

ASSESSMENT OF QUALITY OF LIFE AND TREATMENT ADHERENCE IN PATIENTS UNDER MAINTENANCE HEMODIALYSIS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Introduction

Chronic Kidney Disease causes sudden changes in the daily lives of patients and creates a great impact on their quality of life. Failure of adherence in Hemodialysis can lead to increased morbidity, mortality, cost, and burden on health care system.

Objectives

This study was conducted to assess the quality of life and adherence to treatment of patients undergoing Hemodialysis.

Methodology

A descriptive correlational study was carried out at Nobel Medical College Teaching Hospital, Biratnagar, among 96 patients who were under HD using convenience sampling technique. The data was collected through face to face interview for the period of 5 months. Quality of life and adherence to treatment were assessed using Kidney Disease Quality of Life Questionnaire (KDQOL) and End Stage Renal Disease Adherence Questionnaire (ESRD – AQ) respectively. The data was analyzed using t test, Spearman correlation statistics.

Results

In this study, the overall mean score of quality of life (QOL) of patients under HD was 48.9±13.7. More than half (54.1%) of the patients had moderate adherence to treatment while 31.2% had good adherence. Domains with the highest and lowest scores on quality of life and adherence to treatment were social domain and illness impact and adherence to HD treatment and diet restriction, respectively. There was statistically significant association between total score of quality of life and duration of HD ($p \leq 0.05$). Likewise, there was statistically significant association between adherence to treatment and marital status ($p \leq 0.05$), educational status ($p \leq 0.05$), ethnicity ($p \leq 0.05$), duration of illness ($p \leq 0.05$). Poor correlation ($r = 0.273$) was observed between quality of life and adherence to treatment.

Conclusion

On average, the kidney disease component dimension of quality of life of patients under HD is higher and the overall level of adherence to treatment was moderate. Thus proper periodic counseling on illness and its long term impact, regular follow up as well as information on adherence to dietary measures are important to improve the quality of life and treatment adherence of patients under hemodialysis.

KEYWORDS

quality of life, adherence to treatment, hemodialysis, patients



INTRODUCTION

Chronic Kidney Disease (CKD) is an important cause of morbidity and mortality in the world. End Stage Renal Disease (ESRD) has become a public health concern due to increasing number of patients requiring maintenance hemodialysis (HD).¹ According to Global Burden of Disease report 2015, 1.2 million people died from kidney disease. The estimated number of Disability Adjusted Life Years (DALYS) due to kidney disease globally increased from 19 million to 33 million from 1990 to 2013.² The treatment of patients on ESRD requires complex therapeutic regimen, including scheduled hemodialysis and a strict adherence to medication, diet and fluid control.³ Study conducted in 12 countries including Nepal showed that the overall prevalence of CKD was 14.3% in general population and 36.1% in high risk population and in Nepal was 20.1%. HD tends to be worldwide the most employed Renal Replacement Therapy (RRT) involving nearly 90 % of ESRD population.⁴ The physical, psychological, socio-economic and environmental aspects of life of patients under long-term HD are negatively affected in such a way that later they are unable to perform simple activities of daily living leading to compromised quality of life (QOL).⁵ A study conducted in Nepal showed that Patients under HD have low quality of life score in all domain. Low income status and increased duration on hemodialysis are the independent negative predictors of QOL of HD patients.⁶

In addition, Non adherence to treatment regimen remains a major obstacle in management of ESRD. Failure to adhere in HD can lead to increased morbidity, mortality, cost, and burden on health care system.³

Assessing quality of Life and adherence to treatment among HD patients will allow health care personnel to develop better interventions such as trainings, behavioral modifications and plan the care for future healthy habits and compliance. To the best of researchers' knowledge, a review of the related studies in Nepal demonstrated that only few study has comprehensively and simultaneously surveyed the life quality and adherence to treatment in these patients. Therefore, the study was conducted to assess the quality of life and adherence of treatment of a patient undergoing hemodialysis.

