

## Quality of life in hemodialysis and peritoneal dialysis patients in Saudi Arabia

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**BACKGROUND AND OBJECTIVES:** Quality of life (QoL) in end-stage renal disease (ESRD) patients is an important outcome for both physicians and patients in selecting dialysis modality. We conducted a comparison between regular maintenance hemodialysis and regular peritoneal dialysis patients in two tertiary referral hospitals in King Saud University in Saudi Arabia. We hypothesize that there might be cultural and socioeconomic factors modifying QoL in dialysis patients.

**DESIGN AND SETTING:** Cross-sectional study on hemodialysis and peritoneal dialysis patients.

**PATIENTS AND METHODS:** Two hundred dialysis patients participated in the study, one hundred in each group of dialysis modality, from July 2007 to July 2008. We used a cross-sectional design and collected the data using the Kidney Disease Quality of Life (KDQoL SF) questionnaire.

**RESULTS:** Patients in both groups had similar sociodemographic characteristics (age, marital status, and education). Mean age (SD) in the hemodialysis group was 47.5 (13.8) years and 51.0 (13.5) years in the peritoneal dialysis group. Males represented 53% and 43%, respectively. Mean duration of dialysis was 77.2 (75.5) months in the hemodialysis group and 34.1 (26.9) months in the peritoneal dialysis group. The mean (SD) score was 49.5 (13.7) in the hemodialysis group and 61.3 (12.4) in the peritoneal dialysis group. QoL mean scores were significantly higher among peritoneal dialysis in all domains and in the total QoL, with the exception of the score of physical QoL, which was higher in the hemodialysis patients, compared to peritoneal dialysis patients, although the difference was not statistically significant. Multiple regression analysis indicated that hemodialysis was a negative predictor of QoL score, compared to peritoneal dialysis. Also, age, male gender, and dialysis duration were negative predictors of QoL score.

**CONCLUSION:** In the unique culture of Saudi Arabia, peritoneal dialysis patients have better QoL, compared to hemodialysis patients, validating the findings of research reports from other countries.

Health-related quality of life (HRQoL) is an important outcome as well as indicator in end-stage renal disease (ESRD) patients undergoing hemodialysis (HD) or peritoneal dialysis (PD). Hemodialysis is usually performed in a hospital or day care center, three times in a week with each session lasting four hours. However, peritoneal dialysis is usually performed at home which can be done using two systems, continuous ambulatory peritoneal dialysis with four exchanges a day and continuous cyclic peritoneal dialysis with exchanges occurring at night for 8-9 hours using a peritoneal dialysis machine. ESRD im-

poses substantial effects on the patient's quality of life (QoL) by negatively affecting their social, financial and psychological well-being.<sup>1,2</sup> The disease also affects body image and can have impact on patient's overall QoL and other domains like physical, functional, social and mental status.<sup>3-7</sup> Previous relevant research compared both modalities as well showed that patients undergoing HD or PD treatment were found to experience QoL deficits.<sup>8</sup> A description of a person's QoL should not reflect the opinions of health professionals or family members. QoL measures the individual's subjective perception of his functioning and well-being in his/her day-to-day

life.<sup>9</sup> The QoL of HD and PD patients in Saudi Arabia has never been reported.

Both HD and PD patients have diminished QoL scores compared to healthy individuals. QoL declines over time, with the perception of the quality of physical health deterioration than mental health. However, many patients continue to feel hopeless, anxious, and worried about their financial matters, loss of sexual function, family burden, and loss of independence.<sup>10</sup> These studies have demonstrated that the QoL of PD patients was better than that for HD patients.<sup>11</sup> A literature review found no studies on QoL for patients with ESRD and the comparison between the two modalities in Saudi Arabia. Recent statistics of The Saudi Organ Transplant Center (SCOT) in 2008 identified the total number for patients with ESRD as 20 133, with 10 928 (54.3%) on HD and 1112 (5.5%) on PD; 8073 (40.2%) were under follow up after renal transplantation.<sup>12</sup> Moreover, a rapid rise in the incidence of ESRD was also reported in Saudi Arabia, the United States and other countries.<sup>13,16</sup> Our study aimed at comparing the QoL between these two patient groups to validate the findings from other countries in our population considering the unique socioeconomic factors in Saudi Arabia.

## PATIENTS AND METHODS

The study included 200 diagnosed cases of ESRD patients more than 18 years old seen between July 2007 and July 2008 at the dialysis clinics of King Khalid University Hospital of King Saud University, and Security Forces Hospital, both in Riyadh, Saudi Arabia. Patients who had cognitive impairment, a focal neurological deficit in the form of paresis/paralysis and psychiatric illness that prevented understanding and responding to the QoL questionnaires were excluded from the study.

