Contents lists available at ScienceDirect

Clinical Epidemiology and Global Health

Effectiveness of education and exercise on quality of life among patients undergoing hemodialysis

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ABSTRACT

Objective: The aim of this study was to evaluate the effectiveness of an education and exercise intervention on the quality of life of patients with end-stage renal disease (ESRD).

Methods: A randomized controlled trail was used. A random sample of 150 patients (75 in intervention and 75 in control group) with ESRD and receiving dialysis was selected to participate in the study. The laptop assisted interactive education was prepared in vernacular language (Tamil) that runs for 25 min and shown to the patients and their relatives for the study group whereas the control group had only routine care by the dialysis unit. Before dialysis pretest was conducted and the following next visit patients was given laptop assisted interactive education before dialysis and supervised the exercise during dialysis. The data was collected using the Research and Development health-related kidney disease QOL (KDQOL) questionnaire.

Results: Majority of them belong to age group between 50 and 59 years, studied upto primary education (29,30%), doing skilled work (44,40%)and earning more than Rs.12,000 and were having no health insurance. Most of them had diabetes and hypertension (35,34%) and was undergoing hemodialysis for more than 6 months (60,57%) and with Hemoglobin level (41,38%) of 6–8.5 g/dl and was underweight (48,41%). The mean scores for the Kidney Disease and general QoL sub-scales among the intervention group (Mean 66.5) were higher and statistically significant (p < 0.01) compared to the control group (Mean 55.25). QOL.

Conclusion: The education and exercise intervention had a positive effect on the physical and mental health wellbeing of patients with ESRD. Therefore early education about renal disease in affected patients improves QoL and treatment outcomes in patients with ESRD on dialysis.

1. Introduction

Chronic Kidney Disease (CKD) was defined based on the presence of kidney damage or glomerular filtration rate (GFR 60 ml/min per 1.73 m^2) for ≥ 3 months, irrespective of cause, and was classified into five stages based on the level of GFR.[1] CKD may also result in life-threatening metabolic derangement[2] and lead to end-stage renal disease (ESRD).[3] It is evident that the elderly population with diabetes, cardiovascular diseases and hypertension are growing and the poor outcome of these endemic diseases are mainly due to renal impairment which increases the global prevalence and incidence of ESRD.[4] The outcomes of ESRD are highly influenced by renal replacement therapy, health care cost, and the economic strength of the country where the affected person lives. For instance the mortality rate among patients with ESRD depends on the renal replacement services offered by the organizations and availability of such services.

The factors of cost, access and quality of renal replacement services are some of the main reasons behind the trends showing increasing prevalence of ESRD in developed and under developing countries. The mean age stage 3 CKD in India was 51 years and in China was 63·6 years. Adults aged 20–50 years in sub-Saharan Africa mainly develop CKD due to hypertension and glomerulonephritis and in the USA, African American and Hispanic people reach ESRD at younger ages than white people (mean age 57 and 58 years *vs* 63 years).[5] In India, the prevalence of CKD is estimated at 800 per million population (pmp) and the incidence of ESRD is 150–200 pmp.[7]

CKD is a unique condition because it causes enormous medical, social and economic distress to the affected individual and their families.[8] Patients with CKD and on dialysis have lower level of quality of life (QoL) and usually this is related to the impact and compromise brought by factors such as fatigue, dietary and fluid restrictions. The other aspects which negatively impact QOL in patients with CKD include the failure to meet the social role and responsibilities due to physical problems such activity intolerance, impotence, and changes in body image.[9] Therefore health-related QOL, which is a measure of adult's functioning, well-being, and general health perception in terms

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of physical, psychological, and social aspects among patients with CKD, is one of the major outcomes of CKD. Available reports show that when patients with CKD have a good QOL, they tend to live independently because of their physical and mental functioning.[10]

