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Original Article

Translation and validation of the Indonesian version of Richard Campbell Sleep Questionnaire (RCSQ) in intensive care unit patients

Nunung Nurhayati[1,2*], Agung Waluyo[3], I Made Kariasa[3], Sali Rahadi Asih[4], Hening Pujasari[5], Bahrul Hayat[6]

[1] Doctoral Study Program in Nursing, Faculty of Nursing, University of Indonesia, Depok, Indonesia
[2] Department of Critical and Emergency Nursing, PPNI West Java College of Nursing, Bandung, Indonesia
[3] Department of Medical Surgical Nursing, Faculty of Nursing, University of Indonesia, Depok, Indonesia
[4] Department of Psychology, Faculty of Psychology, University of Indonesia, Depok, Indonesia
[5] Department of Basic and Basic Nursing, Faculty of Nursing, University of Indonesia, Depok, Indonesia
[6] Department of Psychology, Faculty of Psychology, State Islamic University, Jakarta, Indonesia

***Corresponding Author:**
Nunung Nurhayati
Doctoral Study Program in Nursing, Faculty of Nursing, University of Indonesia, Depok, Indonesia;
Department of Critical and Emergency Nursing, PPNI West Java College of Nursing, Bandung, Indonesia
Email: nung.nunung.nurhayati.2007@gmail.com

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Abstract

Background: Sleep quality is a critical determinant of recovery outcomes among patients admitted to intensive care units (ICUs); however, accurate sleep assessment remains challenging due to environmental disturbances and intensive medical interventions. The Richards–Campbell Sleep Questionnaire (RCSQ) is widely used to assess subjective sleep quality, yet evidence regarding its psychometric performance in Indonesian ICU settings remains limited.
Objective: The purpose of this study was to evaluate the validity and reliability of RCSQ in the ICU and assess the extent to which this instrument can accurately reflect the patient's sleep experience in the ICU.
Methods: A methodological cross-sectional study was conducted involving 11 adult ICU patients recruited using a total sampling technique. Data were collected between April and May 2025 using the Indonesian version of the RCSQ. Construct validity was assessed using item–total correlation analysis, while internal consistency was evaluated using Cronbach's alpha coefficient. Descriptive statistics were used to summarize participants' demographic characteristics.
Results: All RCSQ items demonstrated satisfactory construct validity, with item–total correlation coefficients exceeding the critical r-value ($r > 0.521$) and statistical significance at $p < 0.05$. The instrument showed good internal consistency, with a Cronbach's alpha value of 0.810, indicating reliable measurement of subjective sleep quality among ICU patients.
Conclusion: The Indonesian version of the Richards–Campbell Sleep Questionnaire demonstrates acceptable validity and reliability for assessing subjective sleep quality in ICU patients. Nevertheless, further studies with larger and more diverse samples are recommended to confirm its robustness and to explore integration with objective sleep assessment methods in intensive care settings.

Background

Sleep is a basic physiological need that is very important to maintain health, improve cognitive function, strengthen the immune system, and speed up the healing process, especially in patients admitted to the intensive care unit (ICU). In the context of the ICU, sleep is not only a basic need but also plays a therapeutic role that directly affects the patient's clinical outcomes. Unfortunately, sleep disorders are very common in the ICU, with a high prevalence of more than 50% in patients hospitalized in intensive care (Kapoor, 2020). Various internal and external factors cause sleep disturbances in ICU patients, including uncontrolled pain, noise from medical devices, lighting that does not match the circadian rhythm, repeated invasive procedures, and the use of sedative or analgesic drugs that can disrupt the normal sleep cycle (Dorsch et al., 2019; Bihari et al., 2012).

Sleep disturbances in ICU patients should not be considered mild symptoms, as they have been shown to be associated with a wide range of clinical complications. One of the most serious consequences is an increased risk of delirium, an acute neuropsychiatric disorder characterized by impaired consciousness, attention, and cognition, which can worsen the prognosis of critical patients (Honarmand et al., 2020). Additionally, sleep deprivation can lower the immune response, slow the wound healing process, increase blood pressure, and cause

hormonal imbalances that affect the body's overall metabolism (Yuan et al., 2021). In the long term, patients who experience sleep disturbances during intensive care are also at risk of post-ICU (Post Intensive Care Syndrome) neuropsychiatric disorders, including anxiety, depression, and chronic sleep disorders (Elliott et al., 2018).

