

## Quality of life of patients with End Stage Renal Disease at Tripoli, Libya

Emtair A<sup>1</sup>, Elhamadi M<sup>2</sup>, Buni H<sup>2</sup>

<sup>1</sup> National Heart Center, Tripoli, Libya

<sup>2</sup> Department of Family and Community Medicine, Faculty of Medicine, University of Tripoli, Tripoli, Libya

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### Abstract:

**Background:** End stage renal disease is a chronic disease that exerts a great negative impact on patients' health-related quality of life.

**Objectives:** To assess the health related quality of life (HRQOL) of adult Libyan patients undergoing hemodialysis and to explore the association between the HRQOL and patients' sociodemographic and clinical characteristics

**Materials and Methods:** A descriptive cross-sectional study was carried out at hemodialysis unit in the National Heart Center, Tripoli. QOL was assessed using the WHOQOL-BREF questionnaire. Analysis was performed using SPSS (version 22) package. Appropriate inferential statistics was used with 0.05 level of significance.

**Results:** The mean scores were low for the four QOL subdomains (56.58±12.67), the physical domain was the most affected (53.45±15.98) and the social domain was the least affected (60.33±19.96). There was significant positive association between educational level, working status, and hemoglobin level with QOL (P= 0.001, P=0.025, P=0.027 respectively). Multiple linear regression revealed that high level of education was the only predictor for QOL in this study (P=0.003).

**Conclusion:** Patients with chronic kidney disease on dialysis had an overall low QOL and low scores of the four domains. The highest QOL score was for the social and psychological domains and the lowest was for the physical domain and environmental domains. Higher level of education, working status, and hemoglobin level were the significant factors that affected the QOL. High level of education was the only positive predictor for QOL.

**Key Word:** Hemodialysis, Quality of life, WHOQOL-BREF, Libya

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### I. Introduction

The prevalence and incidence of end stage renal disease (ESRD) is increasing worldwide <sup>(1)</sup>, the incidence of Chronic kidney disease (CKD) in North Africa countries is also increasing; incidence rate of end stage CKD in Egypt was 192 Per Million Population (PMP), Libya 90 PMP, Tunisia 159 PMP, Algeria 120 PMP, and morocco 125 PMP <sup>(2)</sup>.

Rates of CKD vary widely from one geographical area to another due to genetic and environmental factors <sup>(3)</sup>.

End stage renal failure is a chronic disease that exerts a great negative impact on patients' HRQOL mainly due to the accompanied impairment or to the imposed limitations in almost all domains of their daily lives <sup>(4)</sup>. Certain factors such as patient's age, gender, level of education, marital state, income, social support, anemia, associated diseases appear to have an impact on the QOL of those patients <sup>(5)</sup>.

The hemodialysis patients have higher morbidity, multiple hospitalizations, treatment complications, such as vascular access failure, considerable cost, lower QOL and higher mortality <sup>(6)</sup>.

The QOL of hemodialysis patients is significantly affected; there is a change in their life style and habits that affects them and their families. Additionally, their physical health, personal relationships and their social and economic status are greatly affected <sup>(7)</sup>.

Assessment of HRQOL is a predictive indicator of the outcome of the disease as well as a valuable research tool in assessing the effectiveness of therapeutic intervention, patients' survival and hospitalizations <sup>(8)</sup>. Several studies have suggested that regular HRQOL monitoring becomes part of regular ESRD patient assessment and incorporated into the continuous quality assurance and quality improvement systems <sup>(9)</sup>. However, to the best of our knowledge, no studies have been conducted to evaluate the QOL of patients with CKD in Tripoli, Libya. The objectives of this study were to assess the HRQOL of adult patients undergoing hemodialysis at the dialysis unit in the National Heart Center in Tripoli-Libya and to explore the association between the HRQOL and patients' socio-demographic and clinical characteristics.

## **II. Material And Methods**

This was a cross-sectional study carried out in the hemodialysis unit at the National heart center in Tripoli-Libya during the period from November 2018 to March 2019. The hemodialysis Unit contains 20 dialysis machines in use, which serve 115 ESRD patients. There are three daily shifts for dialysis, covering six days per week. All ESRD patients receive three weekly hemodialysis sessions and each session lasts for about four hours. Included patients were adult Libyan patients over 18 years of age, diagnosed as ESRD and had been on regular hemodialysis for at least three months. Patients were excluded if they were younger than 18 years of age, have had hemodialysis for a period of less than three months, not being able to understand (e.g., dementia or mentally retarded) and those who refused to participate.

