

The effect of implementing collaborative care model on diet compliance in hemodialysis patients

Hossein Habibzadeh¹, Sima Pourteimour¹, Rasool Gharaaghaji Asl², Sahar Kazemi¹

Abstract: Non-compliance to diet and increased fluid intake can lead to unpleasant side effects and premature mortality in hemodialysis patients. Intervention strategies in educational and cognitive-behavioral domains can be used to improve diet compliance and restrict fluid intake in hemodialysis patients. The present study aimed to implement a participatory care model on diet compliance in patients undergoing hemodialysis referred to the Urmia Hemodialysis Center of Urmia in 1397.

The present study is an experimental-randomized study that was performed on 60 patients undergoing diet without hemodialysis referring to Urmia Hemodialysis Center of Urmia. From 175 patients undergoing hemodialysis based on laboratory parameters of non-compliance patients and 60 patients were selected based on simple randomization and were randomly divided into intervention and control groups. After intervention steps of participatory care, diet compliance of the two groups was compared using the results of the comparable laboratory parameters. Analysis of the results of the present study showed that the collaborative care model significantly improved the results of laboratory parameters related to diet compliance