Effectiveness of A Nutritional Instructional Program on Health-Related Outcomes for Hemodialysis Patients

Ibrahem A. Al-Ashour[1], Widad K Mohammed[2]

[1]Assistant Professor, Adult Nursing Department, Faculty of Nursing, University of Kufa,
[2]Professor, Adult Nursing Department, Faculty of Nursing, University of Baghdad

Abstract

Objective: the study aimed to evaluate the effectiveness of a nutritional instructional program on health-related outcomes for hemodialysis patients through utilization of quality of life, and subjective global assessment in pretest; posttest1, posttest 2 and posttest 3.

Methodology: quasi-experimental design was conducted at Al-Najaf Al–Ashraf, Specialized Center for Kidney Diseases and Transplantation. The study has been carried out during the period 1st September 2019 to 20th May 2020. The dietary instructions program constructed by researcher to measure the purpose of the study. The study sample of (76) patients referred for dialysis to the Specialized Center for Kidney Diseases and Transplantation. During the period of the study patients were selected through non-probability (purposively) and were randomly divided into two groups of (40) patients for study group and (36) patients for control group. The study group have been exposed to dietary instructional program by the researcher. The group that has not been exposed to dietary instructional program by the researcher are considered the control group. The measurement of effectiveness of dietary instructional program on patients undergoing hemodialysis through used of Quality-of-Life form and consisted of (5) main items. The subjective global assessment checklist questions and consisted of (6) items. Data was analyzed by using of descriptive data analysis (frequencies, percentages, mean, standard deviation, and graphical presentation) and by using of inferential analysis (chi-square, independent t-test, paired t-test, ANOVA test, and binominal test).

Results: The results of the study demonstrated that there was non-significant difference between the study and control groups for quality-of-life score in pre dietary instructional program while; there was highly significant difference between the study and control groups for quality-of-life score in post dietary instructional program. The present study illustrated that there was non-significant difference between study and control groups in pretest at p-value (0.05), while there was highly significant difference in posttest (1,2, and 3) between study and control groups at p-value (0.05) regarding SGA.

Conclusions: The study concluded that implementation instructional session will demonstrating a positive change in nutritional status and dietary habits. Difference between the two groups is due to the effectiveness of the dietary instruction program that given to the patients in the study group and not given to the control group.

Recommendation: The study recommended that establishing of educational center for the patients in the hospital provided by adequate related materials, medias, audio-visuals aids and booklet for educating all patients how to cope with their medical conditions, when giving information to patients and relatives, nurses have more choices to make information clear and easily understandable.

Keyword: *Quality of life, Subjective global assessment, Hemodialysis, early adult, and health related outcomes.*

Introduction

When chronic kidney disease reaches an advanced stage, dangerous levels of fluid, electrolytes and wastes can build up in the body. Chronic kidney disease may not become apparent until the kidney function is significantly impaired. Treatment for chronic kidney

disease focuses on slowing the progression of the kidney damage, usually by controlling the underlying cause. Chronic kidney disease can progress to end-stage kidney failure, which is fatal without artificial filtering (dialysis) or a kidney transplant. [1] Hemodialysis (HD) in an effective modality of treatment; however, management of patients maintained on dialysis is very difficult. Moreover, quality of life (QOL) among patients under treatment of HD is low, which affect their life style. [2] Hemodialysis can take a physical and emotional toll on patients, and most patients on hemodialysis describe poor quality of life. Patients on hemodialysis have worse health related quality of life (HRQoL) than patients with any other chronic illness including cancer and congestive heart failure. This poor quality of life can affect how well these patients manage their own health or their self-care, and can ultimately lead to poor health outcomes. Despite this, there are no commonly used programs to improve quality of life or self-care for patients on hemodialysis. [3]) Quality of life is defined by the World Health Organization (WHO) as "an individual's perception of their position in life in the context of the culture and value system where they live, and in relation to their goals, expectations, standards, and concerns". It is a comparison between patients' expectations and reality. [4] The subjective global assessment scale (SGA) is thought to give a valid composite measure of nutritional status in ESRD patients; however, its value as a nutritional assessor depends on its mortality predictive capacity. By using (SGA), a recent study found a prevalence of protein energy wasting in 31% of adults with ESRD, including dialysis and non-dialysis patients. [5] The American Society for Parenteral and Enteral Nutrition defines malnutrition as "an imbalance between nutrient requirement and intake resulting in cumulative deficits of energy, protein or micronutrients that may negatively affect growth, development and other relevant outcomes.[6] reported that nutrition plays an important role in hemodialysis patients' outcomes. One of the strongest factors that impacts nutrition is socioeconomic status as evidenced by the large body of epidemiologic data showing that income and education are directly associated with diet quality. Apart from individual-level markers of socioeconomic status such as income and education, contextual factors such as availability of and transportation to food outlets that provide healthy food options and the density of fast-food restaurants within particular regions markedly impact the ability of individuals to comply with nutrition. [7] stated that the intergrading previous knowledge with a specific focus on the unique aspect of protein balance and nutrition in CKD and ESRD. International guidelines encourage shared decision making between patients and clinicians for the type of dialysis, with an emphasis on a treatment that aligned to the patients' lifestyle. [8]