METHODOLOGY

A quantitative descriptive correlational study design was used to assess the quality of life and treatment adherence of patients under maintenance HD at Nobel Medical College Teaching Hospital (NMCTH), Biratnagar. Convenience sampling technique was applied to select the sample of the study with the total sample size of 96. Ethical approval was obtained from IRC (257/2019) of NMCTH. Informed written consent was obtained from each respondents and the patients with mental illness, cognitive impairment as well as co existing diseases like tumor, stroke, COPD, and liver

disease were excluded from the study as these factors could potentially affect their quality of life and act as confounding factors. Consecutive patients coming for their scheduled hemodialysis and who were able to understand, speak, or read Nepali language were selected by the method of non-probability sampling. Patients who were at least 18 years of age and on maintenance HD for at least 3 months are included in the study. Data was collected for the period of 5 months (June to October, 2019) from face to face interview by the researcher themselves for the respondents who were unable to read and write at the hemodialysis unit. Educated respondents were encouraged to fill the questionnaire by themselves using a Nepali converted version of the tool. 13 out of 96 respondents filled their questionnaire by themselves. Sociodemographic information including age, gender, marital status, education, employment, income, ethnicity, duration of illness, and duration of HD were collected using a structured questionnaire. Quality of life was assessed using Kidney Disease Quality of Life Questionnaire (KDQOL) which was further divided into overall three dimensions: physical component summary, mental component summary and kidney disease component summary. Treatment adherence was assessed using Adherence to Treatment in End Stage Renal Failure patients (ESRD – AQ). Permission to adopt and modify both validated and standard tool was obtained. Pretesting was done among 10 %, i.e., 8 of the patients. The Cronbach α of both KDQOL and ESRD – AQ was found to be 0.72 and 0.76, respectively. The KDQOL consists of 36 subscale of kidney disease patients. It also consists of 6 dimensions: general health, physical, emotional, social status, illness impact, and medical and financial satisfaction.⁹ In addition, KDQOL has items in this tool are responded by direct responses ranging from never = 0 to always =100 with the total score ranging from 0 to 100. The scoring was based on the guidelines of KDQOL.¹⁰ Higher scores in any of the items indicated better quality of life. Similarly, ESRD- AQ consists of five main sections with 46 items. The first section includes general information (5 items), followed by acceptance of treatment by hemodialysis (14 items), acceptance of drug therapy (9 items), taking constraints (10 items), and the recommended food diet (8 items).¹¹ The total score of adherence to treatment was the sum of the points of these 5 sections. The minimum and maximum scores of the questionnaire were 0 and 1200, respectively. Overall adherence was classified as poor adherence (< 700), moderate score (700 – 999), and good adherence (1000 – 1200).¹² Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to describe the data and inferential statistics (t-test) was used to determine the association between quality of life and treatment adherence with different variables. Spearman correlation coefficient was used to examine the correlation between quality of life and treatment adherence of patients under HD.



RESULTS

Table 1: Characteristics of socio- demographic profile of the respondents

Characteristics	Frequency (n)	Percentage (%)
Age group (years)		
20 – 40	16	16.6
41 – 60	57	59.4
61 and above	23	21.8
Sex		
Male	71	73.9
Female	25	26.1
Ethnicity		
Brahmin / Chhetri	37	38.6
Terai / Madhesi	8	8.4
Dalit	4	4.1
Janajati	47	48.9
Educational level		
Illiterate	17	17.7
Primary	25	26.1
Secondary	32	33.3
Higher / university	22	22.9
Marital status		
Unmarried	9	9.3
Married	83	86.4
Widowed	4	4.1
Employment		
Agriculture	25	26.0
Business	19	19.6
Government services	26	27.8
Private services	17	17.6
Home maker	9	9
Duration of illness		
<1 year	25	26.1
1- 3 year	56	58.3
> 3 years	15	15.6
Duration of hemodialysis		
< 1 year	22	22.9
1 – 3 year	67	69.8
>3 years	7	7.3

Table 1 represents the socio-demographic characteristics of the respondents. Most of the respondents (59.37%) were belonging to the age group 41-60 years. Majority of the respondents, i.e., 73.95%, were male. Nearly half (48.95%) of the respondents were *Janjati*. More than two-third of the respondents (69.79%) were on hemodialysis for 1-3 years.

Table 2: The mean and standard deviation of important dimensions of quality of life.

Dimensions of quality of life	Mean ± SD
General Health	50.2 ± 20.1
Physical Health	51.7 ± 24.6
Emotional Health	52.6 ± 18.3
Social Dimension	53.2 ± 19.2
Illness Impact	47.4 ± 18.9
Satisfaction with medical care	48.3 ± 14.5
Total score of quality of life	48.9 ± 13.7

The QoL measured among the studied patients was converted into percent scores, with higher scores indicating better Quality of Life (QoL). Table 2 indicates that the social domain has the highest score with mean and SD (53.2 ± 19.2), followed by the Physical one (51.7 ± 24.6) while the

general health domain had the lowest score with the mean and SD (50.2 ± 20.1).

