Original Article

Assessment of Health-Related Quality of Life of Chronic Kidney Disease Patients in Aminu Kano Teaching Hospital, Kano

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ABSTRACT

Background: The prevalence of chronic kidney disease (CKD) is increasing globally. Recently, the concept of Health-Related Quality of Life (HRQOL) is receiving attention as a measure of treatment outcome in addition to traditional morbidity and mortality rates. **Objective:** To assess the HRQOL of CKD patients stages 1-5 using the Kidney Disease Quality of Life questionnaire (KDQOL). **Methodology:** The study was a cross-sectional study of CKD patients at a teaching hospital in north-western Nigeria during the study period. The quality of life, sociodemographic, clinical, and laboratory variables were assessed using a pro forma and the KDQOL questionnaire during regular clinic visits/dialysis sessions. Age and sex-matched healthy volunteers without evidence of renal disease were recruited from the hospital environment into a comparison group. **Results:** A total of 150 subjects with CKD and 150 individuals in the comparison group completed the study with 77 males and 73 females for both groups. The mean ± standard deviation (SD) ages of the CKD and comparison group was 52.83 ± 14.21 and 52.43 ± 14.50 years, respectively. Subjects in the comparison group had higher physical composite summary (PCS) and mental composite summary (MCS) scores than individuals with CKD (*P* value <0.05). Subjects with CKD showed a progressive decline in the scores of all HRQOL domains with advancing CKD stages (*P* value < 0.05). **Conclusions:** The results suggest that subjects with CKD have worse HRQOL domain scores when compared to the normal population and these scores progressively worsened with advancing CKD stages.

KEYWORDS: *CKD, HRQOL, quality of life*

INTRODUCTION

The prevalence of Chronic Kidney Disease (CKD) is increasing globally. Developing countries especially those in sub-Saharan Africa bear a disproportionately heavy burden.[1] The number of patients reaching End-Stage Renal Disease (ESRD) is increasing daily with attendant increases in morbidity and mortality.

Nearly one million people are receiving hemodialysis worldwide and more than 80% of patients on renal replacement therapy (RRT) live in North America, Japan, and Europe while 20% are treated in 100 developing countries (including Nigeria) that make up 50% of the world population.[2] The prevalence of CKD in Nigeria has been quoted as ranging from 8% in the southeast[3] to 18.8% in the southwest[4] and 26% in the north[5] showing the enormity of the problem in the country.

In addition to traditional "hard outcome measures" (i.e. mortality, morbidity, and hospitalization), patient-reported outcomes, such as Health-Related Quality of Life (HRQOL), are also being recognized as important aspects of healthcare delivery in chronic medical conditions such as CKD especially for patients on dialysis.[6] The HRQOL of these patients influences the frequency of dialysis, whether they continue to

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work with progressive kidney failure and whether they maintain an active role in the home and community.

The importance of measuring HRQOL has been underscored by recent studies indicating an association between various HRQOL measures and mortality and hospitalization rates in dialysis patients.[7]

HRQOL assessment is essential in evaluating the quality and effectiveness of patient care, comparing alternative treatments and RRT modalities, clinical outcomes, facilitating the rehabilitation of CKD patients, and enhancing patient satisfaction. Moreover, data from this study will provide baseline information and serve as a basis for further interventions.

SUBJECTS, MATERIALS, AND METHODS

The study was conducted at a teaching hospital in North-western Nigeria, which serves as a referral center for Kano State and surrounding states like Jigawa, Zamfara, Bauchi, Gombe, and Yobe. It was a cross-sectional comparative study of CKD patients seen during a period of six months from June to December 2015

The subjects were patients diagnosed with CKD using the KDIGO guidelines[8] (abnormalities of kidney structure or function, present for ≥3 months, with implications for health) who were being followed up at the nephrology clinic and those with CKD on outpatient hemodialysis at the dialysis center. Age and sex-matched volunteers from the hospital staff without CKD were used as a comparison group. Patients who were excluded were those who declined consent to participate, those who have had renal transplantation, and those who recently started hemodialysis within 3 months (the first 3 months of dialysis care is a period during which there may be many changes in dialysis prescription, dry weight, medications, diet, etc., any of which may confound the survey results).

