

# Health-Related Quality of Life in a Sample of Iranian Patients on Hemodialysis

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**Introduction.** This study evaluated the health-related quality of life (HRQOL) in a sample of Iranian patients undergoing maintenance hemodialysis. The data were compared with the HRQOL for the Iranian general population.

**Materials and Methods.** Two-hundred and fifty patients undergoing hemodialysis were included using a convenience sampling approach in a cross-sectional study. Data collection was performed using a Persian translation of the Short Form-36 questionnaire in combination with demographic and clinically related questions. The collected data were analyzed using a logistic regression model with physical and mental summary scales as dependent variables.

**Results.** The patients' mean Short Form-36 scores were significantly lower than those obtained for the general population for all scales. Patients with longer duration of being on hemodialysis, poor adherence to treatment, higher body mass index, and comorbidity diseases suffered from a poorer physical health. Poor mental health was associated with a lower level of education, longer duration of hemodialysis, lower economic status, a lower degree of knowledge on disease, and comorbidity diseases.

**Conclusions.** This study affirms the fact that patients undergoing hemodialysis suffer from poor HRQOL. In comparison with data from other studies from Asian and European countries, this sample of Iranian patients on hemodialysis had a lower HRQOL, a discrepancy that might be due to differences in life style, socioeconomic status, the general level of education of the patients, as well as physician-patient communication.

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## INTRODUCTION

End-stage renal disease (ESRD) is a chronic restrictive illness that affects many aspects of a patient's life. Moreover, chronic kidney disease and ESRD have become worldwide public health problems. These conditions increase patient morbidity and mortality risks and place a major economic strain on the healthcare system.<sup>1</sup> According to the United States Renal Data System in 2001, the

ESRD prevalence rate reached almost 1400 patients per million of population, and by 2030, the number of patients with ESRD is estimated to reach 2 240 000.<sup>2</sup> In Iran, which is seen as a developing country, the prevalence and incidence rates of ESRD have been on the increase from 49.9 patients per million of population in 2000 to 63.8 patients per million of population in 2006, an almost 28% increase over a 6 year period.<sup>3</sup>

Previous studies have shown that patients on hemodialysis have a poor health-related quality of life (HRQOL) and present with complications such as depression, malnutrition, and inflammation. Many of them suffer from impaired cognitive functioning such as memory loss and abnormally low concentration, as well as other unhealthy physical, mental, and social aspects of life that can, and do, affect even the simplest activities of daily life.<sup>4,5</sup> On the other hand, many researchers emphasize that an improvement in HRQOL reduces the complications associated with this disease, or at least makes them more tolerable.<sup>6</sup>

Health-related quality of life measurements are based on a subjective sense of well-being and are commonly used as an important clinical measure of the benefits in terms of medical treatment of patients undergoing maintenance hemodialysis, chronic peritoneal dialysis, or kidney transplantation.<sup>7</sup> Health-related quality of life has also been used increasingly as a factor for incorporation into models of cost effectiveness that are used to determine the relative value for many of the emerging as well as existing forms of treatment.<sup>8</sup> Furthermore, HRQOL has been associated with nutritional outcomes, hospitalizations, and survival in patients with ESRD.<sup>9</sup> Indeed, it is evident that HRQOL predicts outcomes among patients on hemodialysis. In support of which, a large study of 5256 patients from 243 dialysis centers in the United States and Europe documented that the psychological or mental components of HRQOL predicted death and hospitalization in patients on hemodialysis.<sup>10,11</sup>

The present goal for the treatment of patients with ESRD is not simply to prolong life, but also to provide a better HRQOL. To attain this goal, we must first recognize that there are a number of factors that affect a patients' life. To this end, many factors such as age, socioeconomic status, and a sense of ill health have already been related to a decline in HRQOL in this particular patient group.<sup>12</sup> Findings of different HRQOL scores among ESRD patients of different racial and ethnic backgrounds supports a need to individualize the concept of HRQOL, so that we can assess the most crucial aspects of our patients lives, and having done so, integrate these into a comprehensive plan of care. The aims of this study, therefore, were to compare HRQOL in an Iranian sample of adults

undergoing hemodialysis with that of healthy Iranians, and to compare patients' data with data from similar studies of HRQOL in patients undergoing dialysis in Asian, Western, and East European countries. Furthermore, the reliability of the Short Form-36 (SF-36) questionnaire in the current Iranian population was tested.

## MATERIAL AND METHODS

### Patients

From July to November of 2008, we recruited 250 of 294 patients who were undergoing hemodialysis and had been referred to dialysis centers under the supervision of Tehran University of Medical Sciences. The recruitment method used was based on a convenience sampling approach. Inclusion criteria were being on dialysis for more than 3 months, understanding Persian language, agreeing to complete the SF-36 questionnaire, and being older than 18 years. The study received approval from the ethics committee of Tehran University of Medical Sciences. All participants gave their oral consent, and information about the participants was kept strictly confidentially.