At the time of initiation of the study, there were 115 patients undergoing hemodialysis at this Hemodialysis Unit. Of whom, 100 patients met the inclusion criteria and agreed to participate in the study. Visits were organized in an order that allowed all three shifts to be included in the study and to interview every patient attending the hemodialysis unit.

Data was collected; using a structured interviewing questionnaire included the socio-demographic characteristics, lifestyle habits and the type of health insurance. Patients' records of interviewed patients and data were transferred using transfer sheet. Data obtained include: duration of dialysis, underlying kidney disease, and levels of hemoglobin, serum creatinine, and serum urea.

Patient's weight was measured using a pre-calibrated electronic weighing scale. Calibration was performed daily. The scale was put on a firm flat surface and the patient was dressing light clothes, barefooted, facing forward and standing still. Weight was recorded to the nearest 100 gm. Height was measured with the participant is standing upright against a wall on which a height measuring device was affixed, and head in the Frankfort position with heels together. The measurement was recorded to the nearest 1 cm.

To assess the QOL, the translated Arabic version of WHO's QOL (WHOQOL-BREF) questionnaire was used. This instrument derived from the WHOQOL-100. The WHOQOL-BREF questionnaire consists of 26 questions each with 5 possible responses<sup>(10)</sup>. It contains 2 items that were asked separately, question 1 asked about an individual's overall perception of QOL, and question 2 asked about an individual's overall perception of their health. The other 24 items asked about satisfaction and are divided into 4 domains, physical health domain with 7 items; psychological health domain with 6 items; social relationships domain with 3 items; and environmental health domain with 8 items<sup>(10)</sup>. The Arabic version of the WHOQOL-BREF has been used among people with diabetes and found to have adequate psychometric properties<sup>(11)</sup>.

Each item of the WHOQOL-BREF is scored from 1 to 5 on a response scale. Raw domain scores for the WHOQOL were transformed to a 4-20 score according to the guidelines<sup>(12)</sup>. The mean score of items within each domain is used to calculate the domain score. After the scores have been computed, they were transformed linearly to a 0-100-scale. The four domain scores denoted an individual's perception of QOL in each particular domain. Domain scores were scaled in a positive direction (i.e. higher scores denoted higher QOL)<sup>(13)</sup>.

### **Statistical analysis:**

Analysis was performed using SPSS package Version 22. Results were presented as frequencies and percentage or as mean  $\pm$  SD. For comparative purposes, student-t and ANOVA tests were used in bivariate analysis to determine factors contribute to low QOL score. Correlations test between two continuous variables were performed using Pearson correlation coefficient if both variables followed a normal curve and Spearman correlation coefficient if both variables did not follow the normal curve. In order to control simultaneously for possible confounding effect of the variables, multiple linear regression analysis was used to identify factors that could be associated with QOL. Factors included in the model are those showed significant association with the total QOL percent score in bivariate analysis using student -t test and bivariate correlation. Analysis was performed at  $P < 0.05$  level of statistical significance.

### **Ethical consideration:**

All the necessary permissions for carrying out the research were obtained. Prior to the interview, an explanation of the purpose of the research was provided to the patients before filling the questionnaire. Complete confidentiality was ensured and verbal informed consent was obtained.

## **III. Result**

A total of 100 patients with ESRD were participated in the study, with a mean age of  $49.79 \pm 15.039$  years, most of them were men (67%), and more than a half of the patients (57%) were nonsmokers as presented in Table 1 with other socio-demographic characteristics.

