Validity and Reliability of the Indonesian Version of Kidney Disease Quality of Life (KDQOL-36) Questionnaire in Hemodialysis Patients at Hasan Sadikin Hospital, Bandung, Indonesia

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ABSTRAK

Latar belakang: *prevalensi penyakit ginjal kronik (PGK) dan pasien dialisis meningkat setiap tahunnya di Indonesia. Pengaruh PGK dan dialisis terhadap kualitas hidup pasien merupakan bagian penting dalam tatalaksana PGK. Kuesioner Kidney Disease Quality of Life (KDQOL-36) merupakan instrumen khusus penilaian kualitas hidup pasien PGK dan dialisis yang telah diterjemahkan di berbagai negara, namun belum pernah dilakukan di Indonesia. Penelitian ini bertujuan untuk menentukan validitas dan reliabilitas kuesioner KDQOL-36 versi bahasa Indonesia pada pasien di Indonesia.* ***Metode:*** *penerjemahan kuesioner KDQOL-36 ke bahasa Indonesia dan penerjemahan kembali ke bahasa Inggris dilakukan oleh penerjemah bersertifikat, dilanjutkan dengan penilaian kuesioner lebih lanjut oleh tim ahli. Kuesioner versi akhir diuji pada pasien hemodialisis rutin di Unit Hemodialisis RSUP. Dr. Hasan Sadikin Bandung. Validitas dianalisis dengan uji korelasi Pearson antara skor total skala target penyakit ginjal, kesehatan umum (SF-12) dan seluruh skala dalam KDQOL-36. Konsistensi internal diuji dengan koefisien Cronbach Alpha dan reliabilitas dianalisis dengan uji test-retest.* ***Hasil:*** *subjek penelitian berjumlah 103 pasien, sebagian besar laki-laki (52,4%), dengan median usia 51 (22-75) tahun dan telah menjalani hemodialisis rata-rata 3,4 (SB 2,1) tahun. Hasil uji validitas menunjukkan korelasi bermakna ($p<0,001$) antara skor total skala target penyakit ginjal, SF-12 dan setiap skor dalam skala tersebut. Seluruh skala dalam KDQL-36 menunjukkan reliabilitas tes-retest yang baik.Nilai reliabilitas konsistensi internal dapat diterima dengan nilai Cronbach Alpha $\geq 0,7$ untuk seluruh skala.* ***Kesimpulan:*** *kuesioner KDQOL-36 versi bahasa Indonesia memiliki validitas dan reliabilitas yang baik untuk menilai kualitas hidup pasien hemodialisis rutin.*

Kata kunci: *KDQOL-36, validitas, reliabilitas, hemodialisis.*

ABSTRACT

Background: *the prevalence of chronic kidney disease (CKD) and dialysis patients is increasing every year in Indonesia. The impact of CKD and dialysis on patient quality of life (QOL) has been recognized as an important outcome measure in the management of CKD. The Kidney Disease Quality of Life (KDQOL-36) has been validated and is widely used as a measure of QOL for CKD and dialysis patients in many countries, but not in Indonesia. The*

aim of this study is to determine the reliabity and validity of the Indonesian version of KDQOL-36 on hemodialysis patients in Indonesia. ***Methods:*** *the KDQOL-36 was translated into Indonesian language by a certified translator and then it was back-translated into English. The translated questionnaire was further reviewed by an expert panel. The final questionnaire was administered to hemodialysis patients in Hemodialysis Unit at Hasan Sadikin General Hospital. Validity was measured using Pearson's correlation between the kidney disease-targeted scores, generic dimensions (SF-12) scores and each scale score in KDQOL-36. The internal consistensy was assessed using Cronbach's Alpha and reliability was examined using test-retest.* ***Results:*** *out of 103 patients, we found that most subjects were male (52.4%) with median age of 51 (22-75) years. The duration of hemodialysis was 3.4 (SD 2.1) years. The validity test showed a significant correlation ($p<0.001$) on kidney disease-targeted total score, SF-12 and each score of the scale within it. All of the KDQOL-36 scales showed good test-retest reliability. Internal consistency reliability values were acceptable, with Cronbach's Alpha >0,7 for all scales.* ***Conclusion:*** *the Indonesian version of the KDQOL-36 questionnaire is valid and reliable for evaluating QOL in reguler hemodialysis patients.*

