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Original Article

Predictors of Quality of Life in Hemodialysis Patients

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ABSTRACT. Quality of Life (QoL) is a consistent and powerful predictor that affects the outcome in end-stage renal disease (ESRD) patients on dialysis. This study was undertaken to identify the factors that might predict QoL scores among ESRD patients on hemodialysis (HD). The study was conducted at three HD units in Saudi Arabia from January 2007 to January 2008. We studied 100 HD patients (53 males and 47 females) and used the SF-36 and KDQoL-SF forms covering six domains of QoL, namely physical, emotional, social, illness impact, medical and financial satisfaction, and overall general health. The mean age of the study patients was 47.5 ± 13.8 years and the mean duration of dialysis was 77.2 ± 75.5 months. The QoL scores were 45.8 ± 17.1 for general health, 53.1 ± 32.0 for physical QoL, 50.5 ± 14.8 for emotional QoL, 54.9 ± 18.1 for social QoL, 46.5 ± 13.7 for illness impact, and 45.9 ± 12.2 for the medical and financial domain. The total QoL score was 49.5 ± 13.7. The male patients had statistically significantly reduced QoL and younger patients had better QoL scores. The QoL scores revealed a decreasing trend with decreasing level of education; they were elevated among employed patients. Multiple linear regression analysis demonstrated that age, dialysis duration, and male sex were negative predictors of QoL score. We conclude from our study that QoL is reduced in all the health domains of HD patients. Older age, male gender, unemployment, and duration of dialysis adversely affected the QoL scores. Adequate management of some of these factors could influence patient outcomes.

Introduction

End-stage renal disease (ESRD) is a major health problem worldwide. It is projected that by 2020 the number of patients with ESRD will increase by nearly 60% in comparison with that of 2005.[1] In the Middle East, the total number of patients with ESRD is almost 100,000, with a mean prevalence of 430 per million population (PMP).[2] In the Kingdom of Saudi Arabia, the mean prevalence is 540 per million population. Of these, 92.8% are on hemodialysis (HD) therapy.[3]

The evaluation of health-related quality of life (HRQoL) in chronic diseases is becoming

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more and more important.[4] This multidimensional concept reflects patients' health, both physically and mentally.[5] The assessment of HRQoL helps in evaluating the quality of care and efficacy of medical intervention, improving clinical decision-making, and estimating health care needs of the community.[6] Moreover, clinicians can use HRQoL scores to evaluate the effects of a specific disease on patients and specific treatment besides the assessment of progress of patients.[7]

Conventional HD is the most widely used modality of treatment for ESRD.[8] Patient's social activities, physical performance, and psychological health are affected by dialysis[9] and, hence, HRQoL.[10-13] Decreased HRQoL among patients on chronic HD is associated with increased mortality and complications.[13] Moreover, a number of factors such as age, anemia, and comorbidity had been implicated in decreased QOL.[14] in general, patients on dialysis have a reduced QoL compared with transplant patients who have QoL similar to that of the general population.[15-17] Although much research has been carried out on the QoL of dialysis patients, there is a paucity of such studies in Saudi Arabia.

The aim of this study was to evaluate the quality of life (QoL) of HD patients in our population and to determine the related factors.

Patients and Methods

The study was carried out using a cross-sectional descriptive design at the HD units of King Khalid University Hospital, King Saud University Hospital, and the Security Forces Hospital, Riyadh, Saudi Arabia. The study was conducted between January 2007 and January 2008.

A convenience sample of all prevalent HD patients was recruited. Patients with neurological problems and severe co-morbidities were excluded. The total number of eligible patients was 100. The age of the patients ranged from 14 to 70 years, with a mean ± (SD) of 47.5 ±13.8 years, with a slightly higher male to female ratio (53/47). The majority of the patients were married (60%) and educated (62%), but not working (63%). Family caregivers were mostly spouses (37%) or children (29%). Etiology for ESRD was mostly hypertension and diabetes (44%), followed by glomerulonephritis (30%). Slightly more than one-third of the patients (37%) had viral hepatitis. The most common vascular access was A-V fistula (75%). The prescribed hemodialysis dose ranged between 0.8 and 2.5 per session, with a mean of 1.5 ± 0.3. The duration of dialysis ranged between 2 and 360 months, with a mean of 77.2 ± 75.5 months.

