Contributing Factors in Health-Related Quality of Life Assessment of ESRD Patients: A Single Center Study

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Abstract

Background: End stage renal disease (ESRD) patients suffer from low health related quality of life (HRQoL) and according to a report presented at the 40th annual meeting of the American Society of Nephrology, it is predicted that by 2020, the number of patients with ESRD will increase to nearly 60% in comparison to that of 2005.

Methods: We measured HRQoL among 152 patients on dialysis by kidney disease quality of life-short form (KDQoL-SF) questionnaire and compared KDQoL scores by demographic factors such as gender, age, educational level, occupation and marital status.

Results: Male gender, age <50 years, higher educational level, marital status and employment status had a better Physical Component summary (PCS), Mental Component Summary (MCS) and Kidney Disease Component Summary (KDCS). The mean scores of PCS and MCS were significantly decreased by increasing the age (P=0.004 and 0.008, respectively). In addition, MCS and KDCS scores was significantly higher in employed and KDCS was significantly better in literate patients. The mean score of KDCS was higher than MCS and PCS (52.6 ± 13.5 vs 41.6 ± 20.9 and 39.06 ± 19.2, respectively with P<0.001).

Conclusions: Association of poorer HRQoL with preventable or controllable factors suggests that attention should be given to psychosocial and medical interventions to improve HRQoL in hemodialysis patients.

Keywords: Health Related Quality of Life, Dialysis, ESRD

Introduction

End stage renal disease (ESRD) is a major problem that disturbs patients' quality of life (1). From 2000 to 2015 Incidence and prevalence of ESRD are predicted to enhance by 44 and 85%, respectively, and incidence and prevalence rates per million population will increased by 32 and 70%, correspondingly (1). Not only the fact that ESRD complications, such as anemia, hyperlipidemia, nutritional limitations, renal osteodystrophy and cardiovascular disorders (2), can impair the quality of life but also hemodialysis per se generally leads to immobilization of patients. In addition, social activities, physical performances,

and psychological health are affected by dialysis (3). Numerous studies have documented that Health-related quality of life (HRQoL) in patients undergoing hemodialysis is significantly impaired (4-6). HRQoL appraisal and recognition of contributing factors can help to identify the ways of its improvement in ESRD patients, avoid adverse outcomes, evaluate

responsiveness and effectiveness of the treatment and risk stratification of death and hospitalization (3, 5).

From 1980s to the present day, the attention to measurement of HRQoL among ESRD patients has been rising (7). HRQoL is a multidimensional concept that reflects patient's well-being in both the physical and mental aspects of health (8). Moreover, several factors such as disease related manifestations, the side effects of treatments, and patient's quality of interaction with family members can influence HRQoL (8). The generic and particular scales of the Kidney Disease Quality of Life (KDQoL) could practically measure HRQoL of hemodialysis (HD) patients (9). KDQoL is a self-report measure including the generic core (36-item health survey) that is supplemented with targeted disease items.

In chronic diseases, too many differences have been observed in correlation between demographic factors and HRQoL as well its components and subscales. However, some authors believe HRQoL is affected by age (10), gender (11-14), level of education (15), marital status (16), and income (17). In opposition, others showed that these factors had no impact on HRQoL (15, 17, 18). Therefore, we investigated to determine KDQoL scores and its related factors among patients undergoing dialysis.

Materials and Methods

Patients

This cross-sectional study involved 170 hemodialysis patients of Imam Khomeini Hospital, Tehran, Iran, from Sep 2006 to Sep 2007. Inclusion criteria were age older than 18 years, duration of dialysis more than 3 months and patients on three times HD in a week (4 hours in each session). However, hospitalized patients for an acute illness and vascular access failure and those who refused to participate later were excluded. Finally, HRQOL data were obtained from 152 (90%) patients.

Table 1. Demographic factors and primary causes of ESRD

Age (mean ± SD)		51.76 ± 18.37
Men %		58.9
Educational level %	Illiterate	27.8
	Primary school	45
	Middle & high school	21.9
	College	5.3
Income (monthly) rials %	>2500000	20.5
Marital status %	Married	70.2
	Single	15.9
	Widow	13.9
Employment %	Employed	9.3
	Housekeeper	22.5
	Retired	17.2
	Unemployed	46.4
	Unknown	4.6
Primary cause of disease %	Diabetes	28.5
	Hypertension	20.5
	Diabetes & Hypertension	6
	ADPKD	4.6
	GN	1.3
	Others	20.8
	Unknown	19.2

Design

All the patients filled out the KDQoL questionnaire that contained 19 health related domains and demographic variables included age, gender, marital status, level of education, income and employment status, and primary cause of renal disease. The questionnaire was completed by the patients themselves, except blind or disabled patients which in that case was filled with the help of a family member or the physician of dialysis patient.

