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Assessment of Health-Related Quality of Life Among Chronic Kidney Disease (CKD) patients undergoing Dialysis at Kidney Foundation Hospital and Research Institute

Annika Banu Anni [1], Nuvia Nurain [1], Israth Jahan Rimu [1,2]

[1] Department of Nutrition and Food Engineering, Daffodil International University, Dhaka-1216, Bangladesh.
[2] Department of Food Technology and Nutrition Science, Noakhali Science and Technology University, Noakhali, Bangladesh.

Corresponding author*
Israth Jahan Rimu
Department of Nutrition and Food Engineering, Daffodil International University, Dhaka-1216, Bangladesh.
Email: jahan.nfe@diu.edu.bd

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ABSTRACT

Chronic Kidney Disease (CKD) has a significant impact on people's quality of life (QoL) due to multifactorial burdens associated with the condition. It is essential to evaluate CKD patient's QoL in order to comprehend the disease's effects outside of clinical parameters. The objective of this study was to present a thorough examination of health-related quality of life (HRQoL) among CKD patients receiving dialysis. This cross-sectional study utilized pretested, structured kdqol-36 questionnaires to assess health related quality of life (HRQoL) in dialysis patients. We analyzed data from 151 participants by using SPSS software. The study provided important insights into how CKD and dialysis impact patients' daily lives. A weak positive correlation (0.170) was found, which was statistically significant ($p = 0.036$). This suggested that a longer dialysis duration is associated with a slightly higher physical health score. A correlation (0.062) indicated that dialysis duration does not notably affect the total symptom score. Another finding showed no meaningful relationship between dialysis duration and the perceived impact of kidney disease on daily life. HRQoL composite score (KDQoL-36 domain-based score) showed a weak positive relationship ($r = 0.147$) with the duration of dialysis which was not statistically significant ($p = 0.072$). This indicates a very limited impact of dialysis duration on HRQoL scores. The findings will help to inform healthcare providers, guide policy development, and support patient-centered care approaches in the management of CKD.

INTRODUCTION

Chronic renal disease, commonly known as Chronic Kidney Disease (CKD), is defined as kidney damage or reduced kidney function persisting at least three months, regardless of the cause (Wilson, Mone, Jankauskas, Gambardella, & Santulli, 2021). It affects millions of individuals across the world and can lead to significant illness as well as death. The National Kidney Foundation reported that chronic kidney disease (CKD) affects 10% of the world's population, with millions of deaths annually due to a lack of affordable treatment. End-stage renal disease (ESRD) develops when the kidneys function at less than 10% to 15% of their usual capacity. At this point, either transplantation or repeated kidney dialysis are required for survival (Kusiak, Dixon, & Shah, 2005). Hemodialysis, peritoneal dialysis, and kidney transplantation are the available treatment options for end-stage renal disease (ESRD); the latter is frequently seen to be the most cost-effective and successful alternatives. (Kontodimopoulos & Niakas, 2008). In comparison to the size of the prevalent dialysis population and the results obtained, providing maintenance dialysis treatment is expensive and uses disproportionate resources. The direct delivery of dialysis therapy is mostly responsible for these expenses, with significant variations in cost between settings and modalities

(Rokhman et al., 2025).

Chronic kidney disease is a global public health issue that is becoming more common, has poor outcomes, and high cost. In addition to renal failure, chronic kidney disease can also result in consequences from impaired kidney function(Levey et al., 2003). "A state of complete physical, psychological, and social well-being and not merely the absence of disease or infirmity" is how the World Health Organization defines health. As a result of the condition, health impairment imposes a wide range of limits that lower the quality of a patient's functioning on many levels, including social, psychological, and physical. The general definition of health-related quality of life (HRQoL) is an individual's feeling of well-being and capacity to carry out productive daily tasks (Avramovic & Stefanovic, 2012). HRQoL is the term used to describe how well patients report functioning in the social, mental, and physical spheres of life (Avramovic & Stefanovic, 2012). HRQOL is a significant outcome that is linked to morbidity, mortality, and health care utilization, the only way to collect and utilize this data is to employ efficient evaluation techniques (Weisbord, McGill, & Kimmel, 2007). Instruments that are generic or disease-specific can be used to evaluate HRQL (Jesky et al., 2016).