Table 3: Summary of scores of QOL of participants in different domains

Dimensions	Total	Mean ± S. D.
Physical Component Summary	370	31.84 ± 7.2
Mental Component Summary	580	48.66 ± 10.1
Kidney Disease Component Summary	800	81.23 ± 18.21

The table 3 illustrates that among the three dimensions of QOL, i.e., physical component summary, mental component summary and kidney disease component summary, the respondents had higher score for kidney disease component summary (81.23 ± 18.21) in compare to that of mental health summary (48.66 ± 10.05) and Physical Component summary (31.84 ± 7.15)

Table 4: The mean and standard deviation of dimensions of adherence to treatment.

Dimensions of adherence of treatment	Mean score ± S.D.
Adherence to Medication	173.9 ± 29.4
Adherence to Fluid Restrictions	144.5 ± 28.3
Adherence to Diet restrictions	127.3 ± 34.5
Hemodialysis treatment	182.3 ± 30.1

Table 4 represents the adherence to the treatment modalities. Out of total score of 200, Adherence to Hemodialysis treatment was the highest with an average score of 182.31 ± 30.12 followed by adherence to medications with the score of 173.18 ± 29.37. Likewise mean adherence score for fluid restriction was 144.5 ± 28.3 least score was obtained for Diet restrictions 127.34 ± 34.5

Table 5.: Level of Adherence to Treatment of patient with ESRD under HD n= 96

Adherence Category	Frequency (n)	Percentage (%)
Poor (<700)	14	14.5
Moderate (700 – 999)	52	54.1
Good (1000 – 1200)	30	31.2

Table 5 shows that nearly one-third (31.2%) of patients had good overall adherence behavior, while nearly half of them (54.1%) had moderate adherence behavior score.

Table 6: Linear regression model of the effect of demographic variables on the quality of life score

Demographic Variables	Coefficient of regression	Statistics t	P value
Age	0.8	0.8	0.5
Sex	2.3	2.1	0.1
Marital status	0.8	0.7	0.5
Educational Status	1.2	1.2	0.1
Ethnicity	-0.4	-0.7	0.5
Occupation	3.6	1.7	0.1
Duration of Illness	0.9	1.7	0.1
Duration of Hemodialysis	5.7	3.2	< 0.05*

* $p < 0.05$, Level of significance at 95% confidence interval

Table 6 represents the multivariate analysis of demographic



variables with the quality of life score, among the demographic variables only duration of hemodialysis p value (<0.05) was found statistically significant while all the other variables like age, sex, ethnicity, marital status etc. were found statistically insignificant.

Table 7: Linear regression model of the effect of demographic variables on the adherence to treatment.

Demographic Variables	Coefficient of regression	Statistics t	P value
Age	-0.3	-2.7	0.2
Sex	1.4	0.7	0.5
Marital status	18.3	4.3	$<0.05^*$
Educational Status	27.4	6.9	$<0.05^*$
Ethnicity	4.8	2.3	$<0.05^*$
Occupation	-9.4	-6.3	0.12
Duration of Illness	0.6	2.2	$<0.05^*$
Duration of hemodialysis	1.7	2.6	$<0.05^*$

* $p \leq 0.05$, Level of significance at 95% confidence interval

Table 7 represents multivariate analysis of demographic variables on the adherence to treatment. Among them marital status, educational status, ethnicity, duration of illness and duration of hemodialysis were statistically significant with adherence of treatment while other variables i.e. age, sex and occupation were not statistically significant with adherence of treatment.

Table 8: Correlation between quality of life and adherence to treatment

Variable	Quality of life
Adherence to treatment	$r=0.237, P < 0.05$

The study also shows a significant correlation between total score of quality of life ($r=0.273$) and rate of adherence to treatment ($P < 0.05$). In other words, adherence to treatment can predict the quality of life in hemodialysis patients.

DISCUSSION

ESRD patients undergoing Mechanical Hemodialysis (MHD) have to cope with the fact of having an incurable disease that requires painful treatment and causes to degrade the quality of life. They often end up having poor QOL.

In this study, it was noticed that the best QoL domain was social relationship, with an average of 53.2 ± 19.2 , followed by emotional (52.6 ± 18.3) and physical (51.7 ± 24.6). The domain affected most adversely was illness impact. The low scores clearly demonstrate that daily activities were disrupted in ESRD patients due to the stress of the illness and dependence on medical treatment. The findings support the study from south India and Saudi Arabia and Nepal.^{9,13,14} Regarding the dimensions of QoL, the highest score was of kidney disease component summary (81.23 ± 18.3) followed by mental health summary (48.66 ± 10.1) and physical component summary (31.84 ± 7.2). Similarly another study in Nepal showed that the highest median percentage was of mental health summary (56) followed by physical component summary (50) which is consistent with the present study finding¹⁵