Keywords: *KDQOL-36, validity, reliability, hemodialysis.*

INTRODUCTION

Chronic kidney disease (CKD) is a worldwide health problem, including Indonesia.[1,2] Chronic kidney disease and dialysis affects the patient's quality of life in terms of physical, psychological, social, and environmental aspects.[3] Quality of life assessment is an important part in CKD treatment.[4,5] An evaluation instrument or questionnaire can provide accurate information on patient's quality of life in order to select type of dialysis and to evaluate treatment result.[6,7] KDQOL-36 questionnaire is a special instrument to assess quality of life of CKD and dialysis patients. It has been used and translated into many languages with good validity and reliability.[8-11] To date, no questionnaire has been available in Indonesian language to assess patient's condition and treatment. Therefore, it is important to have the Indonesian version of KDQOL-36 questionnaire. Moreover, considering cultural differences, we also need to make translation, cultural adaptation, validity, and reliability test.[12]

Our study aimed to analyze validity and reliability of the Indonesian version of KDQOL-36 in hemodialysis patients at Dr. Hasan Sadikin General Hospital, Bandung.

METHODS

The study was an analytic cross-sectional study, which was conducted at the Hemodialysis Unit of Dr. Hasan Sadikin General Hospital, Bandung between May and July 2016. This study has been approved by the Ethical Committee of Hasan Sadikin Hospital, reference number LB.04.01/A05/EC/128/IV/2016. Subjects were patients who had regular or routine hemodialysis for more than 3 months. They were 18 years old or older, able to read and write in Indonesian language, and willing to participate in the study. Subjects with decreased consciousness and unable to have oral communication were excluded. Minimum sample size in this study was calculated using the Correlation Coefficient formula. Hence, minimum sample size in this study was 102 subjects.

The study consisted of 2 steps, the first step was translation and adaptation of KDOQL-36 questionnaire into Indonesian language and the second step was validity and reliability test. The first step was performed according to RAND corporate standard.[13] We had acquired the copyright to translate KDQOL-36 questionnaire from RAND corporate. The questionnaire was translated into Indonesian language by a certified translator and then it was translated back into English. An expert team consisted of 2 nephrologists and 1 certified translator then developed an adaptation of the translated questionnaire.

We performed a normality test using Kolmogorov-Smirnov test. To analyze the construct validity, we used Pearson's correlation test on total score of kidney disease-targeted score, generic score and each of the subscales score. Each scale in KDQOL-36 was considered

valid when it showed statistically significant ($p<0.05$) results with low (r=0.200 – 0.399), moderate (r=0.400 – 0.599), high (r=0.600 – 0.799), or very high (r: 0.800 – 1.000) correlation. A reliability test was done using test-retest evaluation and internal consistency was estimated using Cronbach's alpha for each subscale of the KDQOL-36. The test- retest evaluation was performed in the form of 2 questionnaire interviews with 7 to 10 days interval. Scale in KDQOL-36 was considered reliable when there was no significant difference found between the first and second measurement ($p > 0.05$). Internal consistency was considered reliable when the reliability coefficient Cronbach Alpha was ≥ 0.7.

RESULTS

The study was performed within 3 months, started from April 2016 until June 2016. Initially, there were 107 subjects. We performed first interview then repeated interview within 7-10 days later. Four subjects could not attend the second interview due to dyspnea (1 subject), decrease in consciousness (1 subject), and hospitalized (2 subjects). Hence, a total of 103 subjects was included to data analyze (**Figure 1**). Baseline characteristics of these subjects were displayed in **Table 1**.

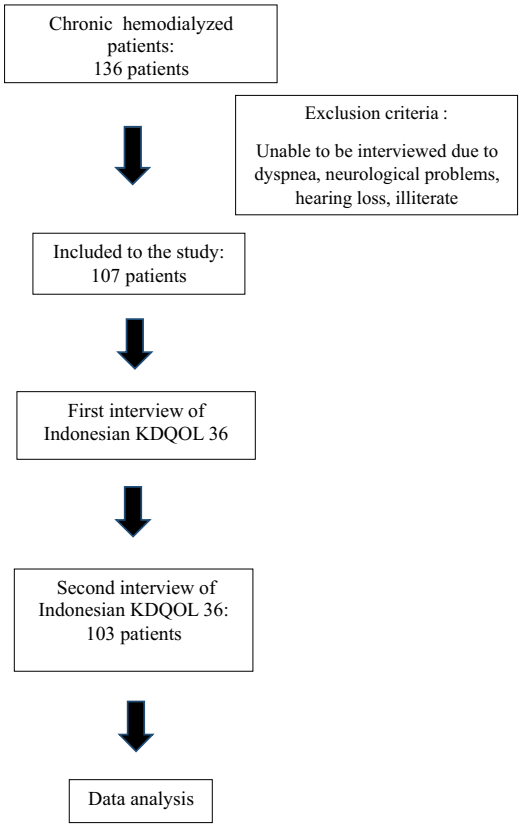

Figure 1. Indonesian KDQOL Study Algorithm

Table 1. Baseline subject characteristics (n=103)

