The Applying the Model of Care Centered Professional Partnership on Laboratory Parameters and Quality of Life of Young People Undergoing Hemodialysis

Elahi N*, Fatemi N and Moradi M

Department of Nursing, Ahvaz Jundishapur University of Medical Sciences, Iran

*Corresponding author: Dr. Nasrin Elahi, Department of Nursing and Nursing Care Research Center in Chronic Diseases, Nursing and Midwifery Faculty, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran, Tel: +986133738071; Email: Elahi-n@ajums.ac.ir

Abstract

Background: Applying of practical model will be affected on quality of life. The aim of this study is to determine the impact of applying the model of care centered professional partnership on Laboratory Parameters and Quality of Life of adolescents undergoing Hemodialysis

Methods: This randomized, controlled trial was conducted at Golestan hospital Dialysis Center, Ahvaz, Iran. A total of 70 hemodialysis patients participated in this study. Patients were randomly divided into two groups, control and experimental. Pre and post -test data were obtained by using and two questionnaires by the current condition of patient education questionnaire, Quality of Life- Short Form (KDQOL-SF) and checklist of measure clinical parameters. A six-week empowerment intervention based on (CCPP) model that included four individual and two group counseling sessions was performed for the experimental group. 3 months after intervention, post-test data were obtained from both groups in the same manner as the pre-test. Data were analyzed by ANCOVA using SPSS 11.5.

Results: There were no statistically significant differences in demographic variables between the groups. The results of paired t-test showed a significant difference between the mean quality of life score and clinical and laboratory indicators in both groups in terms of pre-to post-intervention (P=0.001).

Conclusion: The results of the study showed the effectiveness of using a caring-based professional participation model on improving quality of life and clinical symptoms and laboratory parameters. Therefore, attention to the involvement of clinical and patient and family personnel in patient education is recommended based on effective educational models.

Keywords: Hemodialysis; Model of care centered professional partnership; Quality of life; Clinical indicators

Abbreviations: CKD: Chronic Kidney Disease; ESRD: End Stage Renal Disease; HD: Hemodialysis

Introduction

Chronic kidney disease (CKD) is an important health issue worldwide. The high prevalence and incidence of CKD and

end stage renal disease (ESRD) are a serious global problem [1,2].

The life span of adults with end-stage renal disease is reduced [3] and a devastating illness in patient associated with increased mortality, impaired growth, and reduced quality of life [4]. Gerson et al. are remembered that children with mild to moderate CKD, in comparison with healthy children, reported poorer overall HRQoL and poorer physical, school, emotional, and social functioning. Early intervention to improve linear growth and to address school functioning difficulties [5]. Improving the level of self-management by people undergoing hemodialysis is an effective way to reduce the incidence of mortality and complications and improve quality of life [6,7].

Self-care is a process inserted in the acceptance phase of the patients' new physical and physiological condition, which should be seen as a necessary therapeutic treatment and the nursing care. Educational activities are indispensable to the development of self-care and for the adaptation of HD patients, with consequent improvement in their quality of life [8,9]. Therefore, patient education is one of the essential aspects of nursing activity which might result in health improvement, complication prevention and patient quality of life promotion [10].

Education on self-care behaviors in patients treated with hemodialysis including control of fluid intake, food and medicinal regime, involvement in the care, effective communication leads to self-efficacy and role preservation and also causes improvement in quality of life in these patients [8,11]. Experts believe that the efficacy of self-care education and behavior change programs depends largely on the use of models and theories of health education [12,13]. Practice nurses can be instrumental in assuring that quality patient care is delivered across the ESRD continuum through several different roles: clinician, educator, consultant, researcher, administrator, and case manager. For many chronic conditions, poor patient education with prescribed medications and other aspects of medical treatment can affect the treatment outcome [13,14]. Therefore, the aim of this study was to examine the effect patient self-care education has on quality of life of adolescents undergoing hemodialysis.

