

## Evaluation of Health-Related Quality of Life in Adult Patients on Hemodialysis

### Abstract

**Background:** Hemodialysis in end-stage renal disease patients causes disability in different domains of patient's lives, leading to impaired (quality of life [QOL]). Studies measuring the QOL in patients on renal replacement therapy are limited in the Indian scenario. **Aims:** To evaluate the QOL in adult patients on maintenance hemodialysis by applying the World Health Organization QOL (WHOQOL)-BREF scale. **Material and Methods and Study Design:** Health-related QOL was evaluated in 100 adult patients on maintenance haemodialysis for 3 months or more in Dayanand Medical College and Hospital, Ludhiana. The WHOQOL-BREF was applied in these patients and the physical, psychological, social, and environmental health domains were assessed. **Results:** Most common age group was 31–60 years (56%) with a mean age of 54.44 years, male: 74%. Patients with age more than 60 years had better QOL scores in the social domain which was statistically significant ( $P = 0.005$ ). Male patients had better scores in all four domains and was significant in the social domain ( $P = 0.025$ ). Married patients had better QOL scores in social domain. Duration of dialysis had a reverse correlation with QOL scores in physical domain with better scores in dialysis duration of <12 months. Frequency of dialysis did not significantly affect the QOL scores. QOL scores were directly related to the monthly family income in all four domains with the highest income group showing better scores ( $P < 0.05$ ). **Conclusion:** The present study provided an insight into the factors that affect the QOL in hemodialysis patients. Patients with age >60 years had better QOL scores in the social domain. Female gender, low serum proteins, HD duration of more than 1 year, and low monthly income were found to be associated with impaired QOL domains in patients undergoing maintenance hemodialysis.

**Keywords:** End-stage renal disease, hemodialysis, quality of life, World Health Organization quality of life-BREF

### Introduction

The increasing number of patients with (end-stage renal disease [ESRD]) has caused a substantial rise in the number of individuals receiving hemodialysis. Over 2 million people worldwide currently receive treatment with dialysis or a kidney transplant to stay alive. Over the past few decades, (quality of life [QOL]) research endpoints have emerged as valuable research tools in assessing the outcome of therapeutic intervention in chronic diseases. ESRD is one such chronic disease causing a high level of disability in different domains of the patients' lives, leading to impaired QOL.<sup>[1]</sup>

The (World Health Organization Quality of Life [WHOQOL]-BREF) questionnaire and the Kidney Disease Quality of Life Short

Form questionnaire were both developed in response to the need for proper and thorough insight into the QOL of patients in the healthcare setting. Studies for measuring the QOL in renal replacement therapy are limited in the Indian scenario and require particular attention in developing countries like ours. Suitable measures can thus be undertaken to increase the QOL of ESRD patients.

The objectives of our study were to evaluate the QOL in hemodialysis patients with reference to their physical, psychological, social, and environmental health domains.

### Materials and Methods

Health-related QOL was evaluated in 100 patients undergoing long-term hemodialysis in Dayanand Medical College and Hospital, Ludhiana by applying the WHOQOL-BREF in these patients. Written

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informed consent was taken from each participant enrolled in the study.

It was an observational cross-sectional study. Adult patients of chronic kidney disease stage 5D on maintenance hemodialysis for 3 months or more and having age more than 18 years were included in the study. Exclusion criteria were-Renal transplant patients, and patient on <3 months on hemodialysis.

After obtaining the consent from the patient, a patient profile form was used to record the specific details of all cases during the study period. The detailed history of each patient including demographic data, age, gender, weight and premorbid conditions were noted. Investigations noted were-hemoglobin, renal function tests (RFT), total serum protein, and serum albumin in each patient. Furthermore, the income and the cost incurred by the patient to get the maintenance dialysis were noted. WHOQOL-BREF scale was used to evaluate the QOL of these patients.

Data were described in terms of range, mean  $\pm$  standard deviation, and percentages as appropriate. All statistical calculations were done using SPSS (Statistical Package for the Social Sciences) SPSS 21 version statistical program for Microsoft windows (Chicago, Illinois, United States). Univariate relationships between sociodemographic (gender, working status, and residing area), ESRD-related variables (duration of dialysis, type of comorbidity), and WHOQOL-BREF scores were analyzed with Student's *t*-test. Pearson's correlation was used to study the correlation between QOL scores of each domain of WHOQOL-BREF and continuous sociodemographic and kidney disease variables (age, literacy, income, education status, and comorbidities). We conducted linear regression analysis to determine the strongest predictors of QOL.  $P < 0.05$  was regarded as being statistically significant.

