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Physical Activity and Health-related Quality of Life among CKD Patients at a Tertiary Hospital in Bangladesh

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ABSTRACT

Chronic Kidney Disease (CKD) significantly impacts patients' health-related quality of life (HRQoL), with physical activity being a potential mitigating factor. This study explores the relationship between physical activity and HRQoL among CKD patients in a tertiary hospital in Bangladesh. To assess the impact of physical activity on the HRQoL of CKD patients in a tertiary hospital setting in Bangladesh and identify barriers to physical activity within this population. A cross-sectional study was conducted involving 143 CKD patients at a tertiary hospital in Dhaka, Bangladesh. Data on physical activity levels were collected using the International Physical Activity Questionnaire (IPAQ), and HRQoL was assessed using the Kidney Disease Quality of Life Short Form (KDQOL-SF). Statistical analyses were performed to determine the correlation between physical activity and HRQoL scores. The study found a significant positive correlation between physical activity levels and HRQoL among CKD patients ($p < 0.01$). Patients engaging in regular physical activity reported higher scores in physical functioning, vitality, and mental health components of the KDQOL-SF. However, several barriers to physical activity were identified, including lack of awareness, physical limitations due to CKD, and socioeconomic constraints. The study examines into how socioeconomic and demographic factors affect the KDQOL scale and quality of life. The findings indicate that age has a significant impact on all HRQoL composite scores, with SPKD having the greatest score and MCS having the lowest. Kidney disease has the greatest impact and burden, whereas the symptom/problem list sub-scale has the lowest summary score. The only sociodemographic characteristic that has a significant correlation with IPAQ is education.

INTRODUCTION

The burden of kidney disease worldwide is substantial and poses significant challenges for governments responding to the health of their populations, particularly in low and middle-income countries (LMIC) (Shumbusho et al., 2022). Chronic kidney disease (CKD) is a major contributor to poor health outcomes of noncommunicable diseases (NCDs) and is associated with an 8-10-fold increased risk of cardiovascular disease (CVD) mortality and multiplies risk in diabetes and hypertension (Seidu et al., 202). The annual healthcare cost for persons with end-stage renal disease (ESRD) exceeds $1 trillion, indicating a considerable financial burden (Michael et al., 2022). CKD is largely preventable and treatable, and in 2017, 1.2 million people died from CKD. Risk factors for CKD vary by setting but include diabetes, hypertension, and metabolic syndrome. HIV and exposure to heavy metals and toxins play an additional role (Seidu et al., 2023). Patients with chronic kidney disease (CKD) must undergo two to three sessions of hemodialysis every week, with each session lasting

between 3 and 4 hours. They have limited time for **physical activity (PA)** and become accustomed to a sedentary lifestyle, resulting in lower physical activity participation and lower physical tolerance (Wu et al., 2022). This leads to reduced muscle tension and strength, reduced physical activity, poor prognoses, and low **health-related quality of life (HRQoL)**. The major areas of life affected by CKD and its treatment include employment, eating habits, vacation activities, a sense of security, self-esteem, social relationships, and the ability to enjoy life. Despite medical progress, advanced technology, and better patient care, patients with CKD have significantly impaired HRQOL, leading to compromised QOL (Wassef et al., 2018).

Literature Review

Chronic kidney disease (CKD) is a global public health concern that has a major influence on patients' health-related quality of life (HRQOL). The burden of CKD in underdeveloped nations, such as Bangladesh, is exacerbated by low healthcare resources and knowledge. Physical exercise is widely acknowledged as an important strategy for improving HRQoL among CKD patients. The review of literature examines existing studies on the association between physical activity and HRQoL in CKD patients, with a focus on a tertiary hospital in Bangladesh. Physical exercise is essential for maintaining and enhancing health outcomes in CKD patients. Koufaki and Kouidi (2010) stressed the significance of physical activity in improving muscular strength, cardiovascular health, and general physical functioning in CKD patients. Regular physical exercise has been demonstrated to reduce the negative symptoms of CKD, including muscle atrophy and cardiovascular problems (Johansen & Painter, 2012). Furthermore, exercise can enhance metabolic parameters and slow the course of renal disease, resulting in greater overall health and well-being. HRQoL refers to psychological, physical, and social well-being, all of which are frequently reduced in patients with CKD due to the disease's chronic nature and accompanying comorbidities. Studies have repeatedly indicated that CKD patients had poorer HRQoL than people in general (Tentori et al., 2010). Fatigue, pain, reduced physical activity, and psychological anguish are all contributing factors to CKD patients' low HRQoL. Addressing these issues through tailored therapies is critical to improving HRQoL. The link between physical exercise and HRQoL in patients with CKD is widely known. Johansen and Painter (2012) discovered that regular physical exercise is linked to considerable improvements in several aspects of HRQoL, including physical functioning, energy, and mental health. Patients who exercise regularly report decreased levels of weariness, improved psychological health, and a higher overall quality of life. Clarkson and Warmington (2014) emphasized that physical activity programs targeted to the demands and limits of CKD patients can result in significant HRQoL improvements. These therapies include aerobic, resistance, and flexibility exercises that may be tailored to the patient's health state and ability. Physical exercise has a favorable influence on HRQoL because it improves physical fitness, symptoms, and psychological outcomes.