Study Subjects

All 66 patients who were 30 years of age or younger and who were undergoing regular dialysis in the UCLA Adult and Pediatric Dialysis Program were invited to participate in the study. Thirty-nine patients agreed to enroll; 23

were younger than 20 years old, and 16 were 20 to 30 years old. Twenty-one patients were treated with continuous cycling peritoneal dialysis, and 18 patients with thrice-weekly hemodialysis. The causes of renal failure in the 39 patients included glomerulonephritis in 9, Alport's syndrome in 6, renal dysplasia in 7, obstructive uropathy in 3, vasculitis in 3, reflux nephropathy in 2, and polycystic kidney disease, diabetes mellitus, and tuberous sclerosis in 1 each. The cause of renal failure was unknown in six patients. The clinical characteristics and causes of renal failure did not differ significantly between the patients treated with hemodialysis and those treated by peritoneal dialysis.

Screening for coronary-artery calcification was performed with electron-beam CT. The measurements were repeated in 22 patients after 18 to 24 months. The results of monthly serum biochemical determinations were collected for the six months immediately preceding each scan in each patient, and these results were averaged to obtain a mean value for each measurement. They included measurements of serum calcium, phosphorus, alkaline phosphatase, cholesterol, and albumin and calculations of the serum calcium–phosphorus ion product. Serum parathyroid hormone was measured either monthly in patients treated with calcitriol or quarterly in those not receiving calcitriol. We also obtained electron-beam CT scans of 32 women and 28 men between the ages of 20 and 30 years who had no known history of cardiovascular or renal disease.

Height, weight, and body-mass index (the weight in kilograms divided by the square of the height in meters) were measured when the scans were done. Information about primary causes of renal failure, systolic and diastolic blood pressure, the duration of chronic renal disease, the duration of treatment with dialysis (excluding, in the case of 27 patients, the intervals of adequate renal function as a result of renal transplantation), previous parathyroidectomy, and the use of calcitriol therapy was also gathered. The cumulative doses of calcium-containing medications and calcitriol during the six months immediately preceding the scans were calculated for each patient.

The study protocol was approved by the UCLA Human-Subjects Protection Committee. All study subjects, or a parent or guardian in the case of those who were younger than 18 years of age, gave written informed consent.

Materials and Methods

This randomized controlled trial study was conducted in order to compare the conventional educational strategy

with one based on Professional Collaboration Care Model among adolescent patients who were undergoing hemodialysis and referred to the Hemodialysis Units at three educational hospitals in Ahvaz, southwest of Iran, during 2013-2014.

Families with a child with CKD aged 6–18 years under the care of a pediatric renal service were invited to participate in the study if they had CKD stages I–V, were on dialysis, or had a kidney transplants. Participants were excluded if the caregivers were unable to provide written informed consent, or if the child was not receiving formal education. We also excluded children in families where no one spoke English. The Kids with CKD (KCAD) study, which uses a life-course. From January 2012 until September 2016, we enrolled children aged 12–18 years with CKD (stages I–V, dialysis and transplanted patients) across five tertiary pediatric hospitals in Australia and New Zealand. The KCAD study design and methods have been described previously.

Approach, is a longitudinal study that aims to provide qualitative and quantitative data from school-aged children to young. Inclusion criteria included age between 12 and 18 years, lack of cognitive and psychological disorders, understanding Persian language with at least primary school education, reaching the final stage of renal disease and being constantly under treatment, undergoing at least 6 months of treatment with hemodialysis, being under treatment three times a week for three to four hours, no renal transplantation and immigration during intervention, 3-month average of serum phosphorus >6.0 mg/dL, and no formal training in relation to dialysis. Exclusion criteria included having a history of serious or adverse experiences in the last six months, being treated with antidepressant medications, hospitalization due to acute disease, and unwillingness to continue to participate in the study.

The sample size was calculated using a statistical formula. We selected 60 patients, with the possibility of a loss of 10% of the patients. After obtaining informed consent, (CDCRC9302), the patients were divided via random allocation into a control group and an intervention group. The groups were matched for gender, length of treatment, kind of hemodialysis and other factors. The unit consisted of 15 hemodialysis (HD) active stations in an open area. On average, there were 3 adolescent patients dialyzed each day. [Working in a three-shift system: morning, afternoon and night]. Patients registered in the long-term, maintenance HD programmed. Based on a 3-month average serum phosphorus >6.0 mg/dL, 30 patients who continually referred (patients and their families) were randomly selected and completed the study (after

education being named in the experimental group and before that in the control group). The intervention was a collaborative educational program which included educational films, brochures and booklets which were supplied by the research group (nursing staff and trainee) on the subjects of the study.