Characteristics	Value
Age (Year), Median (range)	51 (22 – 75)
Hemodialysis duration (year), Mean (SD)	3.4 (2.1)
Sex - Male, n (%)	54 (52.4)
Education, n (%)	
- Elementary school	24 (23.3)
- Junior high school	16 (15.5)
- Senior high school/ vocational	32 (31.1)
- University	31 (30.1)
Occupation, n (%)	
- Employed	25 (24.3)
- Unemployed	78 (75.7)
Race, n (%)	
- Sundanese	90 (87.4)
- Javanese	9 (8.7)
- Bataknese	2 (1.9)
- Minangnese	1 (1.0)
- Others	1 (1.0)
Religion (%)	
- Islam	100 (97.1)
- Christian	1 (1.0)
- Catholic	2 (1.9)

A very strong correlation was found between symptoms/problems and total score of kidney disease-targeted scale (r = 0.815). A strong correlation was shown regarding the effect of kidney disease, burden of kidney disease scales and total scores of kidney disease-targeted scale, physical component summary, mental component summary and generic core (r= 0.647-0.798; $p < 0.001$). Such results demonstrated that the KDQOL-36 questionnaire scales had a good validity. (**Table 2**)

A comparative test using paired t-test was used, which showed results presented in the form of mean score for each scale of KDQOL-36 questionnaire. The results were not statistically significant in the first and second measurement. The correlation test on the mean score of each scale of kidney disease- targeted scales and

Table 2. Validity test result of KDQOL-36 questionnaire

Scales	Number of questions	n	Total score	
			Correlation coefficient (r)*	P value*
Kidney disease target				
- Symptoms/problems	12	103	0.815	<0.001
- Effect of kidney disease	8	103	0.798	<0.001
- Burden of kidney disease	4	103	0.785	<0.001
Generic core (SF-12)				
- Physical Component Summary (PCS)	6	103	0.647	<0.001
- Mental Component Summary (MCS)	6	103	0.701	<0.001

*Pearson's correlation test

Table 3. Reliability test-retest result of KDQOL-36 questionnaire

Scales	I	II	P value	Correlation coefficient (r)**
	Mean (SD)	Mean (SD)		
Kidney disease target				
- Symptoms/problems	72.09 (18.31)	74.88 (17.21)	0.061	0.648
- Effect of kidney disease	66.11 (19.55)	68.05 (21.16)	0.231	0.680
- Burden of kidney disease	47.69 (29.08)	49.88 (33.12)	0.327	0.746
Generic core (SF-12)				
- Physical Component Summary (PCS)	35.07 (8.85)	34.75 (10.61)	0.735	0.518
- Mental Component Summary (MCS)	43.99 (10.53)	45.65 (10.44)	0.063	0.635

SD=Standard deviation, *paired t-test, **Pearson's correlation test

mental function test between the first and second measurement demonstrated moderate to strong results (r = 0.635 – 0.746). The correlation test on the mean score of physical function between the first and second measurement showed moderately positive result (r = 0.518). Such results indicated that all scales in the KDQOL-36 were reliable.

The internal consistency test of all the subscales in the KDQOL-36 was very good with Cronbach's alpha values ranging from 0.706 to 0.886 (**Table 4**).

Table 4. Internal consistency test of the KDQOL-36

Scales	Number of questions	Cronbach's alpha
Kidney disease target		
- Symptoms/problems	12	0.886
- Effect of kidney disease	8	0.736
- Burden of kidney disease	4	0.733
Generic core (SF-12)		
- Physical Component Summary (PCS)	6	0.706
- Mental Component Summary (MCS)	6	0.721

DISCUSSION

Our study was the first study that provides formal translation of KDQOL-36 questionnaire into Indonesian language and it is also the first study analyzing its validity and reliability. Quality of life in patients with hemodialysis is worse throughout the time, which is affected by some factors. This questionnaire is important in measuring dialysis adequacy. The Indonesian version of KDQOL-36 is very useful for all Indonesian healthcare workers who are involved in hemodialysis care since some of the workers (nurses, nutritionist, or students) are not fluent in English.