Based on these clinical implications, sleep quality monitoring and assessment is a very important aspect of critical nursing practice. Nurses, as the primary service providers in the ICU, have the responsibility to identify sleep disorders early, carry out appropriate interventions, and evaluate the effectiveness of the interventions provided. However, one of the biggest challenges in assessing sleep quality in the ICU is the limitations of practical and accurate measurement methods. Objective approaches such as polysomnography are indeed the gold standard, but their use is limited by cost, resources, and interference with patient comfort. Therefore, valid, reliable, and easy-to-use instruments are needed to assess sleep quality subjectively, as a basis for appropriate and evidence-based clinical decision-making (Jacobowitz et al., 2022).

However, the assessment of sleep quality in ICU patients faces its own challenges that are methodological and practical. Objective methods such as polysomnography (PSG) are indeed considered the gold standard in assessing sleep architecture, as they are able to record brain activity, eye movements, muscle tone, and breathing waves in real time (Elliott et al., 2018). However, the application of PSG in the ICU environment is very limited because the procedure is complex, requires special equipment and experts, and can interfere with the comfort and freedom of patient mobilization. In addition, many ICU patients are unable to actively participate in PSG procedures due to sedation, mechanical ventilation, or decreased consciousness (Alsulami et al., 2019). Other objective methods such as actigraphy also have limitations in distinguishing between light sleep and passive wakefulness, especially in patients with limited motor activity (Kamdar et al., 2020).

The main advantage of RCSQ lies in its simplicity and its ability to represent patients' subjective perceptions of their sleep, which are often not captured by objective methods. This instrument also allows ICU nurses to monitor periodically and respond quickly to patients' sleep disturbances. Several studies have proven that RCSQ has good construct validity, positive correlation with PSG data, and adequate internal reliability (Chen et al., 2019; Zhang et al., 2020). However, the use of RCSQ still requires a process of local adaptation and validation before it can be widely applied in different cultural and linguistic contexts, including in Indonesia.

A number of studies have shown variations in results in RCSQ validation in different countries, reinforcing the importance of cultural and linguistic adaptation of this instrument. Research by Yang et al. (2020) in China found that the translated version of RCSQ showed sufficient validity and reliability after going through the reverse translation process and field trials. Meanwhile, a study by Douglas et al. (2021) in the Netherlands reported differences in perceptions between patients and nurses on the sleep quality of ICU patients when RCSQ was used in a proxy format by healthcare workers. This difference highlights that although the RCSQ has a simple structure, the interpretation of the scale and dimensions of sleep can differ significantly depending on who is filling it and in what context it is used.

Furthermore, without adequate local validation, the use of instruments such as RCSQ can lead to measurement bias that has a serious impact on data accuracy and clinical decision-making. Misinterpretation of sleep quality data not only interferes with the evaluation of the effectiveness of nursing interventions but can also lead to inappropriate decisions regarding patient management, such as the use of additional sedatives or restrictions on interventions that should be needed (Douglas et al., 2021). Therefore, in the context of Indonesia or other developing countries, retesting the validity and reliability of the RCSQ is a crucial step to ensure that this instrument is not only practical but also scientific and locally accurate.

In Indonesia, research on the validity and reliability of the Richard Campbell Sleep Questionnaire (RCSQ) is still very limited, although the need for valid and reliable measuring tools in critical nursing practice continues to increase. As a country with a high diversity of languages and cultures, the local validation process is an important step so that

an instrument can be used appropriately and relevantly. Validity and reliability are not merely technical aspects; they form the foundation for the application of evidence-based nursing practices (Evidence-Based Practice). This practice demands the use of accurate and measurable data to support effective and efficient clinical decision-making (Tsega et al., 2021).

This research is expected to make a scientific and practical contribution to strengthening critical nursing practices based on objective data and tested instruments. In the context of evidence-based nursing, the validity and reliability of the measurement tool is an important foundation in ensuring that clinical decision-making is conducted rationally and data-driven (Tsega et al., 2021). The data obtained from valid instruments allows ICU nurses to develop appropriate interventions, such as environmental adjustments, pharmacological management, and non-pharmacological approaches in improving the quality of patient sleep.

