Original Article

Cross-Cultural Adaptation, Validation, and Reliability of the Indonesian Version of Kidney Disease and Quality of Life (The KDQOL-SF™ v1.3) Instrument

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Abstract

Background: The Kidney Disease and Quality of Life Short Form (KDQOL-SF™ v1.3) was specifically developed to assess quality of life in individuals with kidney disease, including those not yet requiring dialysis. With the increasing burden of chronic kidney disease (CKD) in Indonesia, there is a need for culturally adapted and psychometrically sound instruments.
Objective: This study aimed to adapt, validate, and evaluate the reliability of the Indonesian version of the KDQOL-SF™ v1.3 among hemodialysis patients.
Methods: The KDQOL-SF™ v1.3 was adapted for cultural use by following international guidelines, including forward and backward translation, expert review, and interviews with patients. A total of 190 hemodialysis patients took part in the study. Construct validity was tested using factor analysis, and convergent validity was checked by comparing it with the EQ-5D-5L quality of life scale. Differences in scores between early-stage CKD patients and those on hemodialysis were used to test known-groups validity. Reliability was measured through internal consistency (Cronbach's alpha) and a two-week test–retest method.
Results: Of the 225 patients invited, 190 (84.4%) completed the survey. The content validity index (CVI) ranged from 0.73 to 1.00 across items. Exploratory factor analysis revealed factor loadings between 0.501 and 0.872, supporting construct validity. Significant correlations between the KDQOL-SF™ v1.3 domain scores and EQ-5D-5L measures confirmed convergent validity. Known-groups validity was demonstrated by significantly lower scores in physical function, role-physical, mental health, general health, pain, and fatigue domains among hemodialysis patients compared to those with earlier-stage CKD ($p < 0.05$). Cronbach's alpha values ranged from 0.710 to 0.883 across domains, indicating good internal consistency, while test-retest reliability coefficients ranged from 0.702 to 0.852.
Conclusion: The Indonesian version of the KDQOL-SF™ v1.3 is a valid and reliable tool to measure quality of life in hemodialysis patients. It can be used in both clinical practice and research to support patient-centered care and track outcomes. Future research should look at how well the tool detects changes in health and whether it works for patients with other stages of CKD.

Keywords: cross-culture adaptation, validation, psychometric, quality of life, chronic kidney disease.

INTRODUCTION

Chronic kidney disease (CKD) is a growing global health burden, affecting more than 750 million individuals worldwide (1,2). According to data from the World Health Organization (WHO), approximately 10% of the global population lives with CKD, yet only a fraction—around 10%—survives without access to dialysis or transplantation (3). The situation is particularly critical in developing nations, where the prevalence of CKD in the general population reaches 14.3%, and among high-risk groups, it escalates to 36.1% (4). In Asia, disparities in healthcare infrastructure further exacerbate outcomes, with an estimated 2.9 million individuals requiring hemodialysis (HD) due to a 66% shortage in service availability.

Indonesia exemplifies these global trends. National data reveal a significant increase in CKD prevalence from 2.0% in 2013 to 3.8% in 2018 among individuals aged 15 years and older (5,6). Concurrently, the number of patients receiving HD has risen sharply, from 77,892 in 2017 to 132,142 in 2018, with West Java Province alone accounting for 33,828 patients—the highest in the country (Kementerian Kesehatan RI Badan Penelitian dan Pengembangan, 2018). These figures underscore the escalating demand for renal replacement therapy and the pressing need to address the multifaceted consequences of CKD.

Hemodialysis remains the predominant modality for renal replacement therapy, alleviating symptoms and prolonging life expectancy for patients with end-stage kidney disease (8). However, despite its clinical benefits, HD imposes substantial physical, psychological, social, and economic burdens. Patients often report higher levels of stress, anxiety, and resignation compared to those with other chronic conditions (9,10). Numerous studies have highlighted that biological, psychological, social, and cultural factors interplay to profoundly diminish the quality of life (QOL) of individuals undergoing dialysis (11,12). Compared to patients with diabetes or cancer, those receiving HD consistently report lower QOL, reflecting the relentless demands of treatment and its pervasive impact on daily living (13–16).

