almost 20 years. Also, the text under evaluation can also be focused on a health issue that is not a treatment, but rather a preventive measure: brushing teeth, vaccinating, using condoms. Therefore, "treatment option" does not, in fact, apply to all texts in the health area.

However, again, the increase in reliability with the withdrawal of this issue 14 would be so minimal (from 0.865 to 0.867), that it would not be worthwhile to stop investigating this problem with DISCERN in Portuguese, even if this provokes a lower or a blank answer. Thus, we opted to maintain these two issues in DISCERN in Portuguese without major compromise of their internal consistency.

The only question that raised some concern still during the pilot application was the one dealing with shared decision-making (#15). However, as the engagement of patients (or health consumers) in the choices on healthcare is considered a key for the reduction of health inequalities and the increase in safety by the World Health Organization [44–46], we felt it was important to maintain this question in the final version, as a form of educating people to search for this issue in texts about health interventions.

There are many studies using DISCERN to evaluate the quality of texts in many health topics. However, most of the participants in these studies are not lay people but health professionals. An instrument should not only be relevant and have strong psychometric properties but also be adapted to the characteristics of the population that will use it [13,24,47]. We decided to use lay people to test the quality of a health text using the translated DISCERN tool, based on the premise that the translated instrument has to be adequate — comprehensible, culturally adapted — for these users in the first place.

Our study participants were all journalism students. In a few years, these individuals will be writing texts for the press, for corporations, for TV and radio in the next years. We hope that

their participation in our study will prompt them to use the Brazilian Portuguese version of the DISCERN to critically assess the work of their colleagues and as a guide to improve the quality of their own texts.

The translated version can now be used in research too, by those wishing to assess the quality of texts for patients or laypeople, and modifications in texts. Future studies should include participants with different literacy levels and socioeconomic backgrounds: studies using larger or smaller, more or less heterogeneous samples, with participants with higher or lower health literacy levels, more or less engaged in communication activities, more or less involved in health care. Research possibilities open up.

Conclusions

The DISCERN tool was successfully translated to Brazilian Portuguese. The translated version has excellent internal consistency and good reproducibility. The evaluator's age, gender or health literacy did not interfere with the score resulting from the evaluation of the quality of the text.

REFERENCES

1. World Health Organization. *Adherence to Long-Term Therapies: Evidence for Action*. Switzerland: World Health Organization; 2003. doi:10.1016/S1474-5151(03)00091-4
2. World Health Organization. Background Note: Regional Preparatory Meeting on Promoting Health Literacy. Beijing, China, 29-30 April 2009. United Nations Economic and Social Council, 2009. In: ; 2009. http://www.un.org/en/ecosoc/newfunct/pdf/chinameetinghealthliteracybackgroundpaperv2.pdf.
3. Bruce JG, Tucholka JL, Steffens NM, Neuman HB. Quality of online information to support patient decision-making in breast cancer surgery. *J Surg Oncol*. 2015;112(6):575-580. https://www.ncbi.nlm.nih.gov/pubmed/26417898.
4. Goh XTW, Tan YB, Thirumoorthy T, Kwan YH. A systematic review of factors that influence treatment adherence in paediatric oncology patients. *J Clin Pharm Ther*. 2017;42(1):1-7. doi:10.1111/jcpt.12441
5. Brody DS, Miller SM, Lerman CE, Smith DG, Caputo GC. Patient perception of involvement in medical care: Relationship to illness attitudes and outcomes. *J Gen Intern Med*. 1989;4(6):506-511. doi:10.1007/BF02599549
6. Ho PM, Bryson CL, Rumsfeld JS. Medication adherence: its importance in cardiovascular outcomes. *Circulation*. 2009;119(23):3028-3035. doi:10.1161/CIRCULATIONAHA.108.768986
7. Bardel A, Wallander M-A, Svärdsudd K. Factors associated with adherence to drug therapy: a population-based study. *Eur J Clin Pharmacol*. 2007;63(3):307-314. doi:10.1007/s00228-006-0246-4