Despite the benefits, a lot of CKD patients experience challenges to participating in regular physical activities. These hurdles include a lack of knowledge about the advantages of exercise, physical constraints, weariness, and enthusiasm (Tentori et al., 2010). In Bangladesh, additional challenges such as restricted access to exercise facilities, social views toward physical activity,

and economic restraints all impede participation in physical activity initiatives. To overcome these limitations, healthcare practitioners must employ measures that encourage physical activity among patients with CKD. Patient education is critical for increasing knowledge of the advantages of being physically active and offering practical advice on how to include exercise in everyday life (Koufaki & Kouidi, 2010). Furthermore, creating organized exercise regimens suited to the individual demands and limits of CKD patients might boost participation and adherence. Community and social encouragement are important factors in motivating physical exercise. Involving caregivers, family members, and peer support groups can offer the motivation and encouragement CKD patients need to be active (World Health Organization, 2010). Establishing supportive conditions and regulations that encourage physical activity in hospital settings is equally critical. Although research on this subject in Bangladesh is scarce, the available worldwide data offers a solid foundation for evaluating the possible advantages of physical exercise for CKD patients in this setting. Given the unique problems that CKD patients in Bangladesh experience, more localized research is needed to investigate the specific barriers and facilitators of physical activity in this group. Such a study can help to create culturally relevant therapies to enhance HRQoL among CKD patients in Bangladesh. The evidence consistently supports the beneficial effects of physical exercise on HRQoL in CKD patients. Regardless of the barriers, focused treatments and supporting techniques can increase physical activity engagement, leading to considerable improvements in HRQoL. Future research should focus on the unique requirements of CKD patients in Bangladesh to create effective, culturally acceptable therapies.

Materials and Methods

Study Design, Duration, and Area

This study utilized a cross-sectional survey design. Structured questionnaires had been administered to investigate the physical activity of patients and to explore the correlation of physical activity with negative emotions. The survey collection period was from July to August 2023, and the research site was the National Institute of Kidney Diseases and Urology Hospital in Dhaka, Bangladesh. Random sampling was used to recruit outpatient & inpatient patients.

Study population

Inclusion criteria

Patients were included if they were (1) aged older than 18 years, (2) regularly receiving CKD treatment and hemodialysis treatment for more than 3 months with three 3-h hemodialysis sessions being held weekly; (3) have sufficient cognitive faculty to complete the questionnaire and express their opinions verbally; (4) can communicate in Bangla; and (5) have consented to participate in the research after being informed of its purpose.

Exclusion criteria

All the potential participants were screened by a specialist, and those who met the inclusion criteria were asked to provide their consent to participate in the survey. Participants were also excluded if the participant's age was < 18 years, history of hospitalization during the past 3 months except for vascular access

problems if dialysis duration was < 6 months if diagnosed as having cognitive disabilities or mental illness if lack of self-care ability such as unable to walk with or without an assistive device, if lack of laboratory findings, refusal to participate, cannot complete the questionnaire or unable to communicate with the interviewer.

Sample size

Sample size determination: $n=z^2pq/d^2$

Anand et al., (2014) have stated 26% of CKD prevalence in community settings in Bangladesh. The sample size was calculated by using a population proportion formula. Where n = is the desired sample size; $Z\ \alpha/2=$ is the standard normal distribution usually set as 1.64 (corresponds to 90% confidence level); p = population proportio$n$ = 0.26), and d = degree of accuracy desired (a marginal error is 6% (0.06). So, n = 146. Current study employed a sample size of 143.

Measurements

Sociodemographic Characteristics

The demographic data of the participants comprised age, gender, education level, marital status, living arrangement, current employment, monthly income, body mass index (BMI, kg/m^2), the existence of chronic diseases (hypertension or diabetes), engagement in regular physical activity (3 times/week), and duration of CKD treatment & hemodialysis (years). The biochemical data of the participants included information on hemoglobin level (mg/dL), BUN (mg/dL), creatinine level (mg/dL), and albumin *level (g/dL) (*Kim et al., 2021).

Physical Activity Measure

This study used the International Physical Activity Questionnaire—Short Form (IPAQ-SF) to measure the physical activity levels of the participants. (Liou et al., 2008) The questionnaire assessed the participants' duration of physical activity during the 7 days preceding their filling in of the questionnaire; the intensity and duration of their physical activity (lasting more than 10 min), including low-intensity (≤600 metabolic equivalents of task [MET]-min/week), moderate-intensity (between ≥600 and <3000 MET min/week), and vigorous-intensity (≥3000 MET min/week) physical activity; and their overall physical activity score. The IPAQ-SF has favorable stability. A Spearman's rho correlation test revealed that the questionnaire had a test-retest reliability of 0.8 and criterion validity of 0.30 (Hallal et al., 2004), thus validating its precision and effectiveness.

Health-related Quality of Life Measure

HRQoL assessed using the Medical Outcomes Study 36-Item Short-Form Health Survey version 2 (SF-36). The questionnaire contains 36 items under eight subscales as follows: physical functioning (10 items), role-physical (4 items), bodily pain (2 items), general health (5 items), vitality (4 items), social functioning (2 items), role-emotional (3 items), mental health (5 items), and health transition (1 item). The eight subscales belong to the two constructs of the physical component score (PCS) and mental component score (MCS) (Lu et al., 2003). The total score ranges from 0 to 100, with a higher score indicating

better health and a higher quality of life (Liou et al., 2008). The Cronbach alpha of the questionnaire has been reported as being greater than 0.70 (Hallal et al., 2004). Diabetes mellitus (DM) was evaluated using three indicators: (1) a patient-reported history of DM, (2) the medical record of DM diagnosis or medication, and (3) a fasting glucose level ≥ 126 mg/dL. We evaluated all three indicators for all the patients and DM will be diagnosed if one or more indicators among the three are positive. Coronary artery diseases (CAD) were evaluated using two indicators: (1) a patient-reported history of angina, myocardial infarction, or congestive heart failure, and (2) the medical record for the presence of angina, myocardial infarction, or congestive heart failure. CVD will be evaluated using two indicators: (1) a patient-reported history of stroke, and (2) the medical record for the presence of stroke. We evaluated all two sources of evidence for all patients and CAD or CVD is diagnosed if one or more of the two indicators are positive.

Data Analysis

Statistical analysis was performed using SPSS version 22.0 (SPSS, Chicago, IL, USA), and the level of significance was set to 0.05. The descriptive statistical data that was obtained comprised of the participants' sociodemographic data and physical activity and HRQoL scores expressed as numbers (%), means, standard deviations (SDs), or ranges. A student's t-test for normally distributed data and the Mann–Whitney U test for non-normal distribution data were used to compare the clinical characteristics between the groups. The Chi-square test and one-way ANOVA test were used to compare the categorical and continuous variables respectively.