Methodology

To achieve the aims of this study, this quasi-experimental design was conducted on patients assigned to study and control groups is used to study the effectiveness of dietary instructional program on health-related outcomes for early adult hemodialysis patients at Al-Najaf Al–Ashraf, the study has been carried out during the period of 1st September 2019 to 20th May 2020. The study was performed on 76 patients referred for dialysis to the Specialized Center for Kidney Diseases and Transplantation. During the period of the study patients were selected through non-probability (purposively) and were randomly divided into two groups of (40) patients for study group and (36) patients for control group. The study group have been exposed to dietary instructional program by the researcher. The group that has not been exposed to dietary instructional program by the researcher are considered the control group. The criteria for the selection of the study were (patients who undergoing hemodialysis at least one year, patients who agreed to participate in the study, patients able to communicate read and write, Adult (18-40) years and conscious patient, both sexes, and free from any psychiatric illness). The steps of the study: consisted of the following steps: (first step): the construction of dietary instructional program designed based on the results of patients' needs assessment, information gained from reviewing that relative scientific literature, previous studies, and researcher experiences. The contents of the dietary instructional program were evaluated by experts in different field, second step the instrument construction, (part I): sociodemographic characteristics for patients undergoing hemodialysis which is comprised of (5) items including such as (age, gender, educational level, occupation, socioeconomic status). (Part II): clinical

characteristics for patients undergoing hemodialysis which composed (3) items including of (origin diseases, putting on special diet, and drugs compliance). (part III): the quality of life for patients undergoing hemodialysis (pre-posttests), this part is concerned with quality of life, The Kidney Disease Quality of Life 36-item short form survey (KDQOL-36) form adapted from (Hays, et al., 1997). Which is comprised of (5) main items including such as (patient health, kidney disease, daily life, satisfaction with care, and background information). Part IV: questionnaire related to subjective global assessment about patient nutritional status (pre, post-tests), it is adopted to assess patients' nutritional status; it consists of (6) check list questions over the content. It is adopted by the researcher from (Canadian Malnutrition Task Force, 2017), and consists of six parts (nutrient intake, weight, symptoms, functional capacity, metabolic requirement, and physical examination). In the hemodialysis ward; after the researcher introduce himself to the patient and the consent form was taken, the demographic, and clinical data were obtained, and assessed the patients' (SGA), (QoL) for both study and control groups. After the dietary instructional program applied on the study group patients, the researcher collects the post- test data of (assessed the patients' (SGA), (QoL) at the following interval of periods: 1) First post-test: after 60 days from application the dietary instructional program for hemodialysis patients, 2) Second post-test: after 120 days from application the dietary instructional program for hemodialysis patients, and 3) Third post-test: after 180 days from application the dietary instructional program for hemodialysis patients. the statistical data analysis approach includes the measurements of the following: (Frequencies, Percentages, mean of score (M.S) with their standard deviation (S.D). ANOVA test (analysis of variance) is used to compare multiple (three or more) samples with a single test; binominal test for testing the different of distribution of the observed frequencies of two categories nominal scale and their non-restricted of an expected outcome at 50%).

Results

Table (1): Distribution of Socio-Demographic Characteristic for both Study and Control Groups

Variables	Groups	Groups				P-value, $\chi 2$
		Study Group		Control Group		
		Freq.	%	Freq.	%	
Age / years	20-24	2	5.0	2	5.6	Chi-square value = (17.6) p-value (0.414) NS
	25 – 29	2	5.0	4	11.1	
	30 – 34	4	10.0	2	5.6	
	35 – 39	17	42.5	15	41.7	
	40+	15	37.5	13	36.1	
	Total	40	100.0	36	100.0	
	Mean+(std. dev.)	37.25±(5.391)		36.75±(5.88)		
Gender	Male	26	65.0	20	55.6	Binomial 3.60 p-value (0.11) NS
	Female	14	35.0	16	44.4	
	Total	40	100.0	36	100.0	