Ethical Approval for the study was sought and obtained from the Research and Ethics Committee of the hospital. An interviewer-administereded pro forma was used to obtain relevant biodata from the subjects with CKD and those in the comparison group.

The Kidney Disease Quality of Life (KDQOL) questionnaire is a validated QOL instrument that combines items from the generic SF-36 instrument with a kidney disease-specific instrument.[9,10]

The KDQOL-36™ is a short form that includes the SF-12 as generic core plus the burden of kidney disease, symptoms/problems of kidney disease, and effects of kidney disease scales from the KDQOL-SF™ v1.3. Items from the generic core were used to generate physical component summary (PCS) and mental component summary (MCS) scores. The raw data obtained from the patients were first transformed to the pre-coded numeric value of a 0–100 possible range, with higher transformed scores always reflecting better QOL. In the final step in the scoring process, items in the same scale were averaged together to create the scale score. The PCS and MCS scores were calculated for both the CKD and the comparison group while the specific scale scores were used for the CKD group only.

Study procedure

Sociodemographic and clinical data were obtained using the Pro forma and then the patients were interviewed using the KDQOL questionnaire. Socioeconomic status was determined using the Registrar General's classification of Social Stratification.[11] Blood pressure measurements were done for each study participant using the standard mercury sphygmomanometer. The systolic blood pressure was recorded at phase 1 Korotkoff sound and diastolic blood pressure at phase V Korotkoff sounds or at phase IV Korotkoff sounds when the difference between phase IV and phase V was more than 10-20 mmHg. Renal ultrasonography was also performed on all the patients to assess the kidney size, echogenicity, corticomedullary differentiation as well as assessing for gross abnormalities of the kidneys and the genitourinary tract. Each participant subsequently had blood drawn for serum creatinine estimation.

Serum creatinine levels were then used to calculate the glomerular filtration rate (GFR) using the Modification of Diet in Renal Disease (MDRD) formula and this was used to classify the stage of CKD using the Kidney Disease Outcome and Quality Initiative (KDOQI) Guidelines.[12]

All data were analyzed using the Statistical Packages for Social Sciences (SPSS) software version 20.0. Percentages and proportions were used to describe categorical data while the Median (Interquartile range) was used for continuous data. Charts were used for graphical illustration. Pearson's Chi-square (a non-parametric inferential statistical procedure) was appropriately used to assess the association between CKD and categorical variables including socio-demographic variables (age group, gender, educational level, occupation) and clinical history/co-morbidity.

Median values of the HRQOL scores for the CKD group and comparison group were compared using the Mann–Whitney test.

HRQOL differences between the 5 stages of CKD were analyzed using a one-way analysis of variance (ANOVA) test. The intergroup differences were determined with schaffe *post hoc* test. Mann–Whitney test was then used to compare median HRQOL scores related to categorized variables (gender, clinical history). In all cases, a *P* value less than 0.05 (confidence level = 95%) was considered to be clinically significant.

RESULTS

A total of 163 subjects with CKD and 170 individuals in the comparison group were recruited into the study. Of these, 150 subjects and 150 individuals in the comparison group who were age and gender-matched completed the study giving a response rate of 92% for subjects and 88% for the comparison group.

There were a total of 77 males and 73 females for both the CKD and comparison groups. The mean ± SD ages of the CKD and comparison group were 52.83 ± 14.21 and 52.43 ± 14.50 years, respectively (t = 0.237, *P* = 0.813). The age and gender distribution of the CKD and comparison groups are shown in Table 1, while their social status and educational classes are shown in Figures 1 and 2, respectively. The majority were traders and low-level business owners.

Clinical history of CKD Patients: Table 2 shows the clinical history of CKD patients. There were 57 (38%) participants with a history of diabetes while 86% had hypertension. The majority of the CKD subjects with hypertension had been diagnosed between 5-10 years while the majority of CKD subjects with diabetes were diagnosed less than 5 years. About one-fifth of the CKD subjects had a history of heart failure while only about a tenth had a history of a previous stroke. Figure 3 shows the clinical history of the CKD subjects and the comparison group.