Results

Table 1: Distribution of the respondents according to Age (n=143)

Age (years)	Frequency	Percent
≤30	14	9.79
31-40	30	**20.98**
41-50	49	**34.27**
51-60	35	**24.48**
≥61	15	10.49
Total	143	100
Mean± SD	**46.57 ± 12.21**	

Table 1 showed that about 33.6% of the respondents were in the age group 41-50 years, followed by 51-60 years (24.5%) and 21.1% of the respondents were 31-40 years. The mean age of the respondents was **46.57 ± 12.21** years.

Figure 1: Distribution of respondents by Gender (n=143)

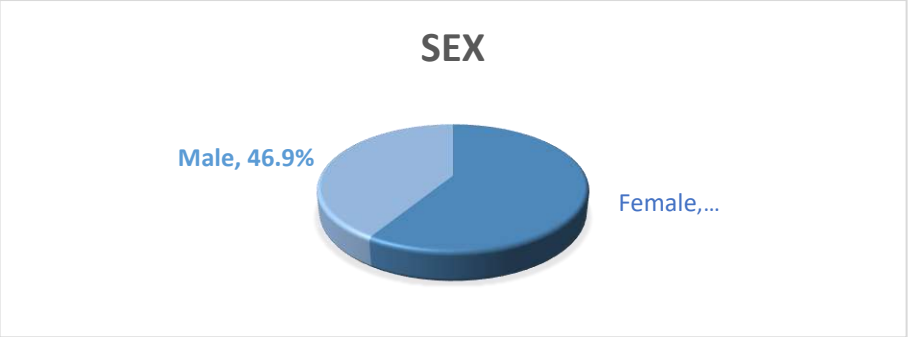

Figure 1 shows that about 53.1% of the respondents were female and the remaining respondents were males (46.9%).

Figure 2: Distribution of Respondents by Marital Status (n=143)

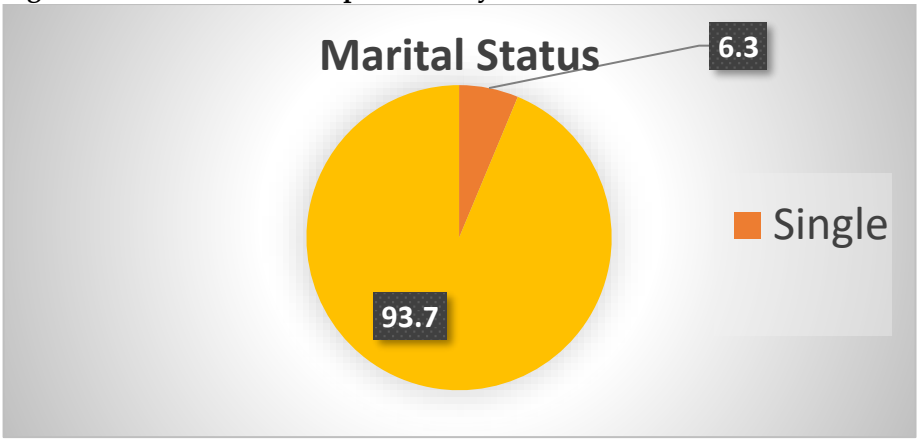

Figure 2 shows that most respondents (93.7%) were married and only a small number were unmarried (6.3%).

Table 2: Distribution of respondents by Education Level (n=143)

Education level	**Frequency**	**Percent**
No Schooling	32	**22.4**
Primary	27	18.9
High school	56	**39.2**
Higher Secondary School	16	11.2
University	12	8.4
Total	**143**	**100.0**

Table 2 showed that about 39.2% of the respondents had a secondary level of education, followed by no formal education (22.4%). 18.9% of the respondents had primary school levels of education and 11.2% had higher secondary education. Only 8.4 % of them had university or higher education

Table 3: Distribution of respondents by their Profession (n=143)

Profession	Frequency	Percent
Unemployed	39	**27.3**
Service	8	5.6
Business	7	4.9
Housewife	70	**49.0**
Retired	9	6.3
Others	10	7.0
Total	**143**	**100.0**

Table 3 showed that about 49.0% of the respondents were housewives, followed by unemployed (27.3%). 6.3% of the respondents were retired personnel, 5.6% were service holders, and business owners were 4.9%.

Table 4: Distribution of Respondents by Family Income (monthly) (n=143)

Income	Frequency	Percent
≤25000	95	**66.43**
≥25001	48	33.57
Total	143	100.0
Mean± SD	**27944.06± 22896.21**	

Table 4 showed that about 66.43% of the respondent's family monthly income was less than 25000 taka and 33.57% of them had 25001 & above. The mean monthly income of the respondent's family was 27944.06± 22896.21 taka.

Figure 3: Distribution of respondents by Place of Living (n=143)

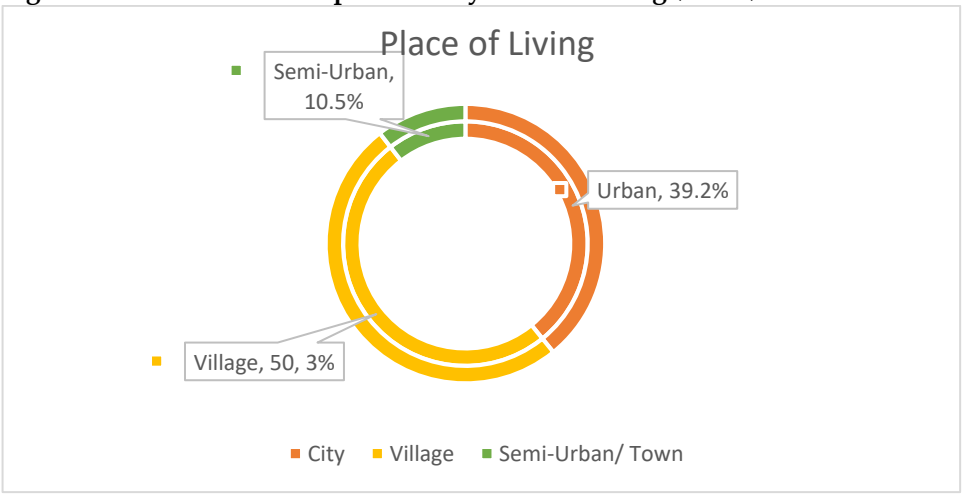

Figure 3 shows that more than half (50.3%) of the respondents lived in the villages

and 39.2% were from urban areas, 10.5% were from semi urban areas.