They participated together based on the job duties and in all stages as educational program was designed for each patient. After implemented intervention, finally they were evaluated. We used two questionnaires and a checklist as pre-test and post-test to investigate the effect of the intervention.

a. The first questionnaire was the current condition of patient education which was used by Zammanzade et al (r=0.90) [15]. The questionnaire had two parts: the first one consisted of patients' demographic information and included four questions pertaining to their socioeconomic status. The second part of the questionnaire included 34 items evaluating the condition of patient education. The four dimensions of scale included evaluation of the educational needs (including data collection about the patient, self-care, patient attitudes toward health and illness diagnosis and treatment), planning (including defining objectives and learning outcomes for the patient and selecting suitable content to teach the patient marked educational activities), implementation (including self-care education hospitalization, discharge, and outreach and education) as part of nursing care and the evaluation of patient education (including formative assessment, written exam, oral test and summative evaluation). The number of correct answers to each question determined the knowledge status of HD. Their knowledge was categorized into three levels of low, moderate and high. Subjects with a knowledge score of 1.33-2 were considered as low, and those between 2.34-3.66 and 3.67-5 were regarded as moderate and high respectively. Queries were encoded and fulfilled a day before, and after the education. The Likert scale (never, rarely, sometimes, often, always) was used to measure items.

b. The checklists of self-care assessment: The checklist was reviewed and revised to evaluate the checklist's validity (r≤70). The instruments for measuring the clinical parameters (degree of swelling, shortness of breath, blood pressure, weight gain between dialysis sessions, itching, sexual inclination, fatigue, depression, etc.) and laboratory parameters (Blood Urea Nitrogen, Creatinine, Hemoglobin, Hematocrit and P, Ca) were used to evaluate the knowledge of diseases, symptoms, treatments and self-care strategies based on PCC model.

c. The KDQOL-36[16] is a self-report measure developed for individuals with kidney disease and those on dialysis. It is a shorter version of a measure developed by the same authors. It includes 43 kidney disease-targeted items, such as the effects of the disease on activities of daily living, work status, and social interaction, and 36 items that provide a measure of physical and mental health, and one overall health rating item ranging from 0 ("worst possible health") to 10 ("best possible health."). The 80 items take about 16 minutes to complete. Reliability of each KDQOL-36™ subscale [SF-12 Physical Component Summary (PCS) and Mental Component Summary (MCS), Symptoms/Problems, Burden of Kidney Disease and Effects of Kidney Disease] was acceptable (Cronbach's alpha >0.8). Then the Kidney Disease Quality Of Life-Short Form (KDQOL-SF) questionnaire was filled out by the patients 2 month later. At the end of the program, each participant was given a copy of the manual.

Programs of patient education are done based on professional participation of centered care model in three steps:

First step: Familiarize: At this stage the practitioner workshops were conducted for students and staff on the importance of patient education, and they were taught how to teach dialysis patients. The program of patient education was based on PCC model. At this step, clinical staff and interns were familiarized with the goal of the research and were assigned certain duties. The researcher organized the workshop on patient education (one-day) to enhance their knowledge and skills. Before implementation, laboratory parameters and clinical signs were evaluated by the research tools.

Second step: Collaborative role: The curriculum (self-care of dialysis) was implemented by the staff and interns in two weeks (every other day) 30-40 minutes before, during and after dialysis for all the patients and their families. They conducted the patient education program according to their duties. The program was completed, one on one, clustered face to face.

Third step: Evaluation empowerment: The program teachers (staff and internships) assessed the knowledge and performance of patients and their families. They detected the weaknesses of self-care in patients and provided the training again. The patients' knowledge and performance on self-care was evaluated for two weeks and one month after the program. Based on this model, evaluation was carried out through self-evaluation (trainers' attitude) and peer-evaluation (assessment of patients' clinical parameters). Ethical considerations were taken into account. In this study, data analysis through descriptive statistics (frequency, percentage and mean) and inferential statistics (paired t-test to compare quantitative and qualitative data using McNamara test before and after intervention was used. The data were analyzed using SPSS 22.

