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QUALITY OF LIFE OF HEMODIALYSIS PATIENTS AND ITS ASSOCIATED FACTORS IN TABUK, KSA

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ABSTRACT

BACKGROUND: This study aimed to assess the quality of life of hemodialysis patients and determine the impact of sociodemographic and clinical factors on patients' quality of life in Tabuk, Saudi Arabia.

METHODS AND MATERIALS: This cross-sectional study was conducted at King Salman Armed Forces Hospital in Tabuk City. The quality of life was assessed using a validated Arabic version of Kidney Disease Quality of Life Instrument-SF36 (KDQOL-SF36). The components of KDQOL-36 are Physical Component Summary (PCS), Mental Component Summary (MCS), Burden of Kidney Disease, Symptoms and Problem List, and Effects of Kidney Disease.

RESULTS: The total number of participants was 142. The mean age was 51.5±15.3 years; 43% were male, 71.1% were married, 10.6 % were employed, 25.4% were illiterate, 27.5% received hemodialysis for more than five years, and 44.4% had diabetes and hypertension. The mean domain scores of the PCS, MCS, Burden of kidney disease, symptoms, and problems list and effects of kidney disease subscales were 48.1±32.4, 62.6±27.8, 33.9±28.4, 72.8±13.8 and 66.7±16.8, respectively. The total score mean was 56.8±19.5. Advanced age, high body mass index, longer duration of dialysis, comorbidities, and widowed and divorced patients were significantly associated with low quality of life scores. Higher education levels and completion of the prescribed dialysis sessions were associated with high quality-of-life scores.

CONCLUSION: This study showed that sociodemographic and clinical factors can positively or negatively influence the quality of life of hemodialysis patients. Considering these factors is important to develop health care plans and outcomes.

Keywords: Hemodialysis, Kidney Disease, KSA, Quality of Life, Tabuk city.

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INTRODUCTION

Chronic Kidney Disease (CKD) is a serious health concern in the Kingdom of Saudi Arabia (KSA) .The prevalence in Saudi Arabia is estimated to be 9,892 per 100,000 people, which is higher than the estimates for Western Europe (5,446 per 100,000) and North America (7,919 per 100,000).[1] In 2019, there were 21,068 patients on renal replacement therapy, both hemodialysis and peritoneal dialysis; 19,522 patients on hemodialysis and 1,546 on peritoneal dialysis treatment. Hemodialysis is the most common management modality, as shown in that study .[2] Chronic kidney disease and its treatment modalities, such as dialysis, have a significant impact on patients' quality of life. Consequently, it limits their physical, mental, and social activities .[3] Quality of life (QOL) is defined as the impact of chronic kidney disease and its treatment on patients' perceptions of their own physical and mental function .[4] By which better QOL scores are associated with reduced morbidity and mortality .[5] Many instruments in different languages are used to assess QOL, such as the Kidney Disease Quality of Life Instrument (KDQOL-36), which is widely used to evaluate QOL in dialysis patients .[6] KDQOL-36 is a self-reported questionnaire that has five subscales ,which are physical component summary (PCS) and mental component summary (MCS), effects of kidney disease, symptoms and problems of kidney disease, and Burden of Kidney Disease[7] . KDQOL-36 is not only used for investigation purposes but also to define and change healthcare modalities. The quality of life of CKD patients is an important factor to consider when evaluating their care, as it can provide important data for comparing different treatment options and improving patient satisfaction and clinical outcomes .[8] Although numerous studies have been conducted on the quality of life of dialysis patients, there is a paucity of such studies in Saudi Arabia. Thus, this study aimed to evaluate the quality of life of hemodialysis patients and verify the association between patients' quality of life and their sociodemographic and clinical characteristics.

MATERIAL AND METHODS

The ethical approval was taken from the Research Ethical Committee in KSAFH (approval number 2022-462, Aug 10, 2022).

Study context and settings:

This descriptive cross-sectional study was conducted in one dialysis unit in Tabuk City, northwestern Saudi Arabia. The study was conducted from July to September 2022. The dialysis unit is located at the King Salman Armed Forces Hospital (KSAFH), which has 38 dialysis machines; two of them are used for isolated patients, and one is used for emergencies. Dialysis sessions are divided into three shifts: morning, afternoon, and evening, with 5 hours for each shift, from Saturday to Thursday.

