Original Article

Effect of Educational Nursing Guidelines on Self-management and Health-Related Quality of Life for Hemodialysis Patients

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Abstract

Background: Chronic kidney disease is the biggest problem in health care today, and the primary replacement therapy, hemodialysis, has a severe impact on both self-management and quality of life. This study aimed to evaluate the effect of educational nursing guidelines on self-management and health-related quality of life for hemodialysis patients. **Materials and Methods:** A quasi-experimental design was used. A convenience sample of 100 hemodialysis patients in the hemodialysis unit at Ismailia General Hospital, 50 patients for the study and 50 patients for the control groups. Data were collected using a patient demographic information questionnaire, hemodialysis self-management scale, and survey instrument on kidney disease quality of life 36-item (KDQOL-36). The intervention was conducted over 12 weeks in five sessions, from implementing the guidelines to the post-test phase. The control group received the usual care. SPSS version 23, descriptive statistics, and inferential statistics like independent *t*-test and Pearson Chi-square test were used. **Results:** Regarding self-management dimensions, a statistically significant difference was found between the study and control group regarding problem-solving and communications, fluid control, diet, self-advocacy, and emotional control with $p < 0.001$, and effect size 5.89,4.99, 5.06, and 4.54, respectively. Regarding the quality of life domains, a statistically significant difference was found between the study and control group regarding physical functioning, mental functioning, the burden of kidney disease, management of symptoms, and kidney disease effect with $p < 0.001$ and the effect size 9.39, 6.07, 1.86, 7.65, and 6.96, respectively. **Conclusions:** Educational guidelines are effective for improving self-management and quality of life.

Keywords: *Hemodialysis, quality of life, renal failure, self-care*

Introduction

Chronic kidney Disease (CKD) is the most burden health problem that has significantly increased worldwide, with a rise in financial demands in recent years. CKD is a health problem contributor to the significant increase in morbidity and mortality rates worldwide. The number of patients with CKD continues to rise because of the increasing incidence of diabetes mellitus, hypertension, and the aging population.[1,2] CKD is a progressive condition that affects >10% of the general population worldwide, amounting to >800 million individuals.[3] The recent United States Renal Data System (USRD) revealed that over 480,000 people are on dialysis treatment and denoted that nearly 800,000 prevalent patients with CKD are receiving renal replacement therapy, and more than 150,000 new patients start treatment by 2023.[4] The CKD prevalence in Europe is probably similar to that of the United States. However, with varying figures among European countries,[4] in Egypt, there are 650 per million patients on dialysis treatment, and the estimated End Stage Renal Disease (ESRD) annual incidence is around 192 per million.[5] An Egyptian study in 2018 found that ESRD prevalence is 483 per million populations, and there are 40000 ESRD patients on dialysis as a total recorded number. Ninety-eight percent of these patients received Hemodialysis (HD) in slightly over 600 dialysis units using around 3000 machines.[6] Therefore, encouraging HD patients to participate actively in their disease care actively improves their abilities for self-management.[7]

Self-management is critical for patients to provide adequate care for chronically ill patients. The main self-management components include symptom control,

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information management, side effect treatment, problem-solving, self-care, lifestyle, and social support.[8] Nurses have a vital role in improving self-management and quality of life for HD patients through focusing on promoting symptom control, management of HD problems, vascular access care, fluid restriction, disease and self-management knowledge, dietary restriction weight control, medication adherence, recommended exercise, and educational interventions.[9,10]

Quality of life is critical for assessing patient-centered clinical outcomes for HD. Patients with HD suffer from many physical, mental, social, and spiritual problems that impair their quality of life. Problems are fatigue, pain, muscle cramps, sleeping disorders, anxiety, emotional problems, social isolation, and spiritual problems.[11] Several studies demonstrated that patients with HD had a poor quality of life.[12] Although HD is the leading replacement therapy, it harms self-management and quality of life. This urgent need for interventions to reduce the incidence of mortality and complications and improve quality of life reflects the critical importance of implementing educational guidelines to improve the care provided to HD patients worldwide.[8,10] Therefore, this study aims to evaluate the effect of educational nursing guidelines on self-management and health-related quality of life for HD patients.