Table 5: Distribution of respondents by Body Mass Index (BMI) (n=143)

Body Mass Index (BMI)	**Frequency**	**Percent**
Underweight (Less than 18.5)	13	9.1
Normal (18.5-24.9)	99	69.2
Overweight (25.0-29.9)	25	17.5
Obesity (More than 30)	6	4.2
Total	**143**	**100**
Mean± SD	**22.80± 3.68**	

It is shown in the table that the mean BMI score was 22.80± 3.68, 9.1% participants were underweight, 69.2% were with normal BMI score. 17.5% were overweight and 4.2% were Obese.

Figure 4: Distribution of respondents by comorbidities (n=143)

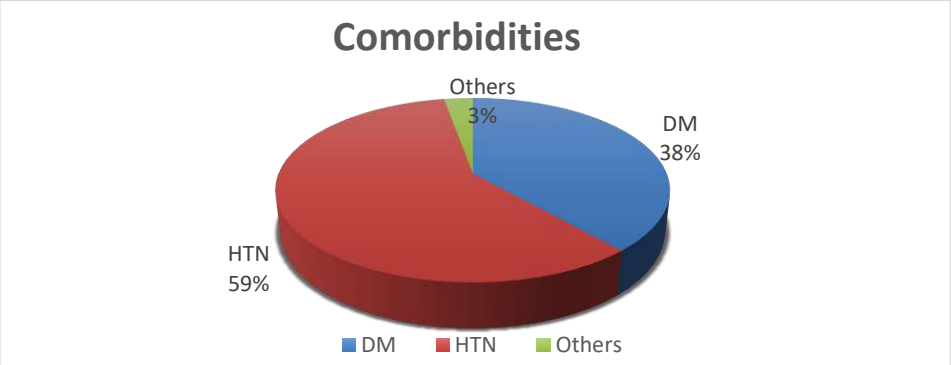

Table 4 showed that about 59% of the respondents had HTN, followed by diabetes (38%) and the remaining respondents had other comorbidities.

Table 6: Distribution of the respondents based on Tobacco Use (n=143)

Tobacco use	**Frequency**	**Percent**
No	122	**85.3**
Yes	**21**	14.7
Total	143	100
If yes, what type? (n=21)		
Cigarette smoking	7	33.3
Smokeless tobacco	14	**66.7**

Table 7 shows that 85.3% of the respondents were non-tobacco users and the remaining (14.7%) were tobacco users. Among the tobacco user respondents, 66.7%

were users of smokeless tobacco (SLT), and 33.3% were smokers.

Figure 5: Distribution of the respondents based on Sleep Problems (n=143)

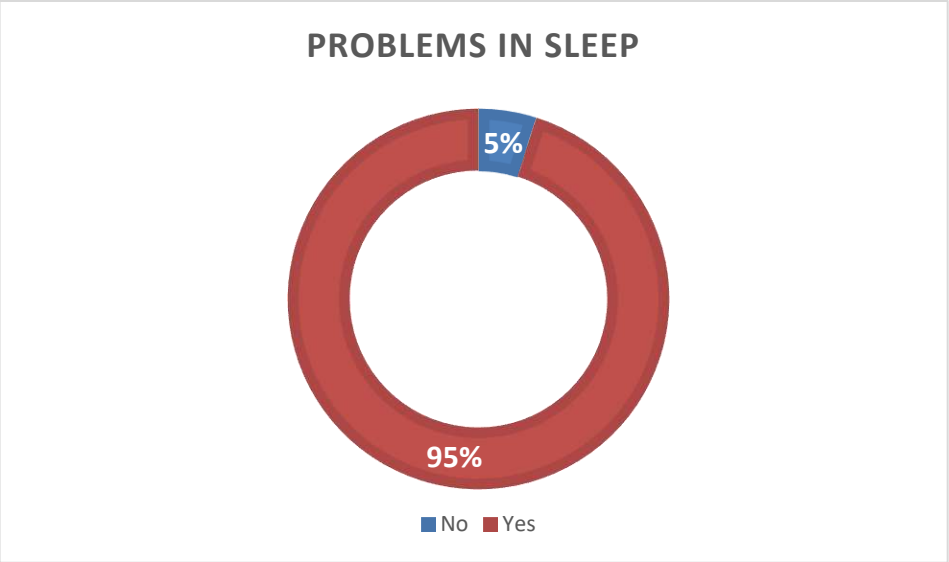

Figure 5 shows that 95.0% of the respondents have sleep problems, and the remaining (5.0%) have no sleep problems.

Table 7: Biochemical profile of the respondents (n=143)

Variables	**Mean± SD**
Hemoglobin	8.78 ± 3.99
Serum Urea	160.26 ± 67.05
Serum Creatinine	8.70 ± 3.31
eGFR	16.10 ± 9.13
Serum Albumin	3.50 ± 1.08
Serum Calcium	8.11 ± 1.68
Serum Phosphorus	5.99 ± 2.14
Serum Potassium	4.60 ± 2.52

Table 8: Health-related quality of life (subscales) and Physical activity (IPAQ) scores

Sub-scales of KDQOL	**Mean ± SD**	**Minimum**	**Maximum**
Symptom/problem list	54.80 (15.14)	12.50	85.42
Effects of kidney disease (EKD)	37.36 (14.62)	9.38	81.25

Burden of kidney disease (BKD)	6.12 (9.72)	00.00	87.50
SF-12 PCS	41.54 (9.32)	16.67	62.50
SF-12 MCS	11.71 (11.01)	00.00	58.33
IPAQ Score	177.23 (119.10)	00.00	693.00

Table 9: Average physical composite summary score (PCS), mental composite summary (MCS) score, kidney disease component summary (KDCS) and IPAQ scores according to socio-demographic variables.