The clinical and financial impact of CKD is substantial, as is the case with many chronic illnesses (Jesky et al., 2016; Thompson et al., 2013). The maintenance of chronic kidney disease (CKD) places a significant financial strain on individuals and their families as well as health systems (Essue, Wong, Chapman, Li, & Jan, 2013). As life expectancy increases, a greater emphasis has been placed on maintaining good health for as long as feasible and improving quality of life. In fact, top health organizations worldwide have underlined the need of aiming for quality of life and well-being at every stage of life(Essue et al., 2013; Phyo et al., 2020) . As kidney function declines, CKD patients undergoing dialysis frequently experience symptoms such as fatigue, pain, itching, and psychological distress, all of which can have a severe impact on their overall health. Furthermore, treatment options such as dialysis, dietary restrictions, and pharmaceutical regimes have a significant impact on their everyday life and long-term health. The Kidney Disease Quality of Life-36 (KDQOL-36) and the Short Form 36 (SF-36) are the most widely used tools for evaluating HRQoL (Morton & Webster, 2014).

CKD has a notable effect, especially on dialysis-dependent patient in both clinical and economical aspect of health-related quality of life (HRQoL) (Spinowitz et al., 2019). There are millions of people worldwide suffer from chronic kidney disease (CKD), which has a substantial morbidity and mortality rate. Patients undergoing dialysis with chronic kidney disease (CKD) have vital physical, psychological, and social barrier that significantly affect their quality of life (QoL). To assess QoL, the standardized KDQOL-36 questionnaire is used which is a kidney disease specific tool that measures both physical and mental health factors. The HRQoL scores derived from these assessments enable the evaluation of intervention cost-effectiveness, which play vital role in planning and policy making. Decision modeling aids in developing healthcare decisions for chronic diseases such as CKD by stimulating disease progression and incorporating uncertainty in across multiple outcomes scenarios (Orlando, Belasco, Patel, & Matchar, 2011). This approach makes the bridge in the gaps between clinical outcomes and patient reported experiences which ensures CKD patients receive comprehensive care.

CKD is an alarming health concern in Bangladesh as growing number of patients requiring dialysis for treatment (Bikbov et al., 2020). But there is limited context specific evidence on how CKD and its related management affect the health-related quality of life (HRQoL) of dialysis patients. In this context, chronic kidney disease (CKD) patients

undergoing dialysis often experience reduced quality of life due to physical, psychological, and social burdens. Therefore, this study aims to assess HRQoL among CKD dialysis patients and to examine the association between dialysis duration and these outcomes.

METHODS AND MATERIALS

Study Design and Participants

The study was a cross-sectional observational study to assess Quality of Life (QoL) among chronic kidney disease patients undergoing dialysis in Kidney Foundation hospitals.

Study Setting

The study is hospital-based research which was conducted at the Kidney Foundation Hospital, a specialized healthcare facility providing comprehensive care to patients with kidney diseases, including dialysis services.

Study Population

The study population consisted of adult CKD patients undergoing dialysis (haemodialysis or peritoneal dialysis) at the Kidney Foundation Hospital. In this study, participants were included individuals aged 18 years or older, currently undergoing dialysis treatment, and willing to give informed consent. Patients were excluded if they had severe cognitive impairments that could affect their ability to answer questionnaires, were experiencing acute illnesses or were hospitalized during the study period, or did not want to participate in the study. This selection ensured the inclusion of a representative sample of stable dialysis patients, enabling an accurate assessment of their Quality of Life.

Sampling Technique

A non-probability consecutive sampling technique was used, where dialysis patients during the study period were approached randomly and recruited based on their availability and willingness to participate. A total of 151 patients were included in the study.