Table 2. Mean and median health related quality of life scores

Components	Subscales	Mean(SD)	Median (quartile 25-75%)
Physical component summary	Physical function	40.9 ± 29.8	35 (15 – 65)
	Role physical	26.9 ± 32.2	25 (0 -50)
	Pain	48.8 ± 29.8	45 (22 – 67)
	General health	39.4 ± 21.6	35 (25 -55)
	Total	39.06 ± 19.2	40 (23.7 – 50)
Mental component summary	Emotional well being	49.3 ± 22.6	52 (32 – 64)
	Role emotion	34.6 ± 38.2	33.3 (0 – 66.6)
	Social function	44.8 ± 28.1	50 (25 – 62.5)
	Energy/fatigue	37.8 ± 24.05	35 (20 – 55)
	Total	41.6 ± 20.9	43.2 (25.6 -53.7)
Kidney disease component summary	Symptom	66.4 ± 18.6	68.1 (56.8 – 79.5)
	Effect of kidney disease	54.2 ± 20.1	57.1 (39.2 – 68.7)
	Burden	23.01 ± 18.7	18.7 (0 – 37.5)
	Work status	25.8 ± 37.7	0 (0 – 50)
	Cognitive function	62.1 ± 24.5	66.6 (46.6 – 80)
	Quality of social function	62.7 ± 26.4	66.6 (40 – 86.6)
	Sexual function	19.03 ± 35.8	0 (0 – 0)
	Sleep	55.04 ± 20.9	52.5 (40 – 70)
	Social support	72.4 ± 27.6	83.3 (66 – 100)
	Encouragement	74.3 ± 27.6	75 (62.5 – 100)
	Satisfaction	64.2 ± 26.7	66.6 (49.9 – 83.3)
	Total	52.6 ± 13.5	51.7 (44.3 – 61.9)

Instrument (18)

The Kidney Disease Quality of Life Short Form (KDQoL-SFTM) version 1.3 was used to measure HRQoL. The KDQoL-SF includes generic and disease related cores. The items that form the generic core of KDQoL-SF version 1.3 are those constructed for SF-36 version 1 (19). The results of generic core reported by two components (MCS and PCS), that are comprised of the eight scales of the SF-36: physical functioning, role-physical, bodily pain, general health, vitality (energy/fatigue), social functioning, mental health (emotional well-being), and role-emotion. Disease-targeted items include eleven scales that relate to the kidney disease are: symptoms/problems, effects of kidney disease on daily life, burden of kidney disease, work status, cognitive function, quality of social interaction, sexual function, sleep, social support, dialysis staff encouragement and patient satisfaction. These 11 subscale (items) make kidney disease component summary (KDCS). The range of each score scale is from 0 to 100; higher scores show better quality of life. Detail of translation and validation of SF-36 Health Survey have been described elsewhere (20). We translated KDQoL-SF version 1.3 into Farsi, then internal consistency in all item was calculated by Cronbach's α (greater than 0.8). The questionnaire was generally self-administered; the patients mostly filled out their questionnaire at home or in dialysis department. To make sure that the patients completed the questionnaires themselves, the written information was verbally confirmed with the patients.

Statistics

Data analysis was performed by SPSS (version 15.0). Qualitative variables were expressed as number and percentage, while quantitative variables were expressed as mean ±standard deviation (SD). Pearson correlation was used to evaluate the association between Quality of Life (QoL) and continuous

variables. Comparisons were done with using of student's *t*-test for independent variables. A P-value of 0.05 or less was considered as statistically significant differences.

Results

Patients

The mean (±SD) of age was 51.8 (18.4) years and 58.9% of patients were male. The most primary cause of ESRD was diabetes (28.5%) and the majority of our patients were married (70.2%), literate (72.2%), unemployed (46.4%), low socioeconomic status (79.5%) and older age (more than 50 years: 60.3%) (Table 1).

