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ORIGINAL ARTICLE

Health-related quality of life of patients undergoing haemodialysis therapy in Dar es Salaam, Tanzania

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ABSTRACT

Background: Patients with kidney failure on maintenance haemodialysis therapy have a lower health-related quality of life (HRQOL) than matched controls without kidney failure. HRQOL is an important predictor of clinical outcomes among patients with kidney failure, yet there is a paucity of such data in Tanzania. We determined HRQOL among Tanzanian patients with kidney failure receiving maintenance haemodialysis therapy.
Methods: A cross-sectional study was conducted at Muhimbili National Hospital (MNH) in Dar es Salaam, from June to October 2020. MNH is a tertiary public sector hospital with 50 dialysis machines. Here, the Kidney Disease Quality of Life Short Form-36 questionnaire was used to assess HRQOL in 209 patients (69% male; mean age 51.9 ± 13.5 years). Their scores were categorized as low if the overall mean was ≤50, and as high if the score was >50. Factors associated with lower HRQOL were identified using multivariate logistic regression.
Results: Overall HRQOL was low (mean score 48.9 ±13.9) and the factors associated with the scores recorded were having less than three haemodialysis treatment sessions per week [adjusted odds ratio (OR) 1.356, 95% CI 0.707–2.254] and urea reduction ratio <65% (OR 2.229, 95% CI 1.238–3.014).
Conclusions: The overall HRQOL of patients undergoing haemodialysis was low. Receiving less than three haemodialysis sessions per week and having a urea reduction ratio of less than 65% were associated with lower scores. These findings underscore the importance of providing adequate haemodialysis treatment in improving the quality of life of patients with kidney failure.

Keywords: health-related quality of life; chronic kidney disease; kidney failure; Tanzania.

INTRODUCTION

Chronic kidney disease (CKD) is among the fastest-growing public health problems worldwide, which is increasing in terms of incidence and prevalence. The global prevalence is estimated to be around 10–13% and similar rates are reported in Africa. Patients with kidney failure require kidney replacement therapy in the form of haemodialysis (HD), peritoneal dialysis (PD) or transplantation. In many low- and middle-income countries (LMICs), conservative and supportive kidney care and chronic haemodialysis are the main management strategies for patients with kidney failure [1-3].

Patients with kidney failure have lower health-related quality of life (HRQOL) scores than the general population, particularly in the physical and emotional domains [4]. In high-income countries, HRQOL of patients on haemodialysis has been extensively studied, and assessment of quality of life is becoming routine. The factors which have an impact on HRQOL include age, sex, educational level, employment status and income. Clinical factors such as the duration of dialysis, comorbidities, and the adequacy of dialysis have also been shown to influence the HRQOL score [5–7].

There are fewer studies on HRQOL among haemodialysis patients in LMICs. Most have reported similar findings to those reported globally, with lower HRQOL compared

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to the general population. However, there is a considerable heterogeneity in the predictors of HRQOL, and the factors that are associated with this measure vary across different populations and settings [8-11].

In Tanzania, there are currently only two transplant centres, each performing fewer than 10 kidney transplants per year, and most patients with kidney failure who start KRT receive chronic haemodialysis. HRQOL has not yet been recorded in Tanzanian patients; the study reported here aimed to assess HRQOL and explore factors associated with it in our setting.

METHODS

A cross-sectional study to assess HRQOL scores was conducted from June to October 2020 among patients on maintenance haemodialysis at the haemodialysis unit of Muhimbili National Hospital (MNH), a 1500-bed tertiary-level public health facility in Dar es Salaam, Tanzania, which has approximately 50 haemodialysis machines. Around half the patients are covered by health insurance, with government health insurance accounting for almost two-thirds of this group, whereas the remainder pay out-of-pocket for haemodialysis treatments. Approximately half the patients complete only twice-weekly sessions, due to financial constraints. Most use high-flux dialyzers, with each treatment session lasting four hours. Temporary (non-tunnelled) dialysis catheters are used as the usual vascular access, and blood flow rates of above 250 mL/min are not often achieved.

