Research Article

Evaluation of quality of life in hemodialysis patients and measurement of clinical outcomes

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ABSTRACT:

End stage renal disease is the final stage of chronic kidney disease in which the kidneys longer function well enough to meet needs of life. The treatments for ESRD are dialysis or kidney transplant. Hemodialysis (HD) is the most common type of dialysis which can cause significant impairment in health related quality of life (HRQOL) and outcomes. The aim of the present study was to learn about the quality of life in patients receiving dialysis treatment and to evaluate the influence of various factors associated with poor HRQOL. In addition, this study compares SF-36 scores of various domains between survival and deceased patients. The study was a prospective observational, analytical study, conducted for 7 months in IPD/OPD of Dialysis Department at Sagar Hospitals, Bengaluru. The validated and authorized health related quality of life questionnaire (RAND SF-36) consists of 36 questions measuring physical and mental health status was used. Statistical significance of differences in physical component summary and mental component summary was calculated by using Kruskal-Wallis test and the Mann-Whitney U test. A total of 126 patients meeting the study criteria participated and completed the study. Overall, 85(67%) were male and the mean ± standard deviation age was 58.10± 11.38 years. Both PCS and MCS scores have significant negative association with age, total number of chronic medications and the total number of chronic co-morbid diseases. Among eight scales of SF-36, Bodily Pain (BP), Physical Function (PF), Role limitation due to Physical health (RP) and Vitality scores were significantly higher in surviving patients when compared to that of deceased patients respectively. Our study showed that important variables like PF, BP, RP and VT scores can be taken into consideration when dealing with hemodialysis patients. Healthcare providers should be aware of poor physical health as well as mental health among female gender, elderly patients, unemployed patients, patients with no formal education, multiple co-morbid diseases, and multiple chronic medications to improve their quality of life.

Key words: End stage renal disease, Hemodialysis, Health related quality of life, SF-36 questionnaire.

1. INTRODUCTION

End stage renal disease (ESRD) or renal disease is a growing worldwide public health concern. ESRD is the final stage of chronic kidney disease in which the kidneys longer function well enough to meet needs of life. People with diabetes or hypertension have the highest risk of developing ESRD[1, 2]. In the United States of America (USA), the number of newly reported ESRD cases in 2013 was 117,162 corresponding to an unadjusted incidence rate of 363 per million per year[3, 4].

The two main treatment modalities for ESRD are transplantation and dialysis (i.e., hemodialysis [HD] or peritoneal dialysis (PD) [5, 6]. Patients on maintenance hemodialysis (MHD) experience decreased quality of life (QOL) and significantly greater rates of malnutrition, inflammation, hospitalization, and mortality compared with the normal population[7.8].The ability to predict future morbidity and mortality is a key to reduce the burden of CKD. To this end, monitoring a patient's functional and subjective status of well-being, collectively known as health-related quality of life (HRQOL), is of particular importance in ESRD patients[9, 10].

According to the World Health Organization, health is defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"[11]. Quality of life defined as the general well being of a person or society, defined interims of health and happiness rather than wealth[12]. Health related quality of life is a multidimensional concept that includes domains related to physical, mental, emotional, and social functioning. It goes beyond direct measures of population health, life expectancy, and causes of death, and focuses on the impact health status has on quality of life. A related concept of HRQOL is well being which assesses the positive aspects of a person's life, such as positive emotions and life satisfaction[13].

Although HRQOL cannot be measured directly, the 36-item Short-Form health survey (SF36) has been validated as a QOL assessment tool for a wide variety of patients, including CKD patients[14, 15]. Here, we evaluate HRQOL using the SF36 and assess the impact of HRQOL on mortality in the elderly, who are likely to develop or already have CKD. A larger study, involving 5256 patients at 243 dialysis facilities in the United States and Europe, presented evidence that the psychological or mental components of quality of life predict death and hospitalization in hemodialysis patients[16]. Furthermore, HRQOL has been shown to be an independent predictor of survival in ESRD patients[17, 18]. Clinicians and public health officials have used HRQOL and well-being to measure the effects of chronic illness, treatments, and short and long term disabilities[19].

