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Impact of hemodialysis on the wellbeing of chronic kidney diseases patients: a pre-post analysis

Um-e-Kalsoom[1*†], Sabiha Khan[1†] and Israr Ahmad[2†]

Abstract

Background: Hemodialysis may have serious psychological impact upon patients suffering from chronic kidney diseases. The aim of the present study is to investigate the impact of hemodialysis on the wellbeing of individuals with chronic kidney diseases (CKD).

Result: A sample consists of ($N = 100$) CKD patients referred from neurology ward of Leady Reading Hospital Peshawar. Data was collected from both male (50%) and female (50%) in 2017. Participants were divided into two groups on the basis of pre-set criteria. In group I, individuals with 4–5 stage of CKD referred first time for dialysis treatment were recruited. Group II comprised of CKD patients with 1–3 stage. Demographic data sheet, Pakistan Anxiety and Depression, WHO Quality of Life scale, and Perceived Social support scale (PSS) were used to test the hypotheses. Paired sample *t* test was use to see the difference between pre- and post-analysis of depression, anxiety, QOL, and PSS in group I (experimental group). Results suggests significant difference on depression ($p > .001$), anxiety ($p > .001$), and QOL ($p > .001$), while no significant difference was reported on perceived social support ($p < .673$). Findings also indicate no significant difference between group I and group II on QOL depression, anxiety, and PSS.

Conclusion: The findings concluded that patients under hemodialysis treatment suffered from depression, anxiety, and poor quality of life.

Keywords: Chronic kidney diseases, QOL, Depression, Anxiety, Perceived Social Support

Background

Chronic kidney disease (CKD) is defined as a progressive and irreversible loss of kidney function. As per glomerular filtration rate (GFR), an adult reports 60 ml/min/1.73 m^2 or less than that indicates a loss of half or more of normal kidney functioning. According to GFR there are five stages of CKD. The first three stages (1–3), i.e., from mild to moderate, whereas stages (4–5) considered as severe therefore recommended for dialysis [1]. CKD is considered a public health problem worldwide and about 50 million people suffering from chronic kidney disease

worldwide [2]. African Americans, American Indians, Hispanics, and South Asians, specifically, people from Pakistan, Sri Lanka, Bangladesh, and India, are at great possibility of experiencing CKD. In Pakistan CKD was found in 75(25.60%) out of 293(97%) subjects [3]. Usually, majority of patients with CKD require replacement treatments including hemodialysis, peritoneal dialysis, and kidney transplantation [4], among which hemodialysis are the most common replacement modalities. Patients under hemodialysis suffer from different physical and mental problems [5]. Depression and anxiety are commonly observed in such patients [6]. A study reported that prevalence of depression in patients with end-stage renal diseases (ESRD) is higher than in the general population [7]. Similarly, a meta-analysis of 249

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studies reported that prevalence of depression was 22.8% among patients undergoing dialysis as compared to placebo group [8]. Chiang et al. concluded the rudimentary prevalence of depression was 22.6% in the Taiwan sample. The findings further reported religious belief, CD stage IV and above, physical activity, and sleep disturbance were the correlates of developing depression in CKD patients [9]. Anxiety is another commonly co-occurring psychopathology with CKD/ESRD. The rate of anxiety in patients with ESRD was estimated to be around 12 to 52% [10]. A longitudinal study following 159 patients for the outcome of depression and anxiety reported that 36.6% had developed depressive symptoms while 31.8% had symptom of persistent anxiety [11]. Another study investigated gender role in quality of life, depression, and anxiety in chronic kidney diseases sufferers. The study concluded that depression and anxiety is more prevalent in male while female shows poor quality of life as compared to male [12]. Hemodiyalsis comprised of complex treatment for CKD sufferers which requires focus visits to dialysis center or hospital, usually visiting hospital 2–3 times per week. Therefore, these patients may feel significant changes in their routine life. Additionally, treatment includes constraints on dietary intake and physical activity. Subsequently, these physical and mental symptoms of patients likely to influence the degree of the personal satisfaction or quality of life. A study reported that clinical and social demographic variables may affect QOL of CKD patients on dialysis treatment [13]

Social connections are significant for patients with chronic diseases; since these connections have noteworthy advantages and positively affect their wellbeing. Those individuals who get to more social help can deal with their mental stress in better way and experience improved wellbeing results [14].

Studies show that social support is related to the quality of life (QOL) in such a way that people who receive social support and are part of a large social networking enjoy higher QOL [15]. CKD is progressing rapidly in Asian countries as compared to other continents of the world. This rapid growth of the disease not only alert physical health professionals but also grasps attention of mental health experts. However, in Pakistan, mental health problems related to CKD has not been extensively investigated. Therefore the present study aims to investigate the impact of hemodialysis on the wellbeing of patients suffering from CKD.

