The Richards-Campbell Sleep Questionnaire and Sleep in the Intensive Care Unit Questionnaire: translation to Portuguese and cross-cultural adaptation for use in Brazil

Samia Khalil Biazim[1] iD, Daniela Almeida Souza[2] iD, Hipólito Carraro Junior[3] iD, Kathy Richards[4] iD, Silvia Valderramas[5] iD

1. Programa de Pós-Graduação em Medicina Interna, Universidade Federal do Paraná, Curitiba (PR) Brasil.
2. Serviço de Fisioterapia, Hospital de Clínicas, Universidade Federal do Paraná, Curitiba (PR) Brasil.
3. UTI Adulto, Hospital de Clínicas, Universidade Federal do Paraná, Curitiba (PR) Brasil.
4. School of Nursing, University of Texas at Austin, Austin (TX) USA.
5. Departamento de Prevenção e Reabilitação em Fisioterapia, Universidade Federal do Paraná, Curitiba (PR) Brasil.

ABSTRACT

Objective: To translate the Richards-Campbell Sleep Questionnaire (RCSQ) and Sleep in the Intensive Care Unit Questionnaire (SICUQ) to Portuguese, making the appropriate cross-cultural adaptations for their use in Brazil, as well as to determine the interobserver reliability of the instruments. **Methods:** In this study, we evaluated medical and surgical patients admitted to the adult ICU of the Federal University of Paraná *Hospital de Clínicas*, in the city of Curitiba, Brazil, between June of 2017 and January of 2018. The translation and cross-cultural adaptation of the questionnaires involved the following steps: translation, synthesis, back-translation, revision by an expert panel, approval of the back-translation by the original authors, pretesting, and creation of the final versions. Two researchers applied the Portuguese-language versions in the evaluation of critically ill patients. Interobserver reliability was assessed by calculating the intraclass correlation coefficient (ICC) and 95% CI. **Results:** The sample comprised 50 patients, of whom 27 (54%) were women. The mean age was 47.7 ± 17.5 years. The main reason for ICU admission, in 10 patients (20%), was cancer. The interobserver reliability of the questionnaires ranged from good to excellent. For the RCSQ, the ICC was 0.84 (95% CI: 0.71-0.90). For SICUQ domains 1-5 (sleep quality and daytime sleepiness), the ICC was 0.75 (95% CI: 0.55-0.86), whereas it was 0.86 (95% CI: 0.76-0.92) for SICUQ domains 6 and 7 (causes of sleep disruption). **Conclusions:** The cross-culturally adapted, Portuguese-language versions of the RCSQ and SICUQ appear to have good interobserver reliability.

Keywords: Sleep; Intensive care units; Sleep deprivation; Surveys and questionnaires; Translations; Cross-cultural comparison.

INTRODUCTION

Sleep plays an important role in restoring the health of individuals who are ill or injured. Sleep disruption is associated with immune system dysfunction, decreased resistance to infection, changes in nitrogen balance, and impaired wound healing, as well as with neurological and cardiopulmonary adverse events.[1] In hospitalized patients, pain, anxiety, medication effects, and environmental stimuli, as well as medical and health care interventions, together with the acute illness itself, can affect the quantity and quality of sleep.[2,3]

Significant changes in sleep architecture are seen in ICU patients, including severely fragmented sleep, circadian rhythm sleep disorders, prolonged sleep latency, frequent awakenings, and reduced nighttime sleep efficiency.[4,5] Sleep disorders constitute an often overlooked complication, the prevalence of which is greater than 50% in critically ill patients, especially very critically ill patients and septic patients.[6-11]

Clinical evaluation, objective methods, and subjective methods can be used in order to investigate sleep disorders. Polysomnography is the gold standard method of objective sleep evaluation, providing information on sleep stages and cycles.[12] However, polysomnography requires appropriate facilities and specially trained personnel, meaning that the costs are high and the availability is limited in the hospital setting, particularly in the ICU.[5,13,14]