We enrolled all patients aged 18 years or above, who had been stable on chronic haemodialysis for at least three months and had provided written informed consent. Those with cognitive impairment were excluded.

For each participant, we documented age, sex, level of education, marital status, occupation and health insurance status. Clinical and laboratory data such as duration on haemodialysis, presence of comorbidities (such as hypertension, diabetes mellitus, HIV infection, stroke, heart failure and cancer), vascular access, haemoglobin, serum albumin and creatinine were also extracted from hospital records. Blood was collected for pre- and post-dialysis urea concentrations and used for the assessment of dialysis adequacy by calculating the urea reduction ratio (URR), with ≥65% considered adequate [12].

To assess HRQOL, the Kidney Disease Quality of Life Short Form-36 (KDQOL-36™) was used. This instrument consists of 36 items, divided in two main categories: the first 12 items are generic components, measuring patients' perceptions of their physical and mental functioning and the remaining 24 items are kidney disease targeted items (KDCS). The generic component section consists of two subscales, the physical health composite score (PCS) and the mental health composite score (MCS). The kidney disease-specific section (KDCS) has three subscales: burden of kidney disease (BKD), symptoms and problems of kidney disease (SPKD) and effects of kidney disease (EKD) on daily life [13]. For our study, the KDQOL-36™ tool was translated from English into Swahili and back translated by a professional translator for consistency and validity and assessed by two experts in the field of nephrology for clarity and comprehensiveness. It was piloted among 15 patients on maintenance haemodialysis and found to be satisfactory; no further modifications were needed. The scoring was uniform across the English and Swahili versions. The tool was administered during haemodialysis sessions, using an interview-based approach as some of the participants could neither read nor write.

Data entry and statistical analysis were performed using SPSS version 25. Cronbach's alpha for the KDQOL-36™ tool was 0.845, indicating good internal consistency. Descriptive statistics are reported using mean ± standard deviation (SD), median and interquartile range (IQR), or proportions, as appropriate. The overall HRQOL and five subscales of the KDQOL-36™ (PCS, MCS, BKD, SPKD and EKD) are presented in terms of mean score ± SD. Overall mean scores of ≤50 and >50 were considered as lower and higher HRQOL, respectively. Factors potentially associated with HRQOL are reported using adjusted odds ratios (OR) with 95% confidence intervals (CI). Variables with P values <0.2 in bivariate analysis and those with clinical relevance were entered into a multivariate logistic regression. A P value of <0.05 was considered statistically significant.

The study was approved by the Research and Publication Committee of Muhimbili University of Health and Allied Sciences (reference no. MUHAS-REC-09-2020-361).

RESULTS

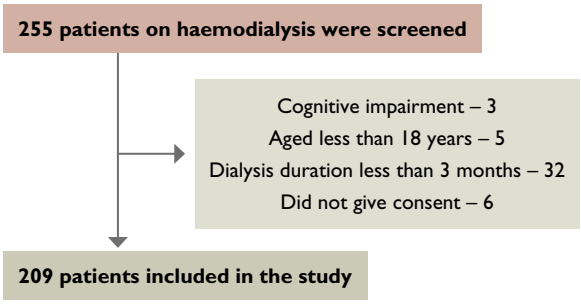

Figure 1. Patient study flow diagram.

A total of 209 patients participated in this study (Figure 1). Their mean age was 51.9 (range 18–82) years. Most were male (76%), aged <50 years (55%), employed (53%), married (74%), with a secondary level of education (40%), and had medical insurance (56%) (Table 1). Hypertension (52%) was reported as the most common aetiology for kidney failure, half had adequate dialysis with a URR ≥65% and 72% had haemoglobin concentrations less than 11 g/dL (Table 2).

The mean HRQOL score was 48.9 (±13.8) with half of the study participants scoring below 50. Among the five subscales, the lowest mean score (27.5 ± 17.5) was on burden of disease, in terms of which 91% of patients scored below 50 (Table 3).