### Health-Related Quality of Life Measurement

Despite the existence of disease-specific instruments in terms of HRQOL measurements in kidney disease, none can be equally applied to both healthy and ill individuals alike. Thus, the SF-36 questionnaire was adopted, particularly since no translation of the questionnaire Kidney Disease Quality of Life was available in the Persian language.<sup>13</sup> The SF-36 has been designed to be a self-administered questionnaire. However, in order to prevent such problems as missing data and issues arising with the inclusion of illiterate individuals, the SF-36 questionnaire was completed under interview. The patients were interviewed separately.

The SF-36 is a generic instrument that has commonly been used in psychometric measurements. The SF-36 has 8 scales: physical function, role physical, bodily pain, general health, vitality, social function, role-function emotional, and mental health. It can also be summarized into 2 component scales; the Physical Component Scale (PCS) and the Mental Component Scale (MCS). Scores in each scale range from zero to 100, with zero representing the worst HRQOL and 100

representing the best possible score. Previous evaluations of the original as well as the Persian version of SF-36 indicated good reliability and construct validity.<sup>14,15</sup>

A questionnaire was also used to collect demographic and clinical data. The questionnaire consisted of 6 parts: part 1 included questions about sociodemographic information (age, marital status, educational status, employment status, accommodation, and economic status). Patients who earned less than 250 000 Rials per month were considered as being poor, patients who earned between 250 000 and 500 000 Rials were considered as being financially intermediate, and patients who earned more than 500 000 Rials were considered being well off (10 000 Rials approximately equals to US \$ 1). Part 2 included questions about kidney and other organ diseases, time since diagnosis of initializing hemodialysis, and comorbid systemic diseases. Part 3 included questions aimed at appraising treatment compliance, such as behavioral factors that may have negative effects on health, such as for example smoking or alcohol consumption, medication, lack of adherence to diet, and missing hemodialysis sessions. Part 4 included a question that addressed the issue of knowledge with regard to the progression of the illness and treatment (answers classified as having or not having sufficient information on ESRD). Part 5 included a question about social support, classified as patients who reported receiving any support on behalf of their families regarding their disease and those who reported that they did not received any support. Finally, part 6 included questions aimed at evaluating clinical aspects of hemodialysis, which contained the index of dialysis adequacy Kt/V for patients on hemodialysis and body mass index (BMI). The Kt/V was calculated according to the method of Gotch.<sup>16</sup>

### Statistical Analyses

Demographic and clinical variables were analyzed using descriptive statistics. Moreover, the patients' scores for the SF-36 questionnaire were compared with those of a general Iranian population using both a 1 sample *t* test and an independent *t* test. Reliability of the SF-36 was derived using a general Iranian population, which comprised a population-based study of a random

sample of 4163 individuals aged 15 years or older living in Tehran, Iran.<sup>14</sup> Internally, consistent reliability was estimated using the Cronbach  $\alpha$  coefficient. The  $\alpha$  coefficient covers a range from 0 to 1, with values greater than 0.70 being generally considered acceptable for group comparisons, and values greater than 0.90 being suitable for person-level comparisons. The percentage of respondents with scores at the upper "ceiling" (score of 100) and lower "floor" (score of zero) were calculated for each scale. Ceiling and floor effects should be less than 20% to ensure that the scale captures the full range of potential responses within the population and that changes over time can be detected.

Finally, we performed logistic regression analysis in order to determine variables that contribute to HRQOL in patients undergoing hemodialysis. For the purpose of the logistic regression analysis, the PCS and MCS were used as dependent variables, and age, gender, education, marital status, employment status, economic status, dialysis duration, treatment adherence, BMI, social support, disease knowledge, comorbidity disease, and the index of dialysis adequacy (Kt/V) were considered independent variables. Relative to the mean PCS and MCS scores, study samples were divided into 2 groups; those who scored equal to or greater than the mean value (PCS, *n* = 120; MCS, *n* = 145) and those who scored below the mean value (PCS, *n* = 130; MCS, *n* = 105).

### RESULTS

In total, all 250 individuals participated in the study. The mean age of the participants was  $53.63 \pm 15.85$  years (range, 19 to 85 years). The mean duration of hemodialysis was  $2.34 \pm 0.47$  years. Twenty-four percent of the patients were smokers. The characteristics of the participants are shown in Table 1.