Literature shows that physical and mental function are inversely correlated with the risk for hospitalization and mortality in patients with CKD.[11] The current therapeutic approach to management of CKD includes maintenance hemodialysis therapy in order to restore the highest level of physical and mental functioning (QOL) possible among patients with ESRD. Hence, enhancing the QOL is one of the primary objectives during the care of patients with ESRD.[12] Besides maintenance hemodialysis therapy, studies have shown that additional interventions can be used to enhance QOL in patients with ESRD. For instance physical activity related rehabilitation interventions have been shown to enhance physical functioning.[13]

Psychoeducational interventions which provide information about the nature of illness, exercise and relevant coping skills have also been used and found to enhance the physical and psychosocial well-being of patients with CKD.[12] Therefore interventions which are able to enhance physical and mental functions can reduce hospitalization and mortality rates in CKD patients.[8] The other interventions which have been used in this population have focused on education, social support, and self-care and these have been shown to raise coping skills among people on dialysis.[14]

Despite the above interventions, literature still shows that emotional adjustment, adherence to treatments, exercise, and engagement in life is still a big challenge for patients with CKD.[15] The available treatment choices, medications, and the renal diet can help patients with CKD on dialysis to maintain a sense of control, only if adherence and life satisfaction with the outcomes are existent.[16] Therefore early education about renal disease, and the potential to live long can aid in overall adjustment and decision making for people on dialysis.[17] Studies show that informed patients tend to report fewer symptoms and more confidence in their ability to manage the symptoms they do have.[17] Patients with CKD usually struggle with energy and activity levels, functional ability, sleeping and eating behaviors, disease symptoms, health status, sex life, well-being, psychological effect, satisfaction with life and health, and happiness, and all these affect their QOL.[18] Similarly, the purpose of this study was to examine the effects of an education and exercise intervention on QOL among patients with CKD in India and was guided by the following objectives to:

1. Assess the existing level of quality of life among patients subjected to hemodialysis.
2. Evaluate the effectiveness of exercise on quality of life among patients subjected to hemodialysis.
3. Associate the clinical variables with quality of life among patients subjected to hemodialysis.

2. Materials and methods

This study was implemented to assess the quality of life among patients with CKD on hemodialysis and to evaluate the effectiveness of an education and exercise intervention on the QOL among patients with CKD on hemodialysis.

2.1. Design

An evaluative intervention approach using a two group (control and intervention) pre-test and post-test design was employed to evaluate the effectiveness of an education and exercise intervention on the QOL of hemodialysis patients. This study instituted two groups: an intervention group exposed to the education and exercise intervention and the control group which received usual care.

Block I		Time schedule		Block II
Monday →	7 – 11 am (8 participants)	11 am – 3 pm (8 participants)	3- 7 pm (8 participants)	Tuesday ←
Wednesday →	7 – 11 am (8 participants)	11 am – 3 pm (8 participants)	3- 7 pm (8 participants)	Thursday ←
Friday →	7 – 11 am (9 participants)	11 am – 3 pm (9 participants)	3- 7 pm (9 participants)	Saturday ←

Fig. 1. Sampling technique through block randomization.

2.2. Setting

This study was conducted in 2012 at a 12-bedded dialysis center which is part of a multi-specialty hospital which is located in one of the metropolitan cities in India.

2.3. Sample and sampling

The target population for this study were patients with CKD and who were receiving hemodialysis. In order to be included in this study the participants had to meet the inclusion criteria of: being an adult with CKD on hemodialysis on elective basis; have been on dialysis for at least 6 weeks; and in the age group of 20–70 years.

The minimum required sample was estimated to be 64 participants in order to achieve an estimated power of 0.80, a medium effect of 0.80 with $p < 0.05$ (Cohen, 1992). A total of 150 patients with CKD undergoing hemodialysis were recruited in the study. Patients with CKD on hemodialysis who fulfilled the inclusion criteria during were recruited to participate in the study. Patients who were known to have a psychiatric disorder and altered level of consciousness were excluded from the study (as shown in Fig. 2).