Variables with P values <0.2 in the bivariate analysis and those known to have clinical significance for quality of life were included in the multivariate analysis. They included age, sex, employment status, frequency of haemodialysis sessions, vascular access type, duration of haemodialysis, insurance status, presence of comorbid conditions and dialysis adequacy. On multivariate analysis, having fewer than three sessions of haemodialysis per week (OR 1.356, 95% CI 0.707–2.254) and URR <65% (OR 2.229, 95% CI 1.238–3.014) were associated with lower HRQOL (Table 4).

Table 1. Sociodemographic characteristics of participants.

Factors	N (%)
Age (years)	
18–50	115 (55)
>50	94 (45)
Sex	
Male	159 (76)
Female	50 (24)
Educational level	
Tertiary	42 (20)
Secondary	84 (40)
Primary	83 (40)
Employment status	
Unemployed	30 (14)
Employed	119 (57)
Retired	60 (29)
Marital status	
Single	30 (14)
Married	154 (74)
Widow/widower/divorced	25 (12)
Insurance status	
Insured	117 (56)
Not insured	92 (44)
Place of residence	
Urban	187 (90)
Rural	22 (10)

Table 2. Clinical and laboratory characteristics of participants.

Variable	N (%)	Mean ± SD or median (IQR)
Aetiology of kidney disease		
Hypertension	109 (52)	
Diabetes mellitus	37 (18)	
Diabetes and hypertension	9 (4.3)	
Unknown	54 (26)	
Duration of haemodialysis (months)		12 (5–19)
3–24	164 (79)	
>24	45 (21)	
Frequency of dialysis sessions		3 (2–3)
3 sessions per week	122 (58)	
Fewer than 3 sessions per week	87 (42)	
Vascular access		
Arteriovenous fistula	96 (46)	
Temporary and tunnelled catheters	113 (54)	
Urea reduction ratio (%)		57.9 ± 17.6
≥65	107 (51)	
<65	102 (49)	
Haemoglobin (g/dL)		9.4 ± 2.3
<11	151 (72)	
≥11	58 (28)	
Presence of comorbid conditions		
Yes	187 (90)	
No	22 (10)	
Albumin (g/L)		36.4 ± 4.6
≥34	168 (80)	
<34	41 (20)	

DISCUSSION

Our study provides valuable insights into the status of HRQOL scores among Tanzanian patients with kidney failure who are treated with haemodialysis. Half of our participants had a mean HRQOL score below 50%, highlighting the significant burden of kidney failure and its treatment on their overall quality of life. The lower HRQOL scores may be due to a combination of physical, emotional and lifestyle factors associated with kidney failure and haemodialysis [9]. Patients on haemodialysis are also at risk of illnesses such as depression, anxiety, and cardiovascular disease, which can negatively affect their HRQOL [10]. Our findings are consistent with studies conducted in similar settings [8-10].

We found that the physical composite score (PCS) was lower than the mental composite score (MCS), in line with results from other studies [10,14]. This could be related to the high prevalence of comorbidities such as diabetes and hypertension in this group of patients [4]. In contrast, MCS scores may have been higher due to the good psychosocial support provided by dialysis nurses and family members, and the regular contact with healthcare providers. The findings suggest that, compared to physical health, the mental health of patients with kidney failure is well preserved [14].

Table 3. Health-related quality of life and subscales scores (N = 209).

	Mean ± SD	Score	N (%)
Overall HRQOL score	48.9 ± 13.9	≤50 >50	105 (50) 104 (50)
Mental health subscale (MCS)	41.7 ± 13.9	≤50 >50	136 (65) 73 (35)
Physical health subscale (PCS)	38.6 ± 14.6	≤50 >50	145 (69) 64 (31)
Symptoms and problems of kidney disease (SPKD)	70.0 ± 14.8	≤50 >50	19 (9) 190 (91)
Effect of kidney disease (EKD)	67.0 ± 16.2	≤50 >50	40 (20) 169 (81)
Burden of kidney disease (BKD)	27.5 ± 17	≤50 >50	192 (91) 17 (9)

Table 4. Multivariate analysis of factors associated with HRQOL among haemodialysis patients.

