

PREDICTING QUALITY OF LIFE IN HAEMODIALYSIS PATIENTS

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ABSTRACT

Objective: To document quality of life in haemodialysis patients and to determine predictive factors.

Study Design: Cross sectional study.

Place and Duration of Study: Department of Nephrology, Pak Emirates Military Hospital Rawalpindi, from Oct to Nov 2016.

Material and Methods: Patients undergoing maintenance haemodialysis were selected by convenience sampling. Patients with acute kidney injury, those on infrequent HD, those on dialysis for less than three months and unwilling patients were excluded. Kidney Disease Quality of Life Short Form Version 1.3 was administered in direct face-to-face interviews. The effects of age, gender, level of education, duration on haemodialysis, smoking, marital status, frequency of dialysis per week, body mass index, presence of comorbid conditions, residence, availability of attendant, type of vascular access and household income on quality of life indices was studied.

Results: There were a total of 109 patients, having a mean age of 50.22 ± 13.73 years. Out of these, 86 (78.90%) were males. Mean physical composite score, mental composite score and kidney disease component summary score were 33.41 ± 6.85 , 46.10 ± 5.89 and 65.00 ± 6.11 respectively. Adequate physical composite score, mental composite score and kidney disease component summary score were attained by 8.26%, 22.94% and 49.54% patients respectively. A higher level of education predicted a higher mental composite score and a younger age predicted a better kidney disease component summary score. None of the factors studied could predict higher physical composite score.

Conclusion: Haemodialysis patients had a poor quality of life. Older age and a lower level of education were best predictive factors in our patients.

Keywords: End stage renal disease, Renal replacement therapy, Sickness impact profile.

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INTRODUCTION

Chronic kidney disease (CKD) is highly prevalent in Pakistani population, though exact figures are difficult to quote because of lack of registries in our country¹. Many years ago, the growth in rate of patients receiving dialysis treatment around the world was averaged around 7%². Haemodialysis (HD) is a costly treatment modality which imposes numerous restrictions on CKD patients, including physical and financial constraints, and impairs their psychological and emotional well-being. An impairment in quality of life (QoL) is therefore universal, but this fact is usually not taken into account when prescribing treatment to

these patients, leaving a gap in appropriate management. Poor QoL not only reflects a dismal status of overall healthiness, but is also associated with higher morbidity and mortality³. Moreover, patients with lower QoL are more likely to abandon regular HD⁴. Therefore, it becomes imperative to regularly monitor QoL in patients on HD, and to institute different interventions aimed at improving the QoL. More frequent HD, exercise training, treatment of anaemia and mineral bone disease, treatment of restless legs syndrome with gabapentin, treatment of carnitine deficiency with carnitine, coping strategies and psychosocial support have been shown to be effective in this regard⁵. Despite the availability of all these options, augmenting QoL remains a challenging task.

This study was therefore done to document QoL in patients undergoing regular HD at our

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Received: 14 Feb 2017; revised received: 10 Apr 2017; accepted: 07 May 2018

setup and to determine characteristics reflective of a poorer QoL. This would help identify such individuals more easily so that a greater emphasis may be placed on instituting measures to improve clinical outcomes.

PATIENTS AND METHODS

This cross sectional study was carried out at department of Nephrology, Pak Emirates

Table-I: Baseline characteristics of study population.

Parameter	Value
Education (years)	10 (0-16)
Duration on haemodialysis (months)	12 (3-204)
Body mass index (kg/m ²)	20.78 ± 3.98
Household income (thousand rupees)	18 (2-100)
Smoking status	
Smokers	15 (13.76%)
Non-smokers	94 (86.24%)
Marital Status	
Single	4 (3.67%)
Married	105 (96.33%)
Frequency of Haemodialysis	
Twice a week	68 (62.39%)
Thrice a week	41 (37.61%)
Co-morbidities	
Yes	56 (51.38%)
No	53 (48.62%)
Residence	
Rural	22 (20.18%)
Urban	87 (79.82%)
Attendant	
Yes	81 (74.31%)
No	28 (25.69%)
Vascular Access	
Double lumen catheter	20 (18.35%)
AV fistula	83 (76.15%)
Graft	6 (5.50%)

Military Hospital Rawalpindi from October to November 2016. Approval was obtained from Ethics Review Committee of the hospital beforehand. Patients undergoing maintenance HD in outdoor were enrolled from the dialysis centre after obtaining informed written consent. Non-probability convenience sampling technique was used. Patients with acute kidney injury, those on infrequent HD, those on dialysis for less than three months and unwilling patients were excluded from the study. A minimum sample

size of 95 patients was calculated with Free Statistics Calculators version 4.0, using an anticipated effect size (f²) of 0.2, statistical power level of 0.8, alpha of 0.05 and 11 predictors. In the first step, demographic data was recorded. This included age, gender, education, frequency and duration on HD, smoking/ marital status, presence of comorbid conditions, availability of attendants, area of residence and monthly household income. Height and weight were recorded to calculate body mass index (BMI).