Methods of subjective sleep evaluation include questionnaires that are routinely used in clinical practice and research. They are used for diagnostic purposes and to assess treatment response, as well as being used in epidemiological studies and clinical trials. In clinical practice, questionnaires are often the only option for daily bedside assessment of sleep quality because of their low cost, practicality, and rapidity.[9,15,16] Of the sleep quality questionnaires that are most commonly used in the ICU setting, the Richards-Campbell Sleep

Questionnaire (RCSQ) and the Sleep in the Intensive Care Unit Questionnaire (SICUQ) have advantages in terms of their applicability and content.[17,18]

The RCSQ and the SICUQ are original English-language questionnaires developed for use in English-speaking populations. In order to be used in Brazil, they must be translated to Portuguese and culturally adapted for use in the country. The translation and cross-cultural adaptation of a questionnaire should be done with great care, with the use of methods recommended in the literature.[19-21]

The objective of the present study was to translate the RCSQ and the SICUQ to Portuguese and adapt them for use in Brazil, as well as to determine the interobserver reliability for assessing sleep quality with the two instruments.

METHODS

The present study was approved by the Research Ethics Committee of the *Hospital de Clínicas da Universidade Federal do Paraná* (HC/UFPR, Federal University of Paraná *Hospital de Clínicas*), located in the city of Curitiba, Brazil (Ruling no. 2,342,453). The study was conducted between June of 2017 and January of 2018 in the HC/UFPR adult ICU, which is a 14-bed ICU with private rooms.

The RCSQ[17] is used in order to assess sleep quality in eligible ICU patients. It has been validated against polysomnographic recordings, showing excellent internal consistency and moderate correlation. The RCSQ is a five-item self-report questionnaire that is used in order to assess perceived sleep depth, sleep latency (time to fall asleep), and number of awakenings, as well as sleep efficiency and quality. The original RCSQ was subsequently adapted to include a sixth item, namely, perceived nighttime noise.[22-24] Each RCSQ item is scored on a visual analog scale ranging from 0 mm to 100 mm, with higher scores representing better sleep. The mean score of the five items is known as the total score and represents the overall perception of sleep.

The SICUQ[18] is used in order to assess sleep quality in critically ill patients, as well as for collecting data on factors affecting sleep in the ICU, including environmental factors and routine patient care activities. On a scale of 1 to 10 (with 1 being "poor" and 10 being "excellent"), patients rate the overall quality of their sleep at home and in the ICU, rating the overall quality of their sleep on the first night in the ICU, during the middle of their ICU stay, and at the end of their ICU stay. Also on a scale of 1 to 10 (with 1 being "unable to stay awake" and 10 being "fully alert and awake"), patients rate the overall degree of daytime sleepiness during their ICU stay, rating the overall degree of daytime sleepiness on the first day in the ICU, during the middle of their ICU stay, and at the end of their ICU stay. Again on a scale of 1 to 10 (with 1 being "no disruption" and 10 being "significant disruption"), patients rate how disruptive environmental stimuli were to their sleep during their

ICU stay, including noise, light, nursing interventions (baths), testing (chest X-rays), assessment of vital signs, collection of blood samples, and administration of medications. As in another study,[25] participants in the present study rated how disruptive pain was to their sleep during their ICU stay. Finally (and yet again on a scale of 1 to 10, with 1 being "no disruption" and 10 being "significant disruption"), patients rate how disruptive certain noises were to their sleep during their ICU stay, including the following: heart monitor alarm; ventilator sounds and alarms; sounds of pulse oximetry; communications between staff members; intravenous pump alarms; nebulizer sounds; suctioning sounds; television sounds; and telephone sounds.

The present methodological study was approved by Dr. Kathy Richards, first author of the original RCSQ, and Dr. Neil Freedman, first author of the original SICUQ.[17,18] Both questionnaires were originally developed in English, in the USA.[17,18] The RCSQ has been translated to and validated for use in German, Chinese, and Farsi.[26-28]