Although valid and reliable instruments exist to measure QOL among CKD patients globally, research on culturally adapted measures remains limited, particularly in Indonesia. Given that perceptions of illness, healthcare expectations, and coping mechanisms are deeply influenced by sociocultural contexts, the direct application of international instruments without adaptation risks misrepresenting patients' lived experiences (17). Translation and cross-cultural adaptation processes are therefore essential to ensure that instruments are linguistically accurate, culturally appropriate, and psychometrically sound. In response to these challenges, the present study aims to adapt and validate the Kidney Disease Quality of Life Short Form version 1.3 (KDQOL-SF™ v1.3) for use among Indonesian hemodialysis patients. This effort seeks to provide a robust, culturally sensitive tool capable of accurately capturing the health-related QOL in this growing patient population.

Quality of life has become a central patient-reported outcome measure (PROM) in nephrology research and clinical practice (18). Broadly defined, QOL encompasses individuals' subjective evaluations of how their illness and its treatment impact their functioning and well-being across physical, psychological, and social domains (19). These perceptions are inherently shaped by cultural backgrounds, personal beliefs, aspirations, expectations, and specific life contexts (20).

Generic QOL assessments, such as the 12-Item Short Form Health Survey (SF-12) (21), the World Health Organization Quality of Life instrument (WHOQOL) (22), and the European Quality of Life Five Dimension Five Level Scale (EQ-5D-5L) (23), offer valuable insights into general health status. However, their broad focus may limit sensitivity to disease-specific concerns, particularly in CKD populations where the treatment burden, dietary restrictions, and psychosocial challenges are unique and profound. To address this gap, condition-specific QOL measures have been developed, aiming to capture aspects of life most affected by specific diseases with greater granularity.

Several instruments have been designed to assess QOL specifically in CKD, including the Kidney Transplant Questionnaire (KTQ) (24,25), the Kidney Disease Questionnaire (KDQ) (24), and tools developed through studies such as the Netherlands Cooperative Study on the Adequacy of Dialysis (NECOSAD) (26). However, many of these measures focus on particular CKD subpopulations, such as transplant recipients or pre-dialysis patients. The Kidney Disease Quality

of Life Short Form (KDQOL-SF™ v1.3) stands out as a comprehensive tool that integrates both a general core—the SF-12—and kidney disease-targeted scales (27). It addresses domains uniquely relevant to individuals living with kidney disease, such as the burden of kidney disease, symptoms/problems, and effects of kidney disease on daily life. Given its dual structure and extensive validation in international settings, KDQOL-SF™ v1.3 has been widely adopted in clinical and research contexts.

Despite its use among Indonesian kidney disease populations, formal cultural adaptation and validation studies of the KDQOL-SF™ v1.3 in the Indonesian context are lacking. Considering Indonesia's diverse linguistic, religious, and cultural landscape, such an adaptation is crucial to ensure the instrument's conceptual equivalence, relevance, and sensitivity. This study thus addresses a significant methodological gap by adapting and validating the KDQOL-SF™ v1.3 for Indonesian hemodialysis patients, supporting more accurate assessment of their quality of life and informing culturally competent care interventions.

METHODS

Study design

A cross-sectional validation study was conducted between April 2020 and July 2020 in West Java, Indonesia, involving a public hospital and a hemodialysis (HD) clinic.

Translation of English KDQOL-SF™ v1.3 instrument into Bahasa version

Cognitive interviewing, a back-translation technique, an expert panel, and forward translation are the four stages involved in translating a questionnaire (28). The tool was translated into Bahasa by two separate translators, both of whom held Ph.D. degrees from universities abroad. Next, a group of experts met to examine the forward translation and find solutions to any differences compared to prior versions or current ones. Aside from the original translator, the expert panel also included a nurse and someone knowledgeable with translating and developing instruments. The next stage was for two native Bahasa speakers who had not been involved in the previous procedures to independently do a backward translation. Finally, ten patients receiving HD (five males and five females, all 18 years or older) were subjected to cognitive questioning and pre-testing (28)