8. Charnock D, Shepperd S, Needham G, Gann R. DISCERN: an instrument for judging the quality of written consumer health information on treatment choices. *J Epidemiol Community Health*. 1999;53(2):105-111. doi:10.1136/jech.53.2.105

9. Logullo P, de Carvalho HB, Saconi R, Massad E. Factors affecting compliance with the measles vaccination schedule in a Brazilian city. *Sao Paulo Med J*. 2008. doi:S1516-31802008000300006 [pii]

10. Kish-Doto J, Moultrie R, Mccormack L, Furberg RD, Labresh KA. Assessing patient – provider communication barriers to implementing new expert panel risk reduction guidelines. *J Commun Healthc*. 2014;7(3):214-227. doi:10.1179/1753807614Y.0000000061

11. Jadad AR, Gagliardi A. Rating health information on the Internet: navigating to knowledge or to Babel? *JAMA*. 1998;279(8):611-614. http://www.ncbi.nlm.nih.gov/pubmed/9486757. Accessed December 15, 2017.

12. Shepperd S, Charnock D, Cook A. A 5-star system for rating the quality of information based on DISCERN. *Health Info Libr J*. 2002;19(4):201-205. https://www.ncbi.nlm.nih.gov/pubmed/12485149.

13. Ang WC, Swain N, Gale C. Evaluating communication in healthcare : Systematic review and analysis of suitable communication scales. *J Commun Healthc*. 2013;6(4). doi:10.1179/1753807613Y.0000000041

14. Schiavo R. Health communication in health disparities settings. *J Commun Healthc*. 2014;7(2):71-73. doi:10.1179/1753806814Z.00000000073

15. Schiavo R. Advancing the field of health communication. *J Commun Healthc*. 2015;8(1):1-2.

16. Schiavo R. Reflecting on community and patient engagement and other health communication topics. *J Commun Healthc*. 2014;7(3):149-151. doi:10.1179/1753806814Z.00000000081

17. O'Connell Ferster AP, Hu A. Evaluating the quality and readability of Internet information sources regarding the treatment of swallowing disorders. *Ear Nose Throat J*. 2017;96(3):128-138. https://www.ncbi.nlm.nih.gov/pubmed/28346643.

18. Montoya A, Llopis N, Gilaberte I. Validation of the translation of an instrument to measure reliability of written information on treatment choices: a study on attention deficit/hyperactivity disorder (ADHD). *Educ Health (Abingdon)*. 2011;24(3):577. https://www.ncbi.nlm.nih.gov/pubmed/22267353.

19. Dierks, M., Lerch, M. & Ollenschläger G. DISCERN - ein Instrument zur Bewertung der Qualität von Gesundheitsinformationen. *Public Heal Forum*. 1999;7(4):16-17. doi:https://doi.org/10.1515/pubhef-1999-1659

20. Vandenbroucke JP, von Elm E, Altman DG, et al. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): Explanation and Elaboration. *PLoS Med*. 2007;4(10):e297. doi:10.1371/journal.pmed.0040297

21. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures. *Spine (Phila Pa 1976)*. 2000;25(24):3186-3191. doi:10.1097/00007632-200012150-00014

22. Reichenheim ME, Moraes CL, São R, Xavier F. Operationalizing the cross-cultural adaptation of epidemological measurement instruments. *Rev Saúde Pública*. 2007;41(4):665-673.