The Cronbach  $\alpha$  coefficients used to test for internally consistent reliability for each scale are shown in Table 2. In every case, the scales were found to have an acceptable reliability, as indicated by the measured values, which either met or exceeded 0.7, as recommended. The percentage of respondents scoring close to or at the upper limit (ceiling effect) was considerable for each of the scales. The converse was also true, in that the percentage of respondents scoring at the lower

**Table 1.** Demographic Characteristics of Patients on Dialysis

Characteristic	Patient (%)
Age, y	
< 30	25 (10.0)
30 to 39	33 (13.2)
40 to 49	53 (21.2)
50 to 59	68 (27.2)
> 60	71 (28.4)
Sex	
Male	140 (56.0)
Female	110 (46.0)
Marital status	
Married	205 (82.0)
Single	45 (18.0)
Education, y	
0 to 8	180 (72.0)
9 to 12	55 (22.0)
> 12	15 (6.0)
Employment status	
Employed	145 (58.0)
Unemployed	105 (42.0)
Accommodation	
Urban	200 (80.0)
Rural	50 (20.0)
Comorbidity disease	
Yes	165 (66.0)
No	85 (34.0)
Treatment adherence	
Good	147 (58.8)
Bad	103 (41.2)
Social support	
Yes	190 (76.0)
No	60 (24.0)
Disease knowledge	
Enough	140 (56.0)
Not enough	110 (44.0)
Dialysis duration, y	
≤ 5	85 (34.0)
> 5	165 (66.0)
Economic status	
Poor	120 (48.0)
Intermediate	110 (44.0)
Good	20 (8.0)
Body mass index	
≤ 18	30 (12.0)
19 to 25	145 (58.0)
> 25	75 (30.0)
Kt/V	
< 1.2	156 (62.4)
≥ 1.2	94 (37.6)

limit (floor effect) was minimal for each of the scales, apart from the two role function scales of role physical and role emotional (Table 2).

With regard to the SF-36 scores, in each of the

scales, the patients mean scores were significantly lower compared to scores obtained from the general population from Tehran (Table 3). In order to determine predictive factors of HRQOL, logistic regression analysis was performed. The obtained results showed that duration of hemodialysis, treatment adherence, BMI, and comorbidity diseases as independent variables, were significant predictors of HRQOL, as represented by the PCS, since patients with longer duration of hemodialysis, nonadherence to treatment, higher BMI, and those having one or more comorbidity diseases suffered from poorer physical health. Also, poor mental health, as represented by low MCS, was associated with a lower level of education, a longer duration of hemodialysis, a lower economic status, minimal patient's knowledge of the disease, and more comorbidity diseases. Moreover, each of the variables showed a directional response that was in agreement with what had been anticipated. The results are show in Table 4.

Multiple regression for assessing the impact of smoking on physical and mental health showed that smoker participants suffered from a poorer physical health (odds ratio, 7.14; 95% confidence interval, 1.28 to 14.30;  $P = .02$ ). No association between mental health and smoking was seen (odds ratio, 0.03 95% confidence interval, 0.63 to 12.5;  $P = .18$ ).

The characteristics of the studies collated from the countries selected for comparison are shown in Table 5. The Figure shows the mean values of the SF-36 scores of 6 studies from 5 European and Asian countries, as well as an Iranian sample from the present study. Comparatively speaking, the graph shows that the patients presented in the study by Stavrianou and Pallikarakis, performed on Greek patients,<sup>17</sup> that of Sayin and colleagues involving Turkish patients,<sup>18</sup> plus the study by Cleary and Drennan on Irish patients,<sup>19</sup> and finally the study by Molsted and colleagues on Danish patients<sup>20</sup> all had higher scores for all the domains in the SF-36 questionnaire, with the exception of vitality scale for the study of Cleary and colleagues, which was relatively similar to that measured for this Iranian sample. In the study by Stojanovic and colleagues,<sup>21</sup> Serbian patients scored lower in terms of the role physical, general health, vitality, role-function emotional, and mental health domains compared with this Iranian sample.

**Table 2.** Internal Consistent Reliability of Short Form-36 Scales With Lower Limits “Floor” and Upper Limits “Ceiling” Values