Validity

Content and Face validity

The translated questionnaire was evaluated for content validity, relevance, proper phrasing, and prioritise using the Content Validity Index (CVI) (29). Three haemodialysis clinicians (a nurse and a doctor) and three specialists with doctoral degrees in nursing were invited to review the Bahasa-translated questionnaire. Using a different scale that takes into account different levels of content appropriateness and importance, we were able to determine the following: 1-content that is inappropriate and should be deleted; 2-content or articles that raise doubts and require significant effort; 3-content within an acceptable range but requiring minimal work; and 4-items that are appropriate without change. By applying Aiken's V formula, we were able to determine the Content Validity Index (CVI) score (30). There is a range of 0 to 1.00 for the V value. A extremely high CVI is indicated by a value of 0.80.

Fifteen non-specialist community members volunteered to evaluate the test's face validity by reading and timing how long it took them to complete the questions.

Construct validity

Construct validity was assessed through exploratory factor analysis (EFA) using principal component analysis (PCA) with Promax oblique rotation (31)(32). Sampling adequacy was evaluated using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's Test of Sphericity. Factors with eigenvalues greater than 1 were retained, and a factor loading of ≥0.40 was considered acceptable (31)(32).

Convergent validity

The term "convergent validity" describes the degree of correlation and measurement agreement between many instruments for the same construct (33). To test the convergent validity, we took the average variance from each component that was at least 0.5 (34).

Discriminant Validity

Discriminant validity was confirmed if the square root of AVE for each construct exceeded its correlations with other constructs (35).

Concurrent validity

The results of the eight domain questions on the Indonesian KDQOL-SFTM v1.3 were found to

correlate with the corresponding five domain scores on the EQ-5D-5L and the visual analogue scale (VAS), demonstrating concurrent validity. The Pearson correlation coefficient was used to investigate the relationships.

Known-groups validity

Known-groups validity was tested by comparing quality of life (QOL) scores between two groups: patients undergoing hemodialysis and patients with CKD stages 1–3A. Based on previous research (37–39). Hence, in order to test the known-groups validity, two groups of participants were chosen. In comparison to patients with CKD stages 1-3A, we anticipated that haemodialysis patients would have a worse quality of life.

Participants

Individuals were considered for recruitment if they met the following criteria: they were 18 years or older, fluent in Indonesian, and had a minimum of six months of haemodialysis experience. No patient was permitted to take part if they had a history of mental or cognitive illness. Patients with chronic kidney disease (CKD) stages 1-3A were included in the sample if they were at least 18 years old, fluent in Indonesian, and their CKD stages were confirmed by medical records. We did not include patients who had a history of autoimmune diseases, cancer that was actively spreading, or any kind of mental or cognitive impairment. A 1:5 ratio was used to determine the components (40). which in turn determined the sample size. There are 37 items in the KDQOL-SFTM v1.3. Patients undergoing HD and 100 patients CKD stage 1-3 needed to have their numbers multiplied by five, for a total of 185 participants. Using easy sampling, participants were recruited.

Instruments

Demographic information such as participants' sex, age, marital status, level of education, profession, and duration of HD therapy was gathered using a baseline questionnaire.

The Indonesian kidney disease quality of life

The KDQOL-SFTM v1.3 survey, which Joshi VD created in 2010, is a streamlined adaptation of the original KDQOL. It has two primary parts: the general core and the disease-specific core. The instrument was constructed from each of its 37 parts. The overall health item is one out of eight subscales that make up the general health items. Energy and exhaustion, general health, social function, physical functioning, emotional well-being, pain, and role physical are the eight sub-scales. A score of 0 indicates severe insufficiency, whereas a score of 5 indicates excellent health. As the scores rise, it becomes clear that both measures of quality of life have improved. Scores ranging from zero to one hundred were calculated using the methods described in the user handbook. A perfect score of 100 indicates the highest possible quality of life.