Although several studies were carried out and published about HRQOL in different disease populations in Palestine such as diabetic or hypertensive patients[20, 21]. No such studies were carried out among HD patients in India. Therefore, the present objective for treatment of end stage renal disease are 2 folds in the first place increase patient survival and in the second place to improve the quality of life it is essential to properly control the symptoms and complications of ESRD and work towards the full rehabilitation of the renal patient. The aim of the present study was to learn about the quality of life in patients receiving dialysis treatment and to evaluate the influence of various factors associated with poor HRQOL and factors related to treatment and patient conditions the co-morbidity associated with renal insufficiency.

2. METHODOLOGY

Study design and settings:

This was a prospective, observational, analytical study of chronic kidney disease (IV&V stage) patients registered in /OPD of

Dialysis Department at Sagar Hospitals, Bengaluru, India from September 2016 to February 2017(seven months) and was followed up for one year.

Ethics approval and consent to participate:

All participants had given written informed consent to participate. The study protocol was prepared and submitted to the Dayananda Sagar College of Pharmacy ethics committee on human subject research for ethical clearance. The study was approved by Institutional ethics committee and issued ethical clearance certificate for the same.

Sources of data and study material:

The sources of data used for this study includes out patient records, personnel interviews of patients and their representatives and Patient's treatment files in case of In-patients. The study materials include Patient Information Sheet, Informed Consent Form, Patient Data Collection (PDC) Form, Questionnaires for assessing (HRQOL).

Inclusion criteria:

All patients either sex who diagnosed with ESRD, patients 18 years of age or older, all patients admitted to dialysis department for hemodialysis, patients on regular hemodialysis for minimum of 3 months prior to the interview, patients who completed the survey.

Exclusion criteria:

Patients under 18, Patients who cannot complete a RAND SF-36 questionnaire due to cognitive Impairment, Dementia, Active Psychosis, Patients on dialysis less than 3 months, Patients who refuse to complete questionnaire method

Study procedure:

Dialysis patients visiting dialysis outpatient department and inpatients admitted in the dialysis department were identified and consented. Patients were enrolled in the study based on inclusion and exclusion criteria. The

validated and authorized health related quality of life questionnaire was used with permission from the author to assess HRQOL of dialysis patient. The RAND SF 36 questionnaires consists of 36 questions (items) measuring physical and mental health status in relation to eight health concepts: 1)Physical functioning(PF), 2)Role limitations due to physical health(RP), 3)Bodily Pain(BP), 4)General health perceptions(GH) 5)Vitality(energy/ fatigue) (VT),6)Social functioning(SF),7) Role limitations due to emotional health(RE), 8)Mental Health(MH). The first four domains were used to measure physical health and the next four used for measuring mental health Responses to each of the SF-36 items are scored and summed according to a standardized scoring protocol and expressed as a score on 0 – 100 scale for each of the eight health concepts. As well as the eight scales, two summary measures have been calculated: the physical component scores (PCS) and mental component scores (MCS). The summary scores are aggregated measures of the physical health and mental health dimensions underlying the SF-36 questionnaire[22].

Statistical analysis:

Data were recorded on a pre-designed data collection form and managed on an MS Office Excel spread sheet. The descriptive statistics are represented by mean ± standard deviation and percentages. The differences between the groups were determined by the parametric t-test & non-parametric statistical test: fisher's exact test or chi-square tests wherever appropriate. Graph Pad prism-5 statistical software was used for the data analysis. Data that were not normally distributed were analyzed using the Mann-Whitney U test or Kruskal-Wallis test according to the number of groups to compare. Statistical significance was defined as $p<0.05$. All P values were two tailed.