Variables	**PCS**		**MCS**		**KDCS**		**IPAQ Score**	
	Mean (SD)	P-value	Mean (SD)	P-value	Mean (SD)	P-value	Mean (SD)	P-value
Age								
Less than 30	39.64 (8.53)	0.291	8.33 (7.49)	0.238	34.78 (12.28)	**0.009***	187.00 (127.87)	0.664
31-40	44.31 (9.88)		14.31 (8.52)		36.83 (8.69)		198.00 (150.74)	
41-50	41.90 (7.09)		13.31 (12.72)		33.60 (10.02)		179.50 (116.29)	
51-60	39.50 (10.14)		10.33 (12.25)		29.39 (8.09)		161.99 (94.61)	
More than 61	41.60 (9.32)		8.67 (8.37)		28.26 (9.92)		136.95 (66.93)	
Sex								
Male	44.39 (8.63)	**0.000****	9.27 (8.58)	**0.012***	30.94 (8.94)	**0.038***	166.94 (113.05)	0.392
Female	38.99 (9.22)		13.89 (12.44)		34.38 (10.47)		186.94 (124.81)	
Marital Status								
Single	42.59 (8.53)	0.727	10.65 (8.10)	0.767	39.82 (4.38)	**0.026***	243.83 (202.72)	0.079
Married	41.47 (9.32)		11.78 (11.20)		32.28 (9.99)		170.98 (107.74)	
Education								

Status								
*Uneducated**	41.28 (9.95)	0.364	9.64 (11.76)	0.785	29.13 (9.29)	0.114	132.00 (93.48)	**0.042 ***
Primary	43.21 (8.02)		11.73 (14.32)		32.64 (8.86)		150.15 (80.64)	
Secondary	40.46 (10.01)		12.87 (10.58)		35.02 (10.63)		217.56 (152.10)	
Higher S	44.84 (9.10)		11.72 (7.94)		31.85 (8.51)		153.68 (43,33	
University	39.24 (6.27)		11.74 (5.73)		33.35 (10.16)		195.94 (91.84	
Profession								
Unemployed	46.18 (7.32)	**0.006****	9.92 (10.26)	0.221	31.29 (9.46)	0.185	157.55 (118.51	0.722
Service	39.06 (7.70)		15.10 (5.43)		39.23 (11.57)		228.94 (132.13)	
Business	40.36 (11.95)		7.26 (6.18)		31.23 (10.44)		194.70 (152.30	
Housewife	39.29 (9.38)		13.04 (12.08)		33.78 (10.04)		183.89 (126.23)	
Retired	38.89 (11.02)		15.28 (13.18)		32.07 (9.46)		171.18 (81.76)	
Others	44.17 (8.15)		6.67 (7.40)		28.07 (7.44)		151.25 (59.42)	
Income								
Less than 25000	41.83 (8.76)	0.536	10.72 (11.20)	0.192	31.87 (9.85)	0.175	182.98 (130.99)	0.429
More than 25001	40.80 (10.38)		13.26 (10.26)		34.25 (9.86)		163.57 (94.18)	
Comorbidities								
Diabetes	40.25 (9.40)	0.245	4.45 (0.56)	0.482	30.25 (10.48)	0.093	165.36 (125.45)	0.605
*Hypertension**	42.67 (9.09)		4.40 (0.65)		33.95 (9.09)		184.34 (116.69)	
Rheumatoid	29.17 (-)		4.00 (-)		44.03 (-)		99.00 (-)	
Others	39.58		5.00		28.82		66.00 (-)	

	(8.84)		(0.00)		(0.98)			
BMI								
Underweight	42.52 (8.22)	**0.012***	11.19 (9.74)	0.109	33.03 (10.00)	0.150	177.72 (101.12)	0.549
Normal	38.44 (10.35)		11.96 (11.97)		33.25 (10.27)		196.35 (164.22)	
Overweight	51.04 (8.59)		23.96 (23.66)		23.96 (10.20)		121.00 (19.05)	
Obese	33.33 (-)		0.00		17.71 (-)		-	
Tobacco Use								
No	40.35 (9.49)	**0.013***	11.71 (11.41)	0.455	32.37 (10.44)	0.519	178.63 (117.68)	0.780
Yes	45.83 (6.97)		9.72 (9.16)		33.93 (8.15)		187.28 (141.97)	
Sleep Problems								
No	38.89 (10.76)	0.487	14.58 (10.12)	0.559	38.33 (8.38)	0.177	261.25 (100.32)	0.090
Yes	41.62 (9.32)		11.85 (11.21)		32.74 (9.94)		174.97 (120.80)	
Hemoglobin								
Above 10.0	43.48 (8.87)	0.228	12.86 (10.12)	0.437	34.07 (8.47)	0.505	173.25 (57.79)	0.882
Less than 10.0	40.92 (9.30)		11.02 (10.43)		32.53 (10.30)		177.73 (129.86)	
CKD Stages								
Stage 2	37.50 (-)	0.489	41.67 (-)	**0.038***	52.84 (-)	0.070	247.50 (-)	0.522
Stage 3	38.54 (12.55)		10.42 (14.09)		29.53 (6.27)		110.00 (113.68)	
Stage 4	40.82 (8.95)		10.60 (10.07)		31.47 (9.69)		180.27 (129.65)	
Stage 5	43.72 (9.33)		12.55 (11.26)		33.84 (9.79)		178.70 (111.62)	

***p-value: level of significance ≤0.05, **p-value: level of significance ≤0.01**

The study highlights the importance of monitoring health-related quality of life (HRQoL) in CKD patients to identify high-risk individuals. The study found that MCS had the lowest HRQoL score (11.71±11.01) and SPKD had the highest

(54.80±15.14). The symptom/problem list sub-scale had a summary score of 54.80 (15.14), effect of kidney disease was 37.36 (14.62), and burden of kidney disease was 6.12 (9.72). Sex ($p < 0.01$), profession ($p < 0.01$), BMI ($p < 0.05$) and tobacco use ($p < 0.05$) are found significant for physical composite score (PCS). Sex ($p < 0.05$) and CKD Stages ($p < 0.05$) are significantly associated with mental composite score (MCS). Kidney disease composite score (KDCS) was associated with age ($p<0.01$), sex ($p<0.05$) and marital status ($p<0.05$). IPAQ Score was associated with only education status ($p<0.05$).