Results

The results of the chi-square test showed that both groups were similar in their socio-demographic characteristics. Table 1 shows some socio-demographic characteristics of the patients. According to the results of the study, 55.7% of the patients had poor knowledge of self-care before and after the intervention. Clinical parameters indicate that the performance of the patients had moderate to good condition.

Group Variable	Control		Experimental		P Value
	Frequency	X±S	Frequency	X±S	
Age(year)	-	14.43±2.40	-	13.83±2.37	0.33
Gender					
Male	16(53.3)		18(60)		0.30
Female	14(46.7)	-	12(40)	-	
Duration of disease	-	4.06±3.03	-	4.43±3.27	0.65
Level of Education					
Primary	3(10)	-	6(20)	-	
guidance	15(50)	-	13(43.3)	-	0.51
High	12(40)	-	11(36.7)	-	
Absence from School					
Yes	21(70)		20(66.7)		0.78
No	9(30)	-	10(33.3)	-	

Table 1: Distribution of demographic characteristics between the two groups of adolescents on hemodialysis.

*For age, gender and duration of disease t-test was used and for other variables X^2 was used.

Table 2 shows the performances of self-care in patients with clinical parameters such as systolic and diastolic blood pressure, weight gain between dialysis sessions were compared before and after interventions (patient education) using independent t-tests. The results indicate that the self- care behavior (performance) of the patients was affected by blood pressure and diastolic pressure and dialysis weight control (p<0.001). The findings of the qualitative indicators such as shortness of breath, swelling, itching, and sexual problems, vascular problems, as well as clinical performance indicator are concerned with the principles of self-care. The results of the qualitative parameters of the patients were compared before and after training using the McNamara test.

Indicator	X±S Before	X±S After	P value	t
Urea Nitrogen	85±35	21.75±78.41	0.52	2.41
Creatinine	8.44±35	2.88±7.69	-0.64	1.96
Hemoglobin	8.25±1.55	8.36±1.44	-0.61	0.64
Hematocrit	1.25±4.84	25.37±4.75	<0.01	0.46
Phosphorus	10±2.08	10.11±1.96	<0.001	0.5
Calcium	9.71±1.38	9.21±1.52	<0.001	2.79
SBP	160.5±24.11	139.7±21.5	<0.001	7.63
DBP	89.42±12.95	79.14±12.12	< 0.02	5.92
Weight Dialysis	3±1.43	2±0.93	<0.05	5.71

Table 2: The mean of clinical parameters checked before and after the training.

On the other hand, an independent t-test showed that the mean quality of life scores of both groups had no significant difference before intervention, but after the intervention they were significantly different (Table 3).

Groups / Dimension of QOL	Experimental Before	Experimental After	The mean difference	Control Before	Control After	The mean difference	P value
Socio-economic	2.03±0.97	2.23±2.23	0.20±0.60	1.90±1.19	1.34±0.99	0.56±0.50	0.001
Psychological	1.08±1.17	1.48±1.57	-0.48±1.18	1.40±1.31	0.68±1.02	0.72±0.93	0.001
Physical	2.44±0.98	2.17±1	0.26±1.10	1.78±0.98	0.97±0.78	0.81±0.55	0.02

Table 3: Comparison of the mean scores of quality of life in experimental and control groups before and after intervention.

Discussion

The results of this study showed that among the two groups the demographic profile including gender, educational level, income, the number of dialysis sessions per week, cause of disease, age and disease duration was not significantly different. As far as the limitations imposed by hemodialysis were concerned, the patients complained about everyday changes, especially the interruption of school and social activities caused by hemodialysis. Pennfort et al found that chronic diseases in children and adolescents generate repercussions in patients' lives and changes their routine due to the need of frequent hospitalizations, medical consultations and exams. As with patients undergoing hemodialysis, lower-than-normal quality of life is an important problem in these patients [17]. Several factors are involved in reducing the quality of life in these patients; they include stress, depression and anxiety, anemia, hospitalization, and inactivity [8,10,16]. Quality of life in people with chronic disease is related to their individual characteristics and it depends on people's coping skills in different situations of life [7]. Therefore, statistically significant differences in the dependent variable between controls can be attributed to the effectiveness of interventions in group. The objectives for patients on hemodialysis include providing sufficient dialysis, ensuring adequate nutrition, maintaining vascular access, correcting hormonal deficiencies, minimizing hospitalization, and prolonging lifespan while enhancing its quality [18]. This study shows that a multifaceted patient-oriented intervention consisting of dialysis information booklets, a video, and a small group education session can increase the proportion of patients with planning to hemodialysis with self-care dialysis. In addition, Maslakpak et al. showed that multifaceted patient-oriented intervention is contributory to self- care behavior [19].