3. RESULTS

Patient characteristics:

Among 140 patients, as per inclusion and exclusion criteria, 130 patients were enrolled in the study, 126 patients completed the study, 4 continued to take further treatment at different dialysis centers. Among all patients, 85 (67%) were males and 41 (32.53%) were females. The age of the patients ranged from 21 to 82 years with a mean (SD) of 58.10(11.38) years. Majority of the patients were from > 60 age group with 43 males and 22 females. Of 126 patients, 49(38.88%) were graduated, 96(76.19%) were married, 51(40.47%) were employed. Majority of patients (52.38%) were non smokers. 71 patients (56.34 %) were on dialysis for less than two years and 105 patients (83.33%) receiving dialysis three times weekly. Most of the patients (66.66%) were having either 1 or 2 co-morbidities. 62.69% (79) were receiving medications less than four and mean no of medications taken by each patients was 3.16. The socio-demographic and clinical characteristics of the study participants are displayed in Table 3.1

Table 3.1: Socio-demographic and clinical characteristics of the study participants.

Variable	No. of males(85)	No. of females(41)	Total (126)
Age			
15-29	1(0.79)	0(0.0)	1(0.79)
30-44	8(6.34)	4(3.17)	12(9.52)
45-59	33(26.19)	15(11.90)	48(38.09)
> 60	43(43.12)	22(17.46)	65(51.58)
Education			
Illiterate	18(13.23)	11(8.73)	29(23.01)
Primary	1(0.79)	2(1.58)	3(2.38)
Secondary	17(13.49)	11(8.73)	28(22.22)
Higher secondary	16(12.69)	1(0.79)	17(13.49)
Graduate	33(26.19)	16(12.69)	49(38.88)
Marital Status			
Married	67 (53.17)	29(23.01)	96(76.19)
Unmarried	4 (3.17)	0	4(3.17)
Divorced	14(11.11)	1(0.79)	15(11.90)
Widowed	0	11(8.73)	11(8.73)
Smoking Status			
Smoker	32(25.39)	0	32 (25.39)
Non smoker	25(19.84)	41(32.53)	66(52.38)
Past smoker	26(20.63)	0	26 (20.63)
Chain smoker	2(1.58)	0	2(1.25)
Occupation			
Employed	49 (39.88)	5(3.96)	51(40.47)
Unemployed	0	30 (23.80)	30(23.80)
Retired	36 (28.57)	6(4.76)	42(33.33)
Dialysis Vintage(years)			

< 1	25 (19.84)	6 (4.76)	31(24.60)
1-2	25 (19.84)	15 (11.90)	40(31.74)
2-3	14 (11.11)	4 (3.17)	18(14.28)
3-4	11(8.73)	7 (5.55)	18 (14.28)
> 4	10 (7.93)	9 (7.14)	19 (15.07)
Dialysis Per Week			
2	5(3.96)	1(0.79)	6(4.76)
3	70 (55.55)	35(27.77)	105(83.33)
4	10 (7.93)	5 (3.96)	15 (11.90)
Total Chronic Co-morbidities			
None	6 (4.76)	0	6 (4.76)
1	27 (21.42)	15 (11.90)	42 (33.33)
2	29 (23.01)	13 (10.31)	42 (33.33)
> 3	23 (18.25)	13 (10.31)	36 (28.57)
No of Medications Per day			
< 4	56 (44.44)	23 (18.25)	79(62.69)
> 4	29 (23.01)	18(14.28)	47(37.30)

RAND SF-36 scores

Males (62.67 ± 17.82) scored slightly higher, but statistically significantly, than females (47.10 ± 16.60) on all scales. Our results demonstrated that increased age was associated with lower QOL. Younger patients in the current study reported that significantly better QOL. It was observed that among all patients elderly patients (> 60 years) had greatly affected in domains such as RP (40.38), PF (41.31), SF (50), GH (55) and have significantly reduced PCS (51) and MCS (56) scores.

The mean PCS and MCS scores of Illiterate patients were found to be 50.02 and 61.28 respectively which indicated that they had poor quality of life. Graduated patients had a good score in both PCS (64.45) and MCS (69.60) scores which showed that they had a good quality of life when compared to all the other categories.

Statistically significant difference was found among different occupation groups. There are no males in unemployed category. Females of unemployed category had a poor QOL in domains like PF (38), RP (38), VT (48), SF (48), BP (49) and PCS (45), MCS (54) compared to other category patients. It was also observed that the MCS of employed males and females is good compared to unemployed females.

