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EFFECTIVENESS OF NURSE-LED SELF-MANAGEMENT SUPPORT ON HEALTH-RELATED QUALITY OF LIFE AMONG PATIENTS WITH CHRONIC KIDNEY DISEASE

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ABSTRACT

Background: Chronic Kidney Disease (CKD) is a progressive and irreversible disorder associated with significant morbidity, reduced quality of life and increased healthcare burden. Effective self-management strategies have been recommended to improve patients' health-related quality of life (HRQoL), treatment adherence and clinical outcomes. Nurse-led interventions have emerged as an important approach to empower patients with CKD through education, behavioural modification and continuous support.
Objectives: The present study aimed to evaluate the effectiveness of a nurse-led self-management programme on health-related quality of life and selected clinical outcomes among patients with chronic kidney disease.
Methods: A quasi-experimental study with a pre-test and post-test control group design was conducted among 60 patients diagnosed with CKD. Participants were allocated into an intervention group (n = 30) and a control group (n = 30). Baseline demographic and clinical data were collected prior to the intervention. The intervention group received a structured nurse-led self-management programme, while the control group received routine clinical care. Health-related quality of life was assessed using the Short Form-36 (SF-36) questionnaire, while clinical outcomes included systolic blood pressure (SBP), diastolic blood pressure (DBP), estimated glomerular filtration rate (eGFR), serum calcium and serum potassium levels. Data were analysed using descriptive statistics, independent sample t-test, paired t-test, Pearson correlation, multiple linear regression and analysis of covariance (ANCOVA).
Results: Baseline demographic and clinical characteristics were comparable between the intervention and control groups ($p > 0.05$). Following the intervention, the intervention group demonstrated statistically significant improvements in SF-36 physical and mental component scores compared with baseline ($p < 0.001$). Significant reductions were also observed in systolic and diastolic blood pressure, while renal function indicators, including eGFR and serum calcium, showed improvement following the intervention. Serum potassium levels demonstrated a significant reduction toward normal values. In contrast, the control group exhibited only minimal, statistically non-significant changes across most outcome measures ($p > 0.05$). Between-group comparison revealed significantly higher HRQoL scores and more favourable clinical outcomes in the intervention group than in the control group ($p < 0.001$). Pearson correlation analysis demonstrated significant positive associations between HRQoL and renal function, whereas blood pressure showed negative correlations with quality-of-life scores. Multiple linear regression identified eGFR and systolic blood pressure as significant predictors of physical quality of life. ANCOVA further confirmed that the intervention remained significantly effective after adjustment for baseline differences.
Conclusion: The findings suggest that the nurse-led self-management programme was effective in improving health-related quality of life and selected clinical outcomes among patients with chronic kidney disease. Structured educational and behavioural interventions delivered by nurses may contribute to better disease management, improved patient empowerment, enhanced renal

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health and reduced cardiovascular risk. Integration of nurse-led self-management programmes into routine nephrology care may improve long-term patient outcomes and quality of life.

Keywords: Chronic Kidney Disease, Nurse-Led Intervention, Self-Management, Health-Related Quality of Life, SF-36, Blood Pressure, Renal Function, EGFR

INTRODUCTION

Chronic kidney disease (CKD) has become one of the fastest-growing public health challenges worldwide, contributing substantially to premature mortality, disability and escalating healthcare expenditure. CKD is defined by the Kidney Disease: Improving Global Outcomes (KDIGO) Clinical Practice Guideline as abnormalities of kidney structure or function that persist for at least three months and have implications for health, including reduced estimated glomerular filtration rate (eGFR), albuminuria, abnormalities detected by imaging, or pathological changes (kidney disease: Improving Global Outcomes kidney disease: Improving Global Outcomes (2024). CKD is classified into five stages according to kidney function, with progressive decline in glomerular filtration ultimately leading to kidney failure requiring renal replacement therapy in the form of dialysis or kidney transplantation if disease progression cannot be slowed kidney disease: Improving Global Outcomes (2024). The global prevalence of CKD has increased steadily over the past three decades due to population ageing, increasing prevalence of diabetes mellitus, hypertension, obesity and cardiovascular disease. The Global Burden of Disease (GBD) Study estimated that more than 850 million people worldwide are living with kidney disease, making CKD one of the leading causes of mortality and disability globally GBD Chronic Kidney Disease Collaboration (2020), Jager et al. (2019). Furthermore, the Global Burden of Disease 2019 Study ranked CKD among the fastest-growing causes of years of life lost, emphasizing its increasing public health importance GBD Chronic Kidney Disease Collaboration (2020).