An interview form was prepared and included two sections. The first was concerned with patients' basic demographic data as well as the details of dialysis. The second section consisted of the Kidney Disease Quality of Life Scale Short Form (KDQOL-SF™),[18] which is disease-targeted and focuses on particular health-related concerns of individuals with kidney disease, including dialysis symptoms and/or problems, effects of the kidney disease on daily life, burden of the kidney disease, work status, cognitive function, quality of social interaction, sexual function, social support, dialysis staff encouragement, and patient satisfaction.

The 36 items of the KDQOL-SF™ are categorized into six domains, namely: general health, physical, emotional, social status, illness impact, and medical and financial satisfaction.[19] The scoring of the tool responses was performed according to the guidelines of the KDQOL-SF™.[20] The scoring direction was done so that higher scores indicate better QoL.

The study proposal was approved by the ethics committee in King Saud University. Patients were informed about the purpose of the study and about their rights to refuse or withdraw at any time. The study maneuvers could not entail any harm to participants. Although the tool included sensitive questions about sexual function, total confidentiality of any obtained information was ensured and secured. The study findings would lead to beneficence in terms of improvement of the quality of care rendered to dialysis patients in the study settings.

Table 1. Quality of life scores of hemodialysis patients (n = 100).

	Mean (SD)	Median
General health	45.8 (17.1)	39.30
Physical	53.1 (32.0)	47.90
Emotional	50.5 (14.8)	47.00
Social	54.9 (18.1)	58.10
Illness impact	46.5 (14.2)	43.20
Satisfaction with medical care	45.9 (12.2)	49.30
Total QoL	49.5 (13.7)	45.65

*Statistically significant at $P < 0.05$

Statistical Analysis

Data entry and statistical analysis were performed using SPSS 13.0 statistical software package (SPSS Inc., Chicago, IL, USA). Quantitative continuous data were compared using the non-parametric Mann–Whitney or Kruskal Wallis tests as normal distribution of the data could not be assumed. Pearson correlation analysis was used for assessment of the correlations between QoL scores and age and duration of dialysis, and Spearman rank correlation for educational level. To identify the independent predictors of total QoL score, multiple stepwise backward linear regression analysis was used and analysis of variance for the full regression models was performed. Statistical significance was set at $P < 0.05$.

Results

The QoL measured among the studied patients was converted into percent scores, with higher scores indicating better QoL. Table 1 indicates that the domain with the highest score was the social domain, followed by the physical one. At the other extreme, the general health domain had the lowest score. Overall, the total QoL score was about half of the scale.

Table 2 demonstrates statistically significant negative correlations between various QoL domains' scores and age, with the exception of satisfaction with medical care. The strongest of these correlations was with the physical domain. Weaker and negative correlations were revealed with the duration of dialysis, which reached statistical significance with general health, social, and satisfaction with medical care domains. As for educational level, it was correlated with all domains. However, only the satisfaction with medical care domain was negatively correlated to educational level.

When the correlation between total QoL scores and patients' characteristics was assessed, some statistically significant associations were revealed (Table 3). It was evident that QoL score was negatively related to age, with decreasing trend as age increased. Also, the score was higher among female and working patients. As for education, the table shows an increased trend with increased level of education.

On multivariate analysis (Table 4), the statis-

Table 2. Correlation between quality of life (QoL) scores of hemodialysis patients and their socio-demographic characteristics.

QoL domains scores	Pearson correlation coefficient		
	Age	Dialysis duration	Education level#
General health	-0.49**	-0.31**	0.42**
Physical	-0.58**	-0.14	0.48**
Emotional	-0.37**	-0.11	0.23*
Social	-0.28**	-0.23*	0.30**
Illness impact	-0.39**	-0.14	0.26**
Satisfaction with medical care	0.10	-0.21*	-0.20*
Total QoL	-0.51**	-0.24	0.41**

*Statistically significant at $P < 0.05$, **Statistically significant at $P < 0.01$, #Spearman rank correlation

Table 3. Relation between QoL total scores and socio-demographic characteristics of hemodialysis patients.