**Table 1: Socio-demographic characteristics**

Character	Number	%
<b>Gender:</b>		
Male	67	67%
Female	33	33%
<b>Age (years):</b>		
<30	8	8%
30 – 40	26	26%
41 – 50	16	16%
51 – 60	22	22%
>60	28	28%
<b>Education:</b>		
Illiterate / Read and write	18	18%
Primary / Preparatory	24	24%
Secondary	38	38%
University or higher	20	20%
<b>Marital status:</b>		
Single	25	25%
Married	72	72%
Widow	3	3%
<b>Residence:</b>		
Tripoli	93	93%
Outside Tripoli	7	7%
<b>Type of housing:</b>		
Ownership house	90	90%
Rent house	10	10%
<b>Occupation:</b>		
Currently working	35	35%
Not working	14	14%
Retired	22	22%
Student	9	9%
House wife	20	20%
<b>Income:</b>		
Sufficient	35	35%
Insufficient	65	65%
<b>Health insurance:</b>		
Yes	11	11%
No	89	89%
<b>Smoking history</b>		
Smoker	13	13%
Not smoker	57	57%
Ex- Smoker	30	30%

With respect to the clinical, and laboratory parameters of the participated cases, 60% of the cases were hypertensive 16% were obese and vast majority of patients were anemic (99%) (Table 2).

**Table 2: Clinical, and laboratory parameters**

	Number	%
<b>Etiology of CRF</b>		
Hypertension	60	60
Chronic glomerulonephritis	3	3
Chronic pyelonephritis	3	3
Obstructive uropathies	3	3
Diabetic nephropathy	5	5
Adult kidney polycystic disease	14	14
Unknown etiology	11	11
Mixed	21	21
<b>BMI</b>		
Underweight	7	7%
Normal	46	46%
Overweight	31	31%
Obesity	16	16%
<b>Biochemical profile</b>	<b>Mean ± SD</b>	
Blood hemoglobin (mg/dl)	8.38 ±1.47	
Serum Creatinin (mg/dl)	8.12±3.28	
Serum Urea (mg/dl)	130.57±47.75	

QOL as evaluated by the means of the WHO-BREF questionnaire domains, overall total QOL score ranged from 30 to 81 with a mean score of 56.58 ±12.67. The mean scores for the four subdomains were low, the highest score was for the social domain (60.33 ±19.96) and the lowest was for the physical domain 53.43±15.98 as shown in Table 3.

**Table3: Domains and total overall scores of QOL**

QOL Domains	Min. – Max.	Mean ± SD
Physical	11 - 79	53.43±15.98
Environmental	16 - 81	53.56±12.74
Psychological	25 - 92	59±14.5
Social	17 - 100	60.33±19.96
Overall score	30 - 81	56.58±12.67

By evaluating the effect of socio-demographic characteristics on the overall QOL, patients who had a higher educational level and those who were in work had statistically significant higher QOL score. Other socio-demographic data showed a non-significant effect on overall QOL score (Table 4). The relation between QOL and the underlying diseases was non-significant as shown in Table 5.

**Table 4: The relation between socio-demographic data and QOL**

Character	No.	Overall QOL score		Test of sig.	P
		Min.-Max.	Mean ± SD		
<b>Sex</b>					
Male	67	30-81	57.23±12.4	t 0.722	0.47
Female	33	30-77	55.27±13.29		
<b>Age (years)</b>					
<30	8	40-77	57.75±12.42	F 1.064	0.379
30 – 40	26	34-77	60.19±9.80		
41 – 50	16	30-74	55.46±16.61		
51 – 60	22	35-75	56.93±12.1		
>60	28	30-81	53.26±12.93		
<b>Smoking history</b>					
Smoker	13	35-75	77.846±9.711	F 0.573	0.566
Non smoker	57	30-76	75.649±11.197		
Ex. Smoker	30	35-81	78.133±12.305		
<b>Education</b>					
Illiterate / Read and write	18	32-70	49.03±11.58	F 5.752	0.001
Primary / Preparatory	24	30-77	54.94±13.27		
Secondary	38	30-76	56.91±12.61		
University or higher	20	47-91	64.72±8.13		
<b>Marital stats</b>					
Not married	25	32-77	58.92±12.88	F 0.587	0.558
Married	72	30-81	55.74±12.49		
Widow	3	35-70	57.35±19.12		
<b>Residence</b>					
Outside Tripoli	7	30-70	50.32±14.40	t 1.36	0.176
Tripoli	93	30-81	57.05±12.47		
<b>Type of housing</b>					
Ownership house	90	30-81	56.94±12.37	t 0.851	0.397
Rent house	10	35-77	53.34±15.52		
<b>Working status</b>					
Not working	65	30-77	54.5±13.6	t 2.28	0.025
Working	35	34-81	60.44±9.79		
<b>Income</b>					
Sufficient	35	30-81	59±12.14	t 1.406	0.163
Insufficient	65	30-77	55.28±12.85		
<b>Health insurance</b>					
Insurance	11	40-75	56.44±12.34	t -0.038	0.97
No insurance	89	30-81	56.6±12.78		

t: Student-test F (ANOVA) and Post Hoc Test (Turkey)