23. Silva FG, Silva CR, Braga LB, Neto AS. Portuguese Children's Sleep Habits

Questionnaire - Validation and cross-cultural comparison. *J Pediatr (Rio J)*. 2014;90(1):78-84. doi:10.1016/j.jped.2013.06.009

24. Hanna L, Hunt S, Bhopal RS. Cross-cultural adaptation of a tobacco questionnaire for Punjabi, Cantonese, Urdu and Sylheti speakers: qualitative research for better clinical practice, cessation services and research. *J Epidemiol Community Heal*. 2006;60(12):1034-1039. doi:10.1136/jech.2005.043877

25. Certal V, de Lima FF, Winck JC, Azevedo I, Costa-Pereira A. Translation and cross-cultural adaptation of the Pediatric Sleep Questionnaire into Portuguese language. *Int J Pediatr Otorhinolaryngol*. 2015;79(2):175-178. doi:10.1016/j.ijporl.2014.12.002

26. Paiva BSR, de Carvalho AL, Kolcaba K, Paiva CE. Validation of the Holistic Comfort Questionnaire- caregiver in Portuguese-Brazil in a cohort of informal caregivers of palliative care cancer patients. *Support Care Cancer*. 2014;23(2):343-351. doi:10.1007/s00520-014-2370-5

27. Oliveira IS, da Cunha Menezes Costa L, Fagundes FRC, Cabral CMN. Evaluation of cross-cultural adaptation and measurement properties of breast cancer-specific quality-of-life questionnaires: a systematic review. *Qual Life Res*. 2015:24. doi:10.1007/s11136-014-0840-3

28. Sousa P, Gaspar P, Vaz DC, Gonzaga S, Dixe MA. Measuring Health-Promoting Behaviors: Cross-Cultural Validation of the Health-Promoting Lifestyle Profile-I. *Int J Nurs Knowl*. 2015;26(2):54-61. doi:10.1111/2047-3095.12065

29. Hill J, Bird HA, Lawton CW, Wright V. The arthritis impact measurement scales: an anglicized version to assess the outcome of British patients with rheumatoid arthritis. *Br J Rheumatol*. 1990;29(3):193-196. http://www.ncbi.nlm.nih.gov/pubmed/2357501.

Accessed December 16, 2017.

30. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. Comment in. *J Clin Epidemiol*. 1993;46(12):1417-1432. http://www.ncbi.nlm.nih.gov/pubmed/8263569.

31. Calado AA, Araujo EM, Barroso U, et al. Cross-cultural Adaptation of the Dysfunctional Voiding Score Symptom (DVSS) Questionnaire for Brazilian Children. *Int Braz J Urol Int Braz J Urol*. 2010;36(4):458-463. doi:10.1590/S1677-55382010000400009

32. Marx RG, Menezes A, Horovitz L, Jones EC, Warren RF. A comparison of two time intervals for test-retest reliability of health status instruments. *J Clin Epidemiol*. 2003;56(8):730-735. http://www.ncbi.nlm.nih.gov/pubmed/12954464. Accessed December 16, 2017.

33. Jelicic Kadic A, Fidahic M, Vujcic M, et al. Cochrane plain language summaries are highly heterogeneous with low adherence to the standards. *BMC Med Res Methodol*. 2016;16:61-64. doi:10.1186/s12874-016-0162-y

34. Apolinario D, Braga R de COP, Magaldi RM, et al. Short Assessment of Health Literacy for Portuguese-speaking Adults. *Rev Saude Publica*. 2012;46(4):702-711. http://www.ncbi.nlm.nih.gov/pubmed/22782124. Accessed December 15, 2017.

35. Sørensen K, Van den Broucke S, Fullam J, et al. Health literacy and public health: a systematic review and integration of definitions and models. *BMC Public Health*. 2012;12:80. doi:10.1186/1471-2458-12-80

36. Souza JG, Apolinario D, Magaldi RM, Busse AL, Campora F, Jacob-Filho W. Functional health literacy and glycaemic control in older adults with type 2 diabetes: a cross-sectional study. *BMJ Open*. 2014;4(2):e004180. doi:10.1136/bmjopen-2013-004180