## Results

The most common age group undergoing dialysis under the study was 31–60 years with 56% presenting in this age group followed by >60 years (33%) and 11% of patients in <30 years with a mean age of  $54.44 \pm 14.19$  years. There was the preponderance of male patients which constituted 74% of the total patients. Out of a total of 100 patients, majority of the patients had diabetes and hypertension as their primary diagnosis with 47% and 27%, respectively. Thirteen had CGN, 5 had chronic TIN, and eight patients fell into the group with other primary diagnosis which included horseshoe kidney, autosomal dominant polycystic kidney disease, Wegner's granulomatosis and obstructive nephropathy.

Patients with age more than 60 years had better QOL scores in the social domain which was statistically significant ( $P = 0.005$ ). However, no significant difference was observed in physical, psychological, and environmental domains of QOL in the different age groups [Table 1].

Male patients had their physical health transformed mean score of 40.15 and females had a mean of 35.16, male patients had their psychological transformed mean score 30.18 and females had a mean of 14.84, male patients had their Environment transformed mean score of 43.50 and females had a mean of 42.55 and finally, male patients had their Social relationship transformed mean score of 41.22 and females had 32.05. Thus, male patients had better scores in all four QOL domains and the difference was statistically significant in the social domain ( $P = 0.025$ ).

Married patients had better QOL scores in the social domain as compared to unmarried and divorced patients.

Duration of dialysis had a reverse correlation with QOL scores in the physical domain. QOL scores were better in hemodialysis patients with a duration less than 12 months than patients who were on hemodialysis for more than 12 months. Statistically significant difference was observed in physical health score ( $P = 0.04$ ) among patients with hemodialysis duration <12 months [Figure 1].

Out of 100 patients, 62% of patients were undergoing biweekly hemodialysis, i.e., 8 times per month, followed by 29% with dialysis frequency <8 times/month and 9% of patients were undergoing >8 times/month hemodialysis. The frequency of dialysis did not significantly affect the QOL scores.

Eighty-five percentage of the patients were having hemoglobin <11 g/dl. Out of the total of 100 patients, 45% of patients had their Hemoglobin <9 g/dl. Patients with hemoglobin levels <9 g/dl had the lowest scores in these domains but were not statistically significant.

The QOL scores in the physical domain were better in patients with total serum protein value above 7 g/dL as compared to patients with total serum protein <7 g/dL ( $P = 0.01$ ). No significant correlation was observed between serum albumin levels and QOL scores [Table 2].

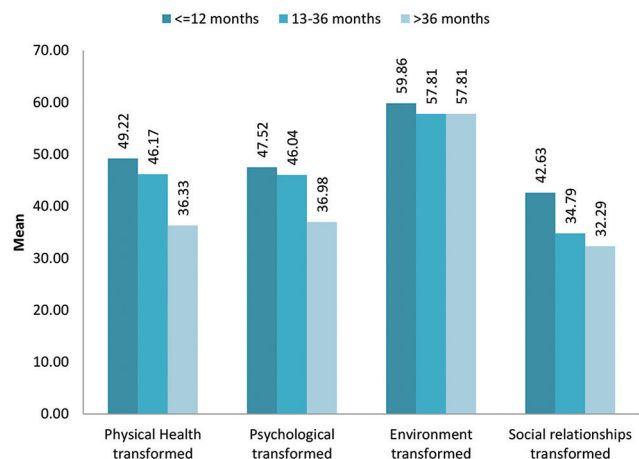


Figure 1: Correlation between duration of hemodialysis and World Health Organization quality of life-bref score

QOL scores were directly related to the monthly family income in all four domains and the scores were significantly better in the group with the highest income as compared to the patients in the group with the lowest income ( $P < 0.05$ ) [Figure 2].

### Discussion

QOL has become an important outcome measure after the initiation of renal replacement therapies. The major therapeutic goal in patients on hemodialysis is to improve their functioning ability so that they can live life to its fullest possible extent. There is an ever-expanding literature related to various factors that affect QOL, namely genetic, environmental, psychosocial, stress, emotional, and comorbid diseases. Findings have shown that lower scores on QOL were strongly associated with higher risk of death and hospitalization in cases of ESRD patients.