The findings indicated a strong correlation between characteristics such as age, gender, marital status, profession, BMI, tobacco use, and CKD stages and HRQoL scores. Numerous studies have found that clinical and demographic variables have an impact on HRQoL (Sharma et al. 2023). On the other hand, education, income status, comorbidities, sleep disorders, and hemoglobin were not substantially linked with HRQoL, despite being predicted in several research conducted worldwide. The potential disagreement could be related to changes in study design, age and CKD stage of the included people, sample size, and management strategy.

Discussion

The study emphasizes the significance of monitoring the health-related quality of life (HRQoL) of CKD patients in order to identify individuals at higher risk and provide suggestions for maintaining an active lifestyle. It reveals information about the socio-demographic distribution, domain-specific summary scores, and characteristics linked with HRQoL. HRQoL is an important indicator for determining the efficacy of chronic illness therapy, particularly in advanced CKD patients. Patients' subjective perceptions of their sickness are important in medical decisions. HRQoL was once thought to be a result of an individual's disease, but it is now acknowledged as a patient-centered metric and health system indicator. However, little is known about how kidney illness affects HRQoL and whether HRQoL predictors may be targeted for future interventions. The study found that MCS had the lowest HRQoL score (11.71±11.01) and SPKD had the highest (54.80±15.14). This is consistent with the research of Kim et al. (2021), in which MCS and SPKD were the lowest and highest quality indicators, respectively. A study in the USA showed the highest mean score in the SPKD subscale and comparable mean scores in other domains (Cohen et al., 2019). However, according to (Alam et al., 2019), BKD (81.09±13.14) and SPKD (16.93±13.0) had the greatest and lowest mean HRQoL ratings, respectively. The symptom/problem list sub-scale had a summary score of 54.80 (15.14), effect of kidney disease was 37.36 (14.62), and burden of kidney disease was 6.12 (9.72). A similar pattern of extremely low scores on the burden of renal disease subscale and reasonably high scores on the influence of kidney disease on everyday life and symptoms and issue subscales was also observed in studies carried out in different contexts.

The most prevalent comorbidity in our study was hypertension (58.9%). This was consistent with the study of (Stefanski et al., 1996), which found that hypertension was present in 80% to 85% of CKD patients. Other studies found similar results, with 91.1% in Ethiopia and 77.6% in the USA (Wu et al., 2016); (Kefale et al., 2018); (Berhe et al. 2023). Further investigation focused on the factors linked with the KDQOL instrument's subscales. In terms of PCS, younger CKD patients in our study had a higher quality of life than older patients. This result was in line with

an Australian study that found younger CKD patients had a considerably higher quality of life than older ones (Brown et al., 2015). This result is in line with some research conducted in Palestine (Mousa et al., 2018; Zuoud et al., 2015), which found that worse HRQOL was linked to older age. Few Nepalese studies also reported poor Health related quality of life (QOL) and found that younger individuals had better chances of good QOL (Anu et al., 2014); (Mahato et al., 2020). The study discovered that women have lower PCS scores than men, which is consistent with earlier research (Manavalan et al., 2017; Wassef et al., 2018; Kamau et al., 2014; Veerappan et al., 2012). This could be related to variables such as lifestyle and nutrition, as well as the numerous domestic activities and responsibilities that women undertake. Female patients' lower HRQoL is more likely owing to an increased incidence of depressive illnesses and the numerous household duties they perform. Education level did not statistically correlate with PCS, MCS, or KDCS in this investigation. Higher educations may assist patients in better understand the nature of their disease and improve coping strategies for challenges related to hemodialysis treatment. There are several studies that show no connection to education at all (Al-Jumaih et al., 2011). Low QoL linked to lower academic achievement could be caused by CKD patient' need for proper knowledge on health management. Poor health outcomes and worse compliance can be caused by low health literacy (Taylor et al., 2018). Health education promotes active involvement in health management, which can enhance patients' quality of life (HRQOL). Yet studies conducted in Greece and Palestine has demonstrated that formal education is not linked to low HRQOL and that formal education has no discernible effect on mental and physical QOL ratings (Ikonomou et al., 2015; Zuoud et al., 2015).

Marital status was found to be relevant with kidney disease composite score (KDCS), but not with PCS or MCS, which is in line with finding from other studies (Taptagaporn et al., 2021; Manavalan et al., 2017; Vo et al., 2018, Al-Jumaih et al., 2011). This could be explained by the unmarried group's tiny sample size. A study in Egypt indicated a strong correlation between social class and both physical and mental QoL ratings, while income level was shown to be connected with KDCS but not with PCS or MCS (Wassef et al., 2018). Patients' HRQoL is impacted by the rising costs of treating chronic illnesses, making the support of friends, family, and caregivers essential for their well-being and ability to cope with the treatment process. Here, we identified that HRQoL, a crucial predictor of patient-focused outcomes, was lower in CKD patients, especially those nearing the end of the disease. This suggests that quality of life plays a substantial role in both positive and poor outcomes for those with this condition. The link between high BMI and greater quality of life is an exciting research. Patients with an underweight or normal BMI scored lower on the physical and mental composite summary subscale than those with an overweight. However, the kidney disease composite score was exactly opposite. It is plausible that greater BMI in the research we conducted is an indicator for better nutrition and wealth in the context of pervasive malnutrition and poverty. Tobacco use (smoking & smokeless tobacco) has been implicated in worse HRQoL in the present study. The cross-sectional Ethiopian study also found previous smoking to be independently associated with poorer PCS (Berhe et al. 2023).