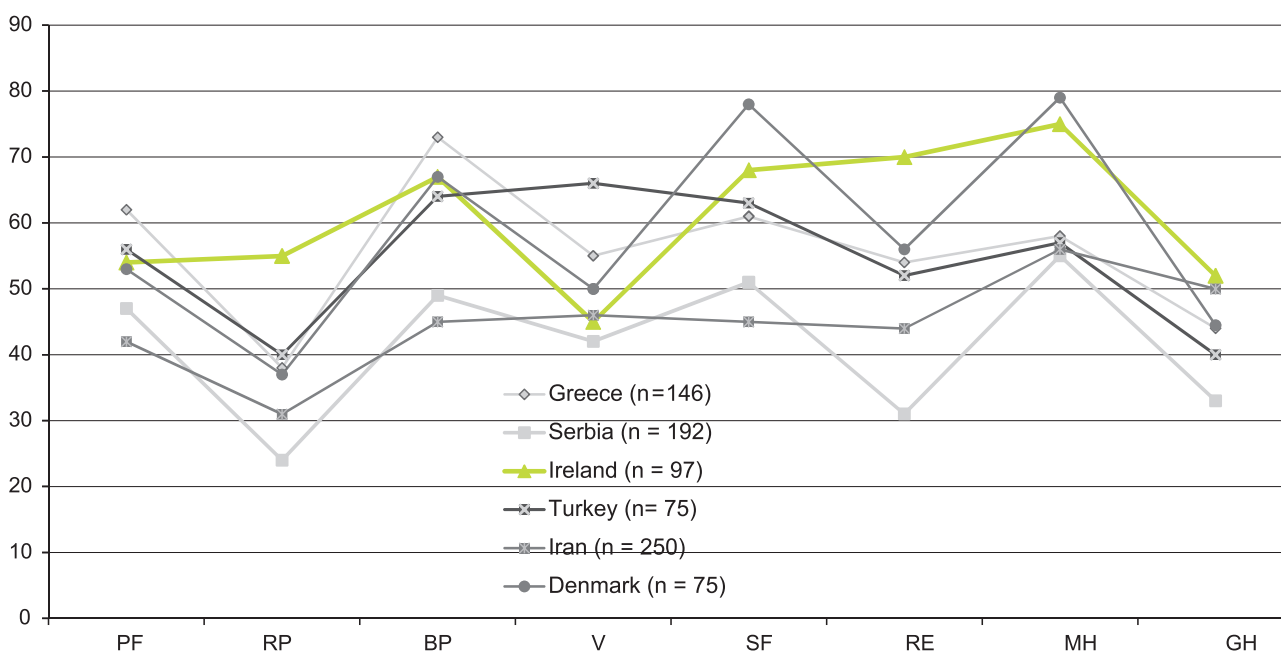
Scale	Number of Items	Cronbach $\alpha$ for Patients on Hemodialysis	Cronbach $\alpha$ for General Population*	Floor, %	Ceiling, %
Physical function	10	0.87	0.90	0.7	30.2
Role physical	4	0.83	0.85	1.2	42.5
Bodily pain	3	0.81	0.83	0.2	5.2
General health	4	0.79	0.71	0.6	12.3
Vitality	5	0.85	0.65	0.3	6.7
Social function	2	0.80	0.77	0.2	2.1
Role emotional	2	0.80	0.84	1.6	1.3
Mental health	5	0.86	0.77	0.4	3.4

\*Derived from a study by Montazeri and colleagues.<sup>14</sup>

**Table 3.** Comparison of the SF-36 scores between hemodialysis patients and a general cohort, representative of the Iranian population (higher scores indicate a better condition)

Short Form-36 Subscales	Patients (n = 250)	General Population (n = 1997)*	P
Physical function	41.6 ± 30.2	85.3 ± 20.8	< .001
Role physical	30.8 ± 32.5	70.0 ± 38.0	< .001
Bodily pain	43.9 ± 28.0	79.4 ± 25.1	< .001
General health	48.5 ± 16.8	67.5 ± 20.4	< .001
Vitality	46.3 ± 23.9	65.8 ± 17.3	< .001
Social function	44.1 ± 25.7	76.0 ± 24.4	< .001
Role emotional	43.1 ± 38.1	65.6 ± 41.4	< .001
Mental health	56.7 ± 22.4	67.0 ± 18.0	< .001
Physical component scale	41.2 ± 19.3	92.0 ± 26.1	< .001
Mental component scale	47.5 ± 20.1	68.6 ± 25.3	< .001

\*Derived from a study by Montazeri and colleagues.<sup>14</sup>



Distribution of the 8 Short Form-36 health dimensions between patients of 6 different countries (Greece, Serbia, Ireland, Turkey, Iran, and Denmark).<sup>17-21</sup> PF indicates physical function; RP, role limitations due to physical health problems; BP, bodily pain; GH, general health; V, vitality; SF, social function; RE, role limitations due to emotional health problems; and MH, mental health.