The RCSQ and SICUQ were translated to Portuguese and adapted for use in Brazil in accordance with internationally accepted guidelines.[21,29-31] The protocol included the following steps: 1) permission and rights of use granted by the original authors of the questionnaires, followed by translation from English to Brazilian Portuguese by two independent translators (T1 and T2), native speakers of Portuguese and fluent in English, with one of the translators being familiar with the original questionnaires and aware of the objectives of the study and the other being unfamiliar with the original questionnaires and unaware of the objectives of the study; 2) synthesis of the translations: T1 and T2, together with our research group, analyzed the two translations and used a consensus approach to resolve discrepancies; 3) back-translation: the consensus version was back-translated to English by two independent translators, native speakers of English and fluent in Portuguese, both of whom were unfamiliar with the original versions of the questionnaires; 4) review and revision by an expert panel: a multidisciplinary expert panel consisting of one specialist in methodological research, physicians, physical therapists, and all translators compared the original questionnaires and the back-translations in order to identify discrepancies and make the necessary adjustments, thus arriving at the final versions of the back-translations of the questionnaires; 5) approval from the original authors: the final versions of the back-translations of the questionnaires were sent to the original authors for verification and comments, which were subsequently reviewed by the expert panel, the pretest versions of the questionnaires being thus arrived at; 6) pretesting among the target population and final versions of the questionnaires: two raters (R1 and R2), both of whom were ICU physical therapists, underwent standardized training in using and scoring the pretest versions of the questionnaires. Subsequently, 11 patients participated in a pilot study, in which the

questionnaires were administered in accordance with the methods described in the original papers.[17,18] This was done in order to identify difficulties in administering the questionnaires and arrive at the final Brazilian Portuguese versions of the questionnaires (Figure 1).

All data were collected blindly and independently. The questionnaire administration time was approximately 30 min, and the functions of rater and observer were swapped every 5 patients. Each rater was responsible for half of the evaluations. In an attempt to avoid bias, the scoring sheets were separate and there was no communication between the raters. The collected data included age, sex, reason for ICU admission, length of ICU stay, use of mechanical ventilation, use of vasoactive drugs, and Acute Physiology and Chronic Health Evaluation II scores.[29]

Ours was a convenience sample of medical and surgical patients. The inclusion criteria were as follows: being 18 years of age or older, having stayed in the HC/UFPR ICU for at least 72 h, and having given written informed consent. The exclusion criteria were as follows: presenting with delirium, as assessed by the Confusion Assessment Method for Intensive Care Unit[30]; having a Glasgow Coma Scale score of < 15 or < 11T (using an endotracheal tube or having a tracheostomy)[31]; having a Richmond Agitation-Sedation Scale score of < 0 (being sedated) or > 0 (being nonsedated)[32]; and being unable to understand Portuguese, write, or score the answers. Screening for eligible patients and data collection were performed by R1 one hour before the administration of the questionnaires, at approximately 9:00 a.m.

All statistical analyses were performed with the IBM SPSS Statistics software package, version 22.0 (IBM Corporation, Armonk, NY, USA). The normality and homogeneity of the data were checked with the Kolmogorov-Smirnov test. Participant clinical and demographic characteristics were expressed as frequency, mean, and standard deviation, or as median and interquartile range. Interobserver reliability and reproducibility were assessed by the intraclass correlation coefficient (ICC) and 95% CI for the RCSQ (mean total scores), as well as for SICUQ domains 1-5 and SICUQ domains 6 and 7 (mean domain scores). With regard to interobserver reliability, an ICC of < 0 indicated no reliability; an ICC of 0.00-0.20 indicated poor reliability; an ICC of 0.21-0.40 indicated fair reliability; an ICC of 0.41-0.60 indicated moderately good reliability; an ICC of 0.61-0.80 indicated good reliability; and an ICC of 0.81-1.00 indicated excellent reliability.[33] The level of significance was set at $p < 0.05$.

Sample size was calculated by using the methodology set forth by Terwee et al.,[34] who recommend a total of 4-10 patients for each questionnaire item in a sample of at least 50 patients.