Divorced and Unmarried patients scored good PCS (63.14 and 70.30) and MCS (70.68 and 68.56) scores which indicated that they had good quality of life compared to other categories. Married females were affected in domains such as RP (34%), PF (43%) and PCS (48%), MCS (59%) which showed that married females had a poor QOL compared to other category patients. Unmarried males had a good PCS (70%) compared to other category of patients.

There was a strong association between smoking and reduced QOL scores. It had been found that chain smokers showed poor PCS and MCS scores (35.52 and 44.71) which indicated lower levels of QOL. Chain smoker males had showed poor scores in domains like PF (25), RP (25), BP (33.75), MH (33), VT (37), SF (50) and both PCS (35.52) and MCS (44.71)

which showed that they had poor QOL. Non smoker males had a good QOL.

Patients who were on dialysis for short period of time had better quality of life scores than patients on long period of time. Patients who were on dialysis >4 years had lower scores of PCS (49.54) and MCS (62.29) indicating that they had poor quality of life whereas patients on dialysis <1 year had good scores of PCS (63.27) and MCS (65.08) indicating that they had good quality of life.

Moreover patients under 2 dialysis sessions per week category had good score of PCS (68.73) and MCS (69.66) compared to all the other patients. The patients with 4 dialysis sessions per week were affected in domains such as PF (40), RP (49.69), GH (59.3).The PCS and MCS of patients under 4 dialysis per week session were 53.50 and 67.41 respectively. The

patients who were on more no of dialysis per week had poor quality of life.

A strong relationship was found between no. of co-morbidity and all the domains of quality of life. Patients with more no of co-morbidities associated with poor PCS (48.98) and MCS (58.68) scores significantly. However there were a few patients had no comorbity showing good scores of all domains of QOL.

It was also found that patients receiving more than 4 medications had poor scores in domains such as PF (44.83), RP (44.17) and both PCS (56%), MCS (62%) are reduced compared to patients receiving less than 4 medications per day. Patients taking less number of medications associated with good quality of life. There was statistical difference between these two groups in PCS and MCS scores. Table 3.2 showed Rand SF-36 scores by socio-demographic and clinical Variables**.**

Table 3.2: Rand SF-36 scores by socio-demographic and clinical Variables

Variables	PF	RP	BP	GH	PCS	VT	SF	RE	MH	MCS
Gender										
Males	52.65	58.76	73.46	56.57	62.67	52.55	74.14	69.77	75.39	68.05
Females	40.98	35.77	57.07	54.72	47.11	51.83	54.08	65.17	62.52	58.39
Age										
15-29	85	25	100	75	71.25	40	50	76	33.33	49.83
30-44	64.17	72.22	68.96	58.78	66.01	57.50	70.83	69.00	77.78	68.78
45-59	54.48	61.35	70.67	55.50	63.22	51.67	71.40	69.80	79.79	68.16
> 60	41.31	40.38	65.60	55.50	51.70	52.03	64.49	66.89	64.23	62.03
Education										
Illiterate	32.24	37.07	58.97	53.42	50.02	47.01	67.04	66.84	63.22	61.28
Primary	48.33	66.67	88.33	65.27	66.98	60.00	79.17	64.67	66.67	67.62
Secondary	46.25	41.96	58.63	51.84	49.58	49.58	57.34	65.91	70.42	60.82
Higher Secondary	55.88	66.18	73.09	54.45	62.40	50.59	66.91	65.32	72.55	63.84
Graduate	57.76	58.91	76.02	59.79	64.45	57.14	73.36	71.71	76.19	69.60
Occupation										
Employed	59.35	67.04	76.48	56.65	67.30	55.00	77.31	71.42	80.25	70.99