Table-II: Measures of quality of life in haemodialysis patients.

Parameter	Value
SF-12 physical composite score	33.41 ± 6.85
SF-12 mental composite score	46.10 ± 5.89
Kidney disease component summary score	65.00 ± 6.11
Symptom/ Problem list	90.27 ± 10.43
Effect of kidney disease	73.37 ± 12.19
Burden of kidney disease	46.79 ± 13.25
Work status	11.93 ± 21.41
Cognitive function	80.37 ± 12.20
Quality of social interaction	65.69 ± 12.79
Sexual function	78.64 ± 14.50
Sleep	61.08 ± 16.89
Social support	83.33 ± 12.83
Dialysis staff encouragement	74.88 ± 9.99
Overall health	53.05 ± 10.80
Patient satisfaction	59.94 ± 12.45
Physical functioning	45.92 ± 23.73
Role- physical	2.29 ± 12.04
Pain	65.99 ± 20.45
General health	35.14 ± 8.32
Emotional well-being	77.91 ± 11.86
Role- emotional	12.84 ± 21.71
Social function	59.75 ± 23.65
Energy/ fatigue	50.00 ± 11.47

Type of vascular access for HD was also noted. In the second step, QoL was assessed using Kidney Disease Quality of Life Short Form (KDQOL-SF™), Version 1.3. It analyses QoL on 19 scales, 11 being specific to kidney disease and 8 referring to SF-36. Each domain is marked from zero to hundred, with higher scores reflective of a better QoL. This instrument was administered to all patients verbally by a single physician in Urdu language. It was ensured that no significant differences arise during the translation of the questionnaire to Urdu language. This was done

by translating the Urdu version into English, and then getting both the English versions compared by an independent physician.

Responses from individual patients were recorded and scored using KDQOL-SF™ version 1.3 Scoring Program (v 2.0). SF-12 physical

subscales were averaged to form the kidney disease component summary score (KDSC). Univariate and multivariate binary logistic regressions were performed to ascertain the effects of age, gender, level of education, duration on HD, smoking, marital status, frequency of

Table-III: Factors related to physical composite score.

Variable	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age	0.956 (0.908, 1.008)	0.094	0.966 (0.907, 1.028)	0.272
Gender*	2.667 (0.318, 22.385)	0.366	-	-
Education	1.095 (0.918, 1.306)	0.313	-	-
Duration on haemodialysis	0.975 (0.936, 1.016)	0.235	0.989 (0.975, 1.004)	0.191
Smoking**	1.912 (0.358, 10.219)	0.448	-	-
Marital status***	0.247 (0.023, 2.661)	0.249	0.048 (0.001, 3.018)	0.151
Frequency of haemodialysis****	0.188 (0.023, 1.557)	0.121	0.170 (0.015, 1.944)	0.154
Body mass index	0.976 (0.807, 1.180)	0.803	-	-
Co-morbidities*****	0.443 (0.105, 1.872)	0.268	-	-
Residence*****	0.470 (0.056, 3.972)	0.488	-	-
Attendant*****	0.395 (0.098, 1.589)	0.191	0.253 (0.047, 1.363)	0.110
Vascular access*****	0.768 (0.147, 4.009)	0.755	-	-
Household income	1.000 (1.000, 1.000)	0.293	-	-

OR = Odds ratio; CI = Confidence interval

Reference Categories:

Females*; Non-smokers**; Single/unmarried***; Twice-a-week****; No comorbidities*****; Urban*****; No attendant*****; Temporary*****

Table-IV: Factors related to mental composite score.

Variable	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age	0.970 (0.938, 1.004)	0.080	0.971 (0.943, 1.001)	0.491
Gender #	1.333 (0.445, 3.995)	0.607	-	-
Education	1.167 (1.027, 1.326)	0.018	1.147 (1.002, 1.314)	0.047
Duration on haemodialysis	1.005 (0.994, 1.017)	0.363	-	-
Smoking @	1.264 (0.365, 4.381)	0.712	-	-
Marital status \$	0.280 (0.037, 2.101)	0.216	0.529 (0.055, 5.137)	0.583
Frequency of haemodialysis ^	2.687 (1.078, 6.694)	0.034	2.614 (0.835, 5.610)	0.112
Body mass index	0.982 (0.872, 1.106)	0.766	-	-
Co-morbidities %	1.273 (0.518, 3.124)	0.599	-	-
Residence &	0.467 (0.126, 1.729)	0.254	-	-
Attendant *	0.857 (0.314, 2.337)	0.763	-	-
Vascular access ~	1.861 (0.498, 6.955)	0.356	-	-
Household income	1.000 (1.000, 1.000)	0.661	-	-

