

Quality of Life Measurement of End-Stage-Renal Disease Patients in Indonesia based on responses to the EQ-5D-3L questionnaire

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Abstract

The government of Indonesia must tackle the challenge of providing equitable access to dialysis treatment for all patients with end-stage renal disease, if so. the country should exist with strategic policy for providing services that will increase the health-related quality of life for these patients by investigate at their preferred dialysis modality. We, therefore, aimed to study the health dimensions that affect the quality of life in Indonesian patients with end-stage renal disease undergoing hemodialysis or peritoneal dialysis. This cross-sectional study was conducted at three hospitals in Jakarta and Bandung in 2015. In total, 100 patients (50 hemodialysis and 50 peritoneal dialysis) were selected and matched by age, sex, years on dialysis, and diabetes status. Health-related quality of life was assessed by the Indonesian version of the EQ-5D-3L questionnaire, with statistical analysis based on the EQ-5D descriptive system and visual analog scale (EQ-VAS). The analysis based on EQ-5D-3L questionnaire shows that only anxiety/depression dimension which significantly distinguishing the quality of life between the hemodialysis and peritoneal dialysis patients ($p < 0.05$). For all the dimensions, although the statistical analyses showed no significance differences between the groups based on age and sex, they did show that numerically more patients who underwent peritoneal dialysis felt that they had better health outcomes. Peritoneal dialysis was also associated with greater improvement from dialysis-related complications if patients were younger than 50 years, improved mobility among males, and improved usual activity among females. Anxiety and depression most affected the quality of life of patients, irrespective of whether they received hemodialysis or peritoneal dialysis, indicating that strategies are needed to manage these dimensions better. Moreover, this supports our hypothesis that understanding a patient's values and preferences when choosing dialysis could substantially improve outcomes from end-stage renal disease.

Clinical article (J Int Dent Med Res 2019; 12(1): 331-336)

Keywords: Quality of life, dialysis, EQ-5D, EQ-VAS.

Received date: 25 August 2018

Accept date: 30 September 2018

Introduction

Chronic kidney disease is a non-communicable diseases that continues to attract a lot of research attention because it is both expensive and life-saving.¹ In Indonesia, hemodialysis and peritoneal dialysis are established therapies, having been introduced in 1972 and in 1985, respectively.² As a low-middle income country,³ the Indonesian government must deliver equitable access to dialysis within the context of a vast population that is spread

over a huge archipelago. Despite this, the reimbursement rate for hemodialysis is higher than that for continuous ambulatory peritoneal dialysis.⁴ Given that many patients require long-term or even life-long dialysis, this approach imposes not only a major economic burden on health services but also increases morbidity and impairs the quality of life.⁵

Considered an important outcome measure in end-stage renal disease (ESRD), health-related quality of life (HRQOL) during dialysis has been used in the evaluation of economic⁶ and clinical⁷ outcomes. The HRQOL is typically measured by questionnaire: these range from generic questionnaires, such as the EQ-5D, SF-6D, or SF-36, to disease-targeted questionnaires that are specific to ESRD, such as the Kidney Disease Quality of Life Instrument Short Form-36.^{8,9} The EQ-5D, developed by the

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EuroQol group, is among the most widely used of these instruments. Although there are several variants, it fundamentally consists of the EQ-5D descriptive system and the EQ-VAS (visual analog score). The scores of the five dimensions can be presented as a health profile or converted to a single summary index (utility number) reflecting preference compared with other health profiles.^{10,11} Utility values are obtained from a representative sample of the general population, and are constructed by applying weights to each level within a dimension, adding these together for particular health states, and using the data to calculate quality-adjusted life years for economic evaluations.^{10,12,13}

To date, studies of treatment options for ESRD in Indonesia have focused on hemodialysis treatment itself, with less focus on the HRQOL outcomes. However, long-term dialysis can have a profound negative impact on a patients' physical, mental, and emotional well-being.¹⁴ To improve the HRQOL outcomes for patients with ESRD, we must better understand the factors considered important to patients when choosing a method of dialysis,¹⁵ dimensional and EQ-VAS changes in the EQ-5D could facilitate such understanding. Therefore, we investigated what health dimensions affected the quality of life in patients given hemodialysis or peritoneal dialysis for ESRD, using the Indonesian version of the EQ-5D.