The correlation between patient's age and QOL scores was assessed and it was found that there was statistically

significant difference in the scores in the social relationship domain among different age groups. Patients with age >60 years had better QOL scores in the social domain. In a study by Ferreira and da Silva Filho,<sup>[2]</sup> there was no statistically significant difference in mean scores of WHOQOL-BREF domains in relation to age. In another study by Germin-PetroviD,<sup>[3]</sup> age was the only statistically significant predictor of the physical component score (PCS) and Mental Component Score in patients on hemodialysis and age was found to have a negative impact on QOL scores.

The impact of gender on QOL of patients on hemodialysis has been studied earlier with dissimilar observations. Study by Rostami *et al.*<sup>[4]</sup> showed that men had better QOL than women. Other studies by Bayoumi *et al.*<sup>[5]</sup> and Pakpour *et al.*<sup>[6]</sup> found that females had better or equal QOL when compared to males. In our study, male patients were having better scores in all four domains and the difference between male and female scores in the social domain was statistically significant. Impaired HRQOL in women on HD reflects the gender-related differences that are also shown in the general population, and they are related to the higher prevalence of anxiety and depressive symptoms in women.

Social and environmental scores were better in the married group and the score in social domain was statistically significant ( $P < 0.05$ ). Emotional support affects the health in different ways, since the support from family members, friends and partners usually generate better physical and mental health conditions among hemodialysis patients, and improve their depressive mood. But the same was not observed in other studies (Guerra-Guerrero *et al.*,<sup>[7]</sup> Sathvik *et al.*,<sup>[8]</sup> Merkus *et al.*<sup>[9]</sup>) in which no significant differences were found between people who were married, single, separated or live in any other marital condition. Divorced patients had lower mean scores as compared to the other two groups in our study.

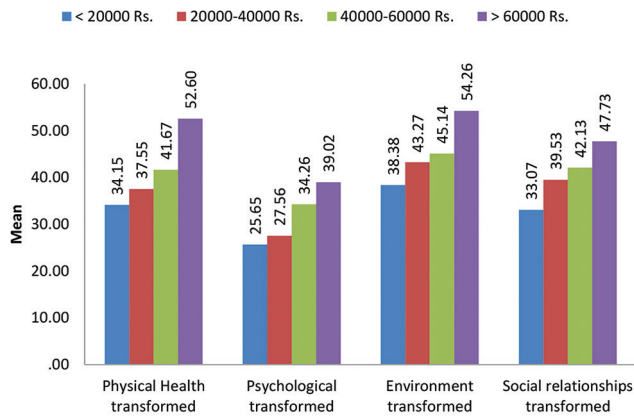


Figure 2: Correlation between monthly income of patients and World Health Organization quality of life-bref score

Table 1: Correlation between patient's age and World Health Organization Quality of Life-BREF scores

Age (years)	Mean±SD							
	Physical health transformed		Psychological transformed		Environment transformed		Social relationships transformed	
≤30 (n=11; 11%)	48.01	13.92	51.89	10.43	56.53	16.73	24.24	18.42
31-60 (n=56; 56%)	46.26	13.49	45.24	13.04	58.14	11.20	38.09	18.79
>60 (n=33; 33%)	47.82	15.24	45.58	12.67	60.89	10.36	44.44	14.82
P	0.852		0.275		0.441		0.005	

SD: Standard deviation

Table 2: Correlation between total serum protein and World Health Organization Quality of Life-BREF score

Total serum protein (g/dl)	Mean±SD			
	Physical health transformed	Psychological transformed	Environment transformed	Social relationships transformed
<5 (n=11; 11%)	26.30±15.51	26.14±11.80	35.80±12.37	28.03±19.816
5-7 (n=65; 65%)	39.23±15.94	28.46±13.19	43.80±10.90	39.87±17.399
>7 (n=24; 24%)	43.60±17.01	33.51±11.23	45.18±12.36	40.97±18.044
P	0.015	0.167	0.068	0.105

SD: Standard deviation

Duration of dialysis plays an important role in affecting QOL in dialysis patients. According to Vasileva<sup>[10]</sup> (2006), in linear regression analysis, duration of dialysis was a significant independent predictor of the low PCS in hemodialysis patients. A similar observation was seen in this study, duration of dialysis had a reverse correlation with QOL. In all four domains, QOL scores were better in hemodialysis patients with duration <12 months than patients with dialysis duration >12 months. Statistically significant difference was observed in physical health scores and weak negative correlation was observed in psychological health scores among patients. The possible explanation for these low scores in patients who are on hemodialysis for more than 12 months is that when patients start dialysis, they hope that their kidneys will recover soon and they would not require further dialysis, but with the passage of time, they realize that they have to maintain their life on dialysis, and this impairs the QOL. Anees *et al.*<sup>[11]</sup> conducted similar kind of study in Pakistan and found that duration of dialysis had a reverse correlation with QOL. Similar finding was also observed in a study by Sangle *et al.*<sup>[12]</sup> Hallinen *et al.*,<sup>[13]</sup> however, had a different observation in which QOL was similar during the 1<sup>st</sup> year of dialysis and the later years of dialysis.