Data collection

There are three dialysis centers in Tabuk City: the dialysis center at King Fahad Specialist Hospital, King Khalid Hospital, and King Salman Armed Forces Hospital (KSAFH). By simple random sampling, one center was chosen, which is the dialysis unit in KSAFH. Using the Single-stage cluster sampling, all patients were dialyzing at this unit included in the study according to the

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inclusion and exclusion criteria. Patients included in this study were over 18 years of age, had been on dialysis for at least three months, and patients who had diabetes or hypertension, while the excluded patients were under 18 years of age, had been on dialysis less than three months, and patients diagnosed with cognitive dysfunction, coexisting morbidities such as chronic liver diseases, malignancy, multi-organ system failure or HIV. A total of 226 patients are dialyzing in this unit.

After applying exclusion criteria,142 patients remained and were recruited for this study. Data collection was conducted by the researchers on patients undergoing hemodialysis by using the kidney disease quality of life-36 questionnaire (KDQOL-36). The objectives of the study were explained to the patients, and informed consent was taken from them. Then, they were given the KDQOL-36 questionnaire (an electronic survey). The time required to fill out the questionnaire was approximately 5-7 min. The researchers clarified and read the questions for patients who were not educated and noted down their responses, considering not to influence the patients' responses.

Data collection tool

Data collection was conducted through questionnaires and records review. The records review for laboratory data and weight and height for BMI calculation; the formula for BMI is weight in kilograms divided by height in meters squared .The questionnaire had two sections: the first was concerned with sociodemographic and clinical data ,comprised of the following variables: age, gender, marital, educational, and employment status, besides the comorbidities and dialysis details. The second section of the questionnaire consisted of the KDQOL-36, which was created by RAND and the University of Arizona and validated to assess the quality of life among patients with renal disease. [7] It is a short version of KDQOL-SF that includes only 36 questions and is divided into two categories: The first 12 questions assess the Physical Component Summary (PCS) scale (items 1–5 and 8) and Mental Component Summary (MCS) scale (items 6, 7and 9–12). The remaining 24 questions assess the burden of the kidney disease scale (items 13–16), symptoms and problems of the kidney disease scale (items 17–28), and the effect of the kidney disease scale (items 29–36). The PCS includes the following items: physical function, physical role, pain, and general health. The MCS includes emotional role, emotional well-being, energy, and social function. The responses were rated from 0 to 100, and high scores indicate a better quality of life. The questionnaire is available in different languages, including Arabic language. The formal Arabic version of KDQOL-36 used in this study has been validated and reported excellent internal validity and reliability with Cronbach's alpha coefficient of 0.81. And it has a good conceptual equivalence with the English original version [9].

Data analysis

Data were analyzed using IBM SPSS statistics version 20 (SPSS Inc., Chicago, IL). Quantitative data were described as mean ± standard deviation (SD), median, and range,

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while qualitative data were represented as numbers and percentages. For analysis of KDQOL-36 subscales as regards to different associated factors, the Mann- Whitney test (non-parametric t-test) was used for comparison between two groups, and the Kruskal Wallis test (non-parametric t-test) was done for more than two groups. The Spearman-Rho method was used to test the correlation between KDQOL-36 subscales and other numerical parameters. A p-value < 0.05 was considered significant.

