Relationship Between Duration of Dialysis and Quality of Life in Hemodialysis Patients

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Abstract

Background: The number of patients with chronic renal failure is increasing in Iran. Quality of life is an important indicator that reveals the sense of well-being, positive understanding of their, and the effectiveness of health care in patients undergoing dialysis, which could be affected by duration of dialysis.

Objectives: This study aimed at investigating the relationship between quality of life and duration of dialysis in hemodialysis patients.

Methods: In this descriptive correlational study, 246 patients with chronic kidney failure were selected by Single-stage stratified cluster sampling. Hemodialysis patients were put into 2 groups with a duration of hemodialysis less than and more than 36 months and were then compared with each other. The quality of life was measured using the kidney disease quality of life short form (KDQOL-SF36). Data analysis was performed by the Pearson correlation coefficient, independent t-test, and ANOVA

Results: The mean duration of hemodialysis patients was 34.03 months. There was no significant relationship between the quality of life in patients and duration of hemodialysis. Poor quality of life had a significant correlation with old age (P < 0.001), educational level (P < 0.001), job, and income (P < 0.001).

Conclusions: The findings showed poor quality of life in patients on dialysis. The length of the disease and other accompanying diseases reduced the quality of life in dialysis patients as their age increased. It is evident that educated people who have better access to sources of support and are able to cope with disease complications have a higher quality of life.

Keywords: Chronic Renal Failure, Dialysis, Quality of Life

1. Background

In any society, there are a number of people suffering from incurable diseases who must receive continuous treatments (1). One of the chronic diseases, which is a public health problem worldwide, is end stage renal failure (2). Chronic renal failure is a progressive and irreversible disorder of kidneys in which the body's ability to maintain fluid and electrolyte balance and excretion of metabolic waste disappears and ultimately leads to uremia (3). Common methods of renal replacement therapy are hemodialysis, peritoneal dialysis, and kidney transplantation. Hemodialysis is the most common method of dialysis that aims at providing a near normal life for afflicted patients (4). The global average of this disease is 465 per 1 million. Accordingly, by the end of 2014, 2,358,000 people have been treated in 36,000 dialysis centers around the world. That

is an average of 66 patients in each treatment center (5). In United States of America in 2010, there were 594,374 cases with end stage renal disease, of whom, 415,013 patients were on dialysis (6). The number of hemodialysis patients in Iran is annually increased by 15% (7). According to the report of Iran's Society of dialysis patients, the number of dialysis patients at the end of 2014 was 27,457 people, of which 25,934 patients (94%) were treated by hemodialysis (5). Dialysis protects patients' lives and increases their life expectancy, however it could not replace the function of healthy kidneys, therefore, the main purpose of treatment is to reach the highest level of function and well-being of the patient as well as improvement of the quality of life (8). Quality of life involves different aspects of health, welfare, and also physical, mental, and social comfort experienced by people who are are resulted from their understanding of life, and change over time (9). The world health organi-

zation defines the quality of life as individuals' perceptions of their living conditions, in terms of culture and values of the society and the goals, expectations, standards, and individual interests (10). Renal replacement therapies are responsible for significant changes in the lives of patients with chronic kidney disease (11). The feelings of lack of ability, lack of control over the disease and treatment, financial problems, inability to maintain jobs, multiple drug therapies, special nutrition program, and the ability to cope with physical and mental disabilities can affect the quality of life in involved patients (12). Lack of attention to the quality of life can lead to frustration, lack of motivation, and reduce the rate of economic, cultural, and health activities. Furthermore, in deeper dimensions, it can influence the socio-economic development of a country. In other words, enhancing the quality of life will improve the health of the society (13). The routine dialysis is very inflexible as well as the need to cope and adapt to different aspects of it, these patients have trouble coping with the stress of the disease (14). According to some studies, a period of 3 to 4 years is needed to cope with a chronic disease (15). Over time, increased adjustment in patients therefore results in better performance and quality of life (16). Increasing the history of hemodialysis due to the compliance with the conditions of hemodialysis for patients and improving uremic symptoms, can be helpful in improving the quality of life (17). In dialysis patients, the improvement of quality of life is an important issue that can be influenced by the time elapsed since the start of the dialysis; therefore, this study was designed to investigate the relationship between the duration of dialysis and the quality of life in dialysis patients.