Materials and Methods

A quasi-experimental pre − post-test control group design. The quasi-experimental research design involved manipulating the independent variable to observe the impact on the dependent variable. The outcomes of the pre- and post-test helped establish the effectiveness of the intervention measures proposed in the research.[13] The study was conducted in a HD unit at Ismailia General Hospital in Egypt from September 2021 to March 2022. The unit consists of 50 dialysis beds divided into three rooms. Available 7 days a week for dialysis patients from 8 a.m. until 8 p.m.

The sample comprised 50 patients (50) for each group (study and control group). Sample size calculation was estimated using the following equation: n = (Z $\alpha/2$ + Zβ/P1-P2) 2* (p1q1 + p2q2),[14] where n was the sample size, Z $\alpha/2$ was 1.96, Zβ =0.90, P1 was prevalence/proportion post-intervention (0.90), P2 was prevalence/proportion pre-intervention (0.66), and Q was 1-P.[15] A convenience sample was selected to represent the sample subjects. Random allocation of the sample was done using systemic randomization. Eligibility criteria were HD patients diagnosed with end-stage renal failure (chronic renal failure stage 5), undergo HD for at least 6 months, and patients aged ≥20 years, where HD patients with renal transplantation, terminal illness, altered mental status, altered level of consciousness, the unwillingness of patients to continue cooperation, and communication disorder were excluded.

Questionnaire for Patient Demographic Information: TOOL (I): The patient demographic information questionnaire included the patients' profile section collecting information about age, sex, occupation, marital status, and income. TOOL (II): The Hemodialysis Self-Management scale was used to assess self-management among HD patients. This tool was adopted by Cha and Kang (2017). The scale consisted of 20 questions: 7 items for problem-solving and communication, three for fluid and weight control, five for diet and HD, and five for self-advocacy and emotion control. Each item ranged from never (1) to always (4) on a 4-point scale. Scores varied from 20 to 80, an increased score above the mean score indicating a higher level of self-management. Back translation for the HD self-management instrument was done before collecting data. The tool was tested for content validity, and its content validity index was 0.81. Three experts from the medical-surgical department of the Faculties of Nursing tested the tools to determine whether the included tools were comprehensive, applicable, understandable, precise, and suitable to achieve the aim of the study. Internal consistency reliability was conducted using Cronbach's α for the HD self-management scale, which was 0.734.

Survey instrument KDQOL-36 (The Kidney Disease Quality of Life 36-item) was adopted.[16,17] KDQOL-36 was widely used to measure dialysis patients' quality of life. This instrument KDQOL-36 has five subscales, involving the SF-12 version 1 (12 items total) as two generic Health Related Quality of Life (HRQOL) scales, six items for SF-12 Mental Component Score (MCS) and six items for SF-12 physical component score (PCS), as well as three kidney-specific scales (24 items total); 4 items for the burden of kidney disease (4 items): 12 items for symptoms of kidney disease and eight items for effects of kidney disease. For KDQOL-36 scoring, the range of scale scores is from 0 to 100, and a higher score indicates an increase in Quality-of-Life (QoL). Before collecting data, back translation for the KDQOL-36 instrument was done. The tool was tested for content validity, and its content validity index was 0.81. Three experts from the medical-surgical department of the Faculties of Nursing tested the tools to determine whether the included tools were comprehensive, applicable, understandable, accurate, and suitable to achieve the aim of the study. Internal consistency reliability was conducted using Cronbach's α for the HD self-management scale, which was 0.979. The pilot study's purpose was to test the study tools applicability of study tools and to estimate the needed filling time. The pilot study's data results helped the researcher modify the tools. Accordingly, modifications were made.