The Indonesian EQ-5D-5L

Among the five dimensions and five components that make up the EQ-5D-5L are mobility, self-care, daily activities, discomfort, and anxiety/depression (41). The Bahasa version of the instrument was also available. Each of the five questions had a 5-point Likert scale, where 1 meant a high quality of life and 5 meant a low one. A percentage scale from 0 to 100 was used to convert the scores.Patients are asked to score their health on a scale from 0 (worst-case scenario) to 100 (best-case method) using a visual analogue scale (VAS).

Data collection

Prior to data collection, the institutional board of the connected university granted ethical authorisation. The hospitals and HD clinics that were observed granted consent for the research. The researchers met with the manager and chief nurse to go over the study's goals, procedures, and ethical considerations. Research participants' identities were divulged to the researchers by the management and head nurse. They were subsequently approached by the researchers, who outlined the study's purpose and methodology. A formal informed consent form was presented to each participant who consented to participate. The participants were asked to fill out the entire questionnaire when the study began. The Indonesian KDQOL-SFTM v1.3 was administered again to participants after a two-week period.

Reliability

Reliability is defined as the extent to which a measurement is free from measurement error (44).

Internal consistency

To determine how well a test's components assess the same concept, researchers utilised Cronbach's alpha coefficient (44). If Cronbach's alpha is below 0.70, then the internal consistency is weak; if it is between 0.70 and 0.90, then it is good (45).

Test-retest

Results from both the first and second tests were analysed using the intra-class correlation coefficient (ICC). Results over 0.9 suggest a high level of confidence, 0.75-0.90 suggest a good level of reliability, 0.5-0.75 indicate a moderate level of assurance, and less than 0.5 suggests a low level of dependability (45).

Data analysis

Data were analyzed using SPSS version 20.0 (SPSS Inc., Chicago, IL, USA). Data normality was assessed prior to analysis. Descriptive statistics (mean ± standard deviation, frequencies, and percentages) were used to summarize participant characteristics.

EFA using PCA with Promax rotation was conducted to explore factor structure. Sampling adequacy was evaluated with KMO (>0.60 acceptable) and Bartlett's Test ($p<0.05$ indicating factorability). One-sample independent t-tests assessed known-groups validity. Pearson correlation coefficients tested concurrent validity between KDQOL-SFTM v1.3 and EQ-5D-5L/VAS scores.

Ethical consideration

Ethical approval was obtained from the affiliated university's institutional review board. Hospital and clinic administrators provided site approvals. Researchers met with managers and chief nurses to explain study objectives, ethical considerations, and confidentiality protocols. Participant recruitment was conducted confidentially. Informed consent was obtained before data collection.

RESULTS

Table 1. Demographic characteristics (n=290)

	HD patients n=190 (%)	CKD patients n=100 (%)
Age, Mean ± SD	51.87 ± 19.33	54.22 ± 17.56
Gender		
Male	104 (54.7)	56 (56.0)
Female	86 (45.3)	44 (44.0)
Education level		
Above the senior high school	98 (51.6)	45 (45.0)
Below senior high school	92 (48.4)	55 (55.0)
Marital status		
Married	154 (81.0)	76 (76.0)
Single	36 (19.0)	24 (24.0)
Working status		
Employed	57 (30.0)	43 (43.0)
Unemployed	133 (70.0)	67 (67.0)
Length of HD (months), Mean ± SD	13.87± 4.29	-

Note: CKD: chronic kidney disease; HD: hemodialysis.

Of the 225 eligible patients undergoing hemodialysis (HD), 190 (84.4%) consented to participate, while 100 out of 132 patients with chronic kidney disease (CKD) stages 1–3 (75.8%) agreed to take part. Table 1 presents the demographic characteristics of the participants. The mean age of HD patients was 51.87 years (SD = 19.33), while CKD patients had a mean age of 54.22 years (SD = 17.56). Males constituted a slight majority in both groups (54.7% and 56.0%, respectively). Educational attainment was relatively balanced, with 51.6% of HD patients and 45.0% of CKD patients having completed education above the senior high school level. Most participants were married (HD: 81.0%; CKD: 76.0%). In terms of employment, 30.0% of HD patients and 43.0% of CKD patients were employed. The mean duration of HD therapy was 13.87 months (SD = 4.29).