Sample Size

The following formula is used to calculate the size of the required sample (Pagano, Gauvreau, & Mattie, 2022),

$$n_0 = \frac{Z^2 PQ}{E^2}$$

$$= \frac{1.96^2 X 0.11 X 0.89}{(0.05)^2}$$

$$= 150.4 \sim 151$$

n_0 is the sample size
Z is the standard normal distribution's level of confidence. (z = 1.96 at a 95% confidence level)

P = the estimated percentage of the population is 11% (Kar & Islam, 2023)
E = allowed margin of error (for instance, we wish to determine the actual percentage within 5%).

However, due to limited availability of eligible dialysis patients within the study period, A total of 151 participants was included. This sample size is comparable to similar cross-sectional studies assessing QoL in dialysis populations.

Data Collection

The Kidney Disease Quality of Life (KDQOL-36) questionnaire was used to assess disease-specific QoL. Clinical and demographic information, including age, gender, dialysis duration, and comorbidities, was obtained from medical records and patient interviews. Data was collected through a face-to-face interview with the patient, after mutual agreement. Participants completed the questionnaires during their dialysis sessions. HRQoL scores were derived from KDQOL-36 domains to reflect patient-perceived health status.

Statistical Analysis

The collected data was analyzed by using IBM SPSS Statistics Version 25. Descriptive statistics including frequencies, percentages, averages, and standard deviations were utilized to summarize the individuals' sociodemographic and clinical data. To assess Health Related quality of life (HRQoL) scores across dialysis duration categories, One-Way Analysis of Variance (ANOVA) was used. Pearson's correlation was used to measure the strength and direction of associations between dialysis duration and QoL outcomes. A p-value of 0.05 was considered as statistically significant because all inferential tests were performed at a 5% significance level.

Ethical Considerations

Before collection of data, the relevant academic authority was consulted to get permission to collect data. Participants were told the objective of the study, they were not forced to participate and they could withdraw any time. All participants received verbal informed consent. The anonymity and confidentiality were ensured and the data gathered was not utilized in any other way but an academic one.

RESULTS

The demographic characteristics of 151 patients with chronic kidney disease (CKD) undergoing dialysis at Kidney Foundation Hospital are shown in Table 1. It gives a snapshot of participants demographic information including their gender, age, marital status, employment status and dialysis duration. The KDQOL-36 subscale scores range from 0 to 100, where higher scores indicate better health-related quality of life across all domains, including physical health, symptom burden, and the impact of kidney disease on daily life.

Table 01: Demographic information

Demographic Variable	Category	Frequency	Percent
Age of Respondent (in years)	Mean ± Std. Deviation	51.50 ± 15.08	

Gender of Respondent	Male	69	45.7
	Female	82	54.3
Marital Status of Respondent	Single	13	8.6
	Married	138	91.4
Employment Status of Respondent	Employment	4	2.6
	Unemployment	31	20.5
	Housewife	74	49.0
	Retired	9	6.0
	Student	10	6.6
	Other	23	15.2
Dialysis Duration Categories	Less than 1 year	37	24.5
	1–3 years	60	39.7
	3–6 years	28	18.5
	More than 6 years	26	17.2
KDQoL-36 based composite HRQoL index scores	Mean ± Std. Deviation	2.38 ± 0.56	

There were 151 participants with mean age 51.50 years and standard deviation 15.08 years. This age represents adult CKD population, primarily comprising middle aged and older persons. The female respondents (54.3%) were slightly higher than male respondents (45.7%) The inclusion of both genders in the study is highlighted by this nearly equal distribution, which provides balanced representation.

Married respondents made up a significant majority (91.4%), whereas single respondents made up just (8.6%). The study's target population's demographics or cultural factors affecting the prevalence of marriage may be reflected in the preponderance of married people.

A large proportion, (49.0%) were housewives, reflecting the potential social roles in the area. The unemployment rate of (20.5%) may have an impact on socioeconomic difficulties or access to healthcare. Employed people (2.6%), retirees (6.0%), students (6.6%), and those categorized as "other" (15.2%) made up smaller groups, indicating that many patients are not in the workforce because of age or health limitations.