Furthermore, the development and validation of RCSQ in Indonesia can be part of a broader effort in the standardization of national critical nursing instruments, which have so far relied on adaptation of foreign instruments without local context tests. Locally validated instruments can help improve the efficiency of clinical documentation, strengthen nursing outcome measurement, and support research and reporting of ICU service quality nationwide (Ghani et al., 2020). Thus, the results of this study not only contribute to the academic literature but can also be the basis for the development of policies and guidelines for critical nursing practice in Indonesia.

Methods

Study Design

This study is a methodological study that aims to test the validity and reliability of the Richard Campbell Sleep Questionnaire (RCSQ) in the context of patients treated in intensive care units (ICUs) in Indonesia. Methodological studies are approaches that focus on the systematic evaluation of the quality of the measuring tool, which include construct validity, content validity, and reliability, ensuring that the results can be used for accurate and consistent measurement of variables in specific cultural and clinical contexts (Varella et al., 2021). Construct validity is used to assess the extent to which an instrument can measure the concept in question, while content validity ensures that each item is relevant and reflects the aspects being measured as a whole. Reliability tests are conducted to determine the internal consistency between items, as well as the stability of measurement results over time.

The use of a quantitative approach in this study was chosen because it allows researchers to obtain objective, standardized, and statistically analyzable measurements, which are very important in the instrument validation process (Politis et al., 2020). This approach allows researchers to obtain numerical data from respondents and test them using inferential statistical methods to assess the reliability and construct structure of the RCSQ. In addition, quantitative studies in methodological research provide a solid foundation for supporting data-driven decision-making in nursing, especially in the context of Evidence-Based Practice (Tsega et al., 2021).

Sampling

The study sample consisted of 11 ICU patients, recruited using a total sampling technique during the data collection period. All patients who met the inclusion criteria during the study timeframe were invited to participate. Inclusion criteria included adult ICU patients who were conscious, clinically stable, able to communicate verbally, and willing to provide informed consent. Patients with severe cognitive impairment, deep sedation, or unstable hemodynamic conditions were excluded from the study.

Instrument

Data were collected using the Richard Campbell Sleep Questionnaire (RCSQ), a self-reported instrument designed to assess subjective sleep quality in critically ill patients. The RCSQ consists of five items measuring sleep depth, sleep latency, frequency of awakenings, ability to return to sleep, and overall sleep quality. Each item is rated on a visual analog scale (VAS)

ranging from 0 to 100, with higher scores indicating better perceived sleep quality. The instrument was administered in its adapted Indonesian version and evaluated for validity and reliability in the ICU context.

Data Collection

Data collection was conducted in the ICU from April 14 to May 13, 2025. Eligible patients were approached by the researcher after clinical stabilization. Participants completed the RCSQ in the morning to reflect their sleep experience during the previous night. When necessary, clarification was provided without influencing participants' responses. Demographic data, including age, gender, and education level, were also collected using a structured questionnaire.

Data Analysis

Data analysis was performed using statistical software. Item validity was assessed using Pearson product–moment correlation, comparing item-total correlation coefficients with the critical r-value at a significance level of $p < 0.05$. Reliability was evaluated using Cronbach's alpha coefficient to determine internal consistency, with a value ≥ 0.70 considered acceptable. Descriptive statistics were used to summarize demographic characteristics of participants.

Ethical Consideration

This study received ethical approval from the Health Research Ethics Committee of STIKep PPNI West Java (Approval No. III/004.1/KEPK-SLE/STIKep/PPNI/JABAR/I/2025). Written informed consent was obtained from all participants prior to data collection. Confidentiality and anonymity were maintained throughout the study, and participants were assured of their right to withdraw at any stage without any consequences to their medical care.

Results

In the study on the validity and reliability of the Richard Campbell Sleep Questionnaire (RCSQ) in ICU patients in Indonesia, the initial stage was a descriptive analysis of demographic characteristics. This study was carried out on April 14-May 13, 2025 on ICU patients in Indonesia with a sample of 11 patients.