RESULTS

A total of 142 patients were included in this study. Their sociodemographic, clinical characteristics and laboratory findings are shown in Table 1. The age mean ± standard deviation (SD) was 51.5±15.3 years; 43% of the respondents were men. Among the studied patients, 71.1% were married, 10.6% were employed, and 25.4% were uneducated. The mean weight in Kg was 68.2±16.8, the mean height in cm was 159.5 ± 9.2, and the mean body mass index (BMI) was 26.8±6.5. According to the dialysis profile, 27.5% of patients were on hemodialysis for more than five years. 31.7% of patients dialyzing in the morning shift, 33.8% in the afternoon, and 34.5% in the evening. 62% of patients had permanent catheter access for blood draw, while 31% were on arterio-venous fistula, and 7% were on arterio-venous graft. The majority of the patients had hemodialysis three times a week, and 83.1% of patients stayed for a full prescribed time of the dialysis sessions (four hours). Regarding the comorbidities, 44.4% of patients had both diabetes and hypertension, While 7% had diabetes mellitus only, and 32.4% had hypertension only. For the laboratory tests results, the mean score is for urea reduction rate (%) 66.2±11.2, for serum albumin (g/L) 39.3±3.5, for serum creatinine (µmol/L), 366.1±183.3, for serum sodium (mmol/L) 135.7±8.8, for serum potassium (mmol/L) 4.4±4.3, and for serum Hemoglobin (g/dl) 10.3±1.1) Table 2 (shows the mean and SD of KDQOL- 36 domains. To clarify, higher scores of subscales reflect better quality of life. The mean score of the PCS scale was 48.1±32.4. The highest score on its subscales was the Bodily pain, 70.4±29.9 and the lowest was the physical role 31.3± .29.9The mean score on the MCS scale was 62.6± ,27.8 with the emotional role being the highest score 67.6±45.8 ,and Vitality the lowest score 46.8±29.2 .Symptom/problem list mean score was 72.8 .13.8±The mean scores of the Burden of Kidney Disease and Effect of Kidney Disease were 33.9±28.4 and 66.7 ,16.8±respectively. The overall KDQOL- 3 6domains score mean was 56.8± 19.5

The correlation between either of MCS, PCS, Burden of Kidney Disease, Symptom/problem list, and Effect of Kidney Disease and patients' characteristics was assessed in (Table 3). Patients older than sixty years scored worse on PCS, MCS, Burden of kidney disease, and Effect of kidney disease than younger patients. PCS, burden of kidney disease, and effect of kidney disease scores were significantly affected by the marital status, in which widowed and divorced patients had lower scores. All scores were significantly higher among patients with secondary school

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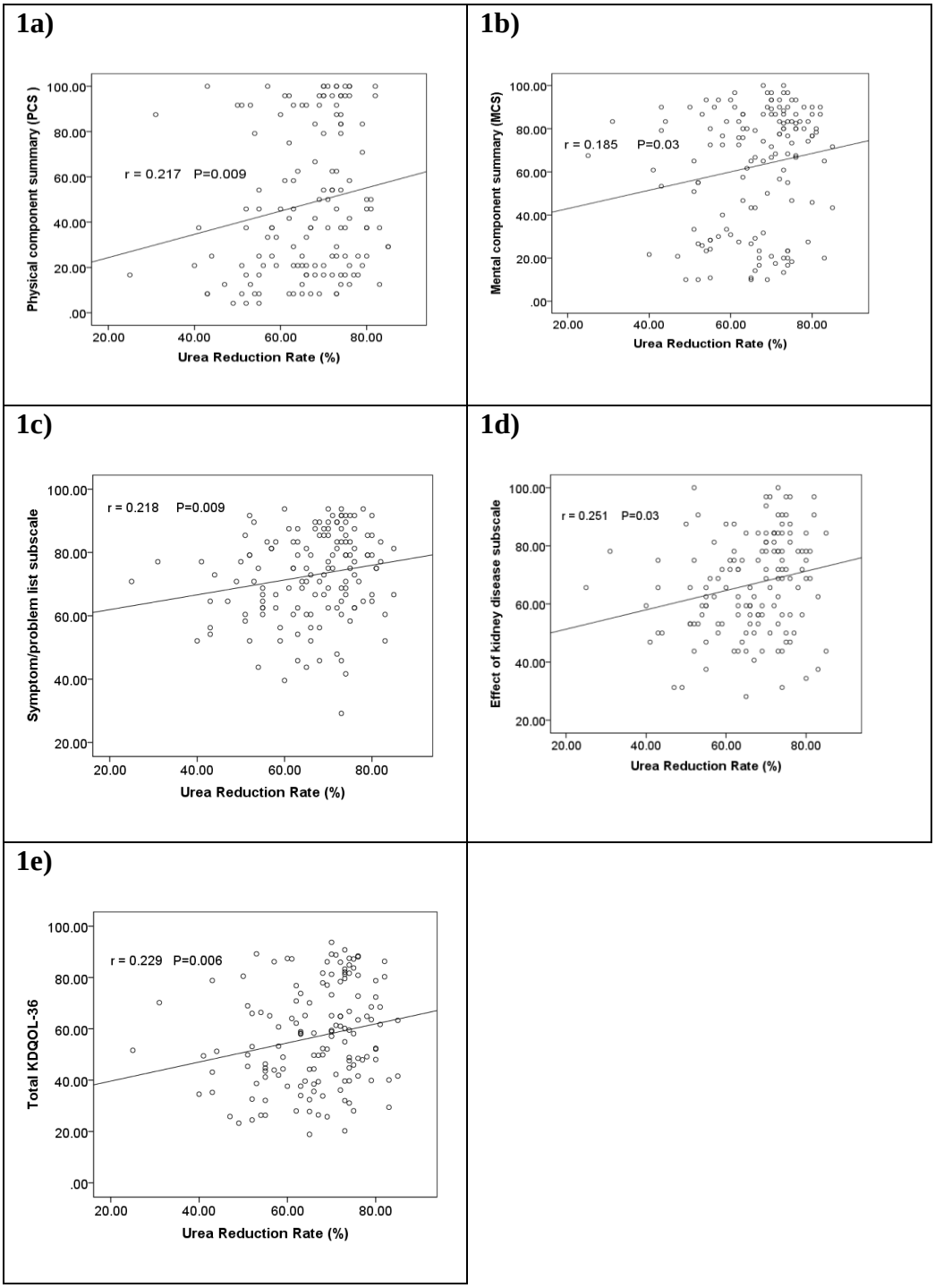