A cross-sectional approach was employed to facilitate this QoL study as suggested and used by previous several studies.<sup>17-19</sup> The questionnaire had two sections; a section on basic demographic data, main caregiver and dialysis duration, and a section on the Kidney Disease Quality of Life scale (KDQOL-SF-1.3).<sup>19</sup> The KDQoL scale is disease-targeted and focuses on particular health-related concerns of individuals with kidney disease, patients on dialysis, and the effects of the kidney disease on daily life, the burden of kidney disease, work status, cognitive function, and quality of social interaction, sexual function, social support, dialysis staff encouragement, and patient satisfaction. Its 36 items are categorized into six domains: general health, physical, emotional, social status, illness impact,

**Table 1.** Sociodemographic characteristics of hemodialysis and peritoneal dialysis patients.

	Dialysis modality		Chi-square test statistic	P
	Hemodialysis (n=100) No. of patients	Peritoneal dialysis (n=100) No. of patients		
<b>Age (years)</b>				
<40	28	19		
40-60	48	53	2.28	.32
60+	24	28		
<b>Range</b>				
Mean (SD)	47.5 (13.8)	51.0 (13.5)	3.4	.07
<b>Gender</b>				
Male	53	43	2	.16
Female	47	57		
<b>Marital status</b>				
Single	40	29	2.68	.1
Married	60	71		
<b>Job status</b>				
Working	37	21	6.22	.01
Unemployed	63	79		
<b>Education</b>				
No formal education	38	34	0.38	.83
Basic/intermediate	45	47		
High	17	19		
<b>Dependant</b>				
Parent	12	3	19.23	.002
Spouse	37	22		
Sibling	3	4		
Children	29	41		
Self	9	24		
Housekeeper	10	6		

Values are mean (standard deviation) or number (percent) unless otherwise indicated.

and financial and medical satisfaction.<sup>20</sup> The scoring of the tool responses was done according to the guidelines of the KDQOL-SF.<sup>19</sup> The questionnaire was translated to Arabic and was reviewed by five experts of different specialities. The author conducted a pilot study using this questionnaire, which was presented as

**Table 2.** Duration of dialysis in hemodialysis and peritoneal dialysis patients.

Duration of dialysis (months)	Dialysis type		Chi-square test statistic	P
	Hemodialysis (n=100)	Peritoneal dialysis (n=100)		
<12	12	15	23.09	<.001
12-60	42	70		
60+	46	15		
<b>Range</b>	2-360	2-144		
<b>Mean (SD)</b>	77.2 (75.5)	34.1 (26.9)	16.11	<.001

**Table 3.** Quality of life scores of hemodialysis and peritoneal dialysis patients.

	Dialysis type		Mann-Whitney test	P
	Hemodialysis (n=100)	Peritoneal (n=100)		
<b>General health</b>				
Mean (SD)	45.8 (17.1)	58 (9.8)	21.85	<.001
Median	39.3	60		
<b>Physical</b>				
Mean (SD)	53.1 (32)	47.7 (23.6)	1.2	.27
Median	47.9	43.4		
<b>Emotional</b>				
Mean (SD)	50.5 (14.8)	61.9 (13.5)	30.85	<.001
Median	47	61.3		
<b>Social</b>				
Mean (SD)	54.9 (18.1)	68.0 (17.5)	20.9	<.001
Median	58.1	70.3		
<b>Illness impact</b>				
Mean(SD)	46.5 (14.2)	63.9 (9.5)	63.32	<.001
Median	43.20	62.65		
<b>Financial and medical satisfaction</b>				
Mean (SD)	45.9 (12.2)	68.4 (13.0)	99.82	<.001
Median	49.30	65.30		
<b>Total</b>				
Mean (SD)	49.5 (13.7)	61.3 (12.4)	36.75	<.001
Median	45.65	62.6		

thesis for a doctorate degree and was published three times in international renowned journals.<sup>20,21</sup> Informed and written consent were secured from patients prior to the interview. Each interview was conducted by the author, thereafter the patient fills up the questionnaire. Forms were collected once patient has completely filled it up. The study protocol was approved by the Ethics Committee- Institutional Review Board of King Saud University, Riyadh, Saudi Arabia and was supported by the Deanship of the Scientific Research College of Medicine King Saud University.

Data entry and statistical analysis were done using the SPSS version 13.0 (IBM Corp, Armonk, New York, United States). Quantitative continuous data were compared using the t test in case of comparisons between two groups. When normal distribution of the data could not be assumed, the non-parametric Mann-Whitney or Kruskal-Wallis tests were used. To identify the independent predictors of patient scores for QoL as dependent factors, and various personal and disease factors as independent factors, multiple linear stepwise backward regression analysis was used, and analysis of variance for the full regression models were done. Statistical significance was considered at  $P < .05$ .