RESULTS

The RCSQ and the SICUQ were initially translated to Brazilian Portuguese by two independent translators (T1 and T2). A consensus approach was used in order to resolve discrepancies, which were found to be few and minor. A decision was made to prioritize terms and phrases familiar to the Brazilian population. For
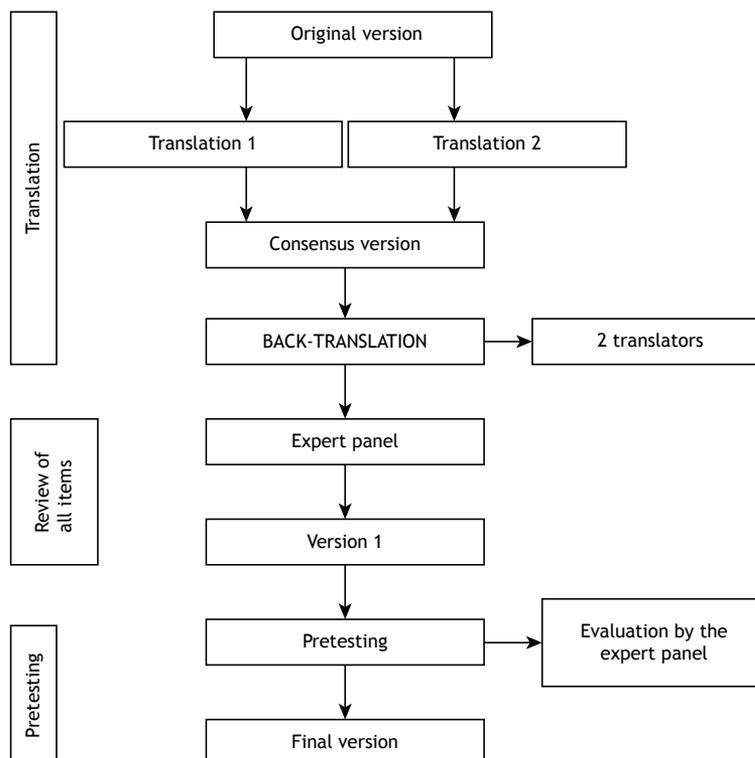

Figure 1. Flow chart of the process of translation and cross-cultural adaptation of the questionnaires.

instance, RCSQ term "noise" was translated as *barulho* rather than as *ruído*; SICUQ terms "poor", "stay", and "disruption" were translated as *ruim*, *permanência*, and *interrupção*, respectively, rather than as *pobre*, *estadia*, and *disruptivo*, respectively. The original authors of the RCSQ and SICUQ made very few changes to the back-translations because they were found to be very similar to the original versions of the questionnaires.

During the expert panel meeting, there was a high level of agreement regarding most of the items on the pretest versions of the questionnaires. Special attention was given to RCSQ item 2, namely, sleep latency. Although the term can be literally translated as *latência do sono*, a decision was made to use the term *tempo para dormir* (time to fall asleep) because patients might not understand the term *latência* (latency). SICUQ item 3 can be rated from 0 to 10, with 1 being "no sleep" and 10 being "excellent". The terms refer to the overall quality of sleep in the ICU on specific days, and although the term "no sleep" can be translated as *não durmo* or *não consigo dormir*, the expert panel suggested that the term be translated as *ruim* (poor, as in "poor quality of sleep"). The same was done for SICUQ items 1 and 2, which also rate the quality of sleep from 0 to 10, with 1 being "no sleep" and 10 being "excellent". All items are summarized in Tables 1 and 2.

During pretesting, raters reported no difficulty administering the questionnaires, reporting that patients had no difficulty understanding the questions. Therefore, no additional changes were made to the final versions of the questionnaires. The RCSQ and SICUQ were rapidly administered (administration time, 2-3 min and 4-5 min, respectively).

A total of 50 patients met the criteria for inclusion in the present study. Of those 50 patients, 27 (54%) were female. The mean age of the participants was 47.7 ± 17.5 years, with cancer being the most common reason for ICU admission, in 10 patients (20%). Of the 50 participants, 1 (2%) was on mechanical ventilation, 2 (4%) underwent tracheostomy, and 2 (4%) were on sedatives at the time of evaluation but met the eligibility criteria, as assessed by the Richmond Agitation-Sedation Scale[32] and the Confusion Assessment Method for Intensive Care Unit.[30] Table 3 shows the demographic and clinical characteristics of the study participants, and Table 4 shows the questionnaire scores.