Components

Table 2 shows generic and disease related item scores. The highest and least scores were social support (72.4 ± 27.6) and sexual function (19.0 ± 35.8), respectively. Nevertheless, 25.7% of patients answered the question about sexual activity. The mean score of Kidney Disease Component Summary (KDCS) was higher than Mental Component Summary (MCS) and Physical Component Summary (PCS) (52.6 ± 13.5 *vs* 41.6 ± 20.9 and 39.06 ± 19.2, respectively) (P<0.001). In addition, the mean scores of PCS and MCS were significantly decreased with the increasing age (P=0.004 and 0.008, respectively) (Table 3). Employment was not associated with higher scores in PCS (41.7 ± 19.9 *vs* 37.8 ± 18.9, respectively, p=0.22).

Table 3. Age differences between the components and subscales of KDQO

Components	Subscales	Age (year)		P value
		≤ 50	> 50	
Physical component summary	Physical function	54.6 ± 30.4	32.9 ± 26.2	< 0.001
	Role physical	34.1 ± 32.8	21.1 ± 30.2	0.01
	Pain	51.7 ± 28.1	47.6 ± 30.5	0.41
	General health	43.2 ± 21.6	37.1 ± 22	0.10
	Total	45.9 ± 17.9	34.7 ± 19.0	< 0.001
Mental component summary	Emotional well being	54.4 ± 20.4	45.2 ± 24.0	0.01
	Role emotion	41.6 ± 38.6	29.4 ± 36.8	0.05
	Social function	51.8 ± 26.4	40.4 ± 28.5	0.01
	Energy/fatigue	46.6 ± 23.3	32.1 ± 23.07	< 0.001
	Total	48.6 ± 18.2	36.8 ± 21.6	0.001
Kidney disease component summary	Symptom	69.7 ± 15.4	64.8 ± 19.7	0.11
	Effect of kidney disease	59.0 ± 19.3	50.8 ± 20.3	0.01
	Burden	25.5 ± 22.3	21.1 ± 22.3	0.25
	Work status	30.0 ± 41.3	22.9 ± 34.9	0.26
	Cognitive function	65.6 ± 24.2	59.6 ± 25.1	0.15
	Quality of social function	65.3 ± 25.3	59.7 ± 27.2	0.21
	Sexual function	29.1 ± 41.1	12.2 ± 30.1	0.005
	Sleep	58.2 ± 19.2	53.9 ± 22.1	0.22
	Social support	74.7 ± 26.3	70.5 ± 28.3	0.36
	Encouragement	71.9 ± 30.7	76.9 ± 25.3	0.29
	Satisfaction	58.5 ± 29.8	68.9 ± 24.1	0.02
	Total	55.2 ± 14.2	51.0 ± 13.1	0.06

Table 4. Correlation between demographic factors and health related quality of life components

Demographic factor		PCS	P value	MCS	P value	KDCS	P value
Sex	Male	40.9 ± 19.2	0.1	42.3 ± 20.5	0.6	53.4 ± 14.2	0.3
	Female	36.3 ± 19.1		40.6 ± 21.6		51.5 ± 12.5	
Age	≤ 50	45.9 ± 17.9	<0.001	48.6 ± 18.2	0.001	55.2 ± 14.2	0.06
	> 50	34.7 ± 19.0		36.8 ± 21.6		51.0 ± 13.1	
Income	≤ 250	39.3 ± 19.2	0.6	41.6 ± 20.4	0.9	51.9 ± 13.3	0.1
	> 250	37.5 ± 19.1		41.8 ± 23.05		55.5 ± 14.5	
Literacy level	Literate	40.4 ± 19.5	0.1	43.03±21.07	0.2	54.02 ± 13.5	0.04
	Illiterate	35.4 ± 18.3		38.1 ± 20.4		49.1 ± 13.09	
Marital status	Married	39.9 ± 19.5	0.4	41.9 ± 20.1	0.8	53.5 ± 13.8	0.2
	Single/widow	37.04 ± 18.7		41.03 ± 22.9		50.6 ± 12.7	
employment	Employed/housekeeper	41.7 ± 19.9	0.2	46.8 ± 22.5	0.03	56.2 ± 13.8	0.02
	Unemployed/retired	37.8 ± 18.9		39.2 ± 19.8		51.02 ± 13.1	

PCS, Physical Component Summary; **MCS**, Mental Component Summary; **KDCS**, Kidney Disease Component Summary.

Subscales and demographic factors

Table 4 illustrates association between score scales and demographic and clinical factors.