37. Oliveira SE, Esteves FG, Pereira EG, Carvalho M, Boyd JE. The Internalized Stigma of Mental Illness: Cross-Cultural Adaptation and Psychometric Properties of the Portuguese Version of the ISMI Scale. *Community Ment Heal J*. 2015;51(5):606-612. doi:10.1007/s10597-015-9828-x

38. Landis J, Koch G. The measurement of observer agreement for categorical data. *Biometrics*. 1977;33:159-174.

39. Bourzgui F, Serhier Z, Sebbar M, Diouny S, Bennani Othmani M, Ngom PI. Adaptation and validation of the Moroccan Arabic version of the Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ). *Saudi Dent J*. 2015;27:180-186. doi:10.1016/j.sdentj.2014.11.016

40. Guyatt GH, Feeny DH, Patrick DL. Measuring health-related quality of life. *Ann Intern Med*. 1993;118(8):622-629. http://www.ncbi.nlm.nih.gov/pubmed/8452328. Accessed December 16, 2017.

41. Bullinger M, Alonso J, Apolone G, et al. Translating health status questionnaires and evaluating their quality: the IQOLA Project approach. International Quality of Life Assessment. *J Clin Epidemiol*. 1998;51(11):913-923. http://www.ncbi.nlm.nih.gov/pubmed/9817108. Accessed December 13, 2017.

42. Borsa JC, Damásio BF, Bandeira DR. Adaptação e validação de instrumentos psicológicos entre culturas: Algumas considerações. *Paidéia*. 2012;22(53):423-432. doi:10.1590/1982-43272253201314

43. Wagner AK, Gandek B, Aaronson NK, et al. Cross-cultural comparisons of the content of SF-36 translations across 10 countries: results from the IQOLA Project. International Quality of Life Assessment. *J Clin Epidemiol*. 1998;51(11):925-932.

http://www.ncbi.nlm.nih.gov/pubmed/9817109. Accessed March 13, 2019.

44. Coulter A, Parsons S, Askham J. Where are the patients in decision-making about their own care? 2008.

45. Organization WH, Office for Europe R, Ilona Kickbusch, Jürgen M. Pelikan, Franklin Apfel & Agis D. Tsouros, Health Organization W. *Health Literacy : The Solid Facts*. UN City, Marmorvej; 2013. http://www.euro.who.int/__data/assets/pdf_file/0008/190655/e96854.pdf. Accessed December 15, 2017.

46. van der Heide I, Wang J, Droomers M, Spreeuwenberg P, Rademakers J, Uiters E. The relationship between health, education, and health literacy: results from the Dutch Adult Literacy and Life Skills Survey. *J Health Commun*. 2013;18 Suppl 1(Suppl 1):172-184. doi:10.1080/10810730.2013.825668

47. Hanna LC, Hunt SM, Bhopal RS. Using the Rose Angina Questionnaire cross-culturally: the importance of consulting lay people when translating epidemiological questionnaires. *Ethn Health*. 2012;17(3):241-251. doi:10.1080/13557858.2011.610439

Table 1. Demographic characteristics of participants

	Characteristic	n (%)	Total
Sex	Male	42 (33)	127
	Female	85 (67)	
Group (class)	Cásper Líbero (night class)	34 (27%)	83
	PUC (night class)	49 (38%)	
	PUC (morning class)	44 (35%)	44
Age	18 - 21 years	102 (82%)	125
	> 21 years	23 (18%)	

Table 2. Internal consistency of the Brazilian Portuguese version of the DISCERN

Question	Correlation of the item with the total	Cronbach's alpha if the item is removed
Q1	0.319	0.864
Q2	0.403	0.861
Q3	0.473	0.858
Q4	0.670	0.847
Q5	0.457	0.859
Q6	0.365	0.862
Q7	0.599	0.852
Q8	0.135	0.874
Q9	0.723	0.844
Q10	0.575	0.853
Q11	0.513	0.856
Q12	0.570	0.853
Q13	0.611	0.851
Q14	0.222	0.867
Q15	0.522	0.855
Q16	0.711	0.847
Total		**0.865**