CKD patients often have low physical activity levels, light exercise intensity, and walking as their primary exercise type. Factors such as education, and comorbidities are associated with these activity levels and exercise habits. The

study found that participants' HRQOL was higher in the low-intensity exercise group compared to the moderate-to-hard-intensity exercise group. The study also identified a significant positive association between physical activity levels and HRQOL in CKD patients. The WHO recommends older adults with chronic conditions engage in at least 150 minutes of moderate-intensity physical activity or 75 minutes of vigorous-intensity physical activity per week (WHO). However, the CKD participants in the study fell short (177.23 ±119.10) of these requirements. There are various reasons why CKD patients have low physical activity levels. First, they have lower physical function than the general population, such as impaired walking ability, cardiorespiratory function, and muscle strength. Second, a variety of impediments may hinder individuals from engaging in physical activity, including exhaustion, medical issues, a lack of a suitable site, and insufficient social support. Third, regular hemodialysis takes time, which limits physical activity in this population. Furthermore, physical activity was more strongly associated with the physical component (e.g., bodily function) than the mental component (e.g., role-emotional) of HRQOL. This could be because increased physical activity or exercise produces more bodily advantages than mental ones (Hu et al., 2024).

Conclusion

The study reflects the complex character of quality of life as well as the impact of demographic and socioeconomic factors on various components of the KDQOL scale. In this study, the overall mean score of PCS, MCS, KDCS and IPAQ Score was lower and below the standard. Age was significantly associated with all the three composite score of HRQoL. The study also found that MCS had the lowest HRQoL score (11.71±11.01) and SPKD had the highest (54.80±15.14). The symptom/problem list sub-scale had a summary score of 54.80 (15.14), and the effect of kidney disease was 37.36 (14.62), and the burden of kidney disease was 6.12 (9.72). In addition, education was only sociodemographic factors significantly associated with IPAQ.

Ethical Considerations

Participants were enrolled after approval from the Daffodil International University Research Ethics Committee. Participation was voluntary, with no additional cost, and they could withdraw at any time without affecting future medical care. The data collector explained the study and obtained informed consent before enrolment.

References

Alam MB, Khatoon F, Begum SA, et al. Assessment of quality of life of chronic kidney disease patients receiving Hemodialysis with kidney disease quality of life™-36 scale. Mymensingh Med J 2019; 28:906–13.

AL-Jumaih, A., Al-Onazi, K., Binsalih, S., Hejaili, F., & Al-Sayyari, A. (2011). A study of quality of life and its determinants among hemodialysis patients using the KDQOL-SF instrument in one center in Saudi Arabia. Arab journal of nephrology and transplantation, 4(3), 125–130.

Anand, S., Khanam, M., Saquib, J., Saquib, N., Ahmed, T., Alam, D. S., Cullen, M.

R., Barry, M., & Chertow, G. M. (2014). High prevalence of chronic kidney disease in a community survey of urban Bangladeshis: a cross-sectional study. Globalization and Health, 10(1), 9.

Anu V, Pushpa P, Kumar SS. Quaity of life of patients undergoing hemodialysis at B. P. Koirala institute of health sciences. J Manmohan Memorial Institute Health Sci. 2014;1(20):19–25.

Berhe T, Tegegne GT, Berha AB Quality of life and associated factors among chronic kidney disease patients at Zewditu Memorial and Tikur Anbessa Specialised Hospitals, Ethiopia: a cross-sectional study design BMJ Open 2023;13: e069712. doi: 10. 1136/bmjopen-2022-069712

Brown, Mark A; Collett, Gemma K.; Josland, Elizabeth A.; Foote, Celine; Li, Qiang; Brennan, Frank P. CKD in Elderly Patients Managed without Dialysis: Survival, Symptoms, and Quality of Life. Clinical Journal of the American Society of Nephrology 10(2): p 260-268, February 2015. | DOI: 10. 2215/CJN. 03330414

Clarkson, M. J., & Warmington, S. A. (2014). Exercise and chronic kidney disease: Current recommendations. Sports Medicine, 44(5), 547-565.

Cohen DE, Lee A, Sibbel S, et al. Correction to: use of the KDQOL-36™ for assessment of health-related quality of life among dialysis patients in the United States. BMC Nephrol 2019; 20:461.

Fructuoso, M., Castro, R., Oliveira, L., Prata, C., & Morgado, T. (2011). Quality of life in chronic kidney disease. Nefrologia: publicacion oficial de la Sociedad Espanola Nefrologia, 31(1), 91–96. https://doi. org/10. 3265/Nefrologia. pre2010. Jul. 10483

Hallal, P. C.; Victora, C. G. Reliability and validity of the International Physical Activity Questionnaire (IPAQ). Med. Sci. Sports Exerc. 2004, 36, 556.

Hu, H., Chau, P. H., & Choi, E. P. H. (2024). Physical activity, exercise habits and health-related quality of life in maintenance hemodialysis patients: a multicenter cross-sectional study. Journal of nephrology, 37(7), 1881–1891.

Ikonomou M, Skapinakis P, Balafa O, Eleftheroudi M, Damigos D, Siamopoulos KC. The impact of socioeconomic factors on quality of life of patients with chronic kidney disease in Greece. J Renal Care. 2015;41(4):239–46.

Johansen, K. L., & Painter, P. (2012). Exercise in individuals with CKD. American Journal of Kidney Diseases, 59(1), 126-134.

Kamau, E., Kayima, J., & Otieno, C. F. (2014). THE DETERMINANTS OF HEALTH-RELATED QUALITY OF LIFE OF PATIENTS ON MAINTENANCE HAEMODIALYSIS AT KENYATTA NATIONAL HOSPITAL, KENYA. East African medical journal, 91(10), 368–374.

Kefale B, Tadesse Y, Alebachew M, et al. Management practice, and adherence and its contributing factors among patients with chronic kidney disease at Tikur Anbessa Specialized Hospital. PLoS ONE 2018;13: e0200415.