Assessment of HRQOL domains of CKD and Comparison Groups: Table 3 shows that subjects in the

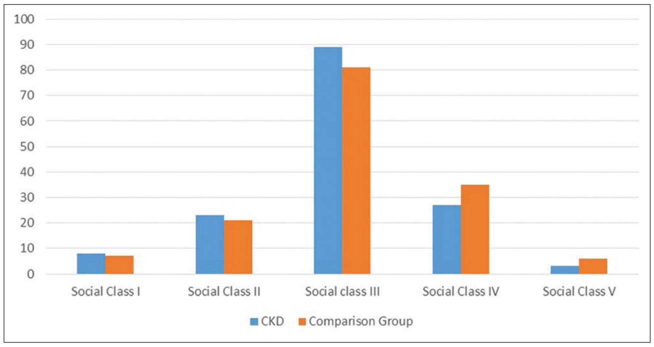

Figure 1: Social class of participants

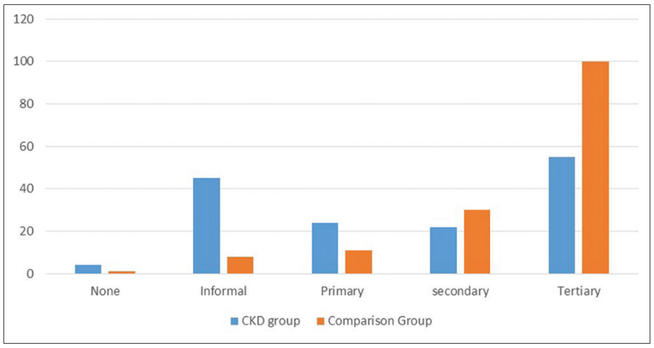

Figure 2: Educational status of study participants

Table 1: Age and gender distribution of CKD and comparison groups

Age group (years)	CKD Subjects		Total *n* (%)	Comparison Group		Total *n* (%)
	Male	Female		Male	Female	
≤20	0	1	1 (0.7)	0	1	1 (0.7)
21-40	18	14	32 (21.3)	22	15	37 (24.7)
41-60	33	40	73 (48.7)	30	40	70 (46.7)
61-80	26	17	43 (28.7)	25	14	39 (26.0)
>80	0	1	1 (0.7)	1	2	3 (2.0)
Total n (%)	77 (51.3)	73 (48.7)	150 (100)	77 (51.3)	73 (48.7)	150 (100)

Df=4, χ^2=49.52, p=0.292, CKD: Chronic kidney disease

Table 2: Clinical history of chronic kidney disease patients based on gender

Clinical History	Gender		Total *n* (%)	*p*
	Male (%)	Female (%)		
History of Diabetes	32 (56)	25 (44)	57 (38)	0.356
History of Hypertension	67 (52)	62 (48)	129 (86)	0.713
History of Smoking	8 (89)	1 (11)	9 (6)	0.019
History of Alcohol Intake	1 (100)	0 (0)	1 (0.6)	0.329
History of Chest pain	8 (40)	12 (60)	20 (13)	0.352
History of Heart failure	16 (53)	14 (47)	30 (20)	0.873
History of Stroke	7 (47)	8 (53)	15 (2)	0.723
History of Recent hospitalization	16 (67)	8 (33)	24 (16)	0.101

Table 3: Quality of life domains of study participants

		Median/IQR QOL scores		*p*
		CKD group	Comparison group	
QUALITY OF LIFE	PCS score	81 (41-92)	92 (83-96)	<0.001*
	MCS score	75 (55-86)	88 (78-93)	<0.001*

*significant at P-value < 0.05, IQR: interquartile range, PCS: physical composite summary; MCS: mental composite summary; QOL: quality of life

Table 4: Health-related quality of life domains among CKD stages

	CKD Stages	Median/IQR QOL score	Chi square	*P*
PCS score	Stage 1	92 (70-92)		
	Stage 2	92 (64-92)		
	Stage 3	77 (45-92)	25.60	<0.001*
	Stage 4	83 (36-92)		
	Stage 5	31 (23-58)		
MCS score	Stage 1	83 (74-89)		
	Stage 2	77 (63-90)		
	Stage 3	75 (59-86)	17.51	0.002*
	Stage 4	74 (58-87)		
	Stage 5	52 (41-74)		
Burden of kidney disease	Stage 1	100 (100-100)		
	Stage 2	100 (100-100)		
	Stage 3	100 (62-100)	63.16	<0.001*
	Stage 4	87 (68-100)		
	Stage 5	46 (23-75)		
Symptoms/ Problems list	Stage 1	88 (85-91)		
	Stage 2	86 (83-89)		
	Stage 3	87 (78-88)	23.07	0.001*
	Stage 4	82 (76-88)		
	Stage 5	75 (65-85)		
Effect of Kidney disease	Stage 1	114 (103-114)		
	Stage 2	111 (104-114)		
	Stage 3	111 (104-114)	37.45	<0.001*
	Stage 4	111 (99-114)		
	Stage 5	79 (56-89)		