**Table 5: Relation between the underlying diseases and QOL**

Underlying diseases	No	Overall QOL		T	P
		Min.- Max.	Mean ± SD		
<b>Hypertension</b>	60	30-81	57.18±12.28	0.575	0.567
<b>Chronic pyelonephritis</b>	3	30-76	54.69±23.41	-0.262	0.794
<b>Obstructive uropathies</b>	3	35-65	53.09±15.88	-0.483	0.630
<b>Diabetic nephropathy</b>	5	31-60	48.88±11.31	-1.402	0.164
<b>Adult polycystic kidney</b>	14	32-75	59.23±12.47	0.843	0.401

T: Student t-test

P: significant when < .05

The overall QOL score showed a significant positive correlation with the hemoglobin level and a non-significant correlation with the BMI and renal function markers respectively (Table 6).

**Table 6: Relation between the BMI and laboratory parameters and QOL**

Item	No.	Overall QOL		Test of sig.	P value
		Min. - Max.	Mean ± SD		
<b>BMI (kg/m<sup>2</sup>)</b>					
Underweight	7	31-77	52.55±15.93	F 1.382	0.253
Normal	46	32-81	58.08±13.15		
Overweight	31	35-72	57.83±9.17		
Obese	16	30-77	51.63±15.07		
Correlation with hemoglobin				r 0.227	0.027
Serum creatinin (mg/dl)				r 0.029	0.778
Serum urea(mg/dl)				r -0.129	0.212

F: F test (ANOVA) r: Pearson coefficient

In the multiple linear regression analysis, high level of education (secondary education or higher) was the only predictor for QOL in this study, where the other factors revealed non-significant impact as QOL predictors (Table 7).

**Table 7: Multiple linear regression analysis of QOL predictors**

Item	Unstandardized Coefficients B	Standardized Coefficients Beta	t-test	P
Age	-0.496	-0.053	-0.529	0.598
Education	3.834	0.304	3.023	0.003
Income	-1.960	-0.074	-0.794	0.429
Blood Hemoglobin	1.052	0.122	1.273	0.206
Working	-3.202	-0.121	-1.225	0.224
R=0.480, R <sup>2</sup> = 0.230, F = 3.925, P= 0.001				

#### IV. Discussion

Life of patients with chronic kidney disease becomes rearranged and adapted to changes resulting from the nature of the disease and the methods of its treatment<sup>(14)</sup>. Patients receiving chronic dialysis should receive holistic care, taking into account somatic, mental, and social aspects, which can consequently prolong life and decrease mortality<sup>(14)</sup>. The social life and family relations are of great importance in the hemodialysis treatment, as the disease influences and generates physical, social, psychological and emotional changes that often lead to the isolation of the patient and clinical depression<sup>(15)</sup>. Caring of all aspects that may improve the QOL in patients requiring hemodialysis has become a relevant area of investigation. Several studies have shown that dialysis patients are more likely to have compromised physical and emotional functioning, in which the decrease in physical functioning has been associated with increased risk of death<sup>(16)</sup>.

In the present study, the highest score was observed for social domain followed by psychological domain and the lowest score was for the physical domain, the mean total score was (56.58 ± 12.67). These results were comparable with a recent study, of Liu et al (2014), where the physical domain was 56.2±15.8, psychological domain 59.8± 16.8, social relations domain 58.2± 18.5, environment domains 59.5± 14.6, and combined overall quality of life and general health was 61.0 ± 18.5<sup>(17)</sup>.

Social support comprises a modifiable psychosocial factor that is related with hemodialysis patients' perception of QOL and the more support patients had the better QOL they had<sup>(18)</sup>. It was documented that social support has a significant effect on general wellbeing of dialysis patients and their adaptation to treatment<sup>(19)</sup>. Poorer social support and other psychosocial factors are associated with higher mortality risk, lower compliance to medical care, and poorer physical QOL in hemodialysis patients<sup>(20)</sup>.