CKD imposes a substantial burden not only on patients but also on families, healthcare systems and national economies because of frequent hospitalizations, lifelong treatment requirements, productivity loss and increasing healthcare expenditure Bikbov et al. (2020). As kidney function deteriorates, patients require more frequent medical care, pharmacological treatment, laboratory monitoring and eventually dialysis or transplantation, all of which substantially increase healthcare costs Levin et al. (2017). CKD has become particularly challenging in low- and middle-income countries where healthcare infrastructure remains inadequate and access to specialist nephrology services is limited Luyckx et al. (2018). India bears a significant proportion of the global CKD burden owing to rapid epidemiological transition, increasing prevalence of diabetes mellitus and hypertension, urbanization and ageing of the population Varma (2015). Community-based epidemiological studies have demonstrated that CKD prevalence is steadily increasing across both urban and rural populations, while limited awareness and delayed diagnosis contribute to poor clinical outcomes Singh et al. (2013). Because early CKD is frequently asymptomatic, many patients present with advanced disease, thereby reducing opportunities for early intervention and slowing disease progression kidney disease: Improving Global Outcomes (2024).

The consequences of CKD extend beyond deterioration in renal function. Patients commonly experience fatigue, sleep disturbances, pruritus, cognitive impairment, muscle weakness, depression, anxiety, cardiovascular complications, mineral and bone disorders, anaemia and progressive decline in physical functioning Levin et al. (2017). These complications substantially impair health-related quality of life (HRQoL), which has emerged as one of the most important patient-centred outcomes in nephrology research Hays et al. (1994). HRQoL encompasses multiple dimensions including physical functioning, emotional well-being, psychological health, social relationships, vitality and general health perception. Numerous studies have consistently demonstrated that individuals with CKD report significantly poorer HRQoL than healthy populations, with deterioration becoming more pronounced as kidney disease progresses Pagels et al. (2012), Wyld et al. (2012). Successful CKD management extends well beyond pharmacological treatment. Patients are expected to adhere to complex medication regimens, restrict dietary sodium, potassium and phosphate intake when indicated, regulate fluid consumption, monitor blood pressure, engage in regular physical activity, avoid nephrotoxic medications, recognize symptoms of disease progression and attend scheduled follow-up appointments (KDIGO, 2024). These complex self-care responsibilities frequently overwhelm patients and contribute to poor treatment adherence, resulting in accelerated disease progression and increased hospitalization Lin et al. (2012).

Self-management has therefore become a cornerstone of chronic disease management. It refers to the ability of individuals to manage symptoms, treatment, physical and psychosocial consequences and lifestyle modifications associated with chronic illness Lorig and Holman (2003). Effective self-management has been associated with improved medication adherence, healthier lifestyle behaviours, enhanced self-efficacy, reduced disease complications, lower hospitalization rates and improved quality of life among patients with chronic diseases, including CKD Novak et al. (2013). However, successful self-management depends not only on disease knowledge but also on confidence, motivation, social support, health literacy and effective communication with healthcare professionals. Among members of the multidisciplinary healthcare team, nurses are uniquely positioned to facilitate self-management because they maintain continuous contact with patients throughout the disease trajectory. Nurse-led interventions generally combine individualized education, behavioural counselling, motivational interviewing, collaborative goal setting, reinforcement of healthy behaviours and structured follow-up Donald et al. (2018). Such interventions are designed to improve patients' knowledge, strengthen confidence, enhance treatment adherence and facilitate sustainable behavioural change.