Table 1. Demographic Characteristics of ICU Patients

Demographic Characteristics	Frequency	Percentage
Gender		
Women	4	36,4
Men	7	63,6
Age:		
18-35 years old	1	9.1
36-45 years old	2	18.2
46-55 years old	1	9.1
56-65 years old	7	63.6
Education		
Elementary chool	5	45.5
Junior high school	1	9.1
Senior high school	5	45.5
Total	11	100

Based on table 1, the number of respondents based on gender characteristics is 63.6% male, while based on u characteristicsthe most are 56-65 years old as 63.6%, and based on education level the highest percentage is elementary and high school with the same number of 45.5%.

Based on table 2 showed that all question items have a calculation of > rtable (0.521) Furthermore, the significant value obtained < 0.05 so that all question items are considered valid and can be included in the next analysis. On the other hand, if the calculation < rtable, then the statement item is invalid.

Based on the tabel 3. the cronbach alpha value is 0.810 and is significant 95% or α = 5%. This indicates that this data is reliable to use because r is calculated > r table (0.810 > 0.70). With this, it can be concluded that the data is RELIABLE and in the high category. on the other hand, if the Cronbach Alpha value is < 0.70, the variable question item is considered unreliable.

Table 2. RCSQ Validity Test for ICU Patients

Goods Statement	Calculation	rtable	Mark<0.05
Sleep depth	0.824	0.521	0.002
Sleep latency	0.722	0.521	0.012
Awakening	0.902	0.521	0.000
Return to sleep	0.757	0.521	0.007
Sleep quality	0.568	0.521	0.048

Table 3. RCSQ Reliability Test for ICU Patients

Reliability Statistics	
Alpha Cronbach	N item
0.810	5

Discussion

Research on the validity and reliability of the Richard Campbell Sleep Questionnaire (RCSQ) among ICU patients in Indonesia aims to evaluate the accuracy of this instrument in assessing subjective sleep quality. Sleep quality plays a critical role in patient recovery and influences physical, cognitive, and psychological outcomes during intensive care (Kapoor, 2020). Researchers must ensure that sleep assessment instruments accurately represent patients' real sleep experiences in complex ICU environments (Dorsch et al., 2019). The first stage of this study involved a descriptive analysis of demographic characteristics to establish contextual relevance. Demographic profiling provides essential background that may influence patient responses to sleep quality instruments (Wang et al., 2019). Variables such as gender, age, and education can shape perception and interpretation of questionnaire items. Therefore, demographic analysis forms a necessary foundation for interpreting psychometric outcomes.

This study was conducted between April 14 and May 13, 2025, involving 11 ICU patients who met the inclusion criteria. Demographic characteristics included gender, age group, and educational level to contextualize patient responses. The findings showed that male patients constituted 63.6% of the sample, while female patients accounted for 36.4%. This gender distribution is consistent with previous ICU studies reporting higher male admission rates (Wang et al., 2019). Gender differences may influence sleep patterns through variations in disease burden and physiological responses (Yao et al., 2023). Perceptions of sleep quality may also differ between male and female patients. Thus, gender composition should be considered when interpreting RCSQ results.

Age distribution analysis indicated that 63.6% of patients were between 56 and 65 years old. This finding reflects the predominance of older adults among ICU admissions in Indonesia. Advanced age is commonly associated with chronic diseases such as hypertension, diabetes mellitus, and cardiovascular disorders (Liu et al., 2022). These conditions frequently necessitate ICU care and complicate recovery trajectories. Aging is also linked to physiological changes that disrupt sleep architecture and circadian rhythm (Hirshkowitz et al., 2015). Older adults are therefore more vulnerable to sleep fragmentation and poor sleep quality. Understanding sleep quality in elderly ICU patients is essential for effective clinical management.

Sleep disturbances among elderly ICU patients can negatively affect both physical recovery and cognitive function. Poor sleep quality may increase the risk of delirium, prolonged hospitalization, and post-ICU complications (Elliott et al., 2018). Accurate assessment of sleep quality is therefore essential in this vulnerable population. Instruments such as the RCSQ enable clinicians to capture subjective sleep experiences efficiently (Jacobowitz et al., 2022). Reliable sleep assessment supports early identification of sleep-related problems. Early detection allows healthcare providers to implement targeted interventions. Consequently, RCSQ plays an important role in

improving recovery outcomes among older ICU patients.