RCSQ scores were similar between R1 and R2. Interobserver reliability was excellent (ICC = 0.84; 95% CI: 0.71-0.90; $p < 0.001$).

SICUQ scores were similar between R1 and R2. Interobserver reliability was good for SICUQ domains 1-5 (ICC = 0.75; 95% CI: 0.55-0.86; $p < 0.001$) and excellent for SICUQ domains 6 and 7 (ICC = 0.86; 95% CI: 0.76-0.92; $p < 0.001$).

DISCUSSION

There has been an increasing number of studies evaluating sleep quality in the ICU because of increasing concerns with the quality of ICU stay and its impact on the mental, cognitive, and physical health of patients surviving a critical illness.[35] Questionnaires have been developed in order to assess sleep quality in ICU patients. Questionnaires allow short- and long-term evaluation of a larger number of patients than does polysomnography, as well as allowing the implementation of effective interventions to improve sleep quality.[5]

The present study provides health professionals in Brazil with access to two questionnaires that can improve the quality of the care provided to critically ill patients in the ICU and be used in order to compare results across studies.[21]

In the present study, the RCSQ and SICUQ were translated to Portuguese and adapted for use in Brazil, and every effort was made to maintain the reliability of the original instruments.[36] Simple literal translations are insufficient for health questionnaires because of relevant cultural and socioeconomic differences across target populations.[19] According to Behling & Law,[37] cross-cultural adaptation is a process that should be approached with care and address technical, linguistic, and semantic issues.

Interobserver reliability was excellent for the Brazilian Portuguese version of the RCSQ, with an ICC of 0.84. This finding is consistent with those of Chen et al.,[24] who found excellent interobserver reliability for the Chinese version of the questionnaire, with an ICC of 0.91. The Farsi version of the RCSQ was found to have good reliability, with an ICC of 0.71.[25]

The original RCSQ was validated against polysomnography in a sample of 70 critically ill patients, and the data supported the reliability and validity of the questionnaire.[17] Patients in the ICU can present with delirium, receiving intense sedative regimens; this limits the applicability of the RCSQ and can reduce the potential sample size by half.[22] This can partially explain the small sample size of our study.

Although the SICUQ has yet to be validated against polysomnography and via reproducibility studies, the original study in which the SICUQ was developed[18] examined 203 patients and factors contributing to sleep disruption. The SICUQ assesses quality of sleep at home, daytime sleepiness, sleep disruption caused by patient care activities, and sleep disruption caused by environmental factors, none of which are assessed by the RCSQ. Studies using this questionnaire[24,37,38] have shown positive results regarding the implementation of protocols for sleep promotion in the ICU setting and post-ICU evaluation, confirming its utility in clinical practice.

One issue to be addressed is the lack of strict criteria for the use of assessment instruments developed for use elsewhere. Failure to adapt the contents to the target population can undermine the quality of the data being collected and, consequently, invalidate study results.[39,40]

The present study has some limitations that should be noted. Our sample size was small because patients

Table 1. Translations performed by translators 1 and 2, together with the final version of the Richards-Campbell Sleep Questionnaire for use in Brazil.