**Table 4.** Determinants of Poor Physical and Mental Health-Related Quality of Life in Iranian Patients Undergoing Hemodialysis

Factor	Physical Component Scale		Mental Component Scale	
	OR (95% CI)	P	OR (95% CI)	P
Age	0.99 (0.96 to 1.03)	.73	1.03 (1.00 to 1.06)	.08
Sex				
Female	1.0 (ref)		1.0 (ref)	
Male	0.50 (0.19 to 1.33)	.17	0.83 (0.30 to 2.20)	.71
Education, y				
> 12	1.0 (ref)		1.0 (ref)	
9 to 12	1.45 (0.60 to 3.50)	.13	1.98 (1.23 to 3.19)	.01
0 to 8	1.25 (0.50 to 3.10)	.53	1.20 (0.41 to 3.51)	.59
Employment status				
Unemployed	1.0 (ref)		1.0 (ref)	
Employed	0.58 (0.23 to 1.48)	.26	0.99 (0.38 to 2.62)	.99
Dialysis duration (years)				
≤ 5	1.0 (ref)		1.0 (ref)	
> 5	2.73 (1.34 to 5.56)	.001	1.98 (1.42 to 2.76)	.03
Marital Status				
Married	1.0 (ref)		1.0 (ref)	
Single, divorced, widowed	1.63 (0.53 to 5.01)	.22	1.30 (0.46 to 3.67)	.44
Treatment adherence				
Good	1.0 (ref)		1.0 (ref)	
Bad	2.21 (1.52 to 3.21)	.001	1.14 (0.84 to 1.55)	.38
Economic status				
Poor	1.0 (ref)		1.0 (ref)	
Intermediate	1.46 (0.68 to 3.15)	.33	0.47 (0.21 to 1.02)	.06
Good	0.27 (0.06 to 1.22)	.11	0.12 (0.02 to 0.74)	.02
Body mass index				
≤ 18	1.0 (ref)		1.0 (ref)	
19 to 25	1.20 (0.49 to 2.21)	.52	1.12 (0.73 to 1.72)	.67
> 25	2.06 (1.46 to 2.91)	.02	2.41 (0.93 to 6.27)	.07
Social support				
Yes	1.0 (ref)		1.0 (ref)	
No	1.22 (0.67 to 2.22)	.66	1.81 (1.18 to 2.78)	.03
Disease knowledge				
Enough	1.0 (ref)		1.0 (ref)	
Not enough	1.42 (0.84 to 2.40)	.49	2.08 (1.04 to 4.16)	.04
Comorbidity disease				
No	1.0 (ref)		1.0 (ref)	
Yes	2.14 (1.43 to 3.20)	.01	2.03 (1.40 to 2.94)	.01
Kt/V				
≥ 1.2	1.0 (ref)		1.0 (ref)	
< 1.2	1.14 (0.44 to 2.95)	.80	1.04 (0.51 to 2.12)	.92

**Table 5.** Demographic and Disease Characteristics of Patients on Hemodialysis in 6 Countries<sup>17-21\*</sup>

Country	Total Sample	Age, y	Male/Female	Duration of Dialysis, y
Iran	250	53.6 ± 15.8	140/110	3.80 (2.1)
Ireland	97	58.7 ± 18.2	48/49	...
Turkey	75	49.9 ± 15.8	54/21	6.68 (18.4)
Serbia	189	54.9 ± 12.1	115/77	4.74 (3.3)
Denmark	71	59.0 ± 16.0	54/17	3.25 (4.9)
Greece	146	57.0 ± 15.7	...	4.80 (3.2)

\*Ellipses indicate not mentioned in the article.



## DISCUSSION

Health-related quality of life is an important indicator of the outcome of healthcare treatment. Yet, in spite of worldwide focus on HRQOL in patients undergoing hemodialysis, very few studies have been performed in Iran on this topic, and the present study is therefore a rare exception.<sup>22-25</sup> This study explored substantial factors that affect HRQOL in patients on hemodialysis. In the present study, patients undergoing hemodialysis, who were compared with the general population of Tehran, obtained a very low score for the SF-36 questionnaire, which is consistent with most other published data for this field.<sup>5,20,24-28</sup> It is therefore not surprising that having such a disease such as ESRD has a prominent effect on HRQOL.

There was a significant association between the level of education attained and mental MCS. This finding could be the result of the sensitivity of the tool (SF-36) used in terms of education; in other words, the association between the level of education attained and MCS relies heavily on the education level possessed by an individual.

The present study showed that patients with a longer duration of ESRD treated with hemodialysis suffered from a poor HRQOL in terms of both the PCS and MCS dimensions. Similar findings were reported by other authors.<sup>6,13,19-21</sup> Maybe, the reason for this is that most patients registered as having had a long duration of ESRD treated with hemodialysis also tended to be older, a factor that indirectly affects HRQOL.