OR = Odds ratio; CI = Confidence interval

Reference Categories: Females*; Non-smokers**; Single/unmarried***; Twice-a-week****; No comorbidities*****; Urban*****; No attendant*****; Temporary*****

composite scores (PCS) and SF-12 mental composite scores (MCS) were generated by this spreadsheet. These scores and other data were then entered in IBM SPSS Statistics 20 and analysed. The eleven kidney disease-specific

HD per week, BMI, presence of comorbid conditions, residence, availability of attendant, type of vascular access and household income on the likelihood of having higher PCS, MCS and KDSC. For multivariable analysis, only those

variables were used which had p -value <0.25 at univariable stage. For the purpose of regression analysis, cut-off scores of 43 and 51 were used for PCS and MCS respectively, below which the scores were considered inadequate (based on data from previous studies)⁶. A cut-off of 65 was used for KDCS scores. All p -values ≤ 0.05 were considered to be statistically significant.

RESULTS

A total of 109 patients, having a mean age of 50.22 ± 13.73 years were enrolled. Out of these, 86 (78.90%) were males whereas 23 (21.10%) were females. Other baseline characteristics are shown in table-I. Nearly two thirds of the cases were attribute to hypertension and diabetes. Causes of

Results of univariate and multivariate regression analyses for PCS, MCS and KDCS are shown in tables-III to V respectively.

DISCUSSION

Prolonged duration of treatment, demands for physical agility and financial requirements are taxing for patients with end stage renal disease, more so than other chronic non-communicable diseases like hypertension and diabetes mellitus. These patients are thus prone to have a poor QoL. QoL is now recommended as a tool to assess patients on HD⁷. A better QoL indicates more effective disease management. Complications associated with CKD as well as multiple comorbidities generally lead to a poor QoL as

Table-V: Factors related to kidney disease component summary score.

Variable	Unadjusted OR (95% CI)	p -value	Adjusted OR (95% CI)	p -value
Age	0.956 (0.927, 0.987)	0.005	0.954 (0.917, 0.993)	0.021
Gender #	2.797 (1.094, 7.151)	0.032	3.130 (0.770, 12.717)	0.111
Education	1.137 (1.039, 1.244)	0.005	1.086 (0.961, 1.228)	0.185
Duration on haemodialysis	1.000 (0.990, 1.011)	0.998	-	-
Smoking @	0.459 (0.146, 1.446)	0.184	0.366 (0.103, 1.307)	0.122
Marital status \$	0.981 (0.133, 7.228)	0.985	-	-
Frequency of haemodialysis^	0.814 (0.375, 1.770)	0.604	-	-
Body mass index	1.040 (0.942, 1.148)	0.437	-	-
Co-morbidities %	1.203 (0.567, 2.552)	0.630	-	-
Residence &	1.023 (0.402, 2.608)	0.962	-	-
Attendant *	0.444 (0.183, 1.081)	0.074	1.449 (0.477, 4.398)	0.513
Vascular access ~	1.250 (0.472, 3.311)	0.653	-	-
Household income	1.000 (1.000, 1.000)	0.207	1.000 (1.000, 1.000)	0.321

OR = Odds ratio; CI = Confidence interval

Reference Categories: Females*; Non-smokers**; Single/unmarried***; Twice-a-week****; No comorbidities*****; Urban*****; No attendant *****; Temporary*****

CKD in other patients are depicted in fig-1. Mean PCS, MCS and KDCS were 33.41 ± 6.85 , 46.10 ± 5.89 and 65.00 ± 6.11 respectively. Other scores reflecting different measures of QoL are shown in table-II. Adequate PCS, MCS and KDCS were attained by 9 (8.26%), 25 (22.94%) and 54 (49.54%) patients respectively. A higher level of education and thrice a week HD were predictive of a higher MCS, but the latter was statistically insignificant after multivariate regression. Younger age, male gender and a higher level of education predicted a better KDCS, but the latter two lost statistical significance on multivariate regression. None of the factors studied could predict higher PCS.

compared to the general population. Most of the data on QoL in HD patients comes from the Western world, with only a handful of studies having been carried out on Pakistani patients^{4,8-10}. Most of these have assessed patients using WHOQOL-BREF questionnaire, so that a direct comparison with their overall results may not be very easy.

However, QoL of patients included in this study is more or less similar to statistics reported from several other countries. In a paper published in 2013, Rostami *et al* have presented pooled data from 19 different studies¹¹. The

overall results of our study are generally the same. Mean PCS of our patients is lesser (33.41 vs 37.80) despite a younger age, possibly because of generalized fatigue, malaise and discomfort associated with CKD. Of all the different measures of QoL, PCS has previously been shown to be the strongest predictor of mortality¹². The status of our patients is thus very alarming and calls for steps to improve PCS. MCS is comparable to other studies (46.10 vs 46.50) and KDSC is a bit higher (65.00 vs 61.79). MCS was higher than PCS in our patients, reflecting a better mental health as compared to physical status. This may be explained by the fact that patients with chronic conditions may adjust their expectations as they spend more and more time in states of abnormal health.