Unemployed	38.33	38.06	49.58	54.81	45.16	48.33	48.07	62.79	57.67	54.21
Retired	42.86	40.48	70.64	55.91	54.03	51.71	69.11	68.14	69.25	64.73
Marital Status										
Married	49.11	50.23	69.47	57.48	57.94	51.84	68.33	67.78	71.58	64.96
Unmarried	68.75	81.25	83.75	47.71	70.30	51.25	75.00	73.00	75.00	68.56
Divorced	54.67	61.00	69.00	50.41	63.14	54.67	75.00	75.27	77.78	70.68
Widowed	31.36	36.36	49.55	53.30	42.58	53.64	48.56	61.27	57.57	55.25
Smoking Status										
Smoker	46.29	43.43	63.06	56.37	55.29	52.35	65.79	67.59	68.63	63.59
Non smoker	55.16	56.09	75.61	54.15	60.17	53.70	68.42	69.91	71.09	66.01
Past smoker	49.42	67.31	74.41	56.98	62.03	51.67	72.60	68.79	80.77	68.46
Chain Smoker	25.00	25.00	33.75	58.33	35.52	37.50	50.00	58.00	33.33	44.71
Dialysis Vintage(years)										
< 1	50.16	61.83	76.85	55.81	63.27	51.07	69.74	69.62	69.89	65.08
1-2	48.00	55.13	65.04	57.08	57.95	51.32	67.98	70.63	80.70	67.67
2-3	50.00	36.94	69.86	55.92	56.96	52.41	75.69	72.83	64.81	66.85
3-4	50.26	57.89	63.03	52.61	55.91	52.22	68.22	66.36	75.55	65.59
> 4	45.83	31.94	63.62	57.34	49.54	53.75	61.88	64.91	68.62	62.29
Dialysis Per Week										
2	57.50	87.50	75.00	53.67	68.37	52.50	64.58	72.67	88.89	69.66
3	49.52	49.40	68.14	55.59	57.53	51.92	67.73	67.63	69.46	64.26
4	40.00	49.69	65.09	59.30	53.50	55.44	67.50	71.00	75.73	67.41
Co-morbidities										
None	60.00	62.50	87.50	60.77	78.63	50.00	87.50	72.83	72.22	70.64
1	53.93	49.33	70.41	56.05	60.60	53.81	70.71	70.24	77.78	68.13
2	47.02	58.69	67.26	54.28	56.79	53.45	69.91	68.94	68.97	65.31
3	67.50	81.25	80.63	59.37	72.18	55.00	78.13	64.00	75.00	68.03
4	40.16	38.28	61.08	56.75	48.98	48.96	55.48	64.49	64.84	58.68
No of Medications Per day										
< 4	50.10	53.51	68.93	55.21	59.00	52.81	70.51	69.29	73.23	66.46
> 4	44.83	44.17	65.57	58.40	53.15	50.72	58.35	65.02	64.72	59.95

The mean PCS and MCS scores were 57.60 and 64.90 respectively. In PCS and MCS there were significant differences between participant groups according to gender, age, education, marital status, occupation, number of co-morbidities and number of medications (p-value < 0.05) but there were no significant differences according to smoking status,

dialysis vintage and dialysis per week. Comparison of physical component scores and mental component scores socio-demographic and clinical variables were shown in Table 3.3

Table 3.3: Comparison of physical component scores and mental component scores by socio-demographic and clinical Variables