Item	Original version Measure	Original version Question	Translator 1 Measure	Translator 1 Question	Translator 2 Measure	Translator 2 Question	Final version Measure	Final version Question
1	Sleep depth	My sleep last night was: light sleep (0) deep sleep (100)	Profundidade do sono	Meu sono na última noite foi: sono leve (0) sono profundo (100)	Profundidade do sono	Meu sono ontem à noite foi: sono leve (0) sono profundo (100)	Profundidade do sono	Meu sono na última noite foi: sono leve (0) sono profundo (100)
2	Sleep latency	Last night, the first time I got to sleep, I: just never could fall asleep (0) fell asleep almost immediately (100)	Latência do sono	Na última noite, a primeira vez que adormeci, eu: não consegui adormecer (0) adormeci quase imediatamente (100)	Latência do sono	Nesta noite, a primeira vez que adormeci, eu: não consegui adormecer (0) adormeci quase imediatamente (100)	Latência do sono Tempo para dormir[a]	Na última noite, a primeira vez que adormeci, eu: não consegui adormecer (0) adormeci quase imediatamente (100)
3	Awakenings	Last night, I was: awake all night long (0) awake very little (100)	Despertar	Na última noite, eu estava: acordado(a) a noite inteira (0) acordei muito pouco (100)	Despertar	Nesta noite, eu estava: acordado(a) a noite inteira (0) despertei muito pouco (100)	Despertar	Na última noite, eu estava: acordado(a) a noite toda (0) acordei muito pouco (100)
4	Returning to sleep	Last night, when I woke up or was awakened, I: couldn't get back to sleep (0) got back to sleep immediately (100)	Voltando ao sono	Na última noite, quando acordei ou fui despertado(a), eu: não consegui voltar a dormir (0) voltei a dormir imediatamente (100)	Retorno ao sono	Nesta noite, quando acordei ou fui acordado(a), eu: não consegui voltar a dormir (0) voltei a dormir imediatamente (100)	Retorno ao sono	Na última noite, quando eu acordei ou fui acordado(a): não consegui voltar a dormir (0) voltei a dormir imediatamente (100)
5	Sleep quality	I would describe my sleep last night as: a bad night's sleep (0) a good night's sleep (100)	Qualidade do sono	Eu descreveria meu sono na última noite como: uma noite ruim de sono (0) uma boa noite de sono (100)	Qualidade do sono	Eu descreveria meu sono na última noite como: ruim noite de sono (0) boa noite de sono (100)	Qualidade do sono	Eu descreveria meu sono na última noite como: ruim noite de sono (0) boa noite de sono (100)
6	Noise	I would describe the noise level last night as: very noisy (0) very quiet (100)	Ruído	Eu descreveria o nível de ruído na última noite como: muito barulhento (0) muito silencioso (100)	Barulho	Eu descreveria o nível de barulho desta noite como: muito barulhento (0) muito quieto (100)	Barulho	Eu descreveria o nível de barulho na última noite como: muito barulhento (0) muito quieto (100)

[a]Change made after a meeting with the expert panel.

Table 2. Translations performed by translators 1 and 2, together with the final version of the Sleep in the Intensive Care Unit Questionnaire for use in Brazil.