Figure (1): Scatter plots to describe correlation between Urea Reduction Rate (URR) and KDQOL-36 subscales of studied patients.

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or above. Regarding the comorbidities, there were significant low scores found in patients with both diabetes and hypertension. Patients who stayed for full time of the dialysis sessions had higher scores in PCS, MCS, Burden of kidney disease and Effect of kidney disease. In our study, gender, employment status, BMI, dialysis duration, access type, number of sessions, and dialysis shifts had no significant correlation with QOL domains (P >0.05).

The Spearman correlation between KDQOL-36 subscales and patients' characteristics was assessed, and some statistically significant associations were revealed in (Table 4). There was a significant correlation between the quality of life score and age, BMI, level of education, and duration of dialysis (P<0.05). A negative correlation was observed between the age and PCS, Burden of kidney disease, Effect of kidney disease, and Symptoms problem list subscales. A significant negative correlation was observed between the body mass index and the burden of the kidney and the effect of kidney disease subscales. Also, a negative correlation was found between the duration of dialysis and PCS. In other words, older age, high BMI, and longer duration were associated with lower QOL scores. On the other hand, a positive correlation was found between the level of education and KDQOL-36 subscales.

This research found a moderately positive correlation between the KDQOL-36 subscales scores and urea reduction rate (r = 0.229), as illustrated in Figure 1. The urea reduction rate is the treatment-related reduction of serum urea concentration during

Parameter	**Total studied patients(No.=142)**
Age (year)	
Mean±SD	51.5±15.3
Median (Range)	52.5 (19 – 82)
Gender	
Male	61 (43.0%)
Female	81 (57.0%)
Weight (Kg)	
Mean±SD	68.2±16.8
Median (Range)	67.5 (34 – 119)
Height (Cm)	
Mean±SD	159.5±9.2
Median (Range)	160 (112 – 192)
BMI	
Mean±SD	26.8±6.5
Median (Range)	26.1 (13.4 – 49.3)
Marital status	
Single	22 (15.5%)
Married	101 (71.1%)
Widow	17 (12.0%
Divorced	2 (1.4%)
Educational level	
Illiterate	36 (25.4%)
Primary	33 (23.2%)
Preparatory	16 (11.3%)
Secondary	29 (20.4%)
Bachelor/Diploma	26 (18.3%)
Master	2 (1.4%)
Occupations	
Student	2 (1.4%)
Employed	15 (10.6%)
Unemployed	79 (55.6%)
Retired	46 (32.4%)
Duration of hemodialysis (month)	23 (16.2%)
3 – 12	37 (26.1%)
12 – 36	43 (30.3%)
36 – 60	39 (27.5%)
≥60	
Dialysis shift	
Morning	45 (31.7%)
Afternoon	48 (33.8%)
Evening	49 (34.5%)