2. Objective

This study aimed at investigating the relationship between quality of life and duration of dialysis in hemodialysis patients.

3. Materials and Methods

A descriptive-correlational research was conducted on 246 chronic kidney failure patients who were referred to hemodialysis centers in hospitals affiliated to Mazandaran University of Medical Sciences in 2015. Hemodialysis centers included Fatema Zahra, Imam Khomeini, Razi, Imam Reza, Shahid Rajaei, and Imam Sajjad hospitals. The under sample size formula was used by previous studies.

$$n = \frac{\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right) \times \delta^2}{d^2}$$
$$= \frac{3.24^2 \times 9^2}{2^2}$$
$$\cong 260$$

(1)

After obtaining necessary permissions, sampling was conducted via Single-stage stratified cluster to the centers. Patients who were at least 18 years of age and on dialysis for at least 2 months, twice a week, and willing to participate, were included in the study. Patients from other cities as well as those who received emergency dialysis and cases with known mental illnesses were excluded from the study. Data was collected using 2 questionnaires that were completed through interviews by the researchers. The first included demographic information and disease variables such as the age, gender, level of education, place of residence, marital status, number of children, and duration of hemodialysis. Hemodialysis patients were placed into 2 groups with the duration of hemodialysis less than and more than 36 months and were then compared with each other.

3.1. KDQOL- SF

The Kidney Disease Quality of Life Short Form (KDQOL-SF ™ 1/3), which was developed by Hays et al. in 1994 was also used.. The KDQOL- SF 36 measures the general and specific aspects of quality of life in individuals on dialysis (12). The general aspect includes 2 dimensions (physical and mental functioning), which consisted of 8 areas and specific aspect consisted of 11 fields. The scores on each dimension ranges from 0 to 100, with higher scores reflecting a better quality of life (4,18,19). The validity and reliability of the Persian version of the questionnaire had been approved by Yektayi Nejad et al. The Cronbach's-a coefficient, which was used to test for internally consistent reliability for each scale. All of the scales in the questionnaire showed good test–retest reliability (all above 0.7). Afterwards, the validity was assessed using known group comparisons and constructs for the patient group as a whole (20).

Data collection was analyzed in SPSS V. 22 applying descriptive statistics (frequency, mean, and standard deviation) and inferential statistics (Kolmogorov-Smirnov test to determine the normal distribution of data, Pearson correlation coefficient, ANOVA, and independent t-test). The level of significance was 0.95.

4. Results

Among a total of 246 patients, 102 patients (%41.5) were women and 144 (%58.5) were male. The age range of the

patients was between 23 - 83 and an average age of 56.54 ± 12.78, respectively. The average duration of hemodialysis in subjects was 34.03 months. Most primary causes of kidney disease in patients were hypertension and diabetes with 41.1% and 40.1%, respectively. Descriptive statistics are presented in Table 1.

Table 1. Socio-Demographic Characteristics of Hemodialysis Patients

Personal Factors of Samples		No. (%)
Gender	Female	102 (41.5)
	Male	144 (58.5)
Marital status	Single	48 (19.5)
	Married	198 (80.5)
Place of residence	City	145 (58.9)
	Village	101 (41.1)
	Unknown	19 (7.7)
The primary cause of disease	High blood pressure	101 (41.1)
	Diabetes	100 (40.7)
	Glomerulonephritis	4 (1.6)
	kidney stone	12 (4.9)
	Polycystic Kidney	7 (2.8)
	Lupus	3 (1.2)
Education	Illiterate	83 (33.7)
	Primary school	65 (26.4)
	High school	22 (8.9)
	High school	49 (19.9)
	University	27 (11)
Job	Employed	26 (10.6)
	Unemployed	115 (46.7)
	Retired	43 (17.5)
	Keeping house	62 (25.2)
Income	Less than 500 thousand	92 (37.4)
	500 thousand to 1 million	120 (48.8)
	More than 1 million	34 (13.8)

Average quality of life of all patients was 48.09 ± 5.003. The highest score was obtained in the scale of social support (92.61 ± 14.70) and the lowest score was in the scale of physical role limitations (12.90 ± 27.45), respectively.