The distribution of dialysis duration is as follows: (39.7%) of the largest group had been receiving dialysis for 1-3 years. Less than 1 year of dialysis experience was reported by (24.5%) of patients, indicating a sizable percentage of recently diagnosed or initiated patients. Long-term management of their illness was demonstrated by the smaller groups that had been receiving dialysis for 3-6 years (18.5%) or more than 6 years (17.2%).

Table-2: Comparison of Dialysis Duration with Physical Health, Symptoms and daily life impact scores

Dialysis Duration	N	Physical Health Scores (Mean ± SD)	Symptoms Experienced (Mean ± SD)	Impact on daily life (Mean ± SD)
Less than 1 year	37	47.71 ± 11.56	18.14 ± 3.74	21.00 ± 3.34
1–3 years	60	49.06 ± 10.71	19.25 ± 4.14	19.86 ± 3.42

3–6 years	28	50.33 ± 10.53	18.29 ± 3.56	20.96 ± 3.87
More than 6 years	26	53.22 ± 9.61	19.12 ± 3.35	20.63 ± 4.24
Total	151	49.68 ± 10.77	18.77 ± 3.81	20.46 ± 3.63
p-value		0.228	0.453	0.427

In table 02, The descriptive statistics for Physical Health Scores show that scores vary slightly across dialysis duration groups, with the highest mean (53.22) in the "More than 6 years" group and the lowest (47.71) in the "Less than 1 year" group. However, the ANOVA test yielded a p-value of 0.228, which indicates that there are no statistically significant differences in physical health scores across the four dialysis duration categories. Therefore, dialysis duration does not appear to significantly affect physical health in this sample.

The p-value of 0.453 indicates that there is no significant difference in the total symptom score across different dialysis durations, as it is higher than the typical significance level of 0.05. The p-value of 0.427 indicates that there is no significant difference in the total impact score across different dialysis durations, as it is higher than the typical significance level of 0.05.

Table 03: Correlation Between Dialysis Duration Categories and Quality of life in different categories

Variables	**Correlation Coefficient**	**Sig. (2-tailed)**
Duration of Dialysis & Physical Health Score	0.170	0.036*
Duration of Dialysis & Total Symptom Score	0.062	0.450
Duration of Dialysis & Total Impact Score	-0.023	0.790
Duration of Dialysis & HRQoL composite scores	0.147	0.072

*= significant, p value < 0.05

In table 03, a weak positive correlation (0.170) was found, which is statistically significant (p = 0.036). This suggests that a longer dialysis duration is associated with a slightly higher physical health score. The correlation (0.062) is very weak, and the result is not significant (p = 0.450), indicating that dialysis duration does not notably affect the total symptom score. The correlation (-0.023) is negligible and not statistically significant (p = 0.790), suggesting no meaningful relationship between dialysis duration and the perceived impact of kidney disease on daily life. HRQoL composite scores and dialysis time categories have a weakly positive link, as indicated by the correlation coefficient (0.147). This association may not be statistically significant, though, as the p-value (0.072) is higher than the usual significance level of 0.05. Consequently, HRQoL composite scores in this population do not seem to be significantly correlated with dialysis duration.

DISCUSSION

According to our research, CKD is clearly linked to a decline in HRQoL. Regardless of the tools employed to measure quality of life, the results are in line with earlier research that concentrated on people with established diseases (Nguyen et al., 2018). Patients with chronic kidney disease (CKD), particularly those receiving dialysis, have a substantial influence on their quality of life (QoL).

An understanding of the features of dialysis patients at the Kidney Foundation and Research Institute can be gained from the demographic data of the study's participants. A significant portion of the respondents (39.7%) had been receiving dialysis for one to three years, whereas 24.5% had been receiving dialysis for less than a year, according to the dialysis duration categories. When dialysis length and physical health ratings are compared in Table 2, it appears that physical health gradually improves as dialysis duration increases. The mean physical score was highest among patients undergoing dialysis for more than six years (53.22±9.61) and lowest among those receiving dialysis for less than one years (47.71±11.56).The p-value (0.228) suggests that there is no significant difference in the physical health scores in different dialysis duration. This findings is consistent with previous studies showing that while dialysis patients physical condition may change over time, comorbidities and treatment procedure have a greater impact on their health outcome (Gomez et al., 2015).