Blocked randomization was used to minimize the bias across the experimental and control groups. The investigator assessed 177 patients and of these only 150 fulfilled the inclusion criteria. The 150 participants were divided into Block I (Monday, Wednesday and Friday) and Block II (Tuesday, Thursday and Saturday). By drawing lots the investigator selected 8, 8 and 9 participants from 7am to 11am, 11 a.m. to 3 p.m. and 3 p.m. to 7 p.m schedule respectively as shown in the Fig. 1 to prevent contamination between study and the control group. Since block I and II belong to different days of a week, both the group had no chance to meet each other.

2.4. Blinding

The triple blinding technique was used by the investigator, and was used between the researcher, the patient, the nurse and for the data collection outcomes. The patients were blinded to the nurses and the researchers in the study. Both the study and the control group were treated equally in terms of the selection, randomization, administration of the data collection instruments and ethical protocol, except for the intervention.

2.5. Measurements

The Kidney Disease Quality of Life- Short form (KDQOL-SF) was used for data collection. The KDQOL-SF is a self-report measure developed for individuals with kidney disease and on dialysis.[19] It contains 43 kidney-disease targeted items and 36 items that provide a generic score and overall health rating. The KDQOL-SF focuses on particular health-related concerns like symptoms/problems (12 items), effects of kidney disease on daily life (8 items), burden of kidney disease (4 items), work status (2 items), cognitive function (3 items), quality of social interaction (3 items), sexual function (2 items), sleep (4 items), social support (2 items), dialysis staff encouragement (2 items), adult
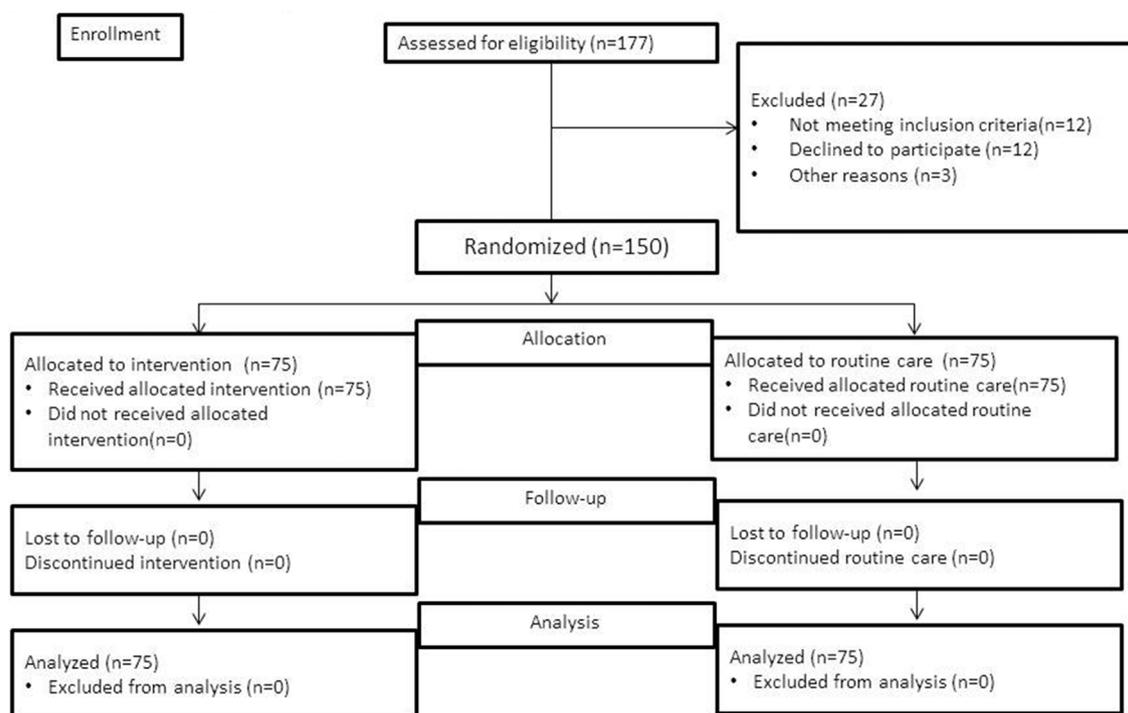
Fig. 2. Consort flow diagram.

satisfaction (1 item) (KDQOL-SF, 1997).