*significant at *P*-value < 0.05, IQR: interquartile range; CKD: chronic kidney disease; QOL: quality of life

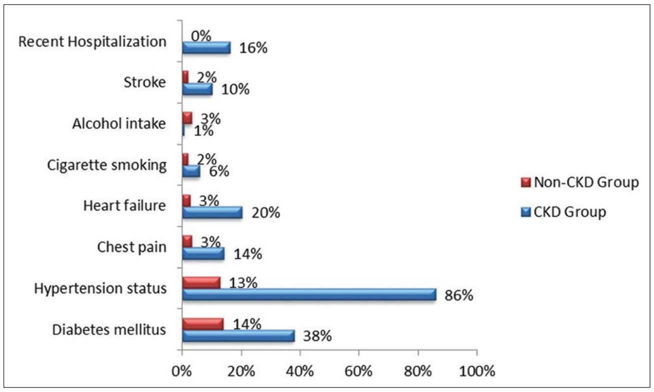

Figure 3: Clinical history of study participants

comparison group had PCS and MCS scores (median of 92 and 88, respectively) compared to subjects with CKD (median of 81 and 75). This observation was statistically significant (*P* value of < 0.05).

Assessment of HRQOL of the CKD Subjects: Table 4 shows the generic and specific kidney disease-related domains with the median scores across the stages of CKD. There was a significant progressive decline in the PCS scores, MCS scores, burden of kidney disease, symptoms/problems, and the effect of kidney disease domains with increasing stage of CKD (*P* < 0.05 in all domains).

Discussion

Disease-specific HRQOL has been shown to significantly decline with the advancing stages of CKD.[7,13,14] This study has revealed that this is no exception for our patients in northwestern Nigeria. Various sociodemographic, clinical, and laboratory parameters have been associated with HRQOL scores.

The mean age of CKD subjects in this study was 53 ± 14 years. This was similar to the studies by Kaltsouda *et al*.[15] and Cruz *et al*.[16] However, the study by Mujais *et al*.[7] had a much higher mean age of 65.6 ± 0.4 years but patient population were majorly Caucasians in a developed country, which could reflect the more aged population with better healthcare systems. In comparison, this study had both early stages of CKD as well as ESRD patients and so this may explain the lower mean age. It has been reported that CKD in developing countries affects mostly the younger age groups who are at the peak of their economic viability.[17] The younger age group in our study could also be attributed to the fact that chronic glomerulonephritis is still a common cause of CKD in our environment and it tends to occur in younger individuals.[3,18] A similar young population was seen in the study done in Egypt by Arogundade *et al*. with a mean age of 40.8 ± 11.0 years.[19]

Majority of our subjects were male (51%) with an M: F ratio of 1.1:1, which is similar to other studies done by Mujais *et al*., Agneta *et al*., and Valdernabanno *et al*.[7,20,21] Males tend to be more represented on account of significant risk factor prevalence and corresponding cultural and religious barriers to female health-seeking behavior in this environment.[22]

Most CKD patients in this study were in social classes 3 and 4 with majority being manual workers, clerical officers, and low to medium level traders. Similar classes were seen in the studies by Kefale *et al*.[23] in Eastern Africa, Kaltsouda *et al*.[15] in Southern Europe, and Cruz *et al*.[16] in South America buttressing the fact that CKD affects mostly lower-income and economically disadvantaged groups with devastating effects such as worsening poverty and dwindling family finances. In a study in South Africa by Okpechi *et al*.,[24] majority of patients were found to be unemployed due to time spent in the hospital away from work or were from low-income families.