Table 3. Reproducibility of two DISCERN evaluations

Question	First	Second	CCI	95% CI		Error
	Mean ± SD	Mean ± SD		Inferior limit	Superior limit	
Q1	4.03 ± 1.06	3.78 ± 1.14	0.655	0.484	0.777	0.63
Q2	3.40 ± 1.12	3.40 ± 1.13	0.721	0.577	0.822	0.60
Q3	3.76 ± 1.10	3.89 ± 1.08	0.371	0.138	0.566	0.87
Q4	2.21 ± 1.31	2.57 ± 1.34	0.522	0.317	0.680	0.90
Q5	2.70 ± 1.55	2.92 ± 1.42	0.397	0.169	0.585	1.15
Q6	3.35 ± 1.08	3.67 ± 1.19	0.416	0.194	0.598	0.86
Q7	1.57 ± 1.04	2.14 ± 1.27	0.525	0.254	0.705	0.75
Q8	3.48 ± 1.39	3.41 ± 1.21	0.474	0.256	0.645	0.95
Q9	2.00 ± 1.34	2.76 ± 1.45	0.529	0.222	0.719	0.88
Q10	2.98 ± 1.34	3.17 ± 1.21	0.358	0.124	0.554	1.02
Q11	3.10 ± 1.35	2.89 ± 1.37	0.457	0.240	0.632	1.00
Q12	1.76 ± 1.29	2.21 ± 1.37	0.547	0.338	0.703	0.87
Q13	2.16 ± 1.32	2.65 ± 1.31	0.504	0.282	0.672	0.90
Q14	4.33 ± 1.11	4.02 ± 1.18	0.461	0.246	0.633	0.83
Q15	2.22 ± 1.31	2.33 ± 1.32	0.480	0.265	0.650	0.95
Q16	2.83 ± 1.23	3.02 ± 1.23	0.769	0.644	0.854	0.58
Total score	**45.9 ± 12.2**	**48.9 ± 13.4**	**0.845**	**0.717**	**0.912**	**4.68**

CI = confidence interval; SD = standard deviation

Table 4. Spearman correlation between the total scores of the total scores of Short Assessment of Health Literacy for Portuguese-Speaking Adults (SAHL- PA) and DISCERN and between DISCERN questions with the total SAHL-PA scores, among participants who responded to both questionnaires (n = 90)

Question/questionnaire	Mean ± SD	Correlation with SAHL-PA	p-value
SAHL-PA total score	15.9 ± 1.62		
Q1 of DISCERN	4.04 ± 1.01	-0.184	0.082
Q2 of DISCERN	3.33 ± 1.11	0.092	0.388
Q3 of DISCERN	3.77 ± 1.09	0.151	0.156
Q4 of DISCERN	2.32 ± 1.41	-0.038	0.723
Q5 of DISCERN	2.80 ± 1.50	-0.020	0.848
Q6 of DISCERN	3.33 ± 1.17	0.163	0.124
Q7 of DISCERN	1.74 ± 1.12	-0.087	0.415
Q8 of DISCERN	3.50 ± 1.37	-0.004	0.969
Q9 of DISCERN	2.37 ± 1.50	-0.152	0.154
Q10 of DISCERN	3.21 ± 1.35	0.005	0.964
Q11 of DISCERN	3.22 ± 1.32	0.070	0.514
Q12 of DISCERN	1.84 ± 1.31	0.026	0.808
Q13 of DISCERN	2.34 ± 1.31	-0.076	0.478
Q14 of DISCERN	4.39 ± 1.01	0.011	0.919
Q15 of DISCERN	2.22 ± 1.28	0.012	0.913
Q16 of DISCERN	2.90 ± 1.26	0.102	0.340
DISCERN total score	47.3 ± 11.9	0.019	0.862

SD = standard deviation

Appendix 1 = DISCERN in Portuguese – PDF attached