The other 36 items consists of eight multi-item measures of physical and mental health status: physical functioning (10), role-physical (4), bodily pain (2), general health (5), vitality (4), Social functioning (sf) (2), role-emotional (3), mental health (5) and general QOL. Overall health is rated on a scale of 0–10 (ranging from worst possible to best possible health). A score between 0 and 100 is calculated on the basis of well-defined guidelines, with a higher score indicating a better state of health. The reliability of the KDQOL-SF was r = 0.80 in this study.

Participants' demographic data such as age, gender, educational status, occupation, marital status, place of residence, type of family, family monthly income, distance of residence from hospital and health insurance was collected. Data on clinical parameters such as presence of co-morbidity, frequency of dialysis per week, physical activity, hemoglobin level, serum creatinine and body mass index (BMI) classification for Indian population were obtained.

2.6. Intervention

The renal education and exercise intervention focused on providing interactive education, exercise, life style modification, and coping advice. The intervention was developed by the investigator and validated for content and concepts. The intervention was a nurse led renal rehabilitation program. The intervention group was provided with information using a laptop. The education part provided teaching focusing on ESRD and life style modification, basic structure and functions of the kidneys, stages of kidney failure, causes of CKD, signs and symptoms of CKD, examinations and tests to identify CKD, hemodialysis and treatment methods. The teaching sessions were prepared in vernacular language (Tamil) and took approximately 25 min. The exercise part consisted of strengthening exercise, aerobic exercises, and Jelly ball/Hand ball (AV-Fistula) exercises. The participants were also provided employment counseling which consisted of job retention strategies, referrals to job training, re-training and placement services to full-time or part-time.

The participants were given the pre-test survey before dialysis. On return for the next visit patients were given the intervention before

dialysis. The first post test was taken after one month before initiating dialysis and reinforcement was given on the same day. The second post-test was taken after one month of the first post test before initiating dialysis and the reinforcement was given on the same. The control group subjects received the usual treatment. Both groups were equivalent in all respects except for the intervention. All the participants were routinely counseled by the treating nephrologists, the unit nurses and were provided with usual information regular dialysis, diet restriction, activity limitations, dos and don'ts and follow up.

3. Data collection

The ethical approval for the study was obtained from the Institution Ethics Board of study site and parent University of the investigator. The permission to conduct research in Dialysis Unit was obtained from concerned authorities. The eligible participants were identified from the hospital medical records after obtaining permission. The purposes of the study and their right to participate or withdraw from the study were explained in a written informed consent which was given to the participants. The baseline data were collected using interview technique. Privacy was provided during the data collection. The first post test was taken after 4 weeks before initiating dialysis and reinforcement was given. The second post-test was taken after 8 weeks of the first post test before initiating dialysis and after the reinforcement was given on the same.

4. Data analysis

The Statistical Package for Social Sciences (SPSS version 21) was used to manage and analyze data. The data analysis was performed using descriptive statistics and the paired 't'- test for independent group. The level of significance was set at $p < 0.05$ for statistical analyses. Chi-square test, the homogeneity test was used to confirm the existence of a significant difference between the intervention and control groups and association between socidemographic and the outcome variable.

Table 1
Demographic characteristics of the participants (N = 150).