Variable	Frequency (%)	PCS score (Mean ± SD)	*P*-Value	MCS score (Mean ± SD)	*P*-Value
Gender					
Males	85(67)	62.67 ± 17.82	< 0.0001[b]	68.05 ± 15.64	< 0.0001[b]
Females	41(32.53)	47.10 ± 16.60		58.39 ± 15.82	
Age					
15-29	1(0.79)	71.25	0.0009 [a]	49.83	0.0009 [a]
30-44	12(9.52)	66.01 ± 11.98		68.78 ± 14.95	
45-59	48(38.09)	63.22 ± 19.00		68.16 ± 14.93	
> 60	65(51.58)	51.70 ± 18.13		62.03 ± 17.11	
Education					
Illiterate	29(23.01)	50.02 ± 21.09	< 0.0001[a]	61.28 ± 17.54	< 0.0001[a]
Primary	3(2.38)	66.98 ± 21.37		67.62 ± 19.31	
Secondary	28(22.22)	49.58 ± 16.87		60.82 ± 14.78	
Higher secondary	17(13.49)	62.40 ± 15.80		63.84 ± 16.46	
Graduate	49(38.88)	64.45 ± 16.42		69.60 ± 15.52	
Occupation					
Employed	51(40.47)	67.30 ± 15.79	< 0.0001[a]	70.99 ± 14.41	< 0.0001[a]
Unemployed	30(23.80)	45.16 ± 16.67		54.21 ± 13.34	
Retired	42(33.33)	54.03 ± 17.73		64.73 ± 16.78	
Marital Status					
Married	96(76.19)	57.94 ± 18.89	0.0188 [a]	64.96 ± 16.51	0.0188 [a]
Unmarried	4(3.17)	70.30 ± 11.01		68.56 ± 15.47	
Divorced	15(11.90)	63.14 ± 17.12		70.68 ± 14.00	
Widowed	11(8.73)	42.58 ± 15.31		55.25 ± 14.02	
Smoking Status					
Smoker	32 (25.39)	60.17 ± 17.04	0.1220 [a]	66.01 ± 16.64	0.1220 [a]
Non smoker	66(52.38)	55.29 ± 20.00		63.59 ± 16.44	
Past smoker	26 (20.63)	62.03 ± 16.46		68.46 ± 15.06	
Chain smoker	2(1.25)	35.52 ± 24.30		44.71 ± 3.24	
Dialysis Vintage(years)					
< 1	31(24.60)	63.27 ± 16.46	0.1768 [a]	65.08 ± 15.54	0.1768 [a]
1-2	40(31.74)	57.95 ± 17.88		62.29 ± 16.28	
2-3	18(14.28)	56.96 ± 19.37		66.85 ± 15.92	
3-4	18 (14.28)	49.54 ± 19.44		65.59 ± 15.53	
> 4	19 (15.07)	55.91 ± 22.08		67.67 ± 19.20	
Dialysis Per Week					
2	6(4.76)	68.37 ± 8.40	0.1966 [a]	69.66 ± 13.06	0.1966 [a]

3	105(83.33)	57.53 ± 19.14		64.26 ± 16.53	
4	15 (11.90)	53.86 ± 19.00		67.58 ± 15.96	
Total Chronic Co-morbidities					
None	6 (4.76)	78.63 ± 10.88	0.0021[a]	70.64 ± 16.54	0.0021[a]
1	42 (33.33)	60.60 ± 17.38		68.13 ± 14.96	
2	42 (33.33)	56.79 ± 18.13		65.31 ± 15.98	
> 3	36 (28.57)	51.56 ± 19.69		59.72 ± 17.32	
No of Medications Per day					
< 4	79(62.69)	59.00 ± 18.39	0.0023[b]	66.46 ± 15.94	0.0046[b]
> 4	47(37.30)	53.15 ± 19.93		59.95 ± 16.65	

[a]**Statistical significance of differences calculated using the Kruskal-Wallis test**

[b]**Statistical significance of differences calculated using the Mann-whitney *U* test**

During the 12 months follow-up period, eleven patients (0.087%) died. Table 3.4 compares the characteristics of the deceased and surviving patients. Both the mental health dimension score and Physical health dimension score were significantly higher in surviving patients (67.08±15.09, 60.48±17.01) when compared with that of deceased patients (40.55±9.17, 26.53±6.15) respectively. There were significant differences between surviving and expired patients in BP, PF, RP and VT.

Table 3.4: Differences of SF-36 domains between survival and deceased patients

Sf-36 Domain	Surviving Patients	Deceased Patients	*P*- Value (t-test)
Physical Component Summary	**60.48±17.01**	**26.53±6.15**	**< 0.0001***
Physical Functioning(PF)	51.61±22.38	26.82±19.40	0.0018*
Role limitations due to physical health(RP)	55.32±41.82	18.18±29.77	0.0020*
Bodily Pain(BP)	71.21±24.45	38.86±23.96	0.0011*
General Health perceptions(GH)	56.99±15.63	48.25±16.39	0.2180
Mental Component Summary	**67.08±15.09**	**40.55±9.17**	**< 0.0001***
Vitality(VT)	53.67±13.24	39.55±11.28	0.0021*
Social functioning(SF)	70.71±25.61	40.91±27.44	0.105
Role limitations due to emotional health(RE),	69.13±13.79	60.73±10.71	0.309
Mental Health(MH).	66.1± 19.3	57.1±17.8	0.248

*****Statistically significant**

4. DISCUSSION

Patients with ESRD who are treated with dialysis experience many threats to HRQOL, both from the myriad symptoms of ESRD itself and from physical and mental burden of dialysis treatment. For these patients, the careful assessment of HRQOL can help guide provision of medical management to optimize their health experience[23].