Bandura's Social Cognitive Theory provides the theoretical basis for many nurse-led self-management interventions. Bandura (1997), self-efficacy defined as an individual's belief in their capability to organize and execute behaviours required to achieve desired outcomes is one of the strongest determinants of behaviour change. Individuals with greater self-efficacy are more likely to

initiate healthy behaviours, overcome barriers to treatment adherence and sustain long-term lifestyle modifications. Consequently, interventions aimed at improving self-efficacy are expected to enhance both behavioural and clinical outcomes among patients with CKD Bandura (1997). Several systematic reviews and randomized controlled trials have reported that nurse-led self-management interventions improve patient knowledge, medication adherence, blood pressure control, self-management behaviour and aspects of quality of life among individuals with CKD Donald et al. (2018), Havas et al. (2017). Nevertheless, substantial heterogeneity remains regarding intervention content, duration, theoretical framework, outcome measures and study populations. Furthermore, evidence regarding objective clinical outcomes such as estimated glomerular filtration rate, serum electrolytes and health-related quality of life among adults with non-dialysis CKD remains comparatively limited, particularly in low-resource healthcare settings Havas et al. (2017).

The present study addresses this important evidence gap by evaluating a structured nurse-led self-management support programme designed to improve health-related quality of life and selected clinical outcomes among adults with CKD. The intervention integrates individualized education, behavioural counselling, collaborative goal setting, lifestyle modification strategies and scheduled follow-up within routine nephrology care. By simultaneously examining patient-reported outcomes and objective clinical indicators, the study aims to strengthen the evidence supporting nurse-led interventions and contribute to improving multidisciplinary management of chronic kidney disease.

MATERIALS AND METHODS

STUDY DESIGN

A randomized controlled trial (RCT) with a parallel-group pre-test and post-test design was conducted to evaluate the impact of a structured nurse-led self-management support programme on health-related quality of life and selected clinical outcomes among patients with chronic kidney disease (CKD). The study was designed and reported in accordance with the Consolidated Standards of Reporting Trials (CONSORT) 2010 guidelines to ensure methodological rigor and transparency Schulz et al. (2010).

STUDY SETTING

The study was conducted in the Nephrology Outpatient Department (OPD) of a selected private tertiary care hospital in Coimbatore, Tamil Nadu, India. The hospital serves a large number of patients diagnosed with CKD and provides comprehensive nephrology services, including outpatient consultations, laboratory investigations, dietary counselling, dialysis facilities and follow-up care.

STUDY POPULATION

The study population comprised adult patients diagnosed with chronic kidney disease stages 2–4 who attended the nephrology outpatient department during the study period.

ELIGIBILITY CRITERIA

INCLUSION CRITERIA

- Patients were included if they:
- were aged between 30 and 70 years;
- had a confirmed diagnosis of CKD stages 1–4 according to the kidney disease: Improving Global Outcomes (2024)
- had been receiving nephrology treatment for at least three months;
- were clinically stable without hospitalization during the preceding month;
- were able to communicate in Tamil or English;
- were willing to provide written informed consent.

EXCLUSION CRITERIA

- Patients were excluded if they:
- were receiving maintenance haemodialysis or peritoneal dialysis;
- had undergone kidney transplantation;
- had severe cognitive impairment or psychiatric illness;
- had terminal illness or active malignancy;
- had severe visual or hearing impairment affecting participation;

- were enrolled in another behavioural intervention programme.

SAMPLE SIZE

The required sample size was determined using G*Power version 3.1, considering an expected moderate intervention effect size (Cohen's d = 0.50), 80% statistical power and a two-sided significance level of 5%. After accounting for an anticipated attrition rate of approximately 10%, a total sample of 60 participants (30 in the intervention group and 30 in the control group) was considered adequate to detect clinically meaningful differences between groups.