Methods

The research was conducted at the dialysis center of the department of Nephrology, Leady Reading Hospital Peshawar in 3 months (June–September 2017). The study got approved by the from advance study and research board (ASRB) of Shaheed Benazir Bhutto Women University, Peshawar. Later permission from medical director and approval institutional ethics and review board (IERB) was also obtained. The study included those patients who were above 18 years of age diagnosed as CKD patients, native language Urdu, volunteer participation, and signed consent form. Whereas any previous psychiatric illness history, patients with previous dialysis history, education less than matriculation, patients unable to provide participation consent were excluded from the study. All patients were referred by nephrologists to participate in the study on the basis of biochemical results of the patients. Participants were informed of the volunteer participation and have right to withdraw any time from this study. Total of 100 patients, 50 in each group were recruited during 3 months period conveniently based on the predetermined criteria as given below.

Group I = In group I recruited individuals suffering from kidney diseases with stage 4–5 and

send to dialysis treatment first time (*n* = 50)

Group II = In group II CKD Patients from stage 1–3 were included and not recommended for

dialysis (*n* = 50)

These two groups were not matched for gender and age.

Once written consent was obtained from the participants, they were given brochure of questionnaires to fill out. The booklet comprised of scales and a demographic sheet. These scales were (1) WHOQOL-BREF developed by World Health Organization Quality of life. It is a 5 point Likert scale based on 26 items with four subscale, i.e., physical wellbeing, mental wellbeing, societal relation, and ecological wellbeing [16]. (2) Pakistan Anxiety and Depression Scale contain two subscale, i.e., depression and anxiety. Each subscale comprised of 15 items, and scores 6 or above is considering as depression and anxiety [17]. (3) Multidimensional Scale of Perceived Social Support (MSPSS) use to assess perceived support by family, peers, and significant others 7-point Likert scale was developed. It consists of 12 items with 3 subscales. Each subscale comprised of 4 items and to calculate its mean score sum items of each subscale and divide by 4. For total item, sum of all 12 items and then divided by 12. Score 1–2.9 consider low support, 3–5 as moderate, and 5.1–7 as high support [18]. Demographic sheet consists of the items which have significant relation with CKD. Both groups were given set of questionnaires and briefed about the study objectives along with instructions "how to fill out questionnaire." Group I participants filled in questionnaires before dialysis started again after completing 10 numbers of dialysis. However, participants of group II were given the booklet of questionnaire only once.

Table 1 Depression, anxiety, quality of life, and perceived social support in study (group I) before and after hemodialysis

Variables	M(SD)	t	p
Quality of life	8.14(6.37)	9.032	.001
Depression	.94(1.81)	3.66	.001
Anxiety	1.34(1.54)	6.12	.001
Perceived Social Support	.28(4.66)	.42	.673

Table results show the paired sample *t* test applied to assess the significant changes of the psychological factors of CKD sufferers before dialysis treatment and after dialysis treatment. According to the results, the difference in the pre- and post-test measures were observed to be statistically significant for QOL, depression, and anxiety except the result of perceived social support which is not significant

Statistical analysis

The analyses were performed in SPSS v20. The descriptive statistics were performed on 100 patients suffering from chronic kidney disease. Differences in mean were assessed by using independent sample *t* test and paired sample *t* test.

Results

The average age of the participants in this study was 43.46 ± 16.29, both male (50%) and female (50%) equally participated. Majority had 93.1% has elementary school level, while 87.1% were married population. Among these, 87.1% have nuclear family system. Employment status was 41.6% for male whereas 27.7% females were house wife. In addition, 18.8% consume CKD family history. A comparison between pre- and post-dialysis for QOL, depression, anxiety, and perceived social support (PSS) among the patients in group I is shown in Table 1. The result of paired sample *t* test of group I suggested

significant difference on depression, anxiety, and QOL while PSS values were not significantly different. The findings of the present study further reported no significant difference between group I and group II results on QOL, depression, anxiety, and PSS through computing independent sample *t* test. Figure 1 illustrates mean difference on QOL, depression, anxiety, and PSS of group I. The results demonstrated poor QOL, while slightly reduction in depression and anxiety values. On the other hand, PSS level remain intact. Whereas group I and II results are not different on QOL, depression, anxiety and PSS (Table 2).