Majority ( $n = 62$ ) of our patients were on biweekly that is 8/month dialysis sessions. In our study, the frequency of dialysis did not significantly affect the QOL scores. Technically, if the patients receive more frequent dialysis sessions, their QOL is supposed to be better, but this was not observed in this study. A similar observation was made by Anees *et al.*<sup>[11]</sup> who did not find any difference in QOL scores between patients in group undergoing HD biweekly and thrice weekly.

Anemia results in fatigue, reduced exercise capacity, decreased cognition and impaired immunity, thus, decreases QOL. Correlation between hemoglobin levels and QOL scores was studied and the same was observed in our study that the physical and psychological domain scores were highest in the patients with having their Hemoglobin levels >11 g/dl followed by patients with hemoglobin level 9 to 11 g/dl. Patients with hemoglobin levels <9 g/dl had the lowest scores in these domains. However, the correlation was not statistically significant in opposition to the findings in other studies by Okaka *et al.*<sup>[14]</sup> and Yang *et al.*<sup>[15]</sup> in which a significant correlation was found between the levels of hemoglobin and QOL. Furthermore, it was found that patients receiving erythropoietin therapy had better QOL scores in all four domains.

The nutritional status of HD patients, independently from the dialysis prescription, has a great impact on morbidity and mortality. The QOL scores in the physical domain were better in patients with total serum protein value >7 g/dl and the difference was statistically significant ( $P < 0.05$ ). Although it was found that patients with serum albumin

value >3.5 g/dl had better QOL scores in physical and environmental domains as compared to patients with lower serum albumin levels, but the differences were not statistically significant. A similar finding with no significant impact of serum albumin levels on QOL was observed in the study by Okaka *et al.*<sup>[14]</sup> The results from other study done by Sathvik *et al.*<sup>[8]</sup> show a significant positive association between serum albumin levels and QOL scores.

The patients on chronic hemodialysis experience poor personal relationships and social support and majority of them do not have adequate financial support and experienced a loss of income. In our study, it was observed that QOL scores were directly related to the monthly family income in all four domains and the scores were far better in the group with the highest income as compared to the patients in the group with the lowest income. This can be attributed to the fact the patients with better income levels have no financial stress in getting a dialysis than in patient with lower income. They have good means of transport, better living, environment and social activities which improve their QOL. Similarly, the scores were lower in the patients' group with more monthly expenditure on hemodialysis. However, no correlation was found between monthly expenditure on dialysis and QOL scores in our study.

The findings are similar to a study by Anees *et al.*<sup>[11]</sup> in which QOL in patients on chronic hemodialysis was assessed using the WHOBRF scale and monthly income was found to be a positive predictor in psychological and environmental domains. This has also been observed in a multi-centric study from Romania by Seica *et al.*<sup>[16]</sup> in which the authors found that patients with a lower socioeconomic status had lower QOL scores.

Our study has some limitations. The study is not generalizable considering this study was performed in a single center of the country. The QOL of hemodialysis patients should have been ideally compared with QOL in healthy individuals of the general population. Although we have not measured the adequacy of dialysis in these patients, there is a need to look into this aspect also. The QOL was measured by a cross-sectional method. Repeat measurement of QOL could have been done for a better assessment of the QOL. Further, interventional studies should be done to assess the impact of the intervention on QOL scores in these patients. We recommend that QOL should be a part of the routine assessment of all patients on maintenance HD. Accordingly, appropriate interventions should be done in the domains which are found to be affected to improve the QOL.

## Conclusion

The study provided an understanding of factors that are associated with QOL in hemodialysis patients. It is important for health professionals to recognize that age,



gender, total serum proteins, and monthly income can impair the various domains of QOL of patients as was observed in our study.

### Consent

As per international standard or university standard written patient consent was taken.

### Ethical approval

Institutional ethical committee approval for the study was taken.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### Ethical clearance

Institutional Ethical clearance was taken reference letter: DMCH/R&D/ 2014/67 Dt: 18/01/2014.

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