Content and face validity

The content validity of the Indonesian KDQOL-SF™ v1.3 was assessed using Aiken's V formula, yielding coefficient values ranging from 0.73 to 1.00, indicating satisfactory content relevance. A value of ≥0.7 was considered acceptable. Regarding face validity, all participants reported that the questionnaire items were clear, easy to comprehend, and directly aligned with the instrument's objectives. Each item demonstrated an effect size greater than 1.5, supporting the clarity and acceptability of the tool.

Construct validity

Table 2. Factor loadings of the eight sub-scales of the Indonesian KDQOL-SF™ v1.3

	Role Physical	Physical Functioning	Emotional well-being	General health	Social function	Pain	Role emotional	Energy/fatigue	KMO	AVE
1. Vigorous activities		0.543							0.834	0.582
2. Moderate activities		0.621								
3. Lifting carrying groceries		0.607								
4. Climbing several flights of stairs		0.568								
5. Climbing one flight of stairs		0.716								
6. Bending, kneeling, stooping.		0.653								
7. Walking more than a mile		0.790								
8. Walking several blocks		0.700								
9. Walking one block		0.670								
10. Bathing or dressing yourself		0.567								
11. Cut down the amount of time on activities	0.852								0.886	0.617
12. Accomplish less than what you would have liked	0.872									
13. Were limited in the kind of activities	0.861									
14. Have difficulty performing activities	0.823									
15. Body pain during last four weeks						0.745			0.791	0.592
16. Did pain interfere with your work?						0.770				
17. How would you rate your health?				0.372					0.876	0.635
18. I get sick more accessible than other people.				0.539						
19. I am as healthy as anyone else.				0.674						
20. I expect my health to get worse.				0.489						
21. My health is excellent.				0.635						
22. Have you been a nervous person?			0.650						0.768	0.574

23. You felt so down that nothing could cheer you up.	0.764					
24. Have you felt calm & peaceful?	0.436					
25. Have you felt downhearted and blue?	0.581					
26. Have you been a happy person?	0.634					
27. Due to emotional problems...						
28. You had to cut down the amount of time on activities			0.775		0.831	0.611
29. You accomplished less			0.826			
30. You could not do activities as carefully as usual.			0.687			
31. To what extent have your physical health & emotional problems...						
32. Interfered with your everyday social life		0.437			0.766	0.548
33. Interfered with visiting friends, relatives		0.501				
34. Did you feel full of pep?				0.76	0.853	0.670
35. Did you have a lot of energy?				0.77		
36. Did you feel worn out				0.65		
37. Did you feel tired				0.66		

KMO Kaiser-Meyer-Olkin test, AVE average variance extracted, CR composite reliability

Exploratory factor analysis (EFA) using Promax oblique rotation confirmed an eight-factor model consistent with the original instrument structure. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.834, indicating good factorability. Factor loadings ranged from 0.501 to 0.872 (Table 2). Although Item 17 ("How would you rate your health?") exhibited a lower loading (0.372), it was retained to preserve the original construct integrity. The average variance extracted (AVE) values for all domains exceeded 0.5, supporting convergent validity.

Convergent and Discriminant validity

For eight domains, the instrument demonstrated strong convergent validity, with average extracted variances over 0.5 (Table 2).

Good discriminant validity was demonstrated by the instrument. With a correlation coefficient of greater than 0.7, the items and subscales measuring physical role, physical functionality, pain, emotional role, and energy/fatigue were moderately correlated (Table 2).