Demographic Variable	Category	Intervention Group (n = 75) F (%)	Control Group (n = 75) F (%)	Chi Square p Value
Age (in years) (Mean = 48.77; SD = 10.32)	30–39	14 (18.6)	12 (16.0)	X^2 = 1.536 p = 0.820
	40–49	24 (32)	31 (41.3)	
	50–59	24 (32)	22 (29.3)	
	> 60	13 (17.3)	10 (13.3)	
Gender	Male	42 (56)	41 (54.7)	X^2 = 0.027 p = 0.870
	Female	33 (44)	34 (45.3)	
Educational status	Not educated	5 (6.7)	2 (2.7)	X^2 = 1.947 p = 0.745
	Primary school	29 (38.7)	32 (42.7)	
	High school	16 (21.3)	19 (25.3)	
	Higher secondary	15 (20)	14 (18.7)	
	Degree and above	10 (13.3)	8 (10.7)	
Marital status	Married	61 (81.3)	50 (66.7)	X^2 = 9.490 P0.023*
	Unmarried	1 (1.3)	11 (14.7)	
	Divorced	7 (9.3)	8 (10.7)	
	Widowed	6 (8)	6 (8)	
Occupation	Skilled	44 (58.7)	40 (53.3)	X^2 = 3.124 p = 0.373
	Unskilled	14 (18.7)	21 (28)	
	Unemployed	17 (22.7)	13 (17.3)	
	Others	0 (0)	1 (1.3)	
Income (Monthly in US Dollar) (Mean = 132.2; SD = 67.4)	118.19–147.74	9 (12)	10 (13.3)	X^2 = 0.427 p = 0.808
	147.74–177.29	28 (37.3)	31 (41.3)	
	> 177.30	38 (50.7)	34 (45.3)	
Place of residence	Rural	14 (18.7)	22 (29.3)	X^2 = 2.378 p = 0.305
	Semi urban	47 (62.7)	40 (53.3)	
	Urban	14 (18.7)	13 (17.3)	
Type of family	Joint family	39 (52)	38 (50.7)	X^2 = 0.091 p = 0.956
	Nuclear family	36 (48)	37 (49.3)	
Distance from hospital in KM (Mean = 13.8; SD = 7.42)	5	9 (12)	12 (16)	X^2 = 1.856 p = 0.603
	10	14 (18.7)	19 (25.3)	
	15	31 (41.3)	26 (34.7)	
	More than 15	21 (28)	18 (24)	
Health insurance	Employee insurance	42 (56)	48 (64)	X^2 = 1.127 p = 0.848
	Self	33 (44)	27 (36)	

Table 2
Clinical parameters of the participants (N = 150).

Clinical Parameter	Category	Intervention Group (n = 75) F (%)	Control Group (n = 75) F (%)	Chi Square p Value
Co-morbid illness	Cardiac disease	23 (30.7)	20 (26.7)	X^2 = 1.079 p = 0.782
	Diabetes mellitus	13 (17.3)	14 (18.7)	
	Hypertension	4 (5.3)	7 (9.3)	
	Diabetes mellitus & Hypertension	35 (46.7)	34 (45.3)	
Frequency of dialysis per week	Once	15 (20)	20 (26.7)	X^2 = 0.932 p = 0.334
	More than once	60 (80)	55 (73.3)	
Physical activity	Moderate	51 (68)	45 (60)	X^2 = 1.042 p = 0.307
	Sedentary	24 (32)	30 (40)	
Hemoglobin level (g/dl) (M = 8.4.; SD = 4.8)	3–5.5	4 (5.3)	7 (9.3)	X^2 = 0.932 p = 0.627
	6–8.5	41 (54.7)	38 (50.7)	
	9 <	30 (40)	30 (40)	
Serum creatinine (mg/dl) (M = 4.57; SD = 2.6)	2–4	63 (84)	55 (73.3)	X^2 = 2.574 p = 0.276
	5–8	7 (9.3)	11 (14.7)	
	9–12	5 (6.7)	9 (12)	
Body mass index	Under weight	48 (64)	41 (54.7)	X^2 = 1.591 p = 0.451
	Obese	15 (20)	21 (28)	
	Normal	12 (16)	13 (17.3)	

5. Results

5.1. Demographic characteristics of the participants

The description of participants presented in Table 1 shows that the majority of the intervention and control group were above the age of 40 years. The mean age in both group was 48.77. The majority of participants in both groups were male, married, skilled workers, and living in semi-urban areas. One-third of the participants in the intervention (32%) had primary education and 42.7% in the control group had similar level of education.