Almost half of the patients in the present study did not show appropriate adherence to the treatment, which had a significant impact on the PCS. Molsted and coworkers found that 41% of the patients undergoing hemodialysis smoked and that smoking had a significant effect on physical HRQOL scales.<sup>20</sup> Results from other studies have indicated that depression as a factor in patients undergoing hemodialysis decreases compliance to treatment, which also has a deteriorative effect on HRQOL.<sup>18,21</sup> On the other hand, increased self-efficacy is associated with an increased adherence to treatment, the initiation of behaviors perceived as promoting health, and a decrease in physical and psychological symptoms. Thus, people who are confident in their abilities may engage in activities that promote health. Conversely, a patient's inability to adjust to the illness may result

in negative outcomes, such as noncompliance and decreased HRQOL.<sup>28-30</sup>

As shown above, patients with a high income have a better HRQOL. Although governmental hemodialysis centers are more common in Iran than private centers, there is a lower quality of service, notwithstanding the cost of treatment, which is lower in the governmental centers in comparison with private centers. This problem leads to the fact that the wealthier population tends to prefer private centers, where the quality of service is better, compared with governmental centers.

The present study has shown a significant association between poor physical HRQOL and BMI, as obese patients with a higher BMI had a lower HRQOL score. It is assumed, however, that patients with a poor nutritional status also have a lower HRQOL score, which may seem to be contradictory. However, a higher value in terms of BMI status (state of obesity) should not necessarily be regarded as being indicative of a good nutritional status. Han and coworkers conducted a study to explore the relation between HRQOL and the incidence of overweight individuals in more than 4000 health workers. They found that greater waist circumferences and higher BMI values were associated with a deterioration of HRQOL and disability, both of which impacted negatively daily life-style activities.<sup>31</sup> Kalantar-Zadeh and associates used the SF-36 questionnaire to assess the HRQOL in patients undergoing hemodialysis and found that the SF-36 scores had a significant negative correlation with both the BMI and the percentage of body fat of individuals, which indicates that overweight outpatients undergoing hemodialysis perceive a worsening of HRQOL parameters compared with less obese patients.<sup>32</sup> Thus, with regard to the correlation between poor HRQOL and obesity, we could infer that the SF-36 may be a reliable tool in terms of detection of high-risk patients with a poor clinical condition. However, some studies showed that patients undergoing hemodialysis and registered as having a high BMI score had a better rate of survival.<sup>32,33</sup> The interpretation of this apparent anomaly is unclear. It may, however, be due to 2 limitations in the outcome measurements. The SF-36 evaluates the current health of people, or at least their health over the past month, and the BMI score does not provide an exact measure of obesity or the degree

to which an individual is overweight, since body composition is not measured.

We observed significant associations between poor mental health and social support. These findings coincide with the conclusions of previous studies that showed social support to be a significant predictor of the emotional aspect of the HRQOL in patients undergoing hemodialysis.<sup>26,34-37</sup> Thus, because of an existing culture in Iran that recognizes good relationship intimacy within families and between friends, social support could be an important tool to improve HRQOL in this area.

The present study found a significant association between poor mental HRQOL and patient's knowledge on the disease. Almost half of the patients stated that the information provided to them concerning the process of their disease was not adequate. Sayin and colleagues found that patients with a poor understanding of their disease had an impaired HRQOL, a finding that supports our data.<sup>18</sup> A reason for this may be that patients with a poor understanding of their disease misrepresent their condition, perceiving it to be a bigger problem than it is in reality. As a consequence, they may worry over much about the disease and even give up/decline forms of treatment. Our results highlight the fact that knowledge about a disease in patients is important. By providing patients with the necessary information relevant to their disease, the process of treatment, the advantages and disadvantages of engaging in given behaviors, of self-management, etc, it is most likely that a patient's HRQOL will improve. Meanwhile, health educators have a crucial role to play in terms of informing patients about their disease.

This study found no significant associations between poor physical and mental HRQOL and the indexes of dialysis adequacy Kt/V. To date, there is no common agreement regarding the impact of Kt/V on the HRQOL. Previous studies have indicated that Kt/V levels have little or no effect on the HRQOL outcome variables.<sup>9,19,37,38</sup> Other studies found that patients that were on a more efficient dialysis attained a higher score in terms of HRQOL parameters.<sup>39,40</sup> Therefore, there is a need for future studies on the effect of dialysis adequacy on the HRQOL.

Finally, with regard to the cross-cultural comparisons undertaken in this study, our data showed that these Iranian patients tended to attain

a higher score for the SF-36 health dimensions than patients from the Serbian study by Stojanovic and colleagues.<sup>21</sup> It should be emphasized that HRQOL values of patients living in Serbia could have been, at least in part, negatively influenced by the dramatic ethnic civil war of the 1990s.

In the studies on Greek, Turkish, Irish, and Danish patients,<sup>17-20</sup> the participants had higher scores for all of the SF-36 health dimensions with the exception of vitality than our cohort (Figure). These differences are difficult to interpret and may be the result of different life styles, socioeconomic status, or cultures. Further, there might be several more reasons for the observed differences between the data obtained from different countries. Moreover, the existence of differences between cultures may illustrate disparities in the management of the disease.