The current study, revealed that the physical parameters were the most affected(53.43±15.98), followed by the environmental (53.56±12.47), social (60.23 ± 19.96), and psychological domains (59±14.5). Which is comparable with a study that was conducted by Mujais et al. (2009)<sup>(21)</sup> who reported a lowest mean score in physical domain. Similar findings were reported by Sathvic et al<sup>(22)</sup> and de Melo et al<sup>(23)</sup> studies.

The environmental domain assesses the influence of different factors on the QOL, such as financial resources, the work environment, access to health and social care, freedom, security, and participation and

opportunities for leisure activities<sup>(24)</sup>. The mean score of environmental domain in present study was  $53.56 \pm 12.74$ , which was better than that obtained by Abraham et al. who reported a score of  $12.24 \pm 1.87$ <sup>(25)</sup>.

Regarding the gender of hemodialysis patient, the current study found that, female gender was associated with lower QOL scores than male gender. Similar observation was made by Anees et al.<sup>(26)</sup>. One possible explanation is that female's multiple domestic tasks and responsibilities, unlike men, they cannot circumvent. Additionally, they may have more negative disease perception and the increased prevalence of depression in women<sup>(9)</sup>. Moreover, males have more chances of outing and meeting friends, which give them encouragement to face life challenges<sup>(26)</sup>.

Current study results demonstrated that increased age was associated with lower HRQOL. Previous studies have reported the same findings; Anees et al<sup>(26)</sup> found that age was a significant factor determining the HRQOL of hemodialysis patients. Age has a negative relationship with physical and psychological health domains. As age increases, QOL impairs and according to Liu et al<sup>(17)</sup>, age of more than forty years was a significant risk factor of QOL of hemodialysis patients. But this was inconsistent with Abdel-Kader et al<sup>(27)</sup> results, which reported that older age was associated with a significantly higher calculated QOL score.

This study reported a significant association between high education level and high HRQOL. This could be due to the fact that educated patients may have a better understanding of the illness, its effects, and will benefit from the best management<sup>(28)</sup>, or they have more information about the treatments, greater self-reported adherence, and a better relationship with their healthcare team<sup>(29)</sup>. This result is consistent with findings of previous studies<sup>(8,30,31)</sup>. A higher education is known to play an essential role in raising the awareness of chronic diseases and in a better coping ability<sup>(32)</sup>.

In the present study, marital status has no obvious influence on QOL. These results differ from the majority of previous studies<sup>(26,33)</sup>, and may be due to the fact that the majority of patients in this study were married. A few single patients are unlikely to indicate the influence of marital status on QOL<sup>(34)</sup>.

Although there was a significant association between the employment and QOL of in the present study. Unemployment was confirmed in several studies as an important factor associated with impaired HRQOL in hemodialysis patients<sup>(35, 36)</sup>.

As family income is one of the indicators of the socio-economic level, it was expected to find that the QOL in those with low family income was worse than the QOL in those with high income. Present study results are consistent with findings of other studies that reported association between family income and QOL scores<sup>(23,37)</sup>.

BMI of patients was insignificantly associated with QOL scores in the present study. Unlike a study conducted by Bossola M et al<sup>(38)</sup> who reported obesity as one of the factors associated with impaired HRQOL and recommended the importance of keeping weight at healthier levels for improvement of QOL.

Although in this study, there was a non-significant relation between QOL and the underlying diseases, ESRD due to diabetic nephropathy was associated with a lower QOL scores as compared to those who develop renal failure due to other secondary causes, late diagnosis of diabetic nephropathy might explain this difference as it is mostly silent until late stages. This was consistence with a study carried out by Rostami et al, which revealed that the most common primary known disease was hypertension and the second etiology was diabetes<sup>(39)</sup>.

Anemia is highly prevalent in patients undergoing hemodialysis and is associated with adverse clinical outcomes and diminished HRQOL<sup>(9)</sup>. The present study found a significant positive correlation between hemoglobin level and overall QOL.

## V. Conclusion

Patients with chronic kidney disease on dialysis had an overall low QOL and low scores of the four domains. The highest QOL score was for the social and psychological domains and the lowest was for the physical and environmental domains. Higher level of education, working status, and hemoglobin level were all statistically significant factors that affected the QOL. Higher level of education was the only independent positive predictors of QOL of patients on hemodialysis. Further multi-center studies that include larger representative samples of ESRD patients on HD are recommended. Comparison with general population samples is needed to identify determinants of QOL more precisely

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