5.2. Clinical characteristics of the participants

The results summarized in Table 2 show that the majority of participants had dialysis more than once a week in the intervention (80%) and control group (73.3%). Fifty percent of the patients had low hemoglobin in the intervention (54.7%) and control group (50.7%).

5.3. Effect of the intervention on the participants kidney disease quality of life

The findings in Table 3 show that there were no differences in the KDQOL between the intervention and control group before the intervention (at the pre-test). The KDQOL mean scores were significantly higher with the symptom, effect of kidney disease, burden of kidney disease, cognitive function, sexual function, sleep, social support,

encouragement, overall health and satisfaction subdomains in the intervention group compared to the control group in the post-test I conducted at 4 weeks. The mean scores of the KDQOL was also significantly higher with symptom, effect, social support, encouragement, overall health, and satisfaction (p < 0.001) in the intervention compared to the control group in the post test II conducted at 8 weeks.

5.4. Effect of the intervention on participant's general quality of life

The findings in Table 4 show that there was no difference in the general QOL between the intervention and control group before the intervention (at the pre-test). The mean general of QOL scores were significantly higher in all the aspects except Energy/Fatigue, Social function and Emotional wellbeing in the intervention group compared to the control group in the post-test I and II.

5.5. Association between the selected demographic variables with quality of life

The Chi-square test described the association between the age (7.205), gender (9.424), income (3.676), comorbidity (9.090), frequency of dialysis (4.452), hemoglobin (3.419), Sr. Creatinine (3.139), body mass index and the QoL among study group during posttest II which is statistically significant at p < 0.01.

6. Discussion

The study findings show that the education and exercise intervention used was able to improve the physical functioning of patients on hemodialysis and this led improvement in their QOL. Other studies have also reported increase in QOL after an intradialytic exercises.[20] In this study factors such as middle age group, men, higher income, dialysis more than once/week, moderate anemia, low Serum Creatinine, and underweight BMI were significantly associated with QOL after intervention at 8 weeks among the intervention group. Other studies have reported factors closely similar to those mentioned above. For instance better QOL mean scores were observed among men who were married, working, good hemoglobin, low serum creatinine among patients with

Table 3
Effect of intervention on kidney disease QoL during Post Test I and II (N = 150).