SAMPLING TECHNIQUE

Participants fulfilling the eligibility criteria were recruited using consecutive sampling until the required sample size was achieved. After completion of baseline assessment, participants were randomly allocated to either the intervention or control group.

RANDOMIZATION

Randomization was performed using a computer-generated random allocation sequence prepared by an independent statistician who was not involved in participant recruitment or outcome assessment. Allocation was carried out using sequentially numbered, opaque, sealed envelopes to ensure allocation concealment.

Participants were assigned in a 1:1 ratio to either

- Intervention Group (Nurse-led Self-Management Support + Routine Care)
- Control Group (Routine Care Alone)

BLINDING

Because of the behavioural nature of the intervention, participants and intervention nurses could not be blinded to group allocation. However, laboratory personnel responsible for biochemical investigations and the statistician who performed the data analysis remained blinded to group allocation throughout the study.

INTERVENTION

Participants allocated to the intervention group received a structured Nurse-Led Self-Management Support Programme in addition to routine nephrology care over a period of 12 weeks. The intervention was developed using the principles of Bandura's Social Cognitive Theory and current KDIGO recommendations for CKD management.

The intervention consisted of six structured components:

1) Individualized Health Education

Each participant received individualized education regarding

- CKD progression
- Causes and risk factors
- Importance of medication adherence
- Blood pressure control
- Dietary sodium restriction
- Potassium management
- Phosphate restriction
- Fluid management
- Physical activity
- Smoking cessation
- Prevention of complications

2) Lifestyle Counselling

Personalized counselling focused on

- healthy eating
- regular exercise

- stress management
- sleep hygiene
- weight control
- avoidance of nephrotoxic medications
- alcohol reduction
- tobacco cessation

3) Goal Setting

Participants collaborated with the nurse to establish individualized weekly self-management goals related to

- medication adherence
- dietary compliance
- physical activity
- blood pressure monitoring
- clinic attendance
- Progress toward goals was reviewed during follow-up visits.

4) Educational Booklet

Participants received educational booklet developed in English and Tamil that summarized all educational components of the programme.

5) Telephone Follow-up

Weekly telephone follow-up (approximately 10–15 minutes) was provided to

- reinforce educational messages;
- address participant concerns;
- encourage adherence;
- provide motivational support;
- review progress toward individualized goals.

6) Family Involvement

One family member was encouraged to participate in education sessions to facilitate home-based support and reinforce adherence to lifestyle recommendations.

CONTROL GROUP

Participants allocated to the control group received routine nephrology care according to the hospital's standard clinical practice. Routine care included physician consultation, prescribed medications, routine laboratory investigations and general counselling as provided during regular outpatient visits. No structured nurse-led self-management support programme was delivered to this group during the study period.

OUTCOME MEASURES

Outcome assessments were performed at baseline (Week 0) and immediately after completion of the 12-week intervention.

PRIMARY OUTCOME

- Health-Related Quality of Life
- Health-related quality of life was assessed using the Short Form-36 Health Survey (SF-36 Version 2).

The SF-36 consists of 36 items distributed across eight health domains

- Physical Functioning
- Role Physical
- Bodily Pain
- General Health
- Vitality

- Social Functioning
- Role Emotional
- Mental Health
- The eight domains were summarized into:
- Physical Component Summary (PCS)
- Mental Component Summary (MCS)
- Higher scores indicate better health-related quality of life.

SECONDARY OUTCOMES

Blood Pressure: Systolic and diastolic blood pressure were measured using a calibrated automated sphygmomanometer after participants rested quietly for at least five minutes. Three readings were obtained, and the average value was recorded.

Estimated Glomerular Filtration Rate (eGFR): Estimated glomerular filtration rate was calculated using the CKD-EPI equation based on serum creatinine concentration.

Serum Calcium: Serum calcium concentration (mg/dL) was measured using an automated biochemical analyzer in the hospital's central laboratory.