Table 1a: Sociodemographic, clinical characteristics and laboratory findings of studied patients

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dialysis. It is used to assess the dialysis adequacy. For adequate hemodialysis, a minimum URR of 65% to 70% is recommended [10]. In other words, a higher percentage of URR for dialysis adequacy was associated with higher QOL scores.

DISCUSSION

In this study, the mental component summary scored better than the physical component summary. This was in line with other studies that have measured the QOL of hemodialysis patients in Saudi Arabia [6,11]. This can be explained by two factors: firstly, the strong family ties among the Saudi population. Secondly, the religious beliefs that help hemodialysis patient to accept their illness and cope with it. Our study showed that patients aged 60 years or older had lower QOL scores. These findings were in agreement with a study that reported an association between low QOL scores and older age [12]. This may be attributed to the fact that elderly patients have more comorbidities and inadequate social interactions. Consequently, it affects their physical, mental, and other QOL scores. As for the presence of comorbidities, a high proportion of patients with hypertension and diabetes, both or only one, was observed in this study. The finding of our study was consistent with another study through which the comorbidities negatively impacted the QOL [13]. The relationship between education and QOL is controversial in the literature. Some studies reported that there is no significant association between education level and QOL scores [6]. Another study has stated that a high education level associated with better QOL scores [11]. Which is

Parameter	**Total studied patients (No.=142)**
Number of dialysis session /week	
Once	3 (2.1%)
Twice	12 (8.5%)
Three time	127 (89.4%)
Dialysis access type	
Permanent catheter	88 (62.0%)
Arterio-venous fistula	44 (31.0%)
Arterio-venous graft	10 (7.0%)
Completion of dialysis duration (4hours)	
Yes	118 (83.1%)
Sometimes	19 (13.4%)
No	5 (3.5%)
Co-morbidity	
No	23 (16.2%)
Diabetes Mellitus	10 (7.0%)
Hypertension	46 (32.4%)
Both DM and hypertension	63 (44.4%)
Urea Reduction rate (%)	
Mean±SD	66.2±11.2
Median (Range)	69 (25 – 85)
Serum Albumin (g/L)	
Mean±SD	39.3±3.5
Median (Range)	40 (25 – 46)
Serum Creatinine (µmole/L)	
Mean±SD	366.1±183.3
Median (Range)	321 (104 – 927)
Serum sodium (mmol/L)	
Mean±SD	135.7±8.8
Median (Range)	136 (37 – 146)
Serum Potassium (mmol/L)	
Mean±SD	4.4±4.3
Median (Range)	3.9 (2.9 – 43.0)
Serum Hemoglobin (g/dl)	
Mean±SD	10.3±1.1
Median (Range)	10.1 (8.1 – 13.9)

Table 1b: Sociodemographic, clinical characteristics and laboratory findings of studied patients

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consistent with our study findings in which education has a positive impact on the total QOL score. This may be related to the fact that educated patients are aware of their own health, medications, dietary requirements, and restrictions. This makes them more capable of making lifestyle changes and dealing with their disease. Many studies claimed that there is no significant correlation between marital status and QOL [14,15]. While our study found that widowed and divorced patients had significantly lower QOL scores. It is inferred that these patients are responsible for their families and they do not have a partner to support them, which places a burden on them. Patients who shortened their dialysis sessions time and leave early had lower quality of life scores. This was in line with a study reported that the QOL scores were significantly lower in non-compliant patients compared to compliant patients [16]. This attributed to the fact that normally the kidneys work 24 hours a day, 7 days a week, which means the kidneys filter blood 168 hours a week. In this study the patients are on 4-hours hemodialysis three times a week which means their blood is filtered only 12 hours a week, so every minute counts. A reverse correlation between the QOL score and the dialysis duration was observed in this study. A similar observation was seen in another study [17]. This is reasonable due to the burden of hemodialysis sessions on the patients. The body mass index (BMI) had a negative correlation with QOL. This was in agreement with a study reported that obese patients had significantly lower QOL scales than patients with normal weight or