The comparison of the length of dialysis period and overall symptom score is shown in table 3. According to the information, those who have been receiving dialysis for one to three years have a basically higher mean symptom score (19.25±4.14) than who were receiving treatment less than one year or more than six years. The p-value of 0.453 indicates that there is no statistically significant difference in the symptoms between the groups. It is crucial to remember that dialysis patients' frequently suffer symptoms like nausea and fatigue and that these symptoms can alter over time as a result of modifications to dialysis treatment and patient health (Jhamb, Weisbord, Steel, & Unruh, 2008).

Table 4, reveals that, respondents who have been receiving dialysis for less than a year had the highest mean score (21.00 ± 3.34), indicating that the impact of dialysis on everyday life is comparatively constant across all categories. Although those who had been receiving dialysis for one to three years scored slightly lower (19.86 ± 3.42), the differences were not statistically significant (p-value = 0.427). These results imply that the early phases of dialysis can affect everyday life more, perhaps because patients need to acclimate. Dialysis's chronic nature may cause adaption over time, making its effects on everyday activities less obvious for patients receiving lengthier sessions (Murdeshwar & Anjum, 2020).

Table 5, evaluates the relationship between the length of dialysis and quality of life across many categories. Longer dialysis duration may be linked to better physical health outcomes, as seen by the statistically significant positive association between the physical health score and dialysis length ($r = 0.170$, $p = 0.036$). Nevertheless, there was no significant link between dialysis length and the total impact score ($r = -0.023$, $p = 0.790$) or the total symptom score ($r = 0.062$, $p = 0.450$), indicating that longer dialysis duration is not always associated with fewer symptoms or less impact on day-to-day functioning.
According to the statistics, the study's findings demonstrate how complicated and varied dialysis treatment is in its effects on patients' physical well-being, symptoms, and day-to-day activities. Longer dialysis sessions appear to be linked to improved physical health,

but they have no discernible effect on symptoms or everyday living. To achieve a better understanding of the elements that lead to better results for dialysis patients, we need more studies with large sample sizes and more precise measurements of symptoms and quality of life could be improved. These results are similar to those reported in earlier research conducted in related issues (Toledano-Toledano et al., 2020). Healthcare providers must use comprehensive care methods that address the physical and psychological requirements of patients with chronic kidney disease (CKD) undergoing dialysis in light of these findings. Mixed approach treatments meant to improve quality of life may be able to improve overall patient outcomes and decrease the progression of disease.

CONCLUSIONS

Chronic kidney disease patients with dialysis have a lower quality of life (QoL), which can be caused due to several reasons. Research has repeatedly shown that they have lower QoL than non-dialysis CKD patients specially in the psychological and physical areas. Individuals with CKD and other comorbidities are susceptible to psychological discomfort. In order to improve CKD control and health outcomes, we strongly advise creating mental screening programs for those individuals. Additionally, we strongly advise nephrologists in particular to raise awareness of the psychological health of CKD patients. According to these results, healthcare professionals must address the various issues dialysis patients encounter and put initiatives in place to improve their general quality of life. More research is required to better understand the quality of life (QOL) of older patients undergoing conservative treatment.

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CONFLICT OF INTEREST STATEMENT

Authors declare that there is no conflict of interest.

AUTHOR'S CONTRIBUTION DECLARATION

Israth Jahan Rimu conceptualized the study, developed the questionnaire, conducted the statistical analysis, interpreted the findings, and drafted the initial manuscript. Proma Banik coordinated the data collection process. Nuvia Nurain contributed to write the final draft of the paper. All authors reviewed and approved the final version of the manuscript for submission.

DATA AVAILABILITY STATEMENT

To safeguard the privacy and confidentiality of the respondents, the data used to support the findings of this study are not publicly available. Though the interviews were anonymous, detailed demographic characteristics were included, which might potentially identify individuals. The information will be given with fair request to the respective author.

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PUBLISHER'S NOTE