In this study, 165 patients were on dialysis for less than 36 month while 81 had a longer duration of dialysis. In the first group, 57 patients (34.5%) had a good quality of life but in latter there were 29 individuals (35.8%) with good quality of life. The scores for overall average quality of life in patients on dialysis for less and more than 3 years were

48.3 ± 14.74 and 47.65 ± 5.50, respectively. These scores, although different, indicated no significant correlation between the 2 groups (P = 0.113). In patients with a duration of hemodialysis less than 36 months, the scores on the subscales of social support, social functioning, employment status, sexual function, general health, physical functioning, and energy were found to be higher compared to those of patients with longer duration of hemodialysis. In patients with more than a 3-year duration of hemodialysis lower scores were observed in symptoms and physical role limitations, while the increase of hemodialysis duration increased the scores of disease burden, disease effect on the life, physical pain, and emotional health. Significant relationships were seen between the hemodialysis duration in 2 groups and social support (P = 0.0001), the burden of disease (P = 0.004), and symptoms (P = 0.005) (Table 2).

Table 2. Subscale Scores of Quality of Life in Patients with a History of Different Hemodialysis

Subscales of Quality of Life	Duration of Hemodialysis		P Value
	≤ 36 mo (N = 165)	> 36 mo (N = 81)	
Physical Performance	59.77 ± 25.94	55.01 ± 28.75	0.141
Physical role limitations	13.78 ± 28.61	11.11 ± 25.00	0.186
Pain	33.33 ± 30.28	37.80 ± 33.36	0.225
General health perception	58.39 ± 16.10	56.04 ± 16.72	0.781
Emotional well-being	58.84 ± 8.22	58.55 ± 8.57	0.955
Role Emotional limitations	19.39 ± 27.80	24.27 ± 31.18	0.107
Social Performance	37.57 ± 16.93	36.88 ± 19.35	0.279
Energy	56.72 ± 12.42	54.13 ± 13.24	0.370
Symptoms	83.14 ± 11.69	80.58 ± 14.57	0.005*
The impact of kidney disease on life	28.08 ± 16.76	29.97 ± 18.80	0.377
Burden of disease	44.96 ± 20.15	49.53 ± 26.67	0.004*
Job Status	70 ± 24.56	63.58 ± 26.23	0.195
Cognitive Function	54.70 ± 15.65	53.49 ± 16.67	0.108
Social communication quality	50.66 ± 10.06	50.28 ± 10.11	0.983
Sleep	45.24 ± 7.60	46.26 ± 7.78	0.890
social support	93.93 ± 12.76	89.91 ± 17.81	0.0001*
Encouragemen by dialysis staff	19.39 ± 15.64	19.75 ± 18.63	0.101
Patient satisfaction	44.58 ± 18.39	44.85 ± 17.82	0.441
Total Quality of life	48.31 ± 4.74	47.65 ± 5.50	0.113

As shown in Table 2, the quality of life was significantly correlated with age, educational level, marital status, and family income level while there was no significant relationship between sex, place of residence, and the primary cause of the disease and quality of life (Table 3).

Table 3. Quality of Life Scores and the Demographic Characteristics of Patients Undergoing Hemodialysis

Personal Factors of Samples		The Average Standard Deviation of life Quality	Test Result (P = 0.05) Significance Level
Age		48.09 ± 5.003	0.000
Gender	Female	47.53 ± 4.98	0.972
	Male	48.49 ± 4.99	
Marital status	Single	47.62 ± 4.04	0.02
	Married	48.20 ± 5.21	
Place of residence	City	48.89 ± 4.88	0.812
	Village	46.94 ± 4.97	
	Unknown	48.79 ± 4.74	
The primary cause of disease	High blood pressure	48.67 ± 5.06	0.521
	Diabetes	47.35 ± 4.95	
	Glomerulonephritis	47.47 ± 4.43	
	kidney stone	46.79 ± 6.86	
	Polycystic Kidney	48.38 ± 4.18	
	Lupus	50.74 ± 8.78	
Education	Illiterate	45.96 ± 4.63	0.000
	Primary school	48.10 ± 4.88	
	High school	49.36 ± 3.68	
	High school	48.88 ± 4.53	
	University	52.15 ± 5.12	
Job	Employed	52.21 ± 4.46	0.000
	Unemployed	46.21 ± 4.57	
	Retired	49.17 ± 4.97	
	Keeping house	49.11 ± 4.52	
Income	Less than 500 thousand	46.63 ± 4.74	0.000
	500 thousand to 1 million	48.52 ± 4.77	
	More than 1 million	50.54 ± 5.35	
History of hemodialysis	≤ 36 month	48.31 ± 4.74	0.13
	> 36 month	47.65 ± 5.5	