Kidney disease Quality of Life		Intervention Group (n = 75)		Control Group (n = 75)		't-test
		Mean	SD	Mean	SD	
Pre Test	Symptom/problem list	57	12.53	54	08.91	0.132
	Effect of kidney disease	52	14.20	50	09.90	0.961
	Burden of kidney disease	39	18.11	35	14.67	0.182
	Work status	30	35.72	40	33.58	0.052
	Cognitive function	62	17.36	61	15.27	0.989
	Quality of social interaction	64	17	59	14.32	0.077
	Sexual function	48	19.97	58	22.41	0.191
	Sleep	47	13.81	45	11.14	0.183
	Social support	68	24.68	61	23.81	0.202
	Dialysis staff encouragement	65	24.60	65	19.27	0.459
	Overall health	54	16.95	52	17.20	0.272
	Patient satisfaction	77	17.03	74	19.24	0.402
Poste test I	Symptom/problem list	73	08.94	42	06.64	0.000***
	Effect of kidney disease	65	10.33	52	14.20	0.000***
	Burden of kidney disease	60	14.06	23	09.25	0.000***
	Work status	30	34.87	30	35.72	0.940
	Cognitive function	75	12.78	45	12.20	0.000***
	Quality of social interaction	64	12.34	32	10.55	0.000***
	Sexual function	64	08.49	48	19.97	0.016*
	Sleep	55	10.10	47	13.81	0.000***
	Social support	73	16.23	68	24.68	0.278
	Dialysis staff encouragement	76	15.64	65	24.60	0.012*
	Overall health	60	11.59	54	16.95	0.018*
	Patient satisfaction	84	12.82	77	17.03	0.012*
Poste test II	Symptom/problem list	77	06.40	57	12.53	0.000***
	Effect of kidney disease	74	07.36	52	14.20	0.000***
	Burden of kidney disease	49	11.25	39	18.11	0.000***
	Work status	37	35.91	30	35.72	0.224
	Cognitive function	68	08.19	62	17.36	0.000***
	Quality of social interaction	67	10.30	64	17.01	0.195
	Sexual function	63	07.73	48	19.97	0.011*
	Sleep	57	10.00	47	13.81	0.000***
	Social support	84	12.08	68	24.68	0.122
	Dialysis staff encouragement	78	14.20	65	24.60	0.001**
	Overall health	60	11.59	54	16.95	0.018*
	Patient satisfaction	84	12.82	77	17.03	0.012*

*p < 0.05 **p < 0.01 ***p < 0.001.

hemodialysis.[21] Cognitive function and quality of social interaction and QOL have also been reported to be associated with older age, socio-economic status and higher educational level among patients on HD in Romania.[22] Education and employment influenced the physical and social domains of QOL as they are aware of the quality of service and individual rights.[23]

In this study intervention group that participated in education and exercise showed better physical functional and QOL than the control group. These positive effects of participating in an education were seen after 8 weeks of dialysis treatment. Patients exposed to pre-dialysis education scored significantly better mood, less functional disabilities compared to the comparison group.[24] Education improves knowledge

and self-management and treatment efficacy.[25] Physical exercise increased physical function among patients on hemodialysis[26] and increased exercise capacity, improves muscle function.[27]

In this study education for patients with end-stage renal failure was found to improve QOL. Other studies showed that physical composite scores were correlated with age, hemoglobin and comorbidity, and mean PCS was lower in depressed patients on hemodialysis.[28] Physical functioning scale were significantly lower for obese subjects than for those with normal weight or moderately high BMI.[29] QOL of the intervention group was higher than the control group in 50% of the dimensions in KDQOL-SF and reported better emotional state, less bodily pain, improved social functioning and fewer problems with work.[13] QOL improved by 20% in coping among patients with hemodialysis.[30]

In this study, the intervention group had higher general and kidney disease QoL compared to control group, except for energy fatigue, emotional well-being, social function and energy fatigue, work status, quality of social interaction, and social support. Physical and mental composites of general QoL were higher in the intervention group compared to the control group. Reduction in HRQOL of elderly patients, in relationship with that of the general population of the same age and gender, was lower than in younger patients. Elderly patients on hemodialysis had relatively better HRQOL.[31] Intervention improves QOL among patients with CKD [32].

In this study, physical, mental domains have significantly influenced QOL. Physical health and functioning improved after education and exercise among patients with CKD. Physical, mental, social and emotional domains promote KDQOL among patients with CKD. QOL was improved with interactive education and exercise among patients with CKD. Education and exercise improves knowledge and QOL and impacts patients with hemodialysis. Patients with CKD are encouraged to accept responsibility for their health and self-care. Education and exercise was shown to be a positive predictor of physical and mental health for people on hemodialysis as they have reported fewer symptoms and confidence in their ability to manage the symptoms they do have. They have reported better subjective quality of life, including social and role functioning, and emotional well-being. Hence education and exercise can enhance the potential for physical activity and improved quality of life and may influence other important outcomes. The results are likely to benefit the patients QOL on hemodialysis post intervention.