Educational status is also closely related to social class and economic empowerment[25] and so it was surprising that we observed a higher number of patients having tertiary education followed by informal education. On closer examination, however, majority of these patients had short course diplomas and post-basic education certificates. Most studies report the majority of patients to be of secondary level of education or less.[7,15,16]

Measurement of HRQOL with a specific kidney disease instrument (KDQOL) has been shown to be more sensitive to disease severity and therapeutic measures. This study showed that CKD subjects in our environment had statistically significant lower scores in both MCS and PCS domains of HRQOL when compared to age and sex-matched normal individuals. This has been the trend with many studies showing lower HRQOL domain scores in CKD patients when compared to the normal population.[9,20] This is not surprising given the complications, comorbidities, and ill health that CKD patients experience. Many CKD patients have persistent feelings of malaise, poor sleep, and other subtle uremic symptoms with associated fluid and electrolyte imbalance coupled with the stress of accessing renal replacement therapy regularly.

This study also showed that the lower HRQOL domain scores in CKD subjects showed a decreasing trend with CKD stages with stage 1 having better HRQOL scores than stage 2 and stage 2 better than stage 3 and so on with the lowest scores seen in stage 5. This decreasing trend cut across not only the PCS and MCS domains but also across the kidney-specific domains including the burden of kidney disease, symptoms/problems, and effects of kidney disease. Though most studies have used the generic SF-36 instrument, a few studies that used the KDQOL instrument have also reported this trend.[7,20]

In an analysis of the prospective Chronic Renal Insufficiency Cohort (CRIC) Study and its ancillary study, the Hispanic Chronic Renal Insufficiency Cohort (H-CRIC) Study, Porter *et al*.[26] showed that participants with lower estimated glomerular filtration rate (eGFR) had lower HRQOL scores in all the five KDQOL subscales than those with higher eGFR.

The study by Cruz[16] in Brazil was unable to demonstrate this trend though they used the SF-36 instrument probably because of the small number of patients in the early stages of CKD. It is also possible that the generic nature of the instrument used may have contributed to this. However, this trend was seen in the US as reported by Mujais *et al*.[7] who showed declining HRQOL domain scores with advancing CKD stages. The study only looked at CKD patients in stages 3-5 and they were able to demonstrate a significant reduction in HRQOL with declining CKD stages.

Another study by Avramovic *et al*.[14] in Serbia utilized the generic SF-30 instrument in examining predialysis and dialysis patients and demonstrated that CKD predialysis patients had better domain scores than dialysis patients.