## RESULTS

Among the 200 patients with ESRD who participated in our study, 100 patients were on regular maintenance hemodialysis and 100 patients were on regular peritoneal dialysis (Table 1). The highest percentage of patients in both groups of subjects were in the age group of 40 to <60 years, married, unemployed, with basic or intermediate education. The only difference of statistical significance was related to job status ( $P = .01$ ). More than one third of the hemodialysis patients were working (37%), compared to only about one-fifth (21%) of the peritoneal dialysis group. Table 1 also shows that the independent patients were 9% of the hemodialysis group, and 24% of the peritoneal dialysis group, and the difference was statistically significant ( $P = .004$ ). Dependence on the spouse was most common in hemodialysis patients (37%), while dependence on children was most common in peritoneal dialysis patients (41%). The mean (SD) duration of dialysis in the cohort was 77.2 (75.5) months in the hemodialysis group and 34.1 (26.9) months in the peritoneal dialysis group ( $P < .001$ ) (Table 2).

QoL mean scores were higher among peritoneal dialysis in all the domains and in total QoL score, with the exception of the score of physical functioning, which was higher in the hemodialysis patients (53.1 [32]) compared to peritoneal dialysis patients (47.7 [23.6]), although the difference was not statistically significant

( $P=0.27$ ) (Table 3). Independent predictors of QoL score were age, gender, dialysis duration, and the type of dialysis in a linear regression model (Table 4). As evident from the beta coefficients, age and dialysis duration were negative predictors of QoL score. Male gender was a negative predictor compared to female gender. Moreover, HD was a negative predictor of QoL score compared to PD. As the standardized beta-coefficients indicate, the strongest predictors were age and the type of dialysis. The model explains 40% of the variation in QoL score, as the value of  $r$ -square indicates. The other sociodemographic and disease characteristics had no independent effect on QoL score.

## DISCUSSION

Patients with ESRD and treated with renal replacement therapy suffer from complications of chronic illness during dialysis. In Saudi Arabia and other countries there are three main medical treatment modalities available: HD, PD and kidney transplantation. Each one has advantages and disadvantages and has different impact on patient QoL. As in other studies, patient characteristics such as age, gender and marital status among Saudi patients treated with HD and PD were statistically similar in effects on QoL.<sup>20</sup>

In our study, QoL mean scores were higher in all domains and total QoL among PD patients compared to HD patients, except the physical QoL score. Our finding is in accordance with several studies that suggested significant advantages for PD in "some" QoL domains.<sup>23</sup> Also other studies showed that patient survival was higher and QoL was better among PD than HD patients.<sup>9</sup> However, patient satisfaction with dialysis care is similar among patients undergoing both modalities of dialysis.<sup>9</sup>

Social functioning and vitality among dialyzed patients decline over time, particularly from 3 to 18 months after onset of treatment.<sup>7</sup> The longer duration of dialysis among our HD patients as compared to our PD patients eventually compromised functioning for their daily activities, thus a more compromised QoL than PD patients.<sup>22</sup> Patients who undergo PD are more at freedom and understandably able to enjoy more valuable time compared to HD patients, since HD patients need longer hours of hospital stay for dialysis. PD patients are also able to continue with their job.<sup>23</sup> Surprisingly though, most of our HD patients were employed and are working. This could be explained by several circumstances that we have to consider such as, the family financial status, number of children, gender, sociocultural factors and employment regulations

**Table 4.** Best fitting linear regression model for the scores of quality of life of hemodialysis and peritoneal dialysis patients.

	Non-standardized coefficients		Standardized coefficients	t test	P
	Beta	SE			
Constant	56.668	4.474		12.665	<.001
Age	-0.454	0.058	-0.435	7.847	<.001
Gender (reference: male)	4.341	1.586	0.152	2.738	.007
Dialysis duration	-0.041	0.014	-0.174	2.945	.004
Dialysis type (reference: hemodialysis)	11.208	1.708	0.392	6.562	<.001

R-square=0.40; Model ANOVA: F=34.25,  $P<.001$ ; Variables excluded by model: education, marital status.

which give full paid day off for patients in day of dialysis. These reasons may have played a role for a patient to seek employment despite their dependence on the dialysis facility.

The most affected domain of the QoL in our study was the physical health as in previous reports partly due to number of PD exchanges that occur every 6 hours per day in continuous ambulatory peritoneal dialysis (CAPD) patients or because they stay in bed for 8 to 10 hours in automated peritoneal dialysis.<sup>9,23</sup> It is logical that patients who are constrained to a dialysis facility suffer more physical constraints than those who are not dependent on a dialysis facility. Due to this, PD patients have better QoL. Age, male gender, duration of dialysis and HD itself as negative predictors of QoL score could be explained by the higher percentage of male patients in the HD group: only 9% of the HD group was self-dependent compared to 24% in the PD group.

Overall QoL is better among PD than HD patients in all domains except physical domain. PD patients spend more quality time and were more satisfied than HD patients. Moreover, a negative predictors of QoL score were age, male gender, and dialysis duration. Improvement in the quality of life can be acquired in both groups, if exercise programs are properly designed and implemented to meet the demands and needs of the patients.

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