Item	Original version	Translator 1	Translator 2	Final version
1	Rate the overall quality of your sleep at home. Use a scale of 1 to 10 (1 is poor; 10 is excellent)	Avalie a qualidade geral do seu sono em casa. Use uma escala de 1 a 10 (1 = pobre, 10 = excelente)	Classifique a qualidade global do seu sono em casa. Utilize uma escala de 1 a 10 (1 = ruim, 10 = excelente)	Classifique a qualidade global do seu sono em casa. Utilize uma escala de 1 a 10 (1 = ruim, 10 = excelente)
2	Rate the overall quality of your sleep in the ICU. Use a scale of 1 to 10 (1 is poor; 10 is excellent)	Avalie a qualidade geral do seu sono na UTI. Use uma escala de 1 a 10 (1 = pobre, 10 = excelente)	Classifique a qualidade global do seu sono na UTI. Utilize uma escala de 1 a 10 (1 = ruim, 10 = excelente)	Classifique a qualidade global do seu sono na UTI. Utilize uma escala de 1 a 10 (1 = ruim, 10 = excelente)
3	Rate the overall quality of your sleep in the ICU on the following days: (1 is no sleep; 10 is excellent) - On the first night in the ICU - During the middle of your ICU stay - At the end of your ICU stay	Avalie a qualidade geral do seu sono na UTI nos dias seguintes: (1 = não dorme, 10 = excelente) - Na primeira noite na UTI - Durante a metade da sua estadia na UTI - No final da sua estadia na UTI	Classifique a qualidade global do seu sono na UTI nos seguintes dias: (1 = não dorme, 10 = excelente) - Na primeira noite na UTI - Durante a metade da sua permanência na UTI - No final da sua permanência na UTI	Classifique a qualidade global do seu sono na UTI nos seguintes dias: (1 não dorme /ª1 = ruim, 10 = excelente) - Primeira noite na UTI - Durante a metade da sua permanência na UTI - No final da sua permanência na UTI
4	Rate the overall degree of daytime sleepiness during your ICU stay: (1 is unable to stay awake; 10 is fully alert and awake)	Avalie o grau geral de sonolência diurna durante sua estadia na UTI: (1 = incapaz de ficar acordado/a, 10 = totalmente alerta e acordado/a)	Classifique o nível global de sonolência diurna durante sua permanência na UTI: (1 = incapaz de ficar acordado/a, 10 = totalmente alerta e acordado/a)	Classifique o nível global de sonolência diurna durante sua permanência na UTI: (1 = incapaz de ficar acordado/a, 10 = totalmente alerta e acordado/a)
5	Rate the overall degree of daytime sleepiness during your ICU stay on the following days: (1 is unable to stay awake; 10 is fully alert and awake) - On the first night in the ICU - During the middle of your ICU stay - At the end of your ICU stay	Avalie o grau geral de sonolência diurna durante sua estadia na UTI nos dias seguintes: (1 = incapaz de ficar acordado/a; 10 = totalmente alerta e acordado/a) - Na primeira noite na UTI - Durante a metade da sua estadia na UTI - No final da sua estadia na UTI	Classifique o nível global de sonolência diurna durante sua permanência na UTI nos seguintes dias: (1 = incapaz de ficar acordado/a; 10 = totalmente alerta e acordado/a) - Na primeira noite na UTI - Durante a metade da sua permanência na UTI - No final da sua permanência na UTI	Classifique o nível global de sonolência diurna durante sua permanência na UTI nos seguintes dias: (1 = incapaz de ficar acordado/a; 10 = totalmente alerta e acordado/a) - Primeira noite na UTI - Durante a metade da sua permanência na UTI - No final da sua permanência na UTI
6	Rate how disruptive the following activities were to your sleep during your ICU stay. Use a scale of 1 to 10 (1 is no disruption; 10 is significant disruption) - Pain - Noise - Light - Nursing Interventions (i.e. baths) - Diagnostic Testing (i.e. chest x-rays) - Vital Signs (blood pressure, pulse, temperature) - Blood Samples - Administration of Medications	Avalie o grau de disruptiva as seguintes atividades foram para seu sono durante sua estadia na UTI. Use uma escala de 1 a 10 (1 = não interrompe, 10 =- interrupção significativa) - Dor - Barulho - Luz - Intervenções da enfermagem (ou seja, banhos) - Testes de diagnóstico (ou seja, radiografias de tórax) - Sinais vitais (pressão sanguínea, pulso, temperatura) - Amostras de sangue - Administração de medicamentos	Classifique o nível de interrupção do seu sono para as seguintes atividades durante sua permanência na UTI. Use uma escala de 1 a 10 (1 = sem interrupção, 10 = interrupção significativa) - Dor - Barulho - Luminosidade - Intervenções da enfermagem (isto é, banhos) - Testes de diagnóstico (isto é, radiografias de tórax) - Sinais vitais (pressão arterial, pulso, temperatura) - Amostras de sangue - Administração de medicamentos	Classifique o nível de interrupção do seu sono para as seguintes atividades durante sua permanência na UTI. Use uma escala de 1 a 10 (1 = sem interrupção, 10 = interrupção significativa) - Dor - Barulho - Luminosidade - Cuidados de enfermagem (banhos) - Exames (radiografias de tórax) - Sinais vitais (pressão arterial, pulso, temperatura) - Coletas de sangue - Administração de medicamentos

ªChange made after a meeting with the expert panel.

Table 2. Continued...