	QOL Score (Mean ï SD)	Mann–Whitney test value	*P*-value
Age (years)			
<40	58.7 ± 11.9		
40-	48.1 ± 13.4	H = 23.34	<0.001
60+	41.5 ± 10.2		
Sex			
Male	45.5 ± 12.7		
Female	53.9 ± 13.6	9.28	0.002
Marital status			
Single	47.7 ± 12.8		
Married	50.7 ± 14.3	1.23	0.27
Job status			
Working	54.7 ± 13.8		
Unemployed	46.4 ± 12.8	9.96	0.002
Education			
No formal education	42.3 ± 9.2		
Basic/intermediate	53.4 ± 13.4	H = 18.17	<0.001
High	55.2 ± 16.6		

H: Kruskall Wallis test

cally significant independent predictors of the QoL score were patient age, sex, and dialysis duration. It is noticed that increased age, increased dialysis duration, and male sex predict a lower QoL score. According to the standardized coefficient, age was the most influencing predictor, followed by duration of dialysis. The model explained 45% of the variation in the total QoL score. The other socio-demographic and disease characteristics had no independent effect on the QoL score.

Discussion

Our results demonstrate that the total QoL score was in the middle of the scale, with the best score being in the social domain and the lowest score being in the general health domain. Male gender, older age, and longer dialysis duration emerged as independent predictors of lower QoL score. In disagreement with our finding, lower QoL scores were reported in other studies, which was higher among women than among men.[21,22] The discrepancy might be attributed to differences in societal contexts of the studies, whereas in Saudi Arabia the male role could be more dominant, which would accentuate the negative feelings associated with chronic illness, disablement, and dependency.

The negative association between the QoL score and the duration of dialysis is quite plausible given the burden of HD sessions on the patients and the caregivers. In line with this finding, Ginieri-Coccossis et al demonstrated deterioration in QoL in HD patients who have been on dialysis for an extended period of time. On the contrary, other studies claimed no change or even improvement in QoL over time.[24] The different findings among various

Table 4. Best fitting linear regression model for total QoL score of hemodialysis patients.

	Unstandardized coefficients		Standardized coefficients	t-test	*P*-value
	B	Std. error			
Constant	35.013	9.112		3.843	<0.001*
Age	-0.347	0.081	-0.349	4.275	<0.001*
Sex (reference: male)	4.819	2.164	0.176	2.227	0.028*
Dialysis duration (months)	-0.045	0.014	-0.245	3.271	0.001*

r-square = 0.45; Model ANOVA: F = 21.58, *P* <0.001; Variables excluded by model: education, job, marital status, dialysis dose, hemoglobin and hematocrit levels, weight gain.

studies could be related to the quality of care provided and the effectiveness of therapy.

Although higher education and employment status had a positive association with QoL score, this association could not be substantiated by multivariate analysis. The relation between QoL and education is actually controversial in the literature. On the one hand, a Taiwanese HD cohort demonstrated that low education level was associated with reduced HRQOL.[25] On the other hand, another study found that lower educational level predicted better physical status score.[22] Meanwhile, no statistically significant association could be revealed between education and QoL components.[1] In our study, education and employment could be confounded by gender and thus were not identified as independent predictors of QoL score. Moreover, education had a differential influence on various domains of QoL, with a negative impact on the domain of satisfaction with medical care and positive impact on all other domains. This finding could be attributed to the fact that a well-educated patient is more aware of quality of service and patient rights issues, and consequently may be more demanding and more critical to the service provided.

In our study, marital status was not significantly associated with QoL score. This finding is in disagreement with Sagduyu et al,[26] who reported a significant effect of marital status on KDQoL. The difference could be attributed to the nature of the oriental families in general, and the Saudi families in particular, which is usually extended with close relations. Therefore, unmarried patients would not feel lonely or helpless.

Our study findings indicated that the social domain of QoL had the highest score, followed by the physical domain, and both were negatively correlated to age. Conversely,[27] Shrestha et al found that the physical health was the most severely affected domain of KDQOL; the mean score (SD) for physical health was 33.36 (16.14) compared with 53.1 (32.0) in our study, and this high standard deviation in our study could be due to the very wide age range in our sample, more than 55 years.

Our study findings are in congruence with the results reported by Seice et al, with high social QoL scores and better physical scores in the young patients.[26] However, Reboolo and Ortega showed the reverse and attributed the better social scores in older patients to their greater adaptation and lower expectation compared with younger individuals.[28]

We conclude that HD patients in our study had QoL scores that fall in the middle of the scale, with the highest being for social and physical domains. Patients' older age, male gender, and longer dialysis duration were negative predictors of QoL score. Although the consistency of our findings with previous studies provides some validation of our Arabic version of the tool, there is still a need for a more standard approach to its validation.

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