Literature on the relationship between age and QoL shows inconsistent results. This study has shown that younger patients have a higher MCS. Similar results have been reported in some other studies as well^{13,14}. Higher level of education is associated with a better KDSC. This may possibly be because of a better understanding of the disease and thus greater compliance to treatment including HD by these patients. The same findings have also been reported in several studies^{15,16}.

It is generally believed that females have a poorer QoL than males because of greater physical and mental stress. This was not the case in our patients. Gender did not affect QoL, similar to what has been reported by Pakpour *et al*¹⁷. Contrary to the popular belief, presence or absence of comorbidities did not influence QoL. This has been documented in the past as well¹⁸. In contrast to previously published studies, we did not count the presence of diabetes and hypertension as comorbid conditions since we considered them to be the cause and/or effect, rather than separate diseases. This could be a reason why presence or absence of comorbidities did not influence QoL in our patients. QoL was also unaffected by the household income, probably because these patients were not the main or only bread winners of their families.

Most of them were jobless and thus were not contributing much. Similarly, type of vascular access and frequency of HD did not affect the QoL, as has been shown in a Pakistani study⁴. Marital status was also not associated with QoL, possibly because of a very small proportion of single individuals. Obesity was also very uncommon in our patients, explaining absence of an effect on QoL. Increasing duration of HD was associated with better MCS and KDSC, but this did not have any impact after adjusting for other variables. This could possibly be because of coping strategies often recommended in HD

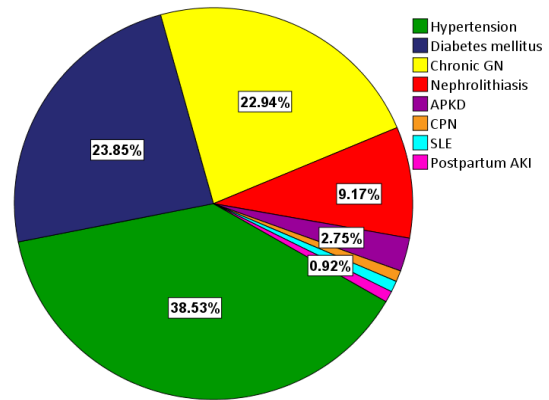


Figure: Causes of CKD in study population.

GN = Glomerulonephritis; CPN = Chronic pyelonephritis; SLE = Systemic lupus erythematosus; APKD = Adult polycystic kidney disease

patients. Similar results have been shown in the past as well, where QoL was not determined by the duration of haemodialysis¹⁹.

KDQOL-SF™ is a self-administered instrument. However, this was not the case in this study, since our patients generally have lesser understanding due to lower level of education. A single doctor asked all questions from each of the participants individually during face to face interviews to overcome these difficulties in comprehension by the patients and to minimize missing answers.

In this study, there was no control group comprising of healthy individuals with whom the different QoL parameters could be compared. This study is also limited by absence of data on compliance to HD and different laboratory

parameters such as haemoglobin, serum albumin and markers of mineral bone disease known to affect QoL. Kt/V was also not measured in any of the patients, though evidence in favour of this affecting QoL is not very clear²⁰.

CONCLUSION

Patients with end stage renal disease have a dismal quality of life. Older age and a lower level of education are best predictive factors in our patients. All efforts must be made to improve QoL, more so in patients with these particular features.

Author's Contributions

Abdul Rehman Arshad: Analysis of data, revising it critically for important intellectual content; final approval of the version to be published; and, agreement to be accountable for all aspects of the work.

Ghayas Khan: Conception and design; revising it critically for important intellectual content; final approval of the version to be published; and, agreement to be accountable for all aspects of the work.

Zakria Amjad: Acquisition of data; drafting the work; final approval of the version to be published; and, agreement to be accountable for all aspects of the work.

Batool Butt: Interpretation of data; drafting the work; final approval of the version to be published; and, agreement to be accountable for all aspects of the work.

Farrukh Islam: Interpretation of data; drafting the work; final approval of the version to be published; and, agreement to be accountable for all aspects of the work.

Mohsin Qayyum: Analysis of data; drafting the work; final approval of the version to be published; and, agreement to be accountable for all aspects of the work.

Ismaa Kiyani: Acquisition of data; drafting the work; final approval of the version to be published; and, agreement to be accountable for all aspects of the work.

Disclosure

This data was presented at the 3rd Surgeon General International Conference (25–27 Oct 2018) in an oral presentation titled “Quality of Life in Haemodialysis Patients”.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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