## CONCLUSIONS

We affirmed that patients undergoing hemodialysis suffered from a poor HRQOL, and in comparison with other nations, our sample of Iranian hemodialysis patients demonstrated a lower HRQOL score. Such patients are in continual contact with the healthcare system, which therefore needs to prioritize the tailoring of interventions in terms of treatment goals, to facilitate and optimize physician-patient communication, and to promote shared decision-making. Moreover, policy makers, who play a crucial role in patient health, need to make informed decisions about the allocation of resources, the provision of adequate insurance cover for patients, as well as understanding and focusing on the health of these patients, particularly their mental health. It is our hope that the results of this survey will be added to the existing literature addressing HRQOL in patients undergoing hemodialysis in Iran, and perhaps more importantly, be used to improve clinical practice.

## CONFLICT OF INTEREST

None declared.

## REFERENCES

1. Modi GK, Jha V. The incidence of end-stage renal disease in India: a population-based study. *Kidney Int.* 2006;70:2131-3.
2. US Renal Data System. *USRDS Annual Data Report.* The



- National Institutes of Health, National Institute of Diabetes, Digestive and Kidney Diseases. Bethesda: The National Institutes of Health; 2004.
3. Aghighi M, Heidary Rouchi A, Zamyadi M, et al. Dialysis in Iran. *Iran J Kidney Dis.* 2008;2:11-5.
  4. Walters BA, Hays RD, Spritzer KL, Fridman M, Carter WB. Health-related quality of life, depressive symptoms, anemia, and malnutrition at hemodialysis initiation. *Am J Kidney Dis.* 2002;40:1185-94.
  5. Vos PF, Zilch O, Jennekens-Schinkel A, et al. Effect of short daily home haemodialysis on quality of life, cognitive functioning and the electroencephalogram. *Nephrol Dial Transplant.* 2006;21:2529-35.
  6. Mau LW, Chiu HC, Chang PY, Hwang SC, Hwang SJ. Health-related quality of life in Taiwanese dialysis patients: effects of dialysis modality. *Kaohsiung J Med Sci.* 2008;24:453-60.
  7. Kalantar-Zadeh K, Unruh M. Health related quality of life in patients with chronic kidney disease. *Int Urol Nephrol.* 2005;37:367-78.
  8. Lee AJ, Morgan CL, Conway P, Currie CJ. Characterisation and comparison of health-related quality of life for patients with renal failure. *Curr Med Res Opin.* 2005;21:1777-83.
  9. Unruh M, Benz R, Greene T, et al. Effects of hemodialysis dose and membrane flux on health-related quality of life in the HEMO Study. *Kidney Int.* 2004;66:355-66.
  10. Lopes AA, Bragg J, Young A. Depression as a predictor of mortality and hospitalization among hemodialysis patients in the United States and Europe in the Dialysis Outcomes and Practice Patterns Study (DOPPS). *Kidney Int.* 2002;61:199-207.
  11. Mapes DL, Lopes AA, Satayathum S, et al. Health-related quality of life as a predictor of mortality and hospitalization: the Dialysis Outcomes and Practice Patterns Study (DOPPS). *Kidney Int.* 2003;64:339-49.
  12. Turk S, Guney I, Altintepe L, Tonbul Z, Yildiz A, Yeksan M. Quality of life in male hemodialysis patients. Role of erectile dysfunction. *Nephron Clin Pract.* 2004;96:c21-7.
  13. Hays RD, Kallich JD, Mapes DL, Coons SJ, Carter WB. Development of the kidney disease quality of life (KDQOL) instrument. *Qual Life Res.* 1994;3:329-38.
  14. Montazeri A, Goshtasebi A, Vahdaninia M, Gandek B. The Short Form Health Survey (SF-36): translation and validation study of the Iranian version. *Qual Life Res.* 2005;14:875-82.
  15. Ware JE, Jr., Gandek B. Overview of the SF-36 Health Survey and the International Quality of Life Assessment (IQOLA) Project. *J Clin Epidemiol.* 1998;51:903-12.
  16. Gotch FA. The current place of urea kinetic modelling with respect to different dialysis modalities. *Nephrol Dial Transplant.* 1998;13 Suppl 6:10-4.
  17. Stavrianou K, Pallikarakis N. Quality of life of end-stage renal disease patients and study on the implementation of nocturnal home hemodialysis in Greece. *Hemodial Int.* 2007;11:204-9.
