

A Cross-Sectional Study to Assess the Predictors of Quality of Life in Patients with End Stage Renal Disease in a Tertiary Care Hospital Multan

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Abstract

Introduction: Globally chronic kidney disease (CKD) has a severe impact on patients health-related quality of life (HRQoL). Hemodialysis (HD) significantly influence HRQoL. **Objective:** This cross-sectional study was conducted to find out physical, mental and societal factors that affect the quality of life (QOL) with ESRD disease. **Methods:** The Kidney Disease of Quality of Life (KDQOL™-36) short form questionnaire was used to measure QOL. Descriptive statistics were used to analyze the individual responses and Pearson correlation, Chi-square tests were utilized to describe the relationship between various patient-specific factors and their QOL. **Results:** A total of 218 patients (123 male and 95 female) undergoing HD with a mean \pm SD of age 40.81 ± 7.42 in years were included in the final analysis. Major cause of ESRD was hypertension (24.8%), followed by diabetes (17%). The mean scores for physical component survey (PCS), mental component survey (MCS) and kidney disease component survey (KDCS) were 23.54 ± 12.69 , 28.92 ± 12.86 and 45.01 ± 3.44 respectively. The burden of kidney disease (BKD) had the lowest mean score of 9.90 ± 7.51 and social interaction (58.48 ± 18.19) had the highest mean score. **Conclusion:** The findings indicate negative effects of the disease on QOL can be observed in dialysis patients. There is a need for more effort towards raising awareness among patients with ESRD about their disease while on treatment. This is important to help control and prevent the disease.

Keywords: Hemodialysis, Quality of life, End Stage renal disease, Kidney disease quality of life

Introduction

Chronic kidney disease (CKD) is a growing public health problem around the world. This is characterized by an inevitable deterioration of renal function which could lead to renal disease (ESRD) in the end stages (Zyoud, Daraghmeh *et al.* 2016). CKD is defined as patients with a glomerular filtration rate (GFR) of less than $60 \text{ ml/min/1.73m}^2$ and glomerulonephritis and up to 3 months as per some international guidelines (Webster, Nagler *et al.* 2017). According to the World Health Organization (WHO), kidney and urinary tract disorders add to global burden of nearly 850,000 deaths per year and more than 115 million life-years adjusted to disability. CKD is the twelfth leading cause of death and seventeenth leading cause of disability (Kamal, Kamel *et al.* 2013). Estimated worldwide mean occurrence for dialysis is 215 patients per million population (Khalid, Hassan *et al.* 2018). There are >100 per million cases of ESRD according to the evaluation of annual prevalence in Pakistan. In 2012, major cause of the ESRD was diabetes which was leading cause of ESRD; results were compatible with the Western countries. The incidence of diabetes in Indian sub-continent countries

were higher than found in Western countries which is expected to multiply in coming years. Glomerulonephritis was the second main cause of ESRD, it showed that there were high incidence of infections in community. In Karachi glomerulonephritis was the second main cause of the ESRD. Indian studies show that glomerulonephritis (37%) was main cause of ESRD, diabetic nephropathy (14%). Hypertension was also third main cause of ESRD. Misuse of analgesics drugs and herbal drugs lead to tubule interstitial nephritis and it is also a leading cause of ESRD (Ullah, Butt *et al.* 2015). Various factors which contributes to ESRD are Apolipoprotein L1 (APOL1) genetic variations, family history, civilization differences, low birth weight (abnormal nephron growth), obesity, socioeconomic status, smoking, atherosclerosis due to smoking, drugs which cause nephrotoxicity, diabetic nephropathy and high blood pressure (Dummer, Limou *et al.* 2015, Kazancioglu 2013, Chang, Chien *et al.* 2016, Ruggajo, Svarstad *et al.* 2016, Stenvinkel 2019, Anees, Batool *et al.* 2018, Formanek, Salisbury-Afshar *et al.* 2018, Stack, Yermak *et al.* 2016, Ingrasciotta, Sultana *et al.* 2014, Ghaderian, Hayati *et al.* 2015, Khalid, Qureshi *et al.* 2013).

Moreover, in CKD patients, health-related quality of life (HRQoL) is below mean population values, declining as the disease progresses and as time on dialysis continues. Quality of life (QOL) generally comprises an individual assessment of multiple aspects of their life's 'goodness.' These evaluations include the emotional reaction to life events, temperament, sense of life fulfillment and happiness, and job and personal relationships happiness (Theofilou 2013). Assessment of QOL is gaining popularity in medical literature for the chronic diseases like liver cirrhosis, diabetes, asthma, chronic obstructive pulmonary disease (COPD) and ESRD. Good QOL scores were found to be related to increased compliance and decreased morbidity and mortality (A, Al-Onazi *et al.* 2011). Diminishing of the QOL of patients with ESRD is currently well acknowledged (Finkelstein, Arsenault *et al.* 2012).