Kim S, Nigatu Y, Araya T, et al. Health related quality of life (HRQOL) of patients with end stage kidney disease (ESKD) on Hemodialysis in Addis Ababa. Ethiopia: a cross-sectional study. BMC Nephrol 2021; 22:280.

Kim, J. C.; Young Do, J.; Kang, S. H. Comparisons of physical activity and understanding of the importance of exercise according to dialysis modality in maintenance dialysis patients. Sci. Rep. 2021, 11, 1–9.

Koufaki, P., & Kouidi, E. (2010). Current best evidence recommendations on measurement and interpretation of physical function in patients with chronic kidney disease. Sports Medicine, 40(11), 1005-1027.

Liou, Y. M.; Jwo, C. J.; Yao, K. G.; Chiang, L. C.; Huang, L. H. Selection of appropriate Chinese terms to represent intensity and types of physical activity terms for use in the Taiwan version of IPAQ. J. Nurs. Res. 2008, 16, 252–263.

Lu, J. F.; Tseng, H. T.; Tsai, Y. J. Assessment of health-related quality of life in Taiwan (I): Development and psychometric testing of SF-36 Taiwan version. Taiwan J. Public Health 2003, 22, 501–511

Mahato, S. K. S., Apidechkul, T., Sriwongpan, P. et al. Factors associated with quality of life among chronic kidney disease patients in Nepal: a cross-sectional study. Health Qual Life Outcomes 18, 207 (2020).

Manavalan, M., Majumdar, A., Harichandra Kumar, K. T., & Priyamvada, P. S. (2017). Assessment of health-related quality of life and its determinants in patients with chronic kidney disease. Indian journal of nephrology, 27(1), 37–43.

Michael, D., S. Fidelis, J., & Joseph Pakalomattom, S. (2022). Effect of Exercise on Health-Related Quality of Life in Patients with End-Stage Renal Disease. Multidisciplinary Experiences in Renal Replacement Therapy. doi: 10. 5772/intechopen. 101133

Mousa I, Ataba R, Al-ali K, Alkaiyt A, Zyoud SH. Dialysis-related factors affecting self-efficacy and qulity of life in patients on hemodialysis: a cross-sectional study from Plestine. Renal Replacement Therapy. 2018;4(21):1–12.

Seidu, S., Abdool, M., Almaqhawi, A. et al. Physical activity and risk of chronic kidney disease: systematic review and meta-analysis of 12 cohort studies involving 1,281,727 participants. Eur J Epidemiol (2023).

Sharma S, Kalra D, Rashid I, Mehta S, Maity MK, Wazir K, Gupta S, Ansari SA, Alruqi OS, Khan R, et al. Assessment of Health-Related Quality of Life in Chronic Kidney Disease Patients: A Hospital-Based Cross-Sectional Study. Medicina. 2023; 59(10):1788. https://doi. org/10. 3390/medicina59101788

Shumbusho, G., Hategeka, C., Vidler, M., Kabahizi, J., & McKnight, M. (2022, October 27). Health related quality of life of patients undergoing in-centre hemodialysis in Rwanda: a cross sectional study. BMC Nephrology, 23(1).

Stefanski A, Schmidt KG, Waldherr R, et al. Early increase in blood pressure and

diastolic left ventricular malfunction in patients with glomerulonephritis. Kidney Int 1996; 50:1321–6.

Taptagaporn, S., Mongkolsomlit, S., Rakkapao, N., Kaewdok, T., & Wattanasoei, S. (2021). Quality of life among patients Suffering from chronic kidney disease in chronic kidney disease clinic of Thailand. The Open Public Health Journal, 14(1).

Taylor, D. M., Fraser, S., Dudley, C., Oniscu, G. C., Tomson, C., Ravanan, R., Roderick, P., & ATTOM investigators (2018). Health literacy and patient outcomes in chronic kidney disease: a systematic review. Nephrology, dialysis, transplantation: official publication of the European Dialysis and Transplant Association - European Renal Association, 33(9), 1545–1558.

Tentori, F., Elder, S. J., Thumma, J., Pisoni, R. L., Bommer, J., Fissell, R. B., & Robinson, B. M. (2010). Physical exercise among participants in the Dialysis Outcomes and Practice Patterns Study (DOPPS): Correlates and associated outcomes. Nephrology Dialysis Transplantation, 25(9), 3050-3062.

Veerappan, I., Arvind, R. M., & Ilayabharthi, V. (2012). Predictors of quality of life of hemodialysis patients in India. Indian journal of nephrology, 22(1), 18–25.

Vo, Trung & Tran, Thai & Duong, Khanh & Pham, Khang. (2018). Impact of Chronic Kidney Disease on Health-Related Quality of Life: A Prospective Observational Study using the Kdq ol-36 Instrument. JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH. 12. 10. 7860/JCDR/2018/36694. 11708.

Wassef OM, El-Gendy MF, El-Anwar RM, El-Taher SM, Hani BM. Assessment of health-related quality of life of hemodialysis patients in Benha City, Qalyubia Governorate. Menoufia Med J 2018; 31:1414-21

World Health Organization. (2010). Global Recommendations on Physical Activity for Health. Geneva: WHO Press.

Wu B, Bell K, Stanford A, et al. Understanding CKD among patients with T2Dm: prevalence, temporal trends, and treatment patterns-NHANES 2007-2012. BMJ Open Diabetes Res Care 2016;4: e000154.

Wu, Y. -H., Hsu, Y. -J., & Tzeng, W. -C. (2022). Physical Activity and Health-Related Quality of Life of Patients on Hemodialysis with Comorbidities: A Cross-Sectional Study. International Journal of Environmental Research and Public Health, 19(2), 811. MDPI AG. Retrieved from

Zuoud SH, Daraghmeh DN, Mezyed DO, Khdeir RL, Sawafta MN, Ayaseh NA, et al. Factors affecting quality of life in patients on hemodialysis: a cross-sectional study from Palestine. BMC Nephrol. 2016;17(1):1–12.