  18. Sayin A, Mutluay R, Sindel S. Quality of life in hemodialysis, peritoneal dialysis, and transplantation patients. *Transplant Proc.* 2007;39:3047-53.
  19. Cleary J, Drennan J. Quality of life of patients on haemodialysis for end-stage renal disease. *J Adv Nurs.* 2005;51:577-86.
  20. Molsted S, Prescott L, Heaf J, Eidemak I. Assessment and clinical aspects of health-related quality of life in dialysis patients and patients with chronic kidney disease. *Nephron Clin Pract.* 2007;106:c24-33.
  21. Stojanovic M, Stefanovic V. Assessment of health-related quality of life in patients treated with hemodialysis in Serbia: influence of comorbidity, age, and income. *Artif Organs.* 2007;31:53-60.
  22. Noohi S, Karami GR, Lorgard-Dezfuli-Nejad M, Najafi M, Saadat SH. Are all domains of quality of life poor among elderly kidney recipients? *Transplant Proc.* 2007;39:1079-81.
  23. Lessan-Pezeshki M, Rostami Z. Contributing factors in health-related quality of life assessment of ESRD patients: a single center study. *Int J Nephrol Urol.* 2009;1:129-36.
  24. Sadeghieh Ahari B, Bashardoost B, Amani F, Moahammadi MA, Siahpoosh H, Arab R. Quality of life in hemodialysis patients at Ardabil University of Medical Sciences (ARUMS) and factor affecting it. *Res J Biol Sci.* 2007;2:529-33.
  25. Mehraban D, Salehi M, Naderi GH, Najafi I, Hakemi MS. [Comparison quality of life in patients on renal replacement therapies and general population]. *J Health Manag.* 2005; 20:68-76. Persian.
  26. Yang SC, Kuo PW, Wang JD, Lin MI, Su S. Quality of life and its determinants of hemodialysis patients in Taiwan measured with WHOQOL-BREF (TW). *Am J Kidney Dis.* 2005;46:635-41.
  27. Pakpour AH, Panahi D, YEkaninejad MS, Ebadifard F, Izy H. [A comparative study on health related quality of life in hemodialysis patients and healthy people]. *J Health Manag.* 2006 25:55-62. Persian.
  28. Tsay SL, Healstead M. Self-care self-efficacy, depression, and quality of life among patients receiving hemodialysis in Taiwan. *Int J Nurs Stud.* 2002;39:245-51.
  29. Lev EL. Bandura's theory of self-efficacy: applications to oncology. *Sch Inq Nurs Pract.* 1997;11:21-37; discussion 9-43.
  30. Lev EL, Owen SV. A prospective study of adjustment to hemodialysis. *Anna J.* 1998;25:495-504; discussion 5-6.
  31. Han TS, Tijhuis MA, Lean ME, Seidell JC. Quality of life in relation to overweight and body fat distribution. *Am J Public Health.* 1998;88:1814-20.
  32. Kalantar-Zadeh K, Kopple JD, Block G, Humphreys MH. Association among SF36 quality of life measures and nutrition, hospitalization, and mortality in hemodialysis. *J Am Soc Nephrol.* 2001;12:2797-806.
  33. Kalantar-Zadeh K, Kilpatrick RD, Kuwae N, et al. Revisiting mortality predictability of serum albumin in the dialysis population: time dependency, longitudinal changes and population-attributable fraction. *Nephrol Dial Transplant.* 2005;20:1880-8.
  34. Gregory DM, Way CY, Hutchinson TA, Barrett BJ, Parfrey PS. Patients' perceptions of their experiences with ESRD and hemodialysis treatment. *Qual Health Res.* 1998;8:764-83.

35. Valderrabano F, Jofre R, Lopez-Gomez JM. Quality of life in end-stage renal disease patients. *Am J Kidney Dis.* 2001;38:443-64.
36. Patel SS, Shah VS, Peterson RA, Kimmel PL. Psychosocial variables, quality of life, and religious beliefs in ESRD patients treated with hemodialysis. *Am J Kidney Dis.* 2002;40:1013-22.
37. Lew SQ, Patel SS. Psychosocial and quality of life issues in women with end-stage renal disease. *Adv Chronic Kidney Dis.* 2007;14:358-63.
38. Moreno F, Lopez Gomez JM, Sanz-Guajardo D, Jofre R, Valderrabano F. Quality of life in dialysis patients. A spanish multicentre study. Spanish Cooperative Renal Patients Quality of Life Study Group. *Nephrol Dial Transplant.* 1996;11 Suppl 2:125-9.
39. Morton AR, Meers C, Singer MA, et al. Quantity of dialysis: quality of life--what is the relationship? *Asaio J.* 1996;42:M713-7.
40. Chen YC, Hung KY, Kao TW, Tsai TJ, Chen WY. Relationship between dialysis adequacy and quality of life in long-term peritoneal dialysis patients. *Perit Dial Int.* 2000;20:534-40.

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