Item	Original version	Translator 1	Translator 2	Final version
7	Rate how disruptive the following noises were to your sleep during your ICU stay. (1 is no disruption; 10 is significant disruption) - Heart Monitor Alarm - Ventilator Alarm - Ventilator - Oxygen Finger Probe - Talking - I.V. Pump Alarm - Suctioning - Nebulizer - Doctor's Beepers - Television - Telephone	Avalie o grau de disruptivo os seguintes ruídos foram para seu sono durante sua estadia na UTI. (1 = não interrompe, 10 = interrupção significativa) - Alarme do monitor cardíaco - Alarme do ventilador - Ventilador - Oximetria de pulso - Conversas - Alarme da bomba de infusão - Sucção - Nebulizador - Telefone do médico - Televisão - Telefone	Classifique o nível de interrupção do seu sono para os seguintes barulhos durante sua permanência na UTI. (1 = sem interrupção, 10 = interrupção significativa) - Alarme do monitor cardíaco - Alarme do ventilador - Ventilador - Oximetria de pulso - Conversas - Alarme da bomba infusora - Vácuo de sucção - Nebulizador - Telefone do médico - Televisão - Telefone da unidade	Classifique o nível de interrupção do seu sono para os seguintes barulhos durante sua permanência na UTI. (1 = sem interrupção, 10 = interrupção significativa) - Alarme do monitor cardíaco - Alarme do ventilador - Ventilador - Oximetria de pulso - Conversas - Alarme da bomba infusora - Vácuo de sucção - Nebulização - Telefone do médico - Televisão - Telefone da unidade

[a]Change made after a meeting with the expert panel.

Table 3. Demographic and clinical characteristics of patients completing the Brazilian Portuguese versions of the Richards-Campbell Sleep Questionnaire and Sleep in the Intensive Care Unit Questionnaire (N = 50).[a]

Variable	Result
Age, years	47.7 ± 17.5
Female sex	27 (54)
APACHE II	14.9 ± 8.5
Reason for ICU admission	
Cancer	10 (20)
Respiratory disease	8 (16)
Gastrointestinal disease	6 (12)
Neurological disease	5 (10)
Heart disease	5 (10)
Liver disease	4 (8)
Kidney disease	3 (6)
Pregnancy	3 (6)
Poisoning	2 (4)
Neuromuscular disease	2 (4)
Endocrine disease	1 (2)
Infectious disease	1 (2)
Charlson comorbidity index	1.3 ± 1.7
Smokers	10 (20)
Length of previous ICU stay, days	2.2 ± 4.4
Total length of ICU stay, days	3.5 [3-7]
Use of mechanical ventilation	1 (2)
Duration of mechanical ventilation, days	0 [0-1]
Tracheostomy	2 (4)
Drugs used in the ICU	
Analgesics	44 (88)
Sedatives	2 (4)
Anxiolytics	4 (8)
Vasoactive drugs	11 (22)
Level of consciousness/agitation and sedation at the time of evaluation	
GCS score = 15 or = 11T	48 (96)
RASS score = 0	2 (4)

APACHE II: Acute Physiology and Chronic Health Evaluation; GCS: Glasgow Coma Scale; and RASS: Richmond Agitation-Sedation Scale. [a]Values expressed as mean ± SD, n (%), or median [interquartile range].

Table 4. Total scores on the Brazilian Portuguese versions of the Richards-Campbell Sleep Questionnaire and Sleep in the Intensive Care Unit Questionnaire for raters 1 and 2.[a]

Questionnaire/rater	Score
RCSQ	
R1	34.3 [23.6-49.8]
R2	37.9 [21.5-52.3]
SICUQ	
R1-Domains 1 to 5	6.2 ± 2.0
R2-Domains 1 to 5	6.1 ± 2.3
R1-Domains 6 and 7	3.1 ± 1.5
R2-Domains 6 and 7	3.2 ± 1.7

RCSQ: Richards-Campbell Sleep Questionnaire; SICUQ: Sleep in the Intensive Care Unit Questionnaire; R1: rater 1; and R2: rater 2. [a]Values expressed as median [interquartile range] or mean ± SD.

must remain awake and be cognitively capable of understanding the questions in order to complete the questionnaires. These criteria make it difficult to identify eligible ICU patients. Another limitation is that questionnaires are not the gold standard for assessing sleep quality in the ICU; however, methods such as polysomnography are highly complex and expensive. Therefore, questionnaires are an alternative method for assessing sleep quality in critically ill patients and implementing interventions to improve it. Future studies should examine the psychometric properties of the RCSQ and SICUQ, testing their construct validity and internal consistency.

In summary, the Brazilian Portuguese versions of the RCSQ and SICUQ have good inter-rater reliability and can therefore be used in order to assess sleep quality in adult ICU patients in Brazil.

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