In the current study, we used RAND SF-36 questionnaire for assessment of health related quality of life. It will assess both physical and mental health comprising of various domains. The SF-36 has become one of the most widely used health-related quality of life measures.

This study indicated that the main socio-demographic factors associated with Hemodialysis-related QOL, were gender, age, education, marital status, smoking status, occupation, dialysis vintage, dialysis per week, number of co-morbid diseases, number of medications per day.

Males scored slightly, but statistically significantly, higher than women on all scales. The differences were more pronounced for the scales more closely associated with Physical health than for the scales associated with mental health. The similar results were obtained in the study conducted by Sa'ed et al. 2016[24].

Our results demonstrated that increased age was associated with lower QOL. Younger patients in the current study reported that significantly better QOL. Among all patients elderly patients (> 60 years) had significantly reduced PCS (51) and MCS (56) compared to other age groups. These results were in agreement with the findings reported by F. Moreno and colleague's study[25, 26].

Divorced and Unmarried patients were strong both physically and mentally compared to other categories. Married females were having low scores in RP (34%), PF (43%) indicated that they had poor physical functioning. There were limited studies reported on marital status.

There was a strong association between smoking and reduced QOL scores. There were no females in Chain Smoking category. It had been found that chain smokers showed poor physical component summary scores and mental component summary scores (35.52 and 44.71) which indicated lower levels of QOL. Similar associations were observed in previous study[24].

Statistically significant difference was found among different occupation groups. Unemployed females were more likely to become more anxious or depressed and also unable to perform vigorous activities such as lifting heavy objects or to perform moderate activities such as moving a table or pushing a vacuum cleaner. These results were in agreement with the previous studies [27, 28].

The mean PCS and MCS scores of Illiterate patients were found to be 50.02 and 61.28 which indicated that they have poor quality of life. Graduated patients had a good score in both PCS (64.45) and MCS (69.60) which shows that they had a good quality of life when compared to all the other categories. This may be due to the fact that educated persons have more information about treatments; greater self reported adherence and a better relationship with their healthcare team[29].

Patients who undergone 2 dialysis sessions per week had good quality of life compared to all the other patients. The patients with 4 dialysis sessions per week had a limitation in performing daily activities due to their physical state of health. The same results were obtained the study conducted by Sa'ed H et.al[24].

Patients with more number of co-morbidities associated with poor PCS (48.98) and MCS (58.68) scores significantly. Most commonly observed co-morbidities are Diabetes mellitus, Hypertension associated with poor quality of

life. The similar associations were found by a study[30].

Patients with medication history more than 4 medications were affected in both PCS (56%), MCS (62%) compared to patients with less than 4 medications per day. Patients taking less number of medications associated with good quality of life. There was statistical difference between these two groups in PCS and MCS scores. These results were in agreement with previous studies[31].

Patients who were on dialysis for short period of time had better quality of life scores than patients on long period of time. Patients who were on dialysis more than 4 years had poor quality of life. A study reported that the dialysis vintage period negatively associated with HRQOL[24].

5. CONCLUSION

HRQOL monitoring and use have great potential to improve patient outcomes, yielding benefits that exceed burden for patients and clinics.

Our study showed that number of important variables that can be taken into consideration when dealing with hemodialysis patients are females, elderly patients, unemployed patients, patients with no formal education were well associated with poor HRQOL. Higher number of co-morbid diseases as well as higher number of medications was also associated with lower HRQOL. In addition, there is a significant difference between survival and deceased patients in PF, BP, RP and VT scores. Healthcare providers should be aware of these SF-36 domains to improve their quality of life.

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