Cont... **Table (1): Distribution of Socio-Demographic Characteristic for both Study and Control Groups**

Occupation	Jobless	29	72.5	16	44.4	χ2 value = (49.2) p-value (0.08) NS
	Employee	5	12.5	10	27.8	
	Retired	1	2.5	1	2.8	
	Home maker	5	12.5	9	25.0	
	Total	40	100.0	36	100.0	
Socio-economic status	Weak	2	5.0	2	5.6	χ2 value = (14.4) p-value (0.10) NS
	Moderate	19	47.5	18	50.0	
	Good	19	47.5	16	44.4	
	Total	40	100.0	36	100.0	

%= percentage, freq. = frequency, χ2= chi-square value, p- value= probability value, NS= non-significance.

Table (1) presented that 17 (42.5%) of patients in the study group and 15 (41.7%) in the control group with age group (35-39) years, with mean age for the study group was (37.2±5.39), and mean age for the control group was (36.7 ±5.88). On the other hand, (65%) of patients in the study group and 38 (55.6%) in the control group were male. In addition to, the table demonstrated 29 (72.5%) in study group were jobless while (44.4%) in control group were jobless, ((27.8%) were employee. Concerning socioeconomic status; the majority of the patients in the study and control groups (95%), (94.4%) respectively were had moderate and good socioeconomic status. Regarding educational level, the table (4.1) demonstrated that (55.6%) in the study group and (37.5%) in the control group were read and write.

Table (2): Distribution of the Clinical Characteristic for both Study and Control Groups

Clinical Data	Responses	Statistics	Groups		Total
			Study	Control	
Chronic Diseases	Hypertension	Freq.	9	9	18
		%	22.5%	25.0%	23.7%
	Diabetes	Freq.	24	20	44
		%	60.0%	55.6%	57.9%
	Chronic Glomerulonephritis	Freq.	5	6	11
		%	12.5%	16.7%	14.5%
	Cancer	Freq.	3	0	3
		%	7.5%	0.0%	3.9%
Did someone put you on special diet?	a physician or other health care provider	Freq.	40	36	76
		%	100.0%	100.0%	100.0%
Do you currently take prescription medications regularly (4 or more days a week) that are prescribed by your doctor for a medical condition?	Yes	Freq.	40	36	76
		%	100.0%	100.0%	100.0%

%= percentage, freq. = frequency.

The table (2) demonstrated that (60%) patients of study group and (55.6%) patients in control group had diabetes mellitus. Furthermore; (100%) of patients in the study and control groups were putted on a special diet by physician or other health care providers, and were taken prescription medications regularly.

Table (3) Comparison of Total Patients' Quality of Life Mean in Pretest and Accumulative Posttest between Study and Control Groups

Period of test	groups								p-value
	Study				Control				
	Freq.	%	Mean	S.D.	Freq.	%	Mean	S.D.	
Quality of Life mean (pre-test)	40	100	29.80	3.50	36	100	27.84	3.35	.065 NS
	t-value= 1.985, d.f.= 74								
Quality of Life mean (post-test)	40	100	47.51	3.06	36	100	43.81	3.022	.0001 HS
	t-value= 5.295, d.f.= 74								

independent sample t-test, S.D.= stander deviation, d.f= degree of freedom, %= percentage , freq.=frequency, p-value= probability, NS= non-significance, HS= high significance

Table **(3)** demonstrated that there was non-significant difference between the study and control groups for quality-of-life score in pre dietary instructional program while; there was highly significant difference between the study and control groups for quality-of-life score in post dietary instructional program.

Table (4) Comparison of Total Patients' Quality of Life in Study and Control Groups between Pretest and Posttest

Period of test	**groups**								**p-value**
	Quality of Life mean (pre-test)				**Quality of Life mean (post-test)**				
	Freq.	**%**	**Mean**	**S.D.**	**Freq.**	**%**	**Mean**	**S.D.**	
Study	40	100	2^{9}.80	3.50	40	100	47.51	3.06	.0001 HS
	t-value= 39.589, d.f.= 39								
Control	36	100	27.84	3.35	36	100	43.81	3.022	.060 NS
	t-value= 21.55^{7}, d.f.= 35								

paired t-test for (study group) = (39.589), paired t-test for (control group) = (21.557), S.D =stander deviation, d.f= degree of freedom, %= percentage , freq.=frequency, p-value= probability, NS= non-significance, HS= high significance.