Materials and methods

Study design

The primary study data were obtained from a previous economic evaluation study in 2015 that was conducted by the Indonesian Health Technology Assessment Committee (Ina-HTAC).¹⁶ The study was cross-sectional, conducted on three hospitals (Cipto Mangunkusumo Hospital, Hasan Sadikin Hospital, and Ny. RA Habibie Nephrology Hospital) in Jakarta and in Bandung. Recruitment to hemodialysis and peritoneal dialysis groups was by matching for age, sex, years on dialysis, and diabetes status. The respondents were interviewed about their condition and any complications

Demographic data, dialysis-related treatment history, hospital costs, and quality of

life details were collected after receiving informed consent. Hemodialysis respondents were included first if they were adults (age 18 years or older), had diagnosed ESRD, and had undergone hemodialysis or peritoneal dialysis for at least 6 months. Those who stopped dialysis, were lost to follow-up for 3 months, or who underwent combination dialysis were excluded. The peritoneal dialysis group was then selected based on the matching criteria.

Measure

Quality of life was measured using the Indonesian version of the EQ-5D-3L questionnaire, as produced by the EuroQol Group. The EQ-5D-3L has a descriptive element that comprises five dimensions (i.e., mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), with each graded on three levels including: no problem, some problems, and extreme problems with value 1 (one) to 3 (three), respectively. Then, the EQ-VAS element of the patients were recorded on a vertical visual analog scale which can be used as a quantitative measure of health outcomes from the patient's perspective, which can be used as a quantitative measure of health outcomes from the patient's perspective. On the VAS, the respondents are asked to mark their current health on a vertical scale from 0 (worst imaginable health) to 100 (best imaginable health).

Statistical analysis

The demographic and dialysis-related treatment data were analyzed descriptively and were reported as means and standard deviations for continuous variables and as proportion and number for categorical variables. The patients' responses to the EQ-5D descriptive system were then dichotomized into no problems or any problems. Statistical analysis of these data between the hemodialysis and peritoneal dialysis groups by age (< 50 years and ≥ 50 years) and sex were analyzed by independent *t*, chi-square, or Fisher exact tests, as appropriate, with *P*<0.05 considered to indicate statistical significance.

Results

A total of 50 hemodialysis recipients and 50 peritoneal dialysis recipients were enrolled.

	HD (n = 50)	PD (n = 50)
Sex		
Male	26	23
Age (mean ± SD)	53.31 ± 9.69	54.17 ± 13.24
Female		
Age (mean ± SD)	45.96 ± 10.58	42.26 ± 11.97
Education		
Primary school	14	5
Secondary school	3	4
High School	18	19
University	15	21
No education	0	1
Years on dialysis (mean ± SD)	52.34 ± 43.79	39.72 ± 26.45
Treatment shifting's history (HD to PD, PD to HD)	1	42
Years on current dialysis (mean ± SD)	52.27 ± 44.24	31.4 ± 25.16
Complications history (ESRD related)	14	25
Comorbidity		
Diabetes	18	16
Hypertension	46	39
Cardiovascular disease	7	8
Other	17	18

Table 1. Demographic and dialysis-related characteristics. ESRD=End-stage renal disease; HD=Hemodialysis; PD=Peritoneal dialysis; SD=Standard deviation.

Their demographic and dialysis-related characteristics are summarized in Table 1.

As shown, there were more males in the hemodialysis group, and men tended to be older than women in both groups. The patients receiving hemodialysis had also been on therapy for longer than those receiving peritoneal dialysis. As many as 42 patients receiving peritoneal dialysis had been changed from hemodialysis, while only 1 patient receiving hemodialysis had been moved from peritoneal dialysis. There were more complications in the peritoneal dialysis group, but hypertension and diabetes were the most reported comorbidities in both patient groups.

Among the five dimensions of the EQ-5D, only anxiety/depression distinguishing quality of life of the patients with peritoneal dialysis and hemodialysis with *P* value 0.02. However, when viewing the distribution of all five dimensions, those receiving hemodialysis reported higher proportions of problems than those receiving peritoneal dialysis did. Indeed, the hemodialysis recipients reported extreme problems for all the five dimensions, while the

peritoneal dialysis recipients only reported extreme problems for the anxiety/depression dimension (4%), as shown in Table 2.

Further analysis of EQ-5D descriptive system and EQ-VAS by age and sex between groups are shown in Tables 3 and 4. In Table 3, grouping by age or sex produced no significant difference in the distribution of the EQ-5D descriptive system between groups. Overall, irrespective of age or sex, more patients in the hemodialysis group reported any problems compared with the peritoneal dialysis group.

EQ-5D Dimensions	HD (n = 50)			PD (n = 50)			P Value
	1 (%)	2 (%)	3 (%)	1 (%)	2 (%)	3 (%)	
Mobility	66	30	4	82	18	0	0.113
Self-care	88	6	6	88	12	0	0.135
Usual Activities	74	18	8	86	10	4	0.323
Pain/ Discomfort	66	26	8	78	22	0	0.097
Anxiety/ Depression	54	40	6	78	22	0	0.02

Table 2. Proportion of level 1, 2, and 3 by dimension and modalities. 1 = no problem; 2 = some problem; 3 = extreme problem.