Discussion

The current study revolves around the impact of dialysis on the wellbeing of CKD sufferers. It was aim at exploring depression, anxiety, QOL, and PSS in CKD patients. Information from CKD patients of nephrology ward of Leady Reading Hospital was gathered. Results of Table 1 indicate that there is a significant difference on QOL, depression, anxiety, and PSS between pre- and post-test analysis. Mean difference (Fig. 1) of anxiety was high (24.02) at pre-test (before hemodialysis) as compared to post-test (22.68), QOL score was (81.42) at pre-test time, and (73.28) at post-test. Mean score on pre-test of depression was (22.12) and at post-test was (21.18). No significant mean difference of PSS was reported on pre-test (68.62) and post-test (68.34). Treating CKD is related to receiving long-term conventional and dialysis therapy by patients which could significantly changes their lives and routine activities. A cohort study conducted by Ng et al. [11] reported that 39.6% patients
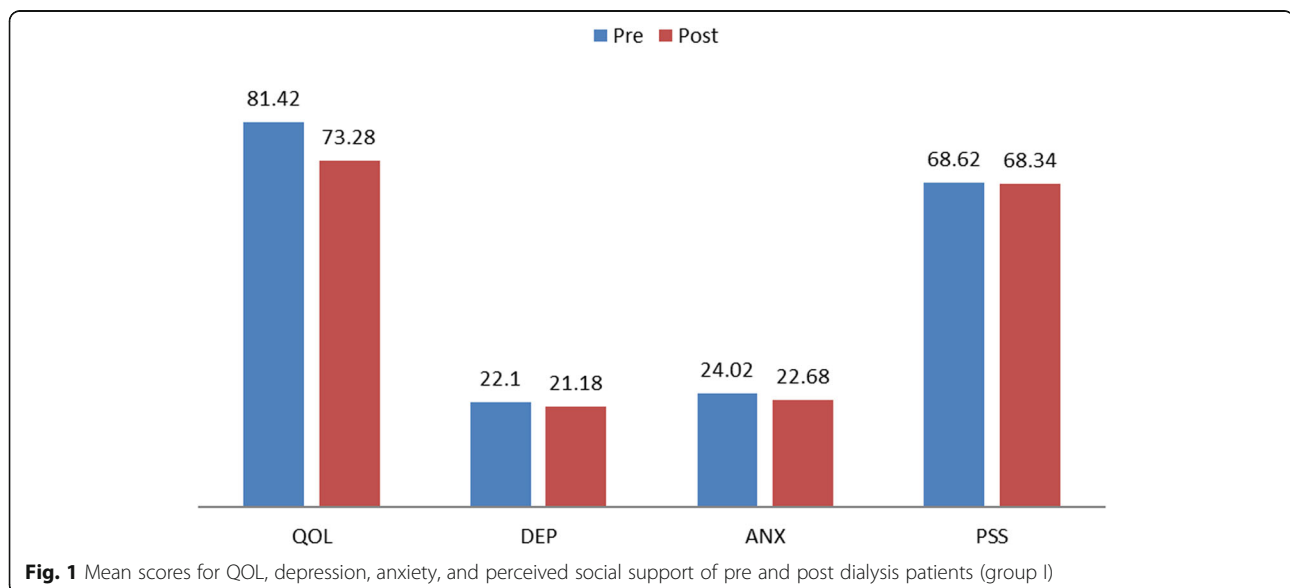

Fig. 1 Mean scores for QOL, depression, anxiety, and perceived social support of pre and post dialysis patients (group I)

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Table 2 Comparison between group I and group II on quality of life, depression, anxiety, and perceived social support

	Group I	Group II	*t* values	*p* values
Quality of life	81.4(7.88)	84.1(9.21)	− 1.58	.11
Depression	22.1(2.40)	21.7(2.37)	.79	.42
Anxiety	24.0(2.97)	23.9(2.88)	.20	.83
Perceived social support	68.6(11.5)	67.6(12.4)	.39	.69

The results of the Table 2 indicate no significant difference between group I and group II in QOL, depression, anxiety and PSS

undergoing dialysis treatment have depression and 31.8% had anxiety. Another study reported data from Morocco on depression and anxiety, suicidal risk, and QOL in chronic hemodialysis, the finding endorsed present study results [19]. A review by Lee et al. [20] stated that both anxiety and depression were prevalent in pre-dialysis CKD sufferers and related with poor QOL. Health-related QOL significantly predicts death and hospitalization which could affect the prognosis and progression of the illness. This reduction of QOL could be due to the presence of depression and anxiety in pre-dialysis patients [21]. Another possible explanation behind poor QOL could be advance age, low SES, and education of the current sample. Secondly, certain complications are also associated with hemodialysis treatment, e.g., dry skin, itching, blood pressure fluctuations, headache, and back pain [13, 22, 23]. It is interesting to note that the present study did not report significant difference on PSS before and after the treatment of dialysis. It seems that in our culture we still intact with social norms and care patients who usually are close/immediate family members (parents/spouse). Independent sample *t* test was used to see the difference on QOL, depression, anxiety, and PSS between group I and group II. The findings indicate no difference on QOL, depression, anxiety, and PSS between both groups. A study reported that CKD patient with elevated depression and anxiety may perceive less social support from family and significant others [24]. A qualitative study suggests that prolong dialysis treatment effects negatively on the CKD patients. They furthers conclude that to get substantial treatment outcome, it is imperative to improve social support of family and significant others [25]. However, in the present study, these results may be due to the fact that both group participants have kidney diseases. Group I were suffering from intense level therefore they have depression, anxiety, and poor QOL while group II have the same level of mental health, which may be because they may develop the fear that their disease could convert into intense stages.

Realizing the seriousness of depression, anxiety, and poor QOL among CKD patients is of genuine concern. Unnecessary delay to treat mental health problems among these patients will affect the CKD management outcome.

Conclusion
The results of the study showed that CKD patients suffer from depression, anxiety, and poor QOL. In addition, pre- and post-test further suggested that dialysis treatment reduces depression, anxiety, and significantly affect QOL, while no effect has been observed on PSS.

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