The assessment phase started from September 2021 to March 2022. The researcher selected the intervention group from undergoing HD patient attendants on Saturday, Monday, and Wednesday from 8 a.m. to 12 p.m., while the control group from patients undergoing HD on Sunday, Tuesday, and Thursday from 4 p.m. to 8 p.m.

Each patient was interviewed to obtain the required data during the planning and implementation phase. The researcher introduced himself to the patient at the beginning of the interview and discussed the study's aim. Two tools were applied to assess demographics, self-management, and HRQOL for control and intervention groups of patients. Educational nursing guidelines were developed and constructed according to patients' needs and were based on self-management. The content of educational nursing guidelines was developed based on a recent literature review. After completing the initial setup, educational nursing guidelines were revised by a group of three experts from the professors of medical-surgical nursing. Based on the opinion of the panel of experts, which was tested on a 5-point Likert scale with a content validity index of 0.75, some modifications were made, and the final frame was developed. Design a plan to implement the educational nursing guidelines in five sessions conducted in 10 weeks after completing each dialysis session. The duration of each session is 45-50 minutes. The session was taken four times/8 patients/day in which 25 patients (for each small group of two patients) were taken. The first session was concerned with the basics of renal failure and HD, including the importance of educational nursing guidelines to improve QoL and self-management. In contrast, the second session was concerned with managing physical symptoms, fistula care, prevention, and management of complications for HD; the third session was concerned with a healthy dietary regimen and fluid and weight control. Also, the fourth session included sleeping hygiene, daily activities, and recreational and spiritual activities, and the fifth session included communication skills and stress management for HD patients. Assessment of the effect of the self-management guidelines was evaluated for patient self-management and QoL by comparing results two months after educational nursing guidelines implementations using the same format of pre-test to determine the effect of implemented educational nursing guidelines. Also, media were prepared by the researchers, including guidelines handouts, PowerPoint presentations, audiovisual materials, and the real object.

During the evaluation phase, the effect of self-management guidelines on patient self-management and QoL was evaluated by comparing results 2 months after implementing educational nursing guidelines and using self-management and HRQOL tools.

The analysis used the Statistical Package for the Social Sciences (SPSS Inc.) Version 23: descriptive statistics, the Chi-square test, and an independent *t*-test. Glass's delta effect size was used. $p \leq 0.05$ is significant.

Ethical considerations

Ethics approval was obtained from the Faculty of Nursing, Suez Canal University of Ethics Committee, with study code 21/2021. Written consent was taken from the study sample, where they were informed about the expected outcomes and the aim of the study. It was confirmed that the study was free from injury, their full participation was voluntary, and they had the right to withdraw at any time without any reason. Anonymity and confidentiality were guaranteed.

Results

There was no statistically significant difference between the study and the control group regarding age groups, sex, occupation, marital status, income, and education with $p > 0.05$ [Table 1].

Regarding self-management dimensions, there was a statistically significant difference between the study and the control group regarding problem-solving and communications, fluid control, diet and self-advocacy, and emotion control with $p < 0.001$ and effect size 5.89, 4.99, 5.06, and 4.54, respectively. Also, there was a statistically significant difference between both groups (study and control) regarding total self-management with $p < 0.001$ and an effect size of 7.09 [Table 2].

Regarding the quality of life domains, there was a statistically significant difference between both groups (study and control) regarding physical functioning, mental functioning,

Table 1: Percentage distribution of the study and control group regarding demographic data