Parameter	**Total studied patients (No.=142)**
Physical component summary (PCS) Mean±SD Median (Range)	 48.1±32.4 37.5 (4.2 – 100)
1-Physical functioning (PF) Mean±SD Median (Range)	 47±40.8 50(0-100)
2-Role physical (RP) Mean±SD Median (Range)	 31.3±29.9 0(0-100)
3-Bodily Pain (BP) Mean±SD Median (Range)	 70.4±29.9 75(0-100)
4-General health (GH) Mean±SD Median (Range)	 61.4±24.3 75(0-100)
Mental component summary (MCS) Mean±SD Median (Range)	 62.6±27.8 72.9 (10 – 100)
1-Mental Health (MH) Mean±SD Median (Range)	 63.8±20.4 70(10-100)
2- Role emotional (RE) Mean±SD Median (Range)	 67.6±45.8 100(0-100)
3-Social functioning (SF) Mean±SD Median (Range)	 66.4±38.4 75(0-100)
4-Vitality (VT) Mean±SD Median (Range)	 46.8±29.2 40(0-100)
Burden of kidney disease subscale Mean±SD Median (Range)	 33.9±28.4 28.1 (0 – 100)
Symptom/problem list subscale Mean±SD Median (Range)	 72.8±13.8 75 (29.2 – 93.7)
Effect of kidney disease subscale Mean±SD Median (Range)	 66.7±16.8 67.2 (28.1 – 100)
Total KDQOL-36 Mean±SD Median (Range)	 56.8±19.5 56 (18.9 – 93.7)

Table 2 . The Kidney Disease Quality of Life Short Form 36 (KDQOL-36) subscales of studied patients