Variable	HRQOL score (N)		Crude OR (95% CI)	Adjusted OR (95% CI)	P value
	≤50	>50			
Age in years					
≤50	63	52	1.00	1.00	0.263
>50	42	52	1.667 (0.885–2.153)	1.474 (0.74–2.936)	
Sex					
Male	78	81	1.32 (0.734–1.851)	1.175 (0.591–2.234)	0.641
Female	27	23	1.00	1.00	
Employment status					
Employed	52	67	1.00	1.00	0.192
Not employed	53	37	1.846 (1.06–3.214)	1.545 (0.797–2.296)	
Frequency of dialysis					
3 sessions per week	54	68	1.00	1.00	0.030
Fewer than 3 sessions per week	51	36	1.784 (1.023–3.112)	1.356 (0.707–2.254)	
Vascular access					
Arteriovenous fistula	42	54	1.00		0.211
Temporary/tunnelled catheters	63	50	1.62 (0.936–2.803)	1.466 (0.804–2.672)	
Dialysis adequacy using URR (%)					
<65	61	41	2.13 (1.226–3.701)	2.229 (1.238–3.014)	0.046
≥65	44	63	1.00	1.00	
Duration of haemodialysis					
≤24 months	87	76	1.695 (0.867–3.314)	1.714 (0.846–2.474)	0.201
>24 months	18	28	1.00		
Insurance status					
Insured	63	54	1.00	1.00	0.474
Not insured	41	51	1.45 (0.838–2.512)	1.55 (0.465–3.195)	
Comorbid conditions					
Yes	90	96	1.492 (0.608–3.657)	2.035 (0.715–3.515)	0.167
No	14	9	1.00		

Abbreviations: OR, odds ratio; HRQOL, health-related quality of life.

Regarding kidney disease-targeted components, we found that the symptoms of the kidney disease subscale had the highest score, which is consistent with findings from other studies [9,15]. The burden of disease subscale had the lowest score with over 90% of participants scoring below 50 points. These findings are in line with those of previous studies [8,16,17] and highlight the fact that patients with kidney failure experience a high burden of disease, due to physical and emotional symptoms, and treatment-related complications.

Haemodialysis is the most common treatment for patients with kidney failure worldwide and is usually performed on three days per week, for 3 to 5 hours per session [18]. In Tanzania, patients who do not have insurance and pay out-

of-pocket have financial constraints that result in them receiving only once- or twice-weekly sessions. Nearly half of our participants were not receiving the recommended frequency of haemodialysis. Previous research conducted in the same setting reported a dialysis adherence rate of 64%, with the high cost of dialysis being the primary reason for poor adherence among uninsured participants [19]. Our study found that patients receiving less than three haemodialysis sessions per week had lower HRQOL scores. Similar findings have been reported in other studies [10].

We used the URR to evaluate the effectiveness of dialysis and found that only half of our participants were having adequate dialysis. This is an improvement compared to the previous study by Somji et al., which found only 34.3% of participants achieved adequate dialysis [20]. The higher rates of adequate dialysis reported in high-income countries may be due to the routine use of high-flux dialysis and the greater blood flow rates with effective vascular access for dialysis [20]. We also found that a URR below 65% was a predictor of lower HRQOL, consistent with findings from other studies [21,22].

Anaemia is common among patients with kidney failure and adversely affects HRQOL [23,24]. We found no such association in our study. It is noteworthy that the majority of our participants belonged to the younger age group and this might have an influence on the effect of anaemia.

Our study has some limitations. It was conducted at a single centre, which may limit the generalisability of the findings to other settings. Additionally, the KDQOL-36™ instrument has not yet been validated in Tanzania and there is no validated translation into the national language (Kiswahili). It is therefore possible that there could have been misinterpretations related to the translation of the questionnaire. While our study does demonstrate the influence of the frequency of dialysis and dialysis adequacy on HRQOL, our analysis could have been strengthened by the inclusion of additional clinical and laboratory variables.

CONCLUSIONS

Overall, HRQOL scores among our patients on haemodialysis were low, with the lowest score in the burden of kidney disease subscale. Our findings suggest that interventions to improve dialysis frequency and the adequacy of each session may be effective for improving HRQOL in this population. Local validation of the KDQOL survey instrument for use in future studies is recommended.

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