Concurrent validity

Table 3. Correlation of each subscale of Indonesian KDQOL-SF™ v1.3 with the EQ-5D- 5

	Mobility	Self-care	Usual activities	Pain/discomfort	Anxiety/ depression
Role physical	0.579**				
Physical functioning	0.465**	0.441**			
Pain	0.351*	0.412**	0.407**		
General health	0.501**	0.351*	0.301*	0.312*	

Emotional well-being	0.407**	0.432**	0.276*	0.465**	0.432**
Role emotional	0.411**	0.535**	0.389*	0.394**	0.354*
Social function	0,386*	0.376*	0.435**	0.405**	0.455**
Energy/fatigue	0.445**	0.411**	0.366*	0.422**	0.387*

Note: * p<0.05; **p<0.001

Table 3 shows that there is a statistically significant relationship between the five EQ-5D-5L components and the eight domains of the Indonesian KDQOL-SF™ v1.3. A moderate degree of connection was found between the KDQOL-SF™ v1.3 and the EQ-5D-5L. The EQ-5D-5L and the EQ VAS were shown to be linked with the Indonesian KDQOL-SFTM v1.3, with correlations ranging from 0.276 to 0.579 and 0.315 to 0.381, respectively.

Known-groups validity

Table 4. Known-groups validity of the Indonesian KDQOL-SF™ v1.3

	Patients on HD	**Patients with CKD (Stage 1-3)**	**Independent-t-test**	
	Mean ± SD	**Mean ± SD**	**t**	***P*-value**
Role physical	55.78 ± 19.57	59.15 ± 17.65	-5.43	< 0.001
Physical functioning	68.34 ± 23.11	73.45 ± 34.14	-4.98	< 0.001
Emotional well-being	66.39 ± 20.05	68.65 ± 23.25	-2.01	< 0.001
General health	48.51 ± 15.22	51.43 ± 23.74	-3.90	< 0.001
Social function	67.33 ± 25.17	68.48 ± 22.60	-0.45	0.351
Pain	70.20 ± 33.66	76.77 ± 36.09	-5.76	< 0.001
Role emotional	70.68 ± 34.04	73.55 ± 30.037	-2.81	0.678
Energy/fatigue	55.14 ± 22.28	60.01 ± 37.54	-4.19	< 0.001

Known-groups validity was evaluated by comparing KDQOL-SF™ v1.3 scores between patients undergoing HD and those with CKD stages 1–3 (Table 4). Independent t-tests revealed statistically significant lower scores among HD patients in role physical ($t = -5.43$, $p < 0.001$), physical functioning ($t = -4.98$, $p < 0.001$), emotional well-being ($t = -2.01$, $p < 0.001$), general health ($t = -3.90$, $p < 0.001$), pain ($t = -5.76$, $p < 0.001$), and energy/fatigue ($t = -4.19$, $p < 0.001$) domains. No significant differences were observed in the social function domain ($p = 0.351$) and role emotional domain ($p = 0.678$).

Reliability

Table 5. Reliability of the eight sub-scales of the Indonesian KDQOL-SF™ v1.3

	Cronbach alpha	**Intra-class correlation**
Role physical	0.779	0.834
Physical functioning	0.856	0.816
Emotional well-being	0.877	0.843
General health	0.748	0.801
Social function	0.725	0.779
Pain	0.716	0.702
Role emotional	0.883	0.852
Energy/fatigue	0.837	0.789

Internal consistency reliability was excellent, with a Cronbach's alpha coefficient of 0.776 for the overall instrument. Domain-specific Cronbach's alpha values ranged from 0.716 to 0.883 (Table 5), indicating satisfactory internal consistency. Test-retest reliability, assessed using the intra-class correlation coefficient (ICC), demonstrated moderate to excellent stability across domains (ICC range = 0.702–0.852), with all estimates exceeding the minimum acceptable threshold of 0.7.

DISCUSSION

The present study provides robust evidence supporting the use of the KDQOL-SFTM v1.3 as a valid and reliable instrument for assessing the quality of life (QoL) among hemodialysis patients in Indonesia. The findings indicate that the KDQOL-SFTM v1.3 demonstrated satisfactory internal consistency, as evidenced by Cronbach's alpha coefficients and intraclass correlation coefficients (ICC), and acceptable construct validity within this population. While the KDQOL-SFTM v1.3 has been widely validated across Western populations, its psychometric properties have only recently been explored in Southeast Asia (46–49). Our results contribute to filling this regional research gap.