There are various aspects which affect the QOL of patients undergoing HD such as cardiovascular disorder (CVD) High cholesterol level, despairiness, nervousness, loss of energy due to low income and less somatic activities, societal support problems burden on family members, loss of self-worth, pain, dietary intake problems and loss of patients gratification (Md Yusop, Yoke Mun *et al.* 2013, Feroze, Martin *et al.* 2010, Gorji, Mahdavi *et al.* 2013, Lou, Li *et al.* 2019, Theodoritsi, Aravantinou *et al.* 2016, Pham, Khaing *et al.* 2017, Kim, Kim *et al.* 2013, Ali, Salem *et al.* 2015).

Past studies have shown that patients with both instance and prevalent dialysis have significantly lower HRQoL relative to the general population (Yang, Griva *et al.* 2015). Patients with several comorbidities like anemia, diabetes and those who are undergoing long-term dialysis had low QOL (Kamal, Kamel *et al.* 2013). Education has positive impact on QOL of HD patients (Bakarman, Felimban *et al.* 2019). There are various different disciplines includes psychological, societal, clinical and dietary plans that pay attention on physical, mental components of QOL can be improved and further problems can be prevented by improving and execution of these mediations to make better the

HD patients (Wassef, El-Gendy *et al.* 2018). The current study was designed to evaluate the predictor of QOL of patients with ESRD on HD to improve QOL and compliance to treatment schedules.

Material and Methods

Study Design

A Cross-sectional study was conducted from 1st November 2019 to 1st March 2020 in biggest South Punjab tertiary care hospital named Nishtar Hospital Multan. The sample size was calculated by Raosoft calculator (Raosoft Inc.USA) and consists of 218 participants with a 95% confidence interval and 5 % margin of error. Participants of age between 20-50 years were enrolled in this study.

Measurement instrument

KDQOL-SF-36 already validated questionnaire was used consisted of four domains that were SF-12 short form survey (KDQOLTM-36), burden of kidney disease (BKD), Symptoms/problems of kidney disease (SPKD) and effects of kidney disease (EKD). This 36-questionnaire survey was first developed in 1994 (Hays, Kallich *et al.* 1994) and was published in 2000 in English version 1 by RAND and the University of Arizona. Results were compiled into three domains which included PCS, MCS and KDCS.

Data collection

Before distributing the questionnaire, informed consent was taken from the participants both verbally and written. The participants were filled the questionnaire themselves and many of them had helped from the doctor, nurses, pharmacists and other medical employs. Questionnaire was filled by the participants after converting into Urdu for the easiness of the participants. Incomplete medical records and the participants not willing to participate were excluded from study.

Ethical considerations

Study design was approved from ethical committee of Department of Pharmacy practice, Faculty of Pharmacy, Bahauddin Zakariya University, Multan. The participants were informed about the study through written and/or verbal consent form before data collection.

Statistical analysis

Statistical package for social sciences (SPSS) version 21 was used for data analyzing. Various descriptive characteristics were calculated from SPSS such as frequency, percentage, mean and SD of demographics of patients and HRQOL scale and domains of (KDQOLTM-36) to demonstrate the predictors of QOL. Chi-square test and Pearson correlation was used to find the significance level.

Results

Among 218 patients on HD, 123 (56%) were males and 95 (43.6%) were females. Mean age of the patients was 40.81. 24 (11%) patients were those who had no income, 27 (12.4%) had income <10,000, 89 (40.8%) had income between 10,001 to 20,000, 53 (24.3%) had income between 20,001 to 30,000 and 25 (11.5%) had income >30,000. 24 (11%) patients were unemployed, 53 (24.3%) were Gov. Employ, 118 (54.1%) were private employ and 23 (10.6%) had their own business. 170 (78%) were from rural area and 48 (22%) were from

urban area. 65 (29.8%) patients were single and 153 (70.2%) were married. 84 (38.5%) patients were uneducated, 64 (29.4%) were primary educated, 38 (17.4%) were secondary educated, 17 (7.8) were educated up to HSSC (higher secondary school certificate) level, 10 (4.6%) were graduated and 06 (2.3%) were post graduated. 78 (35.8%) patients were receiving HD once per week, 120 (55%) were receiving HD twice a week and 20 (20%) were receiving HD thrice a week. 95 (43.6%) were undergoing HD from 0 to 1 year, 84 (38.5%) were undergoing HD from 2 to 5 years and 39 (17.9%) were undergoing HD for >5 years as shown in Table 1. Hypertension 24.8% was found to be major cause of ESRD followed by the diabetes 17% second major cause of ESRD. Glomerulonephritis 15.6%, cardiovascular disorder 14.2%, family history of kidney diseases 6%, diabetes with hypertension 6% hepatitis 3.2 % were found to be foremost factors of ESRD. 13.3% patients were unaware of their ESRD which were admitted for HD.