Items	Study G. (*n*=50) *n* (%)	Control G. (*n*=50) *n* (%)	Test, df, *p*
Age (years)			
18–<28	5 (10)	5 (10)	2.40**, df=3, *p*=0.494
28–<38	18 (36)	15 (30)	
38–<48	14 (28)	21 (42)	
≥48	13 (26)	9 (18)	
Mean (SD)	40.36 (11.65)	39.72 (11.33)	0.28*, 0.781
Sex			
Male	30 (60)	28 (56)	0.164**, df=1, *p*=0.840
Female	20 (40)	22 (44)	
Occupation			
Working	29 (58)	25 (50)	0.64**, df=1, *p*=0.547
Not working	21 (42)	25 (50)	
Marital status			
Single	33 (66)	26 (52)	7.21**, df=3, *p*=0.065
Married	14 (28)	12 (24)	
Divorced/widowed	3 (6)	12 (22)	
Income			
Adequate	35 (70)	38 (76)	1.27**, df=2, *p*=0.528
Inadequate	15 (30)	12 (24)	
Education			
Illiterate	11 (22)	7 (14)	3.82**, df=5, *p*=0.574
Read and write	13 (26)	13 (26)	
Intermediate	15 (30)	13 (26)	
Above average	3 (6)	3 (6)	
High	8 (16)	12 (24)	
Postgraduate	0	2 (4)	

**Pearson Chi-square test & *independent *t*-test, $p \leq 0.05$ is significant

the burden of kidney disease and symptoms management, and the effect of kidney disease with $p < 0.001$ and effect size of 9.39, 6.07, 1.86, 7.65, and 6.96, respectively. Also, there was a statistically significant difference between the study and the control group regarding the total quality of life with $p < 0.001$ and an effect size of 10.25 [Table 3].

Discussion

The end-stage renal disease and its treatment diminish the patient's quality of life. HD patients have a wide range of challenges that impact their health and well-being on many levels, including physical, emotional, social, economic, psychological, and spiritual. It is no secret that HD patients have a miserable quality of life. HD patients need an educational strategy emphasizing disease prevention and quality of life improvement in vascular access care, nutrition, fluid intake, medication management, complication prevention, and coping with emotional and mental health issues. So, any intervention that will help maintain the current level of functioning and even improve the ability to self-manage is essential. The current study aimed to evaluate the effect of educational nursing

Table 2: The mean scores of the study and control group regarding self-management pre- and post-guidelines implementation

Factors	Study G. (*n*=50) Mean (SD)	Control G. (*n*=50) Mean (SD)	*(p) & delta
Factor (1): Problem solving and communications			
Pre-intervention	10.82 (1.27)	10.74 (1.12)	0.33 & (0.739) & 0.07
Post-intervention	23.94 (1.15)	11.50 (2.11)	36.58 (<0.001) 5.89
Factor (2): Fluid control			
Pre-intervention	4.36 (0.89)	4.64 (1.12)	(1.34) & 0.183 & (0.009)
Post-intervention	10.20 (0.90)	4.66 (1.11)	27.25 & (<0.001) & 4.99
Factor (3): Diet and hemodialysis			
Pre-intervention	7.78 (0.96)	7.66 (.84)	0.620 & (0.537) & 0.14
Post-intervention	17.34 (0.87)	8.28 (1.79)	32.08 & (<0.001*) & 5.06
Factor (4): Self-advocacy and emotion control			
Pre-intervention	7.82 (1.93)	8.32 (2.03)	1.32 & (0.189) & 0.24
Post-intervention	17.26 (0.98)	8.40 (1.95)	28.57 & (<0.001) & 4.54
Total self-management			
Pre-intervention	30.92 (2.89)	30.58 (2.79)	0.598 & (0.551) & 0.12
Post-intervention	68.74 (2.29)	32.84 (5.06)	45.66 & (<0.001) & 7.09

*Independent *t*-test; $P \leq 0.05$ is significant; delta is Glass's delta effect size

Table 3: The mean scores of the study and control group regarding quality of life pre- and post-guidelines implementation