Serum Potassium: Serum potassium concentration (mEq/L) was measured using an ion-selective electrode analyzer.

Serum Phosphate: Serum phosphate concentration (mg/dL) was determined using standard colorimetric laboratory methods.

DATA COLLECTION PROCEDURE

Baseline demographic characteristics, medical history, laboratory investigations, blood pressure measurements and SF-36 scores were collected before randomization. Following baseline assessment, participants were randomized into the intervention and control groups. The intervention group completed the 12-week nurse-led self-management support programme, while the control group continued receiving routine care. At the end of 12 weeks, all outcome variables were reassessed using identical procedures by trained research personnel blinded to group allocation.

ETHICAL CONSIDERATIONS

Ethical approval was obtained from the Institutional Ethics Committee before commencement of the study. Written informed consent was obtained from all participants before enrolment. Participant confidentiality was maintained throughout the study by assigning unique identification numbers and all collected data were stored securely with access restricted to the research team. Participation was voluntary and participants retained the right to withdraw from the study at any stage without affecting their medical care.

STATISTICAL ANALYSIS

Data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics (Version 26.0). Descriptive statistics were used to summarize demographic and clinical characteristics. Continuous variables were expressed as mean ± standard deviation, whereas categorical variables were presented as frequency and percentage.

The following statistical analyses were performed

- Frequency and percentage for categorical variables.
- Mean ± standard deviation for continuous variables.
- Independent-samples t-test to compare baseline and post-intervention outcomes between groups.
- Paired-samples t-test to compare pre-test and post-test outcomes within each group.
- Pearson's correlation coefficient to determine relationships between health-related quality of life and clinical outcomes.
- Multiple linear regression analysis to identify predictors of post-intervention health-related quality of life.
- Analysis of covariance (ANCOVA) to compare post-test outcomes while adjusting for baseline values.
- A two-tailed p-value < 0.05 was considered statistically significant.

RESULTS AND DISCUSSION

PARTICIPANT FLOW

A total of 80 patients with chronic kidney disease were assessed for eligibility. Twenty patients did not meet the inclusion criteria and eight declined participation. The remaining 60 participants were randomized equally into the intervention group (n = 30) and the control group (n = 30).

DEMOGRAPHIC CHARACTERISTICS

The demographic characteristics of participants are presented in Table 1. The intervention and control groups were comparable with respect to age, gender, marital status and CKD stage. No statistically significant differences were observed between the two groups ($p > 0.05$), indicating that both groups were homogeneous at baseline prior to implementation of the nurse-led self-management programme.

Table 1

Table 1 Demographic Characteristics of Participants (N = 60)

Variable	Intervention (n=30)	Control (n=30)	p-value
Age (years), Mean ± SD	**55.7 ± 8.9**	**56.8 ± 10.7**	**0.64**
Gender			**0.79**
Male	16 (53.3%)	20 (66.7%)	
Female	14 (46.7%)	10 (33.3%)	
Marital Status			**0.61**
Married	23 (76.7%)	22 (73.3%)	
Unmarried	7 (23.3%)	8 (26.7%)	
CKD Stage			**0.88**
Stage 2	7 (23.3%)	11 (36.7%)	
Stage 3	18 (60.0%)	16 (53.3%)	
Stage 4	5 (16.7%)	3 (10.0%)	

Table 1 demonstrates that the intervention and control groups were comparable regarding demographic and disease-related characteristics. The mean age was approximately 56 years in both groups. Male participants constituted the majority of the study population. Stage 3 CKD was the predominant stage among participants. No statistically significant differences were observed for any baseline characteristic ($p > 0.05$), indicating successful group allocation.

BASELINE COMPARISON OF CLINICAL OUTCOMES

Baseline measurements of health-related quality of life, blood pressure and renal function were compared between the intervention and control groups using independent sample t-test.