(KDQOLTM-36) instrument was used and data was analyzed by using SPSS 21 version. Over all QOL mean score was 34.99 ± 3.85 . PCS, MCS and KDCS mean score was found to be 23.54 ± 12.69 , 28.92 ± 12.86 and 45.01 ± 3.44 respectively. Mean score of BKD was 9.90 ± 7.51 , SPKD mean score 54.05 ± 5.30 and EKD mean score was 50.41 ± 6.10 . Sub scales mean score was as; general health 17.54 ± 14.36 , physical functioning 23.78 ± 18.77 , physical role limitation 26.83 ± 31.51 , pain 22.13 ± 13.37 , emotional well-being 35.00 ± 9.75 , emotional role limitation 16.51 ± 35.30 , energy 35.00 ± 12.03 , social functioning 35.43 ± 13.68 , stress 54.24 ± 16.16 , sex 41.01 ± 17.82 , work status 50.45 ± 15.36 and social interaction 58.48 ± 18.19 as shown in Table 2.

QOL mean score was high among male, married, graduated patients and those who had >30,000 income, living in urban areas and receiving HD twice a week in the last 1 year as given Table 1.

EKD was positively correlated with marital status, duration on HD, education and occupation. SPKD and BKD were positively correlated with education level as given in Table 2. MCS was positively correlated with emotional well-being, emotional role limitation, energy, social functioning and work status. PCS was positively correlated with physical functioning, physical role limitation and general health.

Discussion

Current findings include the physical, mental and societal parameters that show lower HRQOL in the patients undergoing HD. Analyzed data showed the consistency with other studies when compared. Various demographics, generic and health related variables affect the patients QOL and lower score was found in various variables as shown in previous studies.

HD is most common treatment, replacing other renal transplant treatment because there are many financial problems and hurdles in peritoneal dialysis (Khalid, Hassan *et al.* 2018). Long-standing HD therapy often results in monetary worries, loss of liberty, reliance on healthcare workers and care providers, undesirable influences on matrimonial status, family, and societal

events. Therefore, measurement and monitoring of QOL should be carried out for the awareness of patient's situations (THENMOZHI 2018).

QOL mean score of our current was higher than the study done in Egypt which had 27.67 ± 7.12 mean score (Kamal, Kamel *et al.* 2013) and QOL score in Saudi study was 49.5 ± 13.7 which was slightly higher than current study (Bayoumi, Al Harbi *et al.* 2013).

In current study hypertension was the major cause of ESRD disease 54 (24.8%) patients were suffered from hypertension on hemodialysis followed by 37 (17%) patients were diabetic similar to the Rawalpindi and Iranian study. In Iranian study there was 31.9% hypertensive (Rostami, Einollahi *et al.* 2013) while in Rawalpindi there were 70.5% hypertension (Khalid, Hassan *et al.* 2018), which was leading cause of the ESRD and in Brazil there was also a hypertension 59.6% leading cause of the ESRD (Barbosa, Moura *et al.* 2017).

PCS and MCS in current study were found lower than other studies while KDCS in current study was found higher than the study found in Egypt. PCS in current study was found almost similar to the study done in Egypt (Kamal, Kamel *et al.* 2013). There was one point to be noticed that PCS was found lower than the MCS and KDCS, it represents patient's physical health was not well. Score was below average which showed that quality of physical health was worse. If physical health is not well it increases the chances of hospitalization and mortality rate (Kamal, Kamel *et al.* 2013). PCS and MCS was found lower than the study in Russia PCS and MCS mean score 36.9 ± 9.7 and 44.2 ± 10.5 respectively (VASILIEVA 2006).

Mean scores of current study were compared with other countries Egypt, KSA, Benha city in Egypt, USA, Iran and Singapore. PCS, MCS and KDCS mean scores in all other studies except in Egypt were higher while KDCS score in current study was higher than study done in Egypt (Kamal, Kamel *et al.* 2013, A, Al-Onazi *et al.* 2011, Wassef, El-Gendy *et al.* 2018, Mapes, Lopes *et al.* 2003, Rostami, Einollahi *et al.* 2013, Yang, Griva *et al.* 2015) as given below.