Items	Study G. (*n*=50) Mean (SD)	Control G. (*n*=50) Mean (SD)	*(*P*) & (delta|)
Physical functioning			
Pre-intervention	14.66 (7.90)	14.50 (7.72)	0.107 & (.915) & 0.02
Post-intervention	86.64 (5.79)	17.97 (7.31)	52.04 & (<0.001) & 9.39
Mental functioning			
Pre-intervention	18.52 (10.53)	18.12 (10.63)	0.189 & (0.851) & (0.04)
Post-intervention	82.38 (7.60)	22.31 (9.89)	34.02 & (<0.001) & (6.07)
Burden of kidney disease			
Pre-intervention	19.75 (9.56)	20.12 (10.04)	0.191 & (0.849) & (0.03)
Post-intervention	36.62 (13.48)	20.25 (9.74)	6.96 & (<0.001) & (1.86)
Symptoms management			
Pre-intervention	24.66 (7.70)	24.45 (8.00)	0.133 & (.895) & (0.03)
Post-intervention	84.04 (4.11)	25.37 (7.67)	47.62 & (<0.001*) & (7.65)
Effect of kidney disease			
Pre-intervention	24.00 (8.57)	24.25 (8.46)	0.147 & (0.884) & (0.03)
Post-intervention	83.93 (5.43)	24.18 (8.58)	41.59 & (<0.001) & (6.96)
Total quality of life			
Pre-intervention	21.37 (4.92)	21.11 (5.09)	0.261 & (0.795) & (0.05)
Post-intervention	79.61 (3.30)	22.10 (4.73)	70.35 & (<0.001) (10.25)

*Independent *t*-test; $p \leq 0.05$ is significant; delta is Glass's delta effect size

guidelines on self-management and health-related quality of life for HD patients.

Concerning the results of the current study regarding dimensions of self-management, a statistically significant improvement in self-management in the study group regarding problem-solving and communications, fluid control, diet, self-advocacy, and emotion control with a high effect size compared with the control group after implementation of educational guidelines. These study results were in the same line with,[18] illuminating a statistically significant improvement in self-management related to HD following the implementation of educational nursing guidelines. This outcome may be explained by the fact that the HD patient's level of self-management improved as the patient learned more about his disease condition.

In the same context, these study results concur with,[10] who illuminated that educational intervention with the study group had effectively improved the problem-solving approach, fluid control, dietary adjustment, and emotion control dimensions of self-management. This denoted that HD patients must be educated and given more control over their care to improve self-management. One of the critical elements in improving patient responsibility for modifying or eliminating unhealthy habits is raising the degree of knowledge of the patients through educational strategies.

From the researcher's point of view, these findings could be explained in the light of study results that had significant evidence of the impact of self-management guidelines on HD patient self-management due to patients have mastered numerous skills such problem-solving and communication, fluid control, proper diet and self-advocacy, and emotion control. As a result of developing self-management skills, patients can manage and control their illness.

The current study showed a significant improvement in QoL domains in the study group compared with the control group after implementing educational guidelines. These findings agreed with a study by[19] and[20], which demonstrated that the teaching guidelines significantly improved HD patients' quality of life. This might explain that the educational guidelines positively affected being educated regarding the basics of HD, vascular access care, complication management, dietary and fluid restrictions, types of drugs, and activities that can help them cope with their illness and HD.

On the same line,[19] and[21-24] documented that educational interventions positively impacted the patient's quality of life following the intervention and that the experimental group's QoL score had improved when compared to the control group.

A reasonable explanation for the differences between the study and control group following the educational guidelines implementation in all QoL dimensions helps patients manage symptoms, psychological state, and social and spiritual health and improves adherence to the therapeutic regimen.

In this study, there was a significant improvement in self-management and quality of life after implementing the guidelines. Without implementing educational guidelines, HD measures of self-management and quality of life decrease; therefore, educational guidelines should be applied as early as possible. Hemodialysis patients' quality of life could be assessed using instruments measuring self-management and quality of life of HD patients. Assessment of self-management and quality of life could be an aspect of standardized care given by a professional nurse. Adding self-management to the nursing curriculum is vital for improving quality of life. The limitation of the study was prejudice in the intervention's measurement (for example, some research utilized qualitative analyses while others used quantitative ones).

Conclusion

Educational guidelines were effective in improving overall scores of self-management after implementation. Based on the results, it was demonstrated that educational nursing guidelines were effective in improving the quality of life for HD patients.

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Conflicts of interest

Nothing to declare.

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