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Parameter	No	PCS	MCS	Burden of kidney disease subscale	Symptom/problem list subscale	Effect of kidney disease subscale
		Median(Range)	Median(Range)	Median (Range)	Median(Range)	Median(Range)
Age (year)						
18-39	37	62.5(12.5-100)	74.2(16.7-96.7)	37.5(0-100)	77.1(39.6-93.7)	63.6(25.8-93.7)
40-59	57	45.8(4.2-100)	76.7(10-100)	31.2(0-93.7)	75(43.7-93.7)	61.4(18.9-89.1)
≥60	48	22.9(4.2-100)	63.7(10-93.3)	12.5(0-87.5)	69.8(29.2-89.6)	46.7(20.2-89.2)
P value		<0.001*	0.04*	<0.001*	0.06	0.008*
Gender						
-Male	61	41.7(4.2-100)	72.5(10-100)	31.2(0-93.7)	75(41.7-93.7)	65.6(31.2-100)
-Female	81	37.5(4.2-100)	73.3(10-96.7)	25(0-100)	75(29.2-93.7)	68.7(28.1-96.9)
P value		0.43	0.80	0.46	0.94	0.67
BMI						
-Underweight	12	66.7(4.2-100)	78.3(20.8-93.3)	28.1(0-93.7)	71.8(60.4-91.7)	73.4(34.4-96.9)
-Normal	44	41.7(8.3-100)	79.2(10-100)	34.4(0-93.7)	77.1(39.6-93.7)	71.9(31.2-100)
-Overweight	51	37.5(4.2-100)	66.7(10-100)	25(0-100)	72.9(45.8-93.7)	65.6(31.2-96.9)
-Obese	35	37.5(4.2-100)	68.3(10-96.7)	18.7(0-81.2)	72.9(29.2-91.7)	92.5(28.1-100)
P value		0.46	0.53	0.33	0.68	0.14
Marital status						
Single	22	83.3(12.5-100)	76.7(13.3-100)	34.4(0-93.7)	76(39.6-93.7)	78.1(45.9-96.9)
Married Widow/Divorced	101	37.5(4.2-100)	74.2(10-100)	31.2(0-100)	75(29.2-93.7)	68.7(28.1-100)
	19	20.8(8.3-91.7)	57.5(10-96.7)	6.2(0-75)	66.7(52.1-93.7)	59.4(40.6-87.5)
P value		0.001*	0.15	0.004*	0.60	0.04*
Educational level						
-Below secondary school	85	25(4.2-100)	71.7(10-100)	25(0-87.5)	70.8(29.2-93.7)	62.5(28.1-96.9)
-Above secondary school		54.2(8.3-100)	76.7(13.3-100)	37.5(0-100)	79.2(39.6-93.7)	75(31.2-100)
P value	57	<0.001*	0.02*	<0.001*	0.002*	0.001*
Occupations						
-Employed	15	62.5(16.7-100)	75.8(13.3-96.7)	50(0-93.7)	75(41.7-91.7)	71.8(50-90.6)
-Unemployed	81	37.5(4.2-100)	73.3(10-96.7)	31.2(0-100)	75(29.2-93.7)	68.7(28.1-96.9)
- Retired	46	37.5(4.2-100)	72.5(10-100)	25(0-87.5)	70.8(45.8-93.7)	64.1(37.5-100)
P value		0.13	0.95	0.22	0.96	0.57
Duration of hemodialysis (month)						
3 – 12						
12 – 36	23	54.2(4.2-100)	77.5(10-96.7)	25(0-87.5)	75(45.8-93.7)	71.9(43.7-96.9)
36 – 60	37	50(4.2-100)	76.7(10-100)	31.2(0-93.7)	77.1(29.2-93.7)	68.7(31.2-100)
≥60	43	41.2(8.3-100)	76.7(10-100)	25(0-81.2)	75(39.6-93.7)	65.6(28.1-96.9)
	39	37.5(4.2-100)	55(10-93.3)	31.2(0-100)	70.8(52.1-93.7)	65.6(31.2-100)
P value		0.17	0.23	0.96	0.76	0.72
Co-morbidity						
-No	23	79.2(8.3-100)	80(20.8-96.7)	56.2(0-100)	77.1(45.8-93.7)	78.1(31.2-96.9)
-DM	10	52.1(37.5-100)	77.9(28.3-100)	37.5(12.5-75)	79.2(64.6-93.7)	78.1(62.5-100)
-Hypertension	46	43.7(4.2-100)	80(10.8-96.7)	37.5(0-93.7)	75(39.6-93.7)	68.7(31.2-100)
-Both DM and hypertension	63	25(4.2-100)*	61.7(10-100)*	12.5(0-87.5)*	68.7(29.2-91.7)*	59.4(28.1-96.9)*
P value		<0.001*	0.002*	<0.001*	0.005*	0.003*
Dialysis shift						
-Morning	45	37.5(4.2-100)	71.7(10.8-96.7)	31.2(0-93.7)	75(43.7-91.7)	68.7(31.2-90.6)
-Afternoon	48	37.5(8.3-100)	77.1(10-100)	28.1(0-93.7)	80.2(39.6-93.7)	71.8(28.1-100)
-Evening	49	37.5(4.2-100)	72.5(10 -100)	25(0-100)	68.7(29.2-93.7)	62.5(31.2-100)
P value		0.52	0.85	0.61	0.06	0.38
Dialysis access type						
-Permanent catheter	88	37.5(4.2-100)	73.7(10-100)	31.2(0-100)	73.9(29.2-93.7)	65.6(28.1-100)
-Arterio-venous fistula	44	45.8(8.3-100)	70(10-96.7)	31.2(0-87.5)	79.2(43.7-91.7)	75(31.2-96.9)
-Arterio-venous graft	10	39.6(12.5-87.5)	77.5(10.8-100)	18.7(0-75)	69.8(41.7-89.6)	65.6(37.5-84.4)
P value		0.21	0.85	0.42	0.19	0.36
Number of dialysis session/week						
-Once						
-Twice	3	20.8(16.7-87.5)	67.5(21.7-83.3)	25(18.7-37.5)	70.8(52.1-77.1)	65.6(59.4-78.1)
-Three time	12	22.9(4.2-100)	55(10.8-90)	15.6(0-75)	64.6(54.2-91.7)	56.2(31.2-100)
	127	41.7(4.2-100)	75.8(10-100)	31.2(0-100)	75(29.2-93.7)	68.7(28.1-100)
P value		0.08	0.19	0.36	0.26	0.20
Completion of dialysis duration						
-Yes	118	45.8(4.2-100)	76.7(10-100)	31.2(0-100)	75(29.2-93.7)	71.9(28.1-100)
-Sometimes	19	16.7(4.2-91.7)	55(10-90)	6.2(0-87.5)	66.7(43.7-89.6)	53.1(31.2-90.6)
-No	5	20.8(4.2-37.5)	21.7(10-83.3)	18.7(0-25)	70.8(52.1-77.1)	46.9(31.2-59.4)
P value		<0.001*	0.01*	0.02*	0.09	0.001*