4.1. Conclusions

In the present study, the relationship between the quality of life in hemodialysis patients and dialysis duration was investigated, and findings indicated a poor quality of life in patients under hemodialysis. Our results were consistent with those of Javanbakhtian et al. Taheri et al. and Parvan et al. (3, 4, 19). Rodrigues et al. found that the average score of quality of life in hemodialysis patients was less than normal, which signifies the low quality of life in these individuals (21). Al-Jumaih studied 100 patients in Saudi Arabia and observed high scores in KDQOL-SF (physical and mental aspects (22). Similarly, Tanita indicated a relatively high quality of life in hemodialysis patients (23), which was inconsistent with our results. This difference may arise from different health situations and levels of social supports available for patients in different countries.

In this study, the mean quality of life in patients who were on hemodialysis for more than 3 years was somewhat lower than the patients with longer duration of dialysis therapy; however, this relation was not significant. According to Gerasimoula et al. elapsed time from hemodialysis could reduce the patients' quality of life (24). Moreover, increased duration of disease, other accompanying diseases, and aging could cause changes in the quality of life. Some studies indicated no significant relationship between the duration of hemodialysis and quality of life (19, 22, 25, 26). Also, Anees et al. revealed that duration of hemodialysis was inversely correlated with quality of life (27). Consistent with aforementioned studies, Taheri et al. suggested that long-term dialysis treatment reduces the patients' quality of life (4). Guerra et al. and Santos et al. observed higher mental function scores in patients on hemodialysis for less than 36 months compared to those on dialysis for more than 3 years (28, 29). It was believed that an increase in duration of hemodialysis might cause the patients being adapted to hemodialysis and improvement of uremic symptoms to enhance their quality of life (17). Al Arabi also suggested that more time elapsed from the disease onset, increases the patients' adaption to hemodialysis, which may increase their quality of life and performance (16). These differences between the studies are probably due to social support systems in Iran and other countries and different social contexts.

The current study revealed a negative correlation and significant relationship between the age and quality of life score. In fact, low quality of life was observed while age increased. Taheri et al. and Baghayi et al. also suggested that older hemodialysis patients had poor quality of life (4, 7). Current findings are consistent by those of Parvan and et al. Rodrigues et al. Germin et al. and Pakpur et al. (19, 21, 30, 31). However, Rafii et al. found no association between age and quality of life (25). It is believed that by aging, var-

ious factors such as chronic diseases, degeneration of the extremities, inability to do personal care tasks, and the feelings of loss of control on the environment can influence the person's mental and physical health, resulting in diminished quality of life.

We found lower quality of life in female patients compared to male patients, however, this difference was not statistically significant. Pakpur et al. also demonstrated that the women had significantly lower average scores in all 3 domains of quality of life (31). Parvan et al. suggested that the quality of life in men was higher than that in women, however they did not find a significant difference (19), which is consistent with current results. In this regard, some results were not consistent with present results (4, 22, 32). Lower quality of life in women is indeed expected due to multiple pregnancies, obesity, levels of physical ability, and lower educational levels, which directly influences the socio-cultural status.

In our study, people with higher levels of education had a higher quality of life, which indicated a significant positive correlation. In other words, those who had a university education had a higher quality of life score and the lowest score was observed in illiterate individuals. These results are similar to what was observed by Germin et al. as well as Lessan - Pezeshki and et al. (30, 32). In fact, the level of education has always been effective on health and disease as well as other aspects of life with fundamental changes in knowledge and attitudes. It is evident that educated people who have better access to sources of support and could cope with disease complications, thereby have higher quality of life.

The role of income was also investigated on quality of life, which showed that high-income families had a higher quality of life. Seica suggests that individuals, who had poor economic status, also had a lower quality of life (33). It seems that higher incomes can help in improving the diet and increase treatment quality, by which the patient would enjoy a good quality of life.

The strengths of this study were a large sample size and using a standard tool (KDQOL- SF36), which allows the measurement of specific physical and psychological symptoms and quality of life in hemodialysis patients. A limitation of this study was face-to-face interviews in data collection, which could have influenced the answers by patients, as some may have not provided detailed answers for various reasons.

Acknowledgments

Footnotes

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