Age group	HD		PD		P Value
	no problem*	any problem*	no problem*	any problem*	
< 50 years	12	34	30	24	0.069
≥ 50 years	20	34	20	26	0.862
Sex					
male	22	30	26	20	0.48
female	10	38	24	30	0.137

Table 3. EQ-5D Dimensions by Age and Sex. HD=Hemodialysis; PD=Peritoneal dialysis; Any problems (level 2 and 3 combined); * (%)

Age group	HD				PD				P Value
	mean	SD	min	max	mean	SD	min	max	
< 50 years	73.04	19.13	18	100	79.56	16.21	40	100	0.199
≥ 50 years	70.89	18.59	29	89	71.52	14.88	33	89	0.896
Sex									
male	72.85	19.52	29	100	76.43	15.2	33	100	0.481
female	70.83	18.08	18	95	75.37	16.87	40	100	0.359

Table 4. EQ-VAS Values by Age and Sex. HD=Hemodialysis; PD=Peritoneal dialysis.

Similar to the results for the EQ-5D descriptive system, the EQ-VAS value did not differ significantly by age or by sex between treatment groups. However, comparison of the

individual values in Table 4 show that they were lower in the hemodialysis group, for both of the age groups showed the minimum values for both age groups and both sexes were lower in the hemodialysis group.

Finally, we analyzed the change in the dimensions from any problem (levels 2 or 3) to no problem (level 1) after a patient suffered ESRD-related complications. The results for this are shown in Table 5.

Modalities	Dimensions	Age group		Sex	
		< 50 years	≥ 50 years	male	female
HD	Mobility	-50	0	-20	-9.09
	Self-care	-33.33	0	0	-14.29
	Usual activity	-50	-27.27	-50	-27.27
	Pain/ Discomfort	-42.86	-16.67	-60	-14.29
	Anxiety/ Depression	-33.33	-27.27	-50	-23.08
PD	Mobility	-100	-33.33	-66.67	-53.85
	Self-care	-66.67	-50	-42.86	-71.43
	Usual activity	-81.82	-50	-50	-81.82
	Pain/ Discomfort	-69.23	-33.33	-45.45	-52.94
	Anxiety/ Depression	-57.14	-75	-60	-66.67

Table 5. Dimensions Change from Any Problems to No Problems after Treatment of ESRD-Related Complications.

HD= Hemodialysis; PD=Peritoneal dialysis
 Negative values indicate a decrease in the reported problem, and vice versa.

As shown in Table 5, the conditions improved more with peritoneal dialysis than with hemodialysis. Those younger than 50 years receiving peritoneal dialysis had most advances in the mobility (-100%) and usual activity (-82%) dimensions, whereas those older than 50 years in this group had most advances in the anxiety/depression (-75%) dimension. The least improvement was associated with hemodialysis in those older than 50 years, especially in the mobility and self-care dimensions (0% each). In addition, greater improvement was seen with peritoneal dialysis for both males and females, but the greatest improvement for men was in the mobility dimension (-66.67%) and the greatest improvement for women was in the usual activity dimension (-81.82%).

Discussion

When assessing all dimensions of the EQ-5D only the anxiety/depression dimension

was significantly associated with quality of life, irrespective of the treatment group. Although it did so non-significantly, the pain/discomfort dimension was also associated with quality of life. These findings were comparable to those of a similar study using the EQ-5D in Switzerland, which revealed that experiencing pain/discomfort (for hemodialysis and peritoneal dialysis) or anxiety/depression (for peritoneal dialysis) most affected QOL.¹⁷ Using self-reported health from the Indonesian EQ-5D-5L value set study look as if Indonesian people report more problems for pain/discomfort followed with anxiety/depression dimensions.¹² In Thailand, there has been evidence of the need to improve the management of anxiety and depression in patients with ESRD. Introducing psychosocial interventions in healthcare facilities and networks, and creating patient support groups to assist patients, could improve the quality of life outcomes.¹⁴ Unfortunately, these key findings are limited by the descriptive and self-report nature of our data.