We did some adaptation within translation of the questionnaire. The item of "moderate activities such as moving a table, pushing a

vacuum cleaner, bowling, or playing golf" was adapted to "*kegiatan sedang seperti memindahkan meja, menyapu atau mengepel, bersepeda, atau joging* (moderate activities such as moving a table, sweeping or mopping, riding a bicycle, or jogging)". Pushing a vacuum cleaner, bowling, or playing golf were considered uncommon activities in Indonesian community, therefore adaptation was made. We chose the substituting activities based on metabolic equivalent (MET) for moderate activities (3-6 METs).14-15 We adapted the item of "climbing several flights of stairs" to "menaiki tangga beberapa lantai atau jalan menanjak (climbing several floors or uphill pathway)". The team agreed to make a slight change in adaptation due to accuracy in Indonesian language and various socio economic conditions in Indonesian communities as some of them do not have stairs in their house.

Such adaptation in the questionnaire items has also been done by several countries such as Korea, Philippines, Egypt, and China during their adaptation of the KDQOL-36 and KDQOL-SF.8-10,16 Tao, et. al. did a change from "bowling and playing golf" to "walking and Tai Chi" during the translation and validation of the KDQOL-36 into Chinese language.[16] Abd Elhafeez et al.[12] omitted "bowling and playing golf" during translation of the KDQOL-36 into Arabic language in Egypt.[8] "Several flights of stairs" was translated to " 1 or more floors" in Egypt and to "3 or 4 floors" in Korea.[8,10] Adaptation has been done due to different social and cultures in each country and intended to acquire equal understanding with the original version.[12]

Another change in our translated KDQOL-36 was "accomplished less than you would like" to "menyelesaikan pekerjaan kurang sesuai dengan yang diharapkan (accomplished less equal than you would like)" in order to ease understanding. Answer choice for questions in subgroup "how do you feel and how things have been with you during the past 4 weeks" was changed from "enough time" to "sering (frequent)", and answer choice for questions in subgroup "how true or false is each of the following statements for you" was changed from "mostly true" to "sangat benar (very true)" and "mostly false" to "sangat salah (very wrong)".

Correlation test of the KDQOL-36 for kidney disease-targeted and generic score showed strong correlation ($r > 0.600$) and the result was statistically significant ($p < 0.001$). Hence, the Indonesian version of KDOQL-36 had good validity for all subscales. Our result was in accordance with results of studies in other countries. Thaweethamcharoen, et al.[17] in Thailand demonstrated a significant correlation between kidney disease target, physical component summary, and mental component summary ($r = 0.226$-0.542; $p < 0.001$).[11] Similar findings were also demonstrated by Chen, et. al. with moderate correlation ($r = 0.328$-0.602; $p < 0.05$) within the scales.[17]

Our Indonesian questionnaire reliability test demonstrated a non-significant mean score of all scales between the first and second measurement ($p > 0.05$); meanwhile internal consistency showed the Cronbach's alpha of ≥ 0.7 (0.706 – 0.886) for all scales. The present study showed that the Indonesian version of the KDQOL-36 is reliable. Similar studies in other countries have also demonstrated good reliability and internal consistency with Cronbach's alpha of ≥ 0.7. A study in Thailand has shown a non-significant difference of test-retest result between the first and second measurement ($p > 0.05$) with Cronbach's alpha of ≥ 0.7 (0.706-0.827) for all scales.[11] Furthermore, studies in China and India have also demonstrated similar results.[17,18]

Regarding the mean score for kidney disease target, our study demonstrated that the lowest score was found on the burden of kidney disease (47.69) and the highest score on the symptoms/problems (72.09). The result was similar to the study conducted in Thailand and Hong Kong.[11,16,19] Such result might be due to similarity of the subject's baseline characteristics including mean age, occupation, and duration of undergoing hemodialysis. Mean age of subjects was 57.49 SD 15.9) in Thailand and 47.6 (SD 14.2) in Hong Kong with most subjects were unemployed and had undergone hemodialysis for 3.8 (SD 3.4) years.[11,16]

However, a study of Spanish version of the KDQOL-36 by Ricardo, et al.[20], which studied

Hispanic population in the United States of America showed that the highest mean score was in the effects of kidney disease. Higher level of education (63.3% of subjects' education level were university) and social cultural aspects might influence the result. Higher score in effects of kidney disease scale than other scales also showed that chronic kidney disease did not affect hemodialysis patient's quality of life in the United States of America.