Consistent with previous studies, including validations conducted among Greek (51) and Malay (52,53) populations, the exploratory factor analysis in this study confirmed the instrument's eight-factor structure. Substantial correlations among role physical, role emotional, and pain subscales were observed, suggesting coherent domain clustering, while other domains displayed moderate to strong factor loadings. This pattern indicates that the instrument effectively captures distinct but related dimensions of health-related QoL in Indonesian dialysis patients (54,55).

Moreover, the favorable correlations between general health ratings and the specific renal disease domains reinforce the instrument's construct validity. These findings align with the notion that patient-reported outcomes (PROs) provide essential insights into patient experiences, capturing both subjective satisfaction and perceived functional limitations. Given the increasing diversity of the hemodialysis population, instruments like the KDQOL-SFTM v1.3, which encompass a wide range of patient-relevant concerns, are critically important.

However, while the KDQOL-SFTM v1.3 demonstrated good psychometric performance, future studies should examine its cultural sensitivity and potential content gaps. Regular use of focus groups or cognitive interviews could enhance ongoing content validation and ensure that the instrument remains responsive to evolving patient needs in the Indonesian context. Additionally, further research should assess the KDQOL-SFTM v1.3's responsiveness to clinical changes over time, a key property for longitudinal patient monitoring.

Implication

The KDQOL-SFTM v1.3 offers nurses a valid and reliable tool to assess the quality of life of patients undergoing hemodialysis. Utilizing this instrument in routine clinical practice can help nurses identify domains where patients are experiencing significant burdens, enabling tailored interventions to alleviate symptoms, improve patient-centered care, and support shared decision-making processes. Incorporating QoL assessments into routine care practices fosters a holistic approach to chronic disease management, empowering patients to engage actively in their care. The KDQOL-SFTM v1.3 is an effective instrument for future nursing and clinical research focused on hemodialysis populations. Future studies should investigate associations between QoL domains and clinical variables such as nutritional status, dialysis adequacy, and comorbidities. Comparative studies between hemodialysis and peritoneal dialysis patients could further elucidate modality-specific differences in QoL outcomes. Additionally, cultural adaptation studies and psychometric evaluations across different Indonesian regions are necessary to ensure cultural equivalence and maintain the instrument's validity over time.

Limitation

This study has several notable limitations. First, the absence of clinical parameter data such as hemoglobin levels, nutritional status, comorbidities, and dialysis adequacy restricted the evaluation of associations between QoL scores and clinical outcomes. Blinded data collection, although intended to minimize bias, inadvertently limited the ability to explore these important relationships.

Second, logistical challenges prevented re-contacting participants for follow-up assessments, precluding evaluation of test-retest

reliability and limiting the assessment of temporal stability. Third, the use of convenience sampling, although pragmatic, reduces the generalizability of the findings to the broader hemodialysis population in Indonesia. Selection bias may have favored the inclusion of patients with better health literacy or more positive health perceptions.

Future studies should address these limitations by incorporating clinical data, employing random or stratified sampling strategies, and implementing longitudinal designs to better capture changes over time and strengthen causal inferences.

CONCLUSION

To our knowledge, this study represents the first large-scale evaluation of the KDQOL-SFTM v1.3 among Indonesian hemodialysis patients. The findings demonstrate that the KDQOL-SFTM v1.3 possesses satisfactory internal consistency, construct validity, and discriminatory ability within this population. As such, it is a suitable instrument for assessing the quality of life among patients undergoing hemodialysis in Indonesia. Further research is warranted to examine the tool's responsiveness to clinical changes and to validate its performance across different dialysis modalities and diverse regional populations.

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Author Contribution

NS : Conceptualization and Study Design, Writing – Original Draft, Writing – Review & Editing
FMS : Methodology, Formal Analysis, Writing – Review & Editing
DHCH : Data Curation, Writing – Review & Editing
UN : Methodology, Formal Analysis

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this study.

Data Availability Statement

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request. Access to the data is subject to ethical considerations and institutional approval.

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