Differentiation by age and sex failed to reveal a statistically significant difference in outcomes between the hemodialysis and peritoneal dialysis treatment groups. However, the individual percentages of patients undergoing peritoneal dialysis were higher for all health outcome dimensions and for the VAS score. This result is comparable to that of a systematic review of dialysis modalities and quality of life in patients with ESRD, which showed there were no significant differences in HRQOL between hemodialysis and peritoneal dialysis treatment, but that more patients receiving peritoneal dialysis had a better HRQOL in terms of physiological, psychological, social, and disease symptoms.⁷ Using the SF-36 questionnaire, it has also been concluded that patients in China receiving peritoneal dialysis enjoyed a better quality of life than those receiving hemodialysis.¹⁸ Finally, a study of older patients has indicated that no differences in HRQOL existed between peritoneal dialysis and hemodialysis groups, but that patient satisfaction was higher in the peritoneal dialysis group.¹⁹

Many factors contribute to a patient's quality of life, including age, sex, comorbidity,

culture, economic status, access to the basic needs of life, nutritional status, mental health support, and access to national health systems. Each of these needs to be considered when seeking to provide equitable and accessible therapy. Moving forward, the focus of therapy for ESRD patients may need to shift from simply prolonging life to providing better quality of life.²⁰ Indonesian culture is such that men are expected to work and earn a living, while women are expected to handle domestic issues. Our data indicate that opting for peritoneal dialysis may support these roles, at reproductive age under 50 years old, greater improvements were noticeable in mobility among males and improved usual activity among females after dialysis-related complications. Regardless of our findings, hemodialysis and peritoneal dialysis should not compete with each other, but should instead be used appropriately based on the needs of the patient.

Only a few study studies have been published on the topic of HRQOL in Indonesia, but these have used different measurement tools, thereby precluding detailed comparison.²¹⁻²³ Using the EQ-5D as generic measure of the HRQOL may be promising because it benefits from being a short, free, and easy to use questionnaire. The EQ-5D-5L value was only set recently for Indonesia, and may be a useful alternative.¹² Moreover, the National Institute for Health and Care Excellence recommends using the EQ-5D as the preferred measure of HRQOL [24], as is followed by the Netherlands,²⁵ Scotland,²⁶ Thailand,²⁷ and Malaysia²⁸ among other countries. In the future, routinely using the EQ-5D questionnaire in health surveys and patient registries of the general population may help support health technology assessments and decision-making activities in Indonesia.

Conclusions

The EQ-5D can be presentable from another analysis angle. The self-reported health for ESRD patient of dialysis treatment using EQ-5D-3L questionnaire acknowledge peritoneal dialysis superiority, also exhibit anxiety and depression as the most affected dimension. This evidence should be taken into account when formulating future research and policy in Indonesia.

Declaration of Interest

The authors report no conflict of interest.

Acknowledgments

The authors are thankful to the Department of Economic Evaluation and Health Financing (EEPK) - the Center of Health Financing and Security (PPJK) - Ministry of Health of Republic Indonesia for giving access to data from a cost-utility analysis study of dialysis in Indonesia. Thanks are also due to Ina-HTAC, Dr. Kemal N. Siregar SKM, MA, PhD and Dwi Hendro Yudho, SE for their valuable input.

References

1. Liyanage T, Ninomiya T, Jha V, Neal B, Patrice HM, Okpechi I, et al. Worldwide access to treatment for end-stage kidney disease. *Lancet* 2015;6736:1-8.
2. Suhardjono. The development of a continuous ambulatory peritoneal dialysis program in Indonesia. *Perit Dial Int.* 2008;28 Suppl 3:S59-62.
3. World Bank. Country Profile- Indonesia. 2016. Available at: http://databank.worldbank.org/data/Views/Reports/ReportWidgetCustom.aspx?Report_Name=CountryProfile&Id=b450fd57&tbar=y&dd=y&inf=n&zm=n&country=ID N.
4. Ministry of Health. Regulation of Health Minister No 64 Year 2016. [Standard tariff of health services in the implementation of health insurance program]. 2016.
5. Vale L, Cody J, Wallace S, Daly C, Campbell M, Grant A, et al. Continuous ambulatory peritoneal dialysis (CAPD) versus hospital or home haemodialysis for end-stage renal disease in adults. *Cochrane Database Syst Rev.* 2004;(4):Cd003963.
6. Liu FX, Quock TP, Burkart J, Noe LL, Inglese G, Corporation BH. Economic evaluations of peritoneal dialysis and hemodialysis: 2004-2012 [version 1; referees: 1 approved, 1 approved with reservations]. *F1000Res.* 2013;2:273.
7. Ho Y-F, Li I-C. The influence of different dialysis modalities on the quality of life of patients with end-stage renal disease: A systematic literature review. *Psychol Health.* 2016;31:1435-65.
8. Joshi DV. Quality of life in end stage renal disease patients. *World J Nephrol.* 2014;3:308-16.
9. Kontodimopoulos N, Niakas D. An estimate of lifelong costs and QALYs in renal replacement therapy based on patients' life expectancy. *Health Policy.* 2008;86:85-96.
10. van Reenen M, Oppe M. EQ-5D-3L User Guide. 2015. Available at: https://euroqol.org/wp-content/uploads/2016/09/EQ-5D-3L_UserGuide_2015.pdf.
11. EQ-5D instruments - About EQ-5D. 2017. <https://euroqol.org/eq-5d-instruments/>. Accessed 1 Sep 2017
12. Purba FD, Hunfeld JAM, Iskandarsyah A, Fitriana TS, Sadarjoen SS, Ramos-Goñi JM, et al. The Indonesian EQ-5D-5L Value Set. *Pharmacoeconomics.* 2017;35:1153-65.
13. Pike E, Hamidi V, Ringerike T, Wisloff T. More use of peritoneal dialysis gives significant savings: A systematic review and health economic decision model. *J Clin Med Res.* 2017;9:104-16.