There were some limitations in our study. First, it was conducted only in a single unit of medical center and further studies in several centers are still required to reduce bias in social and cultural aspects. Second, data collection was performed through one person interview since the subjects were not able to fill the questionnaire during hemodialysis treatment. Further studies should be carried out to evaluate interviewer factor and difference in data collection methods, which may affect subject's interpretation to the questions in the questionnaire.

CONCLUSION

Our study shows that the Indonesian version of the KDQOL-36 questionnaire has a good validity and reliability for evaluating QoL in routine hemodialysis patients at Dr. Hasan Sadikin General Hospital, Bandung.

REFERENCES

1. World Health Organization. The global burden of disease: 2004 update. Geneva: WHO Library Cataloguing Data. 2008. p. 3-30.
2. Ministry of Health Republic of Indonesia. Basic health research. Jakarta: Ministry of Health Republic of Indonesia; 2013. p. 5-20.
3. Mujais SK, Story K, Brouillette J, et al. Health-related quality of life in CKD patients: Correlates and evolution over time. CJASN. 2009;4:1293-301.
4. Morton RL, Tong A, Howard K, Snelling P, Webster AC. The views of patients and carers in treatment decision making for chronic kidney disease: Systematic review and thematic synthesis of qualitative studies. BMJ. 2010;17:340-8.
5. Lee A, Gudex C, Povlsen JV, Bonnevie B, Nielsen CP. Patients' views regarding choice of dialysis modality. Nephrol Dial Transplant. 2008;23:953-9.
6. Fayers P, Machin D. Quality of life: The assessment, analysis and interpretation of patient-reported outcomes. 2nd ed. Chicester: John Wiley & Sons; 2007. p. 28-42.
7. Guyatt GH, Feeny DH, Patrick DL. Measuring health-related quality of life. Ann Intern Med. 1993;118:622-9.
8. Abd ElHafeez S, Sallam SA, Gad ZM, et al. Cultural adaptation and validation of the "Kidney Disease and Quality of Life - Short Form (KDQOL-SF™) version 1.3" questionnaire in Egypt. BMC Nephrol. 2012;13:170-9.
9. Bataclan RP, Dial MA. Cultural adaptation and validation of the Filipino version of Kidney Disease Quality of Life--Short Form (KDQOL-SF version 1.3). Nephrology. 2009;14:663-8.
10. Park HJ, Kim S, Yong JS, et al. Reliability and validity of the Korean version of kidney disease quality of life instrument (KDQOL-SFTM). Tohoku J Exp Med. 2007;211:321-9.
11. Thaweethamcharoen T, Srimongkol W, Noparatayaporn P, et al. Validity and reliability of KDQOL-36 in Thai kidney disease patient. Value Health Reg Issues. 2013;11:98-102.
12. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine. 2000;25:3186-91.
13. RAND Corporation. Basic guidelines for translating surveys 2015. [cited 29 December 2015]. Available at http://rand.org/health/surveystools/about translations.html.
14. Allen K, Amstrong LE, Balady GJ, et al. ACSM's guidelines for exercise testing and prescription. 8th ed. Georgia: Lippincott; 2009. p. 4-5.
15. Ainsworth BE, Haskell WL, Whitt MC, et al. Compendium of physical activities: An updated of activity codes and MET intensities. Med Sci Sports Exerc. 2000;32:S498-504.
16. Tao X, Chow SKY, Wong FKY. Determining the validity and reliability of the Chinese version of the Kidney Disease Quality of Life Questionnaire (KDQOL-36™). BMC Nephrol. 2014;15(1):78-85.
17. Chen JY, Choi EPH, Wan EYF, et al. Validation of the disease-specific components of the kidney disease quality of life-36 (KDQOL-36) in Chinese patients undergoing maintenance dialysis. Plos One. 2016;11(5):91-113.
18. Mateti UV, Nagappa AN, Attur RP, Nagaraju SP, Mayya SS, Balkrishnan R. Cross-cultural adaptation, validation and reliability of the South Indian (Kannada) version of the Kidney Disease and Quality of Life (KDQOL-36) Instrument. Saudi J Kidney Dis Transpl. 2015;26(6):1246-52.
19. Chow SKY, Tam BML. Is the kidney disease quality of life-36 (KDQOL-36) a valid instrument for Chinese dialysis patients? BMC Nephrol. 2014;15(1):21-30.
20. Ricardo AC, Hacker E, Lora CM, et al. Validation of the kidney disease quality of life short form 36 (KDQOL-36) US Spanish and English versions in a cohort of Hispanics with chronic kidney disease. Ethn Dis. 2013;23(2):202-9.