One of the goals of this study was to evaluate the impact of education on the principles of self- care of patients. For this purpose, we assessed results of para clinical indicators such as Ca, P, Na and clinical symptoms such as weight change between two sessions, edema, etc. Results of studies in this area show a conflict. While Nozaki et al and Elahi et al Experts' emphasize that patient education does not affect recovery in nitrogen and creatinine of patient on hemodialysis [8,18]. Baraz et al. mentioned that often face to face and non-attendance teaching methods are effectiveness on improvement of the indicators [20]. Also, Rahim found that the use of local models can improve patients' performance on hemodialysis [21]. Poorgholami believes that patient education enhances self-esteem of patients undergoing [22]. Therefore, we can conclude self-care education brings about promotion in social activities. This is a very important factor contributing to life expectancy. Additional hemodialysis knowledge and patients' understanding of clinical information such as illness and treatment can change and reform their health behaviors and encourage the promotion of healthy behaviors [23]. As with the comparison of the dimension of quality of life, both groups showed a significant difference before and after intervention. The mean quality of life before and after the intervention increased significantly; this confirms the results of the present research, showing that presentation of adequate training in hemodialysis ward by increasing awareness level in patients creates public health, physical functioning and mental health improvement, and creates general perception of health and thus enhances quality of life in hemodialysis patients [24-29].

Conclusion

The results of this study revealed that information about self-care program has a positive effect on increasing quality of life in patients undergoing hemodialysis. Also, the use of participatory profession collaboration care model is likely to promote self-care behavior and improve the quality of life.

References

1. Murphy D, McCulloch CE, Lin F, Banerjee T, Bragg-Gresham JL, et al. (2016) Trends in Prevalence of Chronic Kidney Disease in the United States. Ann Intern Med 165: 473.

2. Khalsa DD, Beydoun HA, Carmody JB, (2016) Prevalence of chronic kidney disease risk factors among low birth weight adolescents. Pediatr Nephrol September 31(9): 1509-1516.

3. United States Renal Data System (2013) USRDS 2013 Annual Data Report: Atlas of Chronic Kidney Disease and End-Stage Renal Disease in the United States. National Institutes of Health National.

4. Baracco R, Mattoo T, Jain A, Kapur G, Valentini RP (2014) Reducing central venous catheters in chronic hemodialysis--a commitment to arteriovenous fistula creation in children. Pediatr Nephrol 29(10): 2013-2020.

5. Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD 2013 Dialysis Iranian Calendar 2014. Consortium Persian date Khordad 2015

6. Terra FS, Costa AMDD, Ribeiro CCS, Nogueira CS, Prado JP, et al. (2010) O portico de insufficiencies renal chronic dependencies in treatment hemodialysis: comprehension phenomenological. Rev Bras Clin Med 8(4): 306-310.

7. Wong C, Gerson A, Hooper SR, Matheson M, Lande M et al. (2016) Effect of elevated blood pressure on quality of life in children with chronic kidney disease. Pediatr Nephrol 31 (7): 1129-1136.

8. Vosughi M, Movahedpour A (2009) Comparison quality of life between hemodialysis and transplant patient in Ardabil medical centers. Ardabil Univ Med Sci J 9(2): 171-179.

9. Farias M, Millena FD, Marília GAA, Fernanda BBL, Jéssica DS et al. (2014) Nursing care for chronic renal patients on hemodialysis. REV Rene 15(4):701-709.

10. Abreu IS, Kourrouski MF, dos Santos DM, Bullinger M, Nascimento LC, et al. (2014) Children and adolescents on hemodialysis: attributes associated with quality of life. Rev Esc Enferm USP 48(4): 601-609.

11. Riaño-Galán I, Málaga S, Rajmil L, Ariceta G, Navarro M, et al. (2009) Quality of life of adolescents with end-stage renal disease and kidney transplant. Pediatr Nephr 24(8): 1561-1568.