Table 3 . Relationship between KDQOL-36 subscales and sociodemographic data and dialysis details of studied patients

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Parameter	PCS	MCS	Burden of kidney disease subscale	Symptom/problem list subscale	Effect of kidney disease subscale	Total KDQOL-36
	r P value	r P value	r P value	r P value	r P value	r P value
Age (year)	-0.400 <0.001*	-0.163 0.06	-0.360 <0.001*	-0.202 0.02*	-0.257 0.002*	-0.336 <0.001*
BMI	-0.150 0.07	-0.098 0.25	-0.168 0.04*	-0.074 0.38	-0.209 0.01*	-0.164 0.06
Educational level	0.349 <0.001*	0.184 0.03*	0.311 <0.001*	0.255 0.002*	0.277 0.001*	0.322 <0.001*
Duration of hemodialysis (month)	-0.171 0.04*	-0.161 0.06	-0.041 0.63	-0.088 0.30	-0.078 0.36	-0.122 0.15

Table 4 . Spearman correlation between KDQOL-36 subscales and some of the patients factors.

moderately high BMI [18]. This could be explained by that the fact that obesity is always combined with several debilitating diseases, which increase the effect and burden of kidney diseases on a patient's life. Higher URR percentage for dialysis adequacy was associated with better QOL score. Similarly, a study demonstrated a significant positive correlation between dialysis adequacy and quality of life scores [19]. Patients on adequate dialysis means they have less fluid, body swelling and toxins, which makes them, feel better and more energetic. In this study the impact of gender on QOL was insignificant, unlike a study reported that males have worse QOL scores than females [20]. A previous study claimed that the effect of gender on the quality of life was the result of a gender bias, in which female patients received better care and had more support from their families [14]. This statement does not apply on our study population, despite gender differences the patients received the same quality of care and both genders were supported by their families.

Considering that the study was conducted at one center in Tabuk city, the sample size is not representative of all hemodialysis patients in Tabuk. Furthermore, the study was cross-sectional and did not allow for a causal relationship between quality of life and sociodemographic and clinical variables. However, this study evaluated the association between biochemical parameters and dialysis adequacy and QOL. In addition, an electronic survey that facilitates the detection of missing items was used.

CONCLUSION

The current study provides a good understanding of the sociodemographic, clinical, and dialysis factors that are associated with QOL of hemodialysis patients in Tabuk city. Advanced age, high body mass index, longer duration of dialysis, comorbidities, widowed and divorced

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patients adversely affected the quality of life of hemodialysis patients. Higher education levels and completion of dialysis session duration found to be associated with better quality of life.

We recommend that QOL should be an essential component of the routine evaluation of all hemodialysis patients. Therefore, appropriate interventions should be carried out to enhance patients' outcomes, develop the health care plans, and help the patients achieve better quality of life. Also, there is a need to do further studies in larger sample of hemodialysis patients in Tabuk city.

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CONFLICT OF INTEREST

The authors have no conflict to declare.

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