1- Age

All components and subscales decreased with growing age unless accompanied by encouragement (P=0.29) and patient satisfaction subscales (P=0.02) which increased by aging.

2-Gender

There was significant correlation between male and female with physical function (46.1 ± 28.5 *vs* 33.4 ± 30.4, p=0.01), social support (68.5 ± 28.1 *vs* 77.9 ± 26.0, p=0.03) as well as sexual function (27.2 ± 39.8 *vs* 7.2 ± 25.05, p<0.001).

3-Income

There were no significant differences between income and KDQoL except for role physical, it had not been better score in patients with higher level of socio-economical as compared to poor individuals (17.7 ± 29.0 *vs* 30.5 ± 32.6 p=0.05).

4-Literacy

Educated patients had higher score only in symptoms and sexual function when compared to illiterate patients (P=0.03 and 0.01). In addition, role physical score was better in illiterate individuals (29.7 ± 33.2 *vs* 25.9 ± 31.9, p=0.03), but no significant differences were seen in other subscales.

5- Employment

The employed patients had higher scores in emotional well being (P=0.04), work status (P=0.004), effect (P=0.04) and the quality of social functioning (P=0.004) and lower score in encouragement (P=0.04) when compared to the unemployed individuals.

6-Marital Status

Better sexual function had been observed in married patients than single ones (26.1 ± 39.6 vs 2.2 ± 14.9, p<0.001).

Discussion

Among the demographic factors, we found female gender; illiteracy, retired life and older aged HD individuals with the lowest scores in all three components of KDQoL, while in the same components the best scores had been observed in male gender, young age, employed status and high educational level. Similar to other studies in HD patients MCS scores were higher than PCS scores in our patients (21-23). Despite the deterioration of the physical health status, the mental health of dialysis individuals is relatively preserved. This was explained by superior adjustment of older patients to their chronic illness (15, 24). Furthermore, lower QoL scores in women was described in other study (13, 15), and this sex-related difference was also found in the general population (11). Probable reasons for the poorer HRQoL in female gender appears to be more linked to the higher prevalence of depressed mood and anxiety disorder (18, 21) and greater dependency upon their family members and lower adaptability.

Although similar to other studies (15), high socio-economic status in our patients had been coupled with higher QoL; however, this effect wasn't significant.

In agreement to an earlier study (15), in our study higher educational level was not significantly associated with higher QoL components (15) except for KDCS. This can be due to the fact that majority of our educated patients were unemployed.

As mentioned above, there was a negative correlation between age and all three components of KDQoL. Additionally it was also noted with several other subscales such as physical function, role physical, emotional well being, role emotion, social function, effect of kidney disease, sexual function and vitality. Despite lower social support of older patients, satisfaction was better in these patients, possibly because they had greater adaptation and lower expectation than younger individuals (7).

Sexual function scores were significantly lower in female gender. Although sexual dysfunction is common problem in dialysis women (25), the married female rated less favorably than the married male (46.8% *vs* 86.5%). While marital status had significant effect on KDQoL, scores are similar to previous study (23). We expected sexual function score had been higher among married patients.

Although, the better MCS and KDCS scores had been observed in employed and housekeeper patients; however, their PCS score wasn't high. We believe that those with socio-economic responsibility have better concept about their life and their family.

Even though female gender had lower scores in several measures of HRQoL, we found significantly higher scores for their social support. This notable difference could be explained by the Iranian culture which is very supportive to the female individuals, especially the disable ones.

Finally, there was no significant difference between the gender related KDQoL scores except for the physical function, social support and sexual function. In men, physical function and sexual function were better than women. Although, we have not standardized scores for general population or other chronic illness; however, these differences in physical function had been observed previously among men and women even in general population (20).

Limitation

In this study selection bias was minimized as all the patients completed the questionnaire. Nevertheless, despite this advantage, our research is a cross-sectional study that suffers from some usual limitations that can influence the results. We have not adjusted scores with general population and confounding factors were not considered (such as hemoglobin level, serum albumin, KT/V, dialysis length *etc*). Besides, we have not measured spiritual and religious dimensions that are known to influence QoL. We suggest further prospective case control studies to precisely determine the effect of these

factors on QoL.

Conclusions

End-stage renal disease and its subsequent management can negatively affect the quality of life. Therefore it is important to determine the factors related to healthcare effectiveness, and medical treatment in dialysis patients in order to improve HRQoL and insight into these problems can help to design new strategies for problem solving.

Conslict of interest

None declared.

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