Comparison of scores in the PCS, MCS and KDCS domains of KDQOL™-36 in various countries with the present study

	Pakistan* Multan	(Kamal, Kamel <i>et al.</i> 2013) Egypt	Pakistan (Khalid, Qureshi <i>et al.</i> 2013) Rawalpindi	KSA (A, Al- Onazi <i>et al.</i> 2011)	Benha (Wassef, El- Gendy <i>et al.</i> 2018) Egypt	USA (Mapes, Lopes <i>et al.</i> 2003)	Iran (Rostami, Einollahi <i>et al.</i> 2013)	Singapore (Yang, Griva <i>et al.</i> 2015)
PCS	23.54	27.67	37.05	52.7	39.3	44.9	40.79	37.9
MCS	28.92	35.72	43.44	54.1	47.59	35.3	47.79	46.4
KDCS	45.01	41.99	56.28	59.7	64.29	63.5	57.79	57.6

*this was current study result

In one of the Korean study dialysis patients showed higher scores in MCS than in PCS, in spite of higher score in the mental health score but due to lower PCS mental health was not good similar to current study (Kim, Kim *et al.* 2013). There was low score of symptoms in Korean study and higher score of BKD while in current study BKD was lower than SPKD (Kim, Kim *et al.* 2013).

In current study mental health component was compared with Egyptian study. It was found that emotional role limitation and emotional well-being mean score was slightly higher than Egyptian study but was lower than emotional well-being in current study (Kamal, Kamel *et al.* 2013).

Score of BKD was so low it means patient's QOL was impaired. Patients were feeling depression and anxiety their mental health can be disturbed because they felt like they were burden on their care givers and this sense of thinking interfered in their daily work routine. They spent too much of their time in dealing with the kidney disease. BKD in Egyptian study was 10.96 ± 10.75 which was higher than current study score 9.90 ± 7.5 (Kamal, Kamel *et al.* 2013). On the comparison of SPKD score with the study done in Rawalpindi it was seen that SPKD mean score was 66.47 ± 17.95 while in current study mean score was 54.05 ± 5.30 which was lower score but it was above average. EKD mean score in Rawalpindi was 60.83 ± 17.47 while in current study mean score was 50.41 ± 6.10 which was lower but average score than study done in Rawalpindi (Khalid, Hassan *et al.* 2018).

In current study lower score of MCS and EKD were found in female patients as compared to men. MCS and EKD mean score was 29.57 ± 13.19 and 50.72 ± 6.60 respectively because there are many multiple responsibilities implement on women and there is high prevalence of depression and anxiety in women. Women have poor rate of HRQoL as compared to men similar to the study done in Egypt (Wassef, El-Gendy *et al.* 2018). In current study QOL mean score was higher among the patients who were receiving hemodialysis since one year similar to Egyptian study in which patients had low physical QOL but had no significant effect on the MCS and kidney effect (Wassef, El-Gendy *et al.* 2018). SPKD mean score 50.99 ± 6.07 was higher in post graduated patients and was above average it means patients were in good health. In our study there was high score of QOL for the patients who were educated as in Palestine found that they had better QOL with higher education (Zyoud, Daraghmeah *et al.* 2016). More educated patients had better awareness about HD because they can handle out the worse conditions. In current study education was positively correlated with BKD SPKD and with EKD ($p < 0.05$).

Patients living in rural areas had a low score of QOL because they do not have the facilities as patients living in urban areas have there is also environmental difference in rural and urban areas as reported in KSA (A, Al-Onazi *et al.* 2011). In our study marital status was positively correlated with EKD $P = 0.0001$. Overall QOL of life was not influenced by marital status similar to study done by Zhou in Shanxi province in which there was no influence of marital status on QOL (Zhou, Xue *et al.* 2017). In current study, high income patients had high QOL mean score similar to study done in Lahore, Pakistan shown a positive relation of QOL with income (Anees, Malik *et al.* 2014).

Over all QOL life score was high for the patient who had job as compare to unemployed patients similar to the study in Lahore who stated that unemployment affects the QOL it was positively associated with QOL (Anees, Malik *et al.* 2014).

Overall QOL mean score was high for the patients who were undergoing HD for one year similar to the study done in India duration of HD had significant influence on assessment of QOL. When HD is repeated in a week QOL becomes worse (THENMOZHI 2018) showed positive correlation with MCS and with EKD ($P=0.033$).

This study will help out the nurses and physician and other health care providers to take part and help the patients to come out from their anxiety, depression, stress level and other hopelessness and predictors that are affecting their QOL. There should be good relationship between patients and physician so that patients can be encouraged and self-worth can be improved their self-satisfaction level can be enhanced.

Conclusion

Over all QOL score in patients with ESRD on HD was below average in this study. Lowest score was found for BKD and highest score was found for social interaction additionally, interventions ensuring social support, such as family involvement, and education on emotional aspects for patients with HD should be included in pre-dialysis consultation by renal health care providers. If this is not done, these factors could limit the benefits to be gained from HD and worsen the patient's HRQoL. There should be seminars, counseling programs and research studies so that, QOL of patients with ESRD can be improved by improving physical, mental and societal health.

Limitations of study

There are certain limitations in the current study. The major limitation of the current study was cross-sectional design and not explosive evaluation of the aspects related with poor QOL. In future probable interventional study can be directed concentrating on mediations focused on offering assets for patients and their families which include better social hold up and enhancement of self-confidence.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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