14. Teerawattananon Y, Luz A, Pilasant S, Tangsathitkulchai S, Chootipongchaivat S. How to meet the demand for good quality renal dialysis as part of universal health coverage in resource-limited settings? *Heal Res Policy Syst.* 2016;14:21.
15. Dahlerus C, Quinn M, Messersmith E, Lachance L, Subramanian L, Perry E, et al. Patient perspectives on the choice of dialysis modality: results from the empowering patients on Choices for Renal Replacement Therapy (EPOCH-RRT) Study. *Am J Kidney Dis.* 2016;68:901-10.
16. Afiatin, Khoe LC, Kristin E, Masytoh LS, Herlinawaty E, Werayingyong P, et al. Economic evaluation of policy options for dialysis in end-stage renal disease patients under the universal health coverage in Indonesia. *PLoS One.* 2017;12:1-10. <http://dx.doi.org/10.1371/journal.pone.0177436>
17. Wasserfallen JB, Halabi G, Saudan P, Perneger T, Feldman HI, Martin PY, et al. Quality of life on chronic dialysis: comparison between haemodialysis and peritoneal dialysis. *Nephrol Dial Transpl.* 2004;19:1594-9.
18. Zhang A-H, Cheng L-T, Zhu N, Sun L-H, Wang T. Comparison of quality of life and causes of hospitalization between hemodialysis and peritoneal dialysis patients in China. *Health Qual Life Outcomes.* 2007;5:49.
19. Iyasere OU, Brown EA, Johansson L, Huson L, Smee J, Maxwell AP, et al. Article quality of life and physical function in older patients on dialysis: A comparison of assisted peritoneal dialysis with hemodialysis. *Clin J Am Soc Nephrol.* 2016;11:423-30.
20. Awuah KT, Finkelstein SH, Finkelstein FO. Quality of life of chronic kidney disease patients in developing countries. *Kidney Int Suppl.* 2013;3:227-9.
21. Oktavia D, Perwitasari DA, Supadmi W. Quality-adjusted life years (QALYs) of tuberculosis patients in the intensive and continuous phase in a private hospital of Yogyakarta, Indonesia. *J Pharm Biomed Sci.* 2016;4-7.
22. Perwitasari DA, Urbayatun S. Treatment Adherence and Quality of Life in Diabetes Mellitus Patients in Indonesia. *SAGE.* 2016;6:2158244016643748.
23. Asmidawati D, Faridah IN, Perwitasari DA. The analysis of quality of life in diabetic patients consuming oral diabetic agents. In: *The International Conference on Safety Management of Central Cytotoxic Reconstitution in Pharmacy Practice.* Yogyakarta: Ahmad Dahlan University, Yogyakarta - Indonesia; 2013. p. 131-6.
24. NICE. Guide to the Methods of technology appraisal 2013. <https://www.nice.org.uk/article/pmg9/resources/non-guidance-guide-to-the-methods-of-technology-appraisal-2013-pdf>.
25. Zorginstituut Nederland. Guideline for economic evaluations in healthcare. 2016;1-45. <https://english.zorginstituutnederland.nl/publications/reports/2016/06/16/guideline-for-economic-evaluations-in-healthcare>.
26. Scottish Medicines Consortium. Guidance to Manufacturers for Completion of New Product Assessment Form (NPAF) General Guidance to Manufacturers for Completion of New Product Assessment Form. 2014;(June).
27. Thavorncharoensap M. Measurement of utility. *J Med Assoc Thai.* 2014;97:S43-9.
28. Pharmaceutical Services Division. Pharmacoeconomic guideline for Malaysia. 2012;33.