Table 2

Table 2 Baseline Comparison

Outcome	Intervention Mean ± SD	Control Mean ± SD	t	p
SF-36 Physical Score	46.8 ± 7.5	45.9 ± 6.9	0.48	0.63
SF-36 Mental Score	45.9 ± 9.6	45.5 ± 8.7	0.17	0.86
SBP (mmHg)	146.3 ± 10.8	146.8 ± 10.2	-0.19	0.84
DBP (mmHg)	87.1 ± 5.6	86.4 ± 5.8	0.47	0.64
eGFR (mL/min/1.73m^2)	40.2 ± 11.3	40.9 ± 11.7	-0.25	0.81
Serum Calcium (mg/dL)	8.69 ± 0.57	8.62 ± 0.59	0.44	0.66
Serum Potassium (mEq/L)	4.83 ± 0.48	4.72 ± 0.44	0.92	0.36

The baseline comparison revealed no statistically significant differences between intervention and control groups for quality of life, blood pressure or renal function parameters ($p > 0.05$). These findings confirm that both groups were equivalent prior to commencement of the intervention.

PAIRED T-TEST (INTERVENTION GROUP)

Following completion of the nurse-led self-management programme, pre-test and post-test values were compared using paired t-test.

Table 3

Table 3 Paired t-test (Intervention Group)

Outcome	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Difference	t	p
SF-36 Physical	46.8 ± 7.5	61.5 ± 8.4	14.7	11.92	<0.001
SF-36 Mental	45.9 ± 9.6	61.1 ± 8.7	15.2	10.84	<0.001
SBP	146.3 ± 10.8	129.8 ± 10.1	-16.5	9.36	<0.001
DBP	87.1 ± 5.6	78.3 ± 5.2	-8.8	8.51	<0.001
eGFR	40.2 ± 11.3	44.5 ± 11.2	4.3	5.22	<0.001
Calcium	8.69 ± 0.57	8.98 ± 0.54	0.29	3.44	0.002
Potassium	4.83 ± 0.48	4.42 ± 0.43	-0.41	5.37	<0.001

The intervention group demonstrated statistically significant improvements in all measured outcomes following implementation of the nurse-led self-management programme. Significant improvements were observed in physical and mental quality of life, blood pressure control and renal function indicators ($p < 0.001$).

PAIRED T-TEST (CONTROL GROUP)

Routine care resulted in only minimal changes over the study period.

Table 4

Table 4 Paired t-test (Control Group)

Outcome	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Difference	t	p
SF-36 Physical	45.9 ± 6.9	46.8 ± 7.2	0.9	1.12	0.27
SF-36 Mental	45.5 ± 8.7	46.4 ± 8.6	0.9	1.09	0.28
SBP	146.8 ± 10.2	144.5 ± 10.3	-2.3	1.78	0.08
DBP	86.4 ± 5.8	85.5 ± 5.5	-0.9	1.02	0.31
eGFR	40.9 ± 11.7	41.3 ± 11.6	0.4	0.81	0.42
Calcium	8.62 ± 0.59	8.65 ± 0.58	0.03	0.58	0.57
Potassium	4.72 ± 0.44	4.68 ± 0.42	-0.04	0.84	0.41

Only slight, non-significant changes were observed in the control group. Routine clinical care alone did not produce statistically significant improvements in quality of life or clinical parameters ($p > 0.05$).

BETWEEN-GROUP COMPARISON

Table 5

Table 5 Between-group Comparison After Intervention

Outcome	Intervention	Control	t	p
SF-36 Physical	61.5 ± 8.4	46.8 ± 7.2	7.21	<0.001
SF-36 Mental	61.1 ± 8.7	46.4 ± 8.6	6.84	<0.001
SBP	129.8 ± 10.1	144.5 ± 10.3	-5.58	<0.001

DBP	78.3 ± 5.2	85.5 ± 5.5	-5.2	<0.001
eGFR	44.5 ± 11.2	41.3 ± 11.6	2.14	0.036

Post-intervention analysis demonstrated significantly better quality of life, lower blood pressure and improved renal function in the intervention group compared with the control group.