Analysis of educational background revealed that 45.5% of participants had elementary education and 45.5% had high school education. Educational level influences patients' understanding of health concepts, including sleep quality assessment (Yao et al., 2023). Patients with lower education may have limited awareness of sleep's role in recovery. This limitation can affect how they interpret and respond to questionnaire items. Patients with higher education levels tend to provide more precise and reflective responses. Educational attainment also affects comprehension of questionnaire instructions. Therefore, education level must be considered when analyzing RCSQ responses.

Educational level is closely associated with health literacy and communication effectiveness. Patients with higher education are more likely to seek health information and communicate sleep-related concerns actively (Tariq, 2024). This behavior can improve the accuracy of subjective sleep reporting. Conversely, patients with lower education may struggle to articulate sleep experiences clearly. Such communication barriers can influence measurement accuracy. Researchers should therefore provide standardized explanations during questionnaire administration. Tailored communication strategies may enhance data quality across educational levels. These considerations strengthen the validity of sleep quality assessments in ICU research.

Validity testing of the RCSQ was conducted using item–total correlation analysis. Each item demonstrated a correlation coefficient greater than the r-table value of 0.521 with a significance level below 0.05. These findings indicate that all RCSQ items were valid for measuring sleep quality dimensions (Alsulami et al., 2019). The validated dimensions included sleep depth, sleep latency, awakening frequency, ability to return to sleep, and overall sleep quality. These dimensions reflect key aspects of sleep experience in ICU patients. ICU environments are characterized by frequent disturbances due to medical interventions (Dorsch et al., 2019). Despite these challenges, the RCSQ demonstrated strong construct validity.

Nighttime awakenings represent one of the most disruptive sleep dimensions in ICU settings. Frequent awakenings are often caused by procedures such as vital sign monitoring and blood sampling (Delaney et al., 2021). These interruptions significantly affect patients' perception of sleep quality. The RCSQ effectively captured this dimension despite environmental interference. ICU noise, lighting, and medical equipment disrupt normal sleep cycles (Liu et al., 2022). However, the RCSQ remained sensitive to these disruptions. This sensitivity confirms the suitability of the RCSQ for ICU use.

Reliability analysis further supported the psychometric strength of the RCSQ. The Cronbach's alpha value of 0.810 exceeded the recommended threshold of 0.70 (Wu et al., 2022). This result indicates strong internal consistency among questionnaire items. High internal consistency suggests that all items measure a unified construct of sleep quality (Dabirinejad et al., 2023). ICU patients often experience fluctuating conditions such as sedation and mechanical ventilation. These factors may influence response stability. Despite these challenges, the RCSQ produced reliable results. Reliable measurement is essential for consistent sleep assessment in ICU settings.

The high reliability and validity of the RCSQ have important clinical implications. Healthcare professionals can confidently use the instrument to assess sleep quality in ICU patients. Accurate sleep assessment supports targeted interventions to reduce environmental disturbances (Liu et al., 2022). Improved sleep management may enhance patient comfort and recovery outcomes. Nurses and physicians can integrate RCSQ findings into individualized care planning. Evidence-based sleep assessment contributes to holistic critical care practice (Tsega et al., 2021). Overall, this study supports the RCSQ as a valid and reliable tool for ICU sleep quality assessment.

Conclusion and Recommendation

This study concludes that the Richard Campbell Sleep Questionnaire (RCSQ) demonstrates acceptable validity and reliability for assessing subjective sleep quality; however, its application in intensive care unit (ICU) settings requires careful consideration due to the unique and highly disruptive ICU environment. Factors such as continuous noise exposure, suboptimal lighting, frequent medical interventions, mechanical ventilation, and sedative use may influence patients' sleep perceptions and challenge accurate measurement. Although previous studies have confirmed the consistency of RCSQ in general hospital settings, the complex clinical conditions in ICUs necessitate further validation using larger and more representative samples.

Relying solely on subjective assessment may not fully capture the multifaceted nature of sleep disturbances in critically ill patients. Therefore, future research is recommended to integrate RCSQ with objective sleep monitoring methods, such as electroencephalography or actigraphy, to obtain a more comprehensive assessment. Instrument refinement, including the addition of ICU-specific items, may further enhance its relevance and sensitivity. These efforts are expected to support the development of evidence-based guidelines for sleep assessment in ICUs, ultimately improving patient comfort, recovery, and overall quality of critical care

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Declaration on the Use of AI
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