Table (4) presented that there was highly significant difference between (pre) and (post) dietary instructional program in quality-of-life score for study group patients at p-value 0.05, Also; this table shows a non-significant difference between (pre) and (post) dietary instructional program in quality-of-life score for control group patients at p-value 0.05.

Table (5) Distribution of the Quality-of-Life Domains according to The Changing Rate caused by The Application of the Program among The Study and Control Group

List	Quality of life domains	Enhancement rate*	
		Study group	Control group
1.	Social functions	42.81	33.68
2.	role limitation-physical	40.63	39.35
3.	Pain	39.14	28.42
4.	role limitation-emotional	35.8	35.6
5.	General health	33.96	31.67
6.	Overall health	27	21.39
7.	Energy / fatigue	23.83	22.68
8.	Sleep	23.44	23.0
9.	Symptoms / problems list	22.67	18.92
10.	Emotional well-being	19.17	19.0
11.	Physical functioning	14.4	12.45
12.	Burdens of kidney diseases	14.22	12.04
13.	Physical health composite	13.62	10.78
14.	Patients' satisfaction	18.19	13.21
15.	Dialysis staff encouragement	12.81	7.64
16.	Effects of kidney diseases	12.74	10.69
17.	Cognitive functions	11	10.64
18.	Social support	9.31	8.8
19.	Mental health composite	9.12	10.03
20.	Quality of social interaction	8.78	9.13
21.	Work status	2.25	1.86

*ER (is the different in the quality of life due to application of the program in the study group toward the normal levels and is calculated through the following ((mean at the post-test)-(mean at the pre-test)).

Table (5) includes re-arrange the quality-of-life domains according to the rate of enhancement in these domains after application of the program. In the study group, the study results indicate that the major enhancement occur in the social functions, role limitation-physical, pain, role limitation-emotional, general health, and overall health domains. And the enhancement rate is more than 20%. While for the control group the study results indicate that the major enhancement occurs in the role limitation-emotional, Social functions, and Pain domains. And the enhancement rate is more than 20%.

Table (6) Subjective Global Assessment for Study and Control Groups throughout the Periods of Measurements

Periods of measurements	Levels of SGA	Groups		Chi-square value	d.f	p-value
		Study	Control			
Pre-test	Well Nourished	0	0	0.047	1	0.828 NS
	Moderate Malnourished	21	18			
	Sever Malnourished	19	18			
	Total	40	36			
Post-test 1	Well Nourished	7	1	18.109	2	0.001 HS
	Moderate Malnourished	31	19			
	Sever Malnourished	2	16			
	Total	40	36			
Post-test 2	Well Nourished	23	0	35.101	2	0.001 HS
	Moderate Malnourished	16	22			
	Sever Malnourished	1	14			
	Total	40	36			
Post-test 3	Well Nourished	32	2	44.383	2	0.001 HS
	Moderate Malnourished	8	24			
	Sever Malnourished	0	10			
	Total	40	36			

d.f. = degree of freedom, p-value= probability, NS= non-significance, HS= high significance.

The table (6) illustrated that there was non-significant difference between study and control groups in pretest at p-value (0.05). while there was highly significant difference in posttest (1,2, and 3) between study and control groups at p-value (0.05).