12. Harirchi AM, Rasooli A, Montazeri A (2004) The comparative quality of life in patient undergoing hemodialysis and kidney transplant patients. Payesh 3: 117-121.

13. Ricardo AC, Hacker E, Lora CM, Ackerson L, De Salvo KB, et al. (2013) Validation of the Kidney Disease Quality of Life Short Form 36 (KDQOL-36™) US Spanish and English Versions in a Cohort of Hispanics

with chronic kidney disease. Ethn Dis 23(2): 202–209.

14. Zamanzadeh V, Valizade L, Aghdam MA, GHolifam A (2012) Stat use education patient: perception nursing in Tabriz. Tabriz Nursing and Midwifery Journal 19: 13-19.

15. Pennfort VPS, Queiroz MVO, Jorge MSB (2012) Children and adolescents with chronic kidney disease in an educational-therapeutic environment: support for cultural nursing care. Rev Esc Enferm USP 46(5): 1057-165.

16. Nozaki C, Oka M, Chaboyer W (2005) The effects of a cognitive behavioral therapy programmed for self-care on hemodialysis patients. International Journal of Nursing Practice 11(5): 228-236.

17. Maslakpak MH, Shams S (2-15) A Comparison of Face to Face and Video-Based Self Care Education on Quality of Life of Hemodialysis Patients. Int J Community Based Nurs Midwifery 3(3): 234-243.

18. Baraz S, Mohamadi A, Boromand B (2005) Comparison of two educational methods of present and not present on self-care and quality of life on patients on hemodialysis. Arak medical science university journal 9(1).

19. Rahimi A, Ahmadi F, Gholyaf M (2008) The Effects of Continuous Care Model on Depression, Anxiety, and Stress in Patients on Hemodialysis. Nephrol Nurs J 35(1): 39-43.

20. Poorgholami F, S Javadpour S, Vahid Saadatmand V, Kargar J M (2016) Effectiveness of Self-Care Education on the Enhancement of the Self-Esteem of Patients Undergoing Hemodialysis. Glob J Health Sci 8(2): 132–136.

21. Curtin RB, Walters BA, Schatell D, Pennell P, Wise M, et al. (2008) Self-Efficacy and self-management behaviors in patients with chronic kidney disease. Adv Chronic Kidney Dis 15(2): 191-205.

22. Ghadam SM, Poorgholami F, Badiyepeymaie JZ, Parandavar N, Kalani N, et al. (2016) Effect of Self-Care Education by Face-to-Face Method on the Quality of Life in Hemodialysis Patients (Relying on Ferrans and Powers Questionnaire). Glob J Health Sci 8(6): 121-127.

23. Kaspar CD, Bholah R, Bunchman TE (2016) A Review of Pediatric Chronic Kidney Disease. Blood purification 41(1-3): 211-217.

24. Murphy D, McCulloch CE, Lin F, Banerjee T, Bragg-Gresham JL, et al. (2016) Trends in Prevalence of Chronic Kidney Disease in the United States. Annals of internal medicine. 165(7): 4734-81.

25. Wiedebusch S, Konrad M, Foppe H, Reichwald-Klugger E, Schaefer F, et al. (2010) Health-related quality of life, psychosocial strains, and coping in parents of children with chronic renal failure. Pediatric nephrology (Berlin, Germany) 25(8): 1477-1485.

26. Didsbury M, Van ZA, Chen K, James LJ, Francis A, et al. (2019) The association between socioeconomic disadvantage and parent-rated health in children and adolescents with chronic kidney disease—the Kids with CKD (KCAD) study. Pediatric Nephrology 34(7): 1237-1245.

27. Gerson AC, Wentz A, Abraham AG, Mendley SR, Hooper SR, et al. (2010) Health-related quality of life of children with mild to moderate chronic kidney disease. Pediatrics 125(2): e349-57.

28. Li H, Jiang Y-f, Lin C-C (2014) Factors associated with self-management by people undergoing hemodialysis: A descriptive study. Int J Nurs Stud 51(2): 208-216.

29. Griva K, Mooppil N, Seet P, Krishnan DS, James H, et al. (2011) The NKF-NUS hemodialysis trial protocol-a randomized controlled trial to determine the effectiveness of a self-management intervention for hemodialysis patients. BMC nephrol 12: 4.