In conclusion, this study showed that subjects with CKD have worse HRQOL domain scores when compared to the normal population and HRQOL domain scores progressively worsened with advancing CKD stages. One of the limitations of this study was that the cross-sectional design of the study only provided an observation and it will be therefore difficult to make causal inference while the subjective nature of the HRQOL Questionnaire itself may have made the subjects' assessment dependent on environmental changes and degree of recalibration and adjustment to the disease state. Furthermore, the English version of the KDQOL questionnaire was used for this study and translated for subjects who did not understand the English language well. This may have added language bias to the study. Recommendations include the need for more studies preferably prospective longitudinal in nature to further evaluate HRQOL in this environment; the need for further studies to assess the influence of psychosocial variables on HRQOL of CKD patients in this environment and the need for routine use of HRQOL assessments in the care of patients with CKD. This would help to better improve morbidity and mortality associated with low HRQOL. There is also a need for the use of computer adaptive testing to further improve the utility and objectivity of the HRQOL instrument.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Akinkugbe OO. Nephrology in the tropical setting. Nephron 1978;22:249-52.
2. End Stage Renal Disease Patients in 2000: A Global Perspective. Handbook by Fresenius MedicalCare.
3. Ulasi II, Ijoma CK. The enormity of chronic kidney disease in Nigeria: The situation in a teaching hospital in South-East Nigeria. J Trop Med 2010;10:501957.
4. Oluyombo R, Ayodele OE, Akinwusi PO, Okunola OO, Akinsola A, Arogundade FA, *et al*. Prevalence, risk factors and patterns of chronic kidney disease in a rural community in South West Nigeria. West Afr J Med 2011;65:A141.
5. Nalado A, Abdu A, Muhammad H, Alhaji A, Sakajiki AM, Bappa A, *et al*. Prevalence of risk factors for chronic kidney disease among civil servants in Kano. Niger J Basic Clin Sci 2012;9:70-4.
6. KDOQI; National Kidney Foundation. Clinical practice guidelines and clinical practice recommendations for anaemia in chronic kidney disease in adults. Am J Kidney Dis 2006;47 (5 Suppl 3):16-85.
7. Mujais S, Story K, Brouillette J, Takano T, Soroka S, Franek C, *et al*. Health-related quality of life in CKD Patients: Correlates and evolution over time. Clin J Am Soc Nephrol 2009;4:1293-301.
8. National Kidney Foundation. K/DOQI clinical practice guidelines for chronic kidney disease: Evaluation, classification and stratification. Am J Kidney 2002;39 (2 Suppl 1):1-266.
9. Kalantar-Zadeh K, Unruh M. Health related quality of life in patients with chronic kidney disease. Int Urol Nephrol 2005;37:367-78.
10. Molsted S, Prescott L, Heaf J, Eidemak I. Assessment and clinical aspects of health-related quality of life in dialysis patients and patients with chronic kidney disease. Nephron Clin Pract 2007;106:c24-33.
11. Simon RS. The genesis of the registrar-general's social classification of occupations. Br J Sociol 1984;35:522-46.
12. Inker L, Astor BC, Fox CH, Isakova T, Lash JP, Peralta CA, *et al*. KDOQI US commentary on the 2012 KDIGO clinical practice guideline for the evaluation and management of CKD. Am J Kidney Dis 2012;63:713-35.
13. Mapes DL, Lopes AA, Satayathum S, McCullough KP, Goodkin DA, Locatelli F, *et al*. Health-related quality of life as a predictor of mortality and hospitalization: The dialysis outcomes and practice patterns study (DOPPS). Kidney Int 2003;64:339-49.
14. Avramovic M, Stefanovic V. Health-related quality of life in different stages of renal failure. Artif Organs 2012;36:581-9.
15. Kaltsouda A. Defensive coping and health-related quality of life in chronic kidney disease: A cross-sectional study. BMC Nephrol 2011;12:28.
16. Cruz MC, Andrade C, Urrutia M, Draibe S, Nogueira-Martins LA, Sesso Rde C. Quality of life in patients with chronic kidney disease. Clinics 2011;66:991-5.
17. Baiardi F, Degli Esposti E, CocchiR, Fabbri A, Sturani A, Valpiani G, *et al*. Effects of clinical and individual variables on quality of life in chronic renal failure patients. J Nephrol 2002;15:61-7.
18. Akinsola W, Odesanmi WO, Ogunniyi JO, Ladipo GO. Diseases causing chronic renal failure in Nigerians-A prospective study of 100 cases. Afr J Med Sci 1989;18:131-7.
19. Arogundade FA, Zayed B, Daba M, Barsoum RS. Correlation between Karnofsky Performance Status Scale and Short-Form Health Survey in patients on maintenance hemodialysis. J Natl Med Assoc 2004;96:1661-7.
20. Agneta Pagels A, Soderkvist BK, Medin C, Hylander B, Heiwe S. Health-related quality of life in different stages of chronic kidney disease and at initiation of dialysis treatment. Health Qual Life Outcomes 2012;10:71.
21. Valderrabanno F. Quality of Life benefits in early anaemia treatment. Nephrol Dial Transplant 2000;15(Suppl 3):23-8.
22. Osubor KM, Fatusi DA, Chiwuzie J. Maternal health-seeking behavior and associated factors in a rural Nigerian community. Matern Child Health J 2005;10:159-69.
23. Kefale B, Alebachew M, Tadesse Y, Engidawork E. Quality of life and its predictors among patients with chronic kidney disease: A hospital-based cross sectional study. PLoS One 2019;14:e0212184.
24. Okpechi IG, Nthite T, Swanepoel CR. Health-related quality of life in patients on hemodialysis and peritoneal dialysis. Saudi J Kidney Dis Transpl 2013;24:519-26.
25. Ozturk I. The role of education in economic development: A theoretical perspective. SSRN Electron J 2001;10.2139/ssrn.1137541.
26. Porter AC, Lash JP, Xie D, Pan Q, DeLuca J, Kanthety R, *et al*. Predictors and outcomes of HRQOL in adults with CKD. Clin J Am Soc Nephrol 2016;11:1154-62.