PEARSON CORRELATION

Table 6

Table 6 Pearson Correlation Matrix

Variables	Physical	Mental	SBP	DBP	eGFR
Physical Score	1	0.69**	-0.54**	-0.47**	0.48**
Mental Score	0.69**	1	-0.41**	-0.36**	0.43**
SBP	-0.54**	-0.41**	1	0.72**	-0.32*
DBP	-0.47**	-0.36**	0.72**	1	-0.28*
eGFR	0.48**	0.43**	-0.32*	-0.28*	1

*p<0.05, **p<0.01

Higher quality-of-life scores were positively correlated with renal function and negatively correlated with blood pressure, indicating better clinical outcomes among participants with higher HRQoL.

MULTIPLE LINEAR REGRESSION

Table 7

Table 7 Predictors of Physical Quality of Life

Predictor	β	SE	t	p
eGFR	0.36	0.09	3.98	<0.001
SBP	-0.31	0.1	-3.24	0.002
Age	-0.19	0.08	-2.11	0.039
CKD Stage	-0.17	0.07	-2.03	0.046

Model Summary: $R = 0.72$; $R^2 = 0.52$; Adjusted $R^2 = 0.49$; $F = 15.82$; $p < 0.001$

The regression model explained approximately 52% of the variance in physical quality-of-life scores. Higher eGFR was associated with improved physical health, whereas increased systolic blood pressure, older age and advanced CKD stage were associated with poorer physical quality of life.

ANCOVA

Table 8

Table 8 ANCOVA Comparing Post-test Outcomes

Outcome	F	p	Partial η^2
Physical Score	19.84	<0.001	0.26
Mental Score	17.53	<0.001	0.23
SBP	14.42	<0.001	0.2
eGFR	5.27	0.025	0.08

After adjusting for baseline measurements, the intervention remained significantly effective in improving physical and mental quality of life, lowering systolic blood pressure and enhancing renal function. The partial eta-squared values indicated moderate to large intervention effects across the primary outcomes.

CONCLUSION

The present study evaluated the effectiveness of a nurse-led self-management programme on health-related quality of life and selected clinical outcomes among patients with chronic kidney disease. The findings demonstrated that participants who received the structured nurse-led intervention experienced significant improvements in both physical and mental dimensions of quality of life compared with those receiving routine care. The intervention also resulted in significant reductions in systolic and diastolic blood pressure and favourable changes in renal function parameters, including improvement in estimated glomerular filtration rate and serum calcium levels, along with a reduction in serum potassium levels toward normal ranges. These findings indicate that comprehensive self-management education delivered by trained nurses can positively influence patients' ability to manage their disease and improve clinical health indicators. The control group showed only marginal improvements over the study period, suggesting that routine care alone may not be sufficient to achieve meaningful changes in patient outcomes. Between-group comparisons further confirmed the superiority of the nurse-led intervention, with statistically significant differences observed across major outcome variables.

Correlation analysis demonstrated that better renal function was associated with higher quality-of-life scores, whereas elevated blood pressure was negatively associated with quality of life. Multiple linear regression analysis identified renal function and systolic blood pressure as important predictors of physical health status. Furthermore, ANCOVA confirmed that the intervention remained effective even after controlling for baseline measurements, indicating that the observed improvements were attributable to the nurse-led self-management programme rather than pre-existing differences between groups. Overall, the findings support the incorporation of structured nurse-led self-management programmes into routine CKD care. Such interventions have the potential to improve patient knowledge, promote healthy self-care behaviours, enhance health-related quality of life, optimize clinical outcomes and reduce disease-related complications. Future studies involving larger sample sizes, multicentre settings and longer follow-up periods are recommended to establish the long-term effectiveness and sustainability of nurse-led self-management interventions among patients with Chronic Kidney Disease.

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