Discussion

Quality of life (QoL) is a broad multidimensional concept that usually includes subjective evaluations of both positive and negative aspects of life. What makes it challenging to measure is that, although the term "quality of life" has meaning for nearly everyone and every academic discipline, individuals and groups can define it differently. Philosophers were concerned with the nature of human existence and defined the "good life", ethicists debated the shift in health-care decision-making for the concept of "sanctity of life" to "QoL" and social utility, environmentalists have placed emphasis upon attributes and conditions of the physical and biological environment, economists were concerned with the allocation of resources. Physicians focused on health- and illness-related variables and nurses, on keeping with the discipline's holistic approach. [9] The current study showed the patient of both study and control groups had low score of Quality of life (29.80) and (27.84) respectively in pre-test. The current study consisted with [10] found that the Patients with chronic kidney disease on dialysis had overall low QOL scores in all domains. Age, ethnicity, employment status, income, and duration on hemodialysis affected one or more domains of QOL in such patients. Iranian study carried out by [11] to "Assessment of quality of life among Iranian hemodialysis patients". Their study results stated that the hemodialysis patients had low quality of life and highlights necessity of special plan to improve patients' quality of life by social support and medical interventions. The finding of a study done in Egypt by confirmed that 100% of both the study and the control samples having poor knowledge score in pre-test, mentioned that most of the patients had poor knowledge about catheterization and angioplasty. The results of current study showed that a significant improved in post-test (I, II, and III) score of QoL for study group than the control group. [12] mentioned 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 in the intervention group compared to the control group in the post-test I and II. [13], on their study in entitled "Impact of an educational program on knowledge and quality of life among hemodialysis patients in Khartoum state" stated that the educational program was proven to be effective in improving the knowledge of hemodialysis and the quality of life of patients receiving hemodialysis. The implementation of the educational program had a positive effect on the patients help the patients to adapt with disease and hemodialysis.[14], claimed in their study results that the mean QOL score in the two groups before the intervention showed no significant difference (P = 0.24) whereas after the intervention, the mean QOL score significantly increased in the experiment group compared with the control group (P = 0.00) (Table 3). In addition, the QOL score showed no significant difference before and after the intervention in the control group (P = 0.43). However, a significant difference was observed in the experimental group before and after the intervention (P = 0.00). All above studies were coming parallel with current study result which revealed that the significant improvement of the QoL score in study group rather than control group at post-test mean. The researcher believed that the patients had a chronic, progressive irreversible disease, the most affected was education which found to affect most of QOL domains. Education is significant independent variable made change in QOL and higher the education better the QOL. Instructions and booklet significantly improved the patients' knowledge of dietary regimen and that lead to enhancement of undergoing hemodialysis patients' QoL score in study group constantly rather than control group. Malnutrition refers to an abnormal status originating from an inadequate diet and is well known to aggravate various clinical outcomes. Moreover, it is rather common and has a higher prevalence in chronic dialysis patients than in the healthy population. The Subjective Global Assessment (SGA) is a widely used representative tool for nutritional investigation; it is not only available for the nutritional assessment of dialysis patients but is also very practical and convenient for evaluating malnutrition in patients with end-stage renal disease (ESRD). However, the relationship between nutritional status evaluated by SGA and all-cause mortality has not been consistent across

studies. [15] The finding of current study illustrated that all the participants in the study and control groups had malnutrition and there was non-significant difference between study and control groups in pretest. Study of [16] which carried India to assess Subjective global assessment of nutritional status of patients with chronic renal insufficiency and end stage renal disease on dialysis. Their study results stated that (48%) patients with CRI, (58%) patients on HD and (50%) patients on CAPD were malnourished. This finding agreed with current study finding. The current study results came opposite to Australian research conducted by [17] to Assess the nutritional status in hemodialysis patients using patient-generated subjective global assessment which stated that 80% of patients were well nourished and 20% of patients were malnourished. Patients classified as well nourished (SGA-A) attained a significantly lower median PG-SGA score compared with those rated as moderately malnourished or at risk of malnutrition (SGA-B). while the current finding showed an improvement in nutritional status of study group patients more than control group, there was highly significant difference in posttest (I, II, and III) between study and control groups regarding subjective global assessment (SGA). The current study finding is in contrast to Indian study done by [18] showed that SGA score a composite marker of nutritional status significantly improved in the experimental group, whereas it remained more or less same in the control group. [19] mentioned that an individualized protocol used to diagnose, stratify the severity of malnutrition early, and follow up by customized nutrition planning for patients helped to achieve nutritional targets more effectively. Inspite of patients' diversity in nutritional habits and reluctance to accept change, it is clear that a qualified and dedicated transplant nutrition team can successfully implement perioperative nutrition protocol to achieve better nutritional targets. This result agreed with current study finding. [20] which concluded that the majority of the patients were already malnourished at the initiation of HD, and that nutrient intake and nutritional parameters improved during the follow-up of these patients. The researcher confirms that the patients in study group who received dietary instructions program had increased in the SGA score (which reflect positively on patients' nutritional status), compared to control group because the dietary instructional program enhanced the patients' knowledge and attitude toward the hemodialysis diet.

Conclusion

The current study showed that the instructions and booklet significantly improved the patients' knowledge of dietary regimen and that lead to enhancement of undergoing hemodialysis patients'(QoL) score and (SGA) in study group constantly rather than control group.

Recommendation: the study recommended that establishing of educational center for the patients in the hospital provided by adequate related materials, medias, audio-visuals aids and booklet for educating all patients how to cope with their medical conditions, when giving information to patients and relatives, nurses have more choices to make information clear and easily understandable.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of Nursing, University of Kufa, Iraq and all experiments were carried out in accordance with approved guidelines.

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