Association of demographic variables and Quality of Life

QOL is generally correlated with age. A common trend exists within all the domains and age ≥ 60 , i.e., a negative correlation can be observed with respect to older age and physical, psychological, social, and environmental domains. The decline in scores for older age can be attributed to the fact that with increasing age, there is deterioration in physical status of the patient, i.e., energy, work capacity, and quality of sleep, and also the increasing age is linked with a decrease in scores of psychological domains. This may be due to various co morbidities, poor support from the family and society, financial burden associated with self management (medically related transport, illness related home modifications, use of assistive devices, not being able to work and support the family which in turn drives them up in a state of solitude, blue mood, anxiety, and depression. However, in our finding no such association of age was seen with different domains of Quality of life. The study result was contradictory to a study in Nepal, south India, and Saudi Arabia where age was statistically significant with the QoL scores, generally with increasing age QoL decrease in patients.^{6,9,13}

While we expected gender to affect QOL in ESRD patients, we did not come across any significant results on comparing scores in both sexes. Likewise consistent finding was seen on a study conducted in Nepal.¹⁵ In contrast, the study conducted in Mysore, India, which revealed that females have a lower score in psychological and environmental domains compared to males.¹⁶ Similarly a study conducted in Nepal showed that there was statistical significant association between gender and quality of life.¹⁴ The finding of increased duration of dialysis and reduction of quality of life is consistent with a study from Romania.¹⁷ While inconsistent finding was found in a study from Nepal.¹⁵ The inconsistent finding may be due to variation in study setting as well as the sample size. It was also shown better quality of life in patients who had good relations with the medical nursing staff.

This study claimed that educational background had no statistical significance with the quality of life which supports a study conducted in Nepal.⁶ Whereas the study results contradict with the study from Greece, where level of education has been identified as a predictor of good health because more academic qualifications, greater the chances of being employed and hence reliable income and better socioeconomic conditions.¹⁸ Similarly a study conducted in Nepal showed higher education increases the quality of life under Physical component summary but not on the mental component summary.¹⁵

Our findings showed that the mean total score of adherence to treatment was 627.33, which shows that the quality of life in these hemodialysis patients was almost favorable.

Likewise, in the study conducted in Saudi Arabia, the mean total score of quality of life in hemodialysis patients was high and on the whole, the patients enjoyed appropriate quality of life in all features of physical and mental health and aspects of renal disease.¹⁹ These findings are consistent with the present study results.



The status of adherence to treatment was at the moderate level for most patients in the present study which is unlike another study carried out in Italy in which the rate of adherence to treatment was very weak in most patients.²⁰ Similarly a study conducted in India, Karnataka, showed 42% of the HD patients had moderate level of adherence.⁷ which is consistent with the present study finding.

In another study conducted in Saudi Arabia, the highest adherence was on dietary adherence and the lowest was on hemodialysis treatment.²¹ The present study contradicts with the above finding of the study that the highest adherence was on hemodialysis treatment and the lowest was on adherence to diet. Likewise a study conducted in Nepal showed that the dietary practice of patients with kidney disease were low.²² Likewise, a study conducted in Nepal showed that only 28.6% of HD patients were adhering on medication regimen.⁸

In the study demographic variables like education level, marital status, duration of illness, and duration of hemodialysis were significantly correlated with adherence to treatment which supports the study done in Tehran, Malaysia, and from china.^{12,23,24}

Correlation between Quality of Life and Treatment Adherence

The present study shows a significant correlation between total score of quality of life ($r=0.273$) and rate of adherence to treatment ($P<0.05$). The consistent finding is present in a study conducted in Iran with $r=0.218$.⁷

CONCLUSION

The present study showed that overall quality of life and adherence to treatment among ESRD patients undergoing HD were relatively compromised and less than optimum, respectively. The most affected quality of life domain was

social domain followed by emotional domain. Age, education, employment, and marital status were not found significant to affect one or more domains of QOL. Duration of hemodialysis was the independent negative predictor for QOL, as the duration increases QOL of patient decreases. The factors like marital status, educational status, ethnicity, duration of illness, and duration of hemodialysis influence the patients' lack of adherence to treatment.

RECOMMENDATIONS

A large multicenter study is recommended to assess the quality of life of patients with ESRD under HD. Regular motivation and education sessions should also be provided to the patients regarding the importance of adherence to treatment.

LIMITATIONS OF THE STUDY

The study is conducted on a single setting and the sample size is quite small so it is difficult to generalize the finding across the whole country.

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CONFLICT OF INTEREST

The authors declare no conflict of interest

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