7. Strength of the study

The current study was the first to assess the effect of exercise on quality of life among hemodialysis patients in southern part of India. The findings can be used as a baseline to explore the booklet provided by the investigator. This study included only Indian patients in a very big tertiary hospital which is a referral hospital. The use of block randomization in assigning participants to study and control group strengthens the findings in terms of less bias. This increases the generalizability of the findings. The findings can be used to guide clinical nurse specialists, patients and family education link nurses in hospitals to concentrate on structured teaching programs. Ultimately, this can improve patients' quality of care and outcomes, and can reduce readmission and costs, improve quality of life. This study will also be a resource for future research studies in this field.

LIMITATION: Past experiences among patients with dialysis may influence the results.

8. Implications

Patients with CKD may take more responsibility for things they can control, including exercise, remaining actively engaged in life, and renal meal plan. Their involvement in self-care can positively affect their adherence with treatment regimens. Education, exercise, staff encouragement toward education, exercise rehabilitation help patients

Table 4
Effect of the intervention on general quality of life during Post Test I and II (N = 150).

General Quality of Life		Intervention Group (n = 75)		Control Group (n = 75)		*t*-test
		Mean	SD	Mean	SD	
Pre Test	Physical functioning	45	22.36	40	15.56	0.298
	Role physical	40	34.07	35	24.63	0.503
	Pain	60	25.31	55	24.27	0.258
	General Health	48	17.29	46	17.81	0.224
	Emotional well being	59	18.70	55	17.23	0.107
	Role emotional	52	37.23	44	29.82	0.119
	Social function	59	26.66	55	19.40	0.237
	Energy/Fatigue	49	18.39	50	15.24	0.620
Post Test I	Physical functioning	62	15.74	37	17.16	0.000***
	Role physical	72	24.64	32	29.21	0.000***
	Pain	73	17.04	44	15.06	0.000***
	General Health	50	11.88	35	10.83	0.000***
	Emotional well being	58	13.51	43	12.14	0.000***
	Role emotional	78	26.07	37	30.49	0.000***
	Social function	71	16.70	38	13.45	0.000***
	Energy/Fatigue	51	12.92	54	09.58	0.117
Post Test II	Physical functioning	77	11.22	45	22.23	0.000***
	Role physical	88	14.41	40	34.07	0.000***
	Pain	75	13.20	60	25.31	0.000***
	General Health	52	08.63	46	17.05	0.001**
	Emotional well being	57	12.03	59	18.70	0.527
	Role emotional	94	13.83	52	37.23	0.000***
	Social function	67	13.18	59	26.66	0.073
	Energy/Fatigue	52	10.49	49	18.39	0.216

**p < 0.01 ***p < 0.001.

to form positive attitudes that will allow them to participate actively in life. Encouragement and counseling especially from families and dialysis staff can increase autonomy, control, and participation in treatment. Patients with CKD on hemodialysis are encouraged and reinforced to learn about their self-care for improved quality of life. They take more responsibility for domains that they can control, including exercise, being actively engaged in life, and renal meal plan. Based on the study findings, the investigator recommends the following future directions of research work:

- Effectiveness of this intervention on a longer duration, probably 6 months and 1 year can be carried out.
- The combination of other psychosocial intervention along with physical conditioning can be investigated.
- The same study can be replicated with peritoneal dialysis patients.
- The same study can be replicated with large sample size.
- There can be a comparative study between patients with hemo and peritoneal dialysis on Kidney Disease specific QoL components.
- Effectiveness of book let can be tested in future.

9. Conclusion

The economically cheaper nursing intervention (Pre dialysis education and relevant exercise and follow up, reassurance) reduces the economically burdened disease condition (CKD). Effective communication with patients on the benefits of regular exercise, importance of regular dialysis, fluid management, diet plan, reassurance and encouragement by nurses will help the patients to overcome the discomfort, thereby, help them to have a near normal life and better quality of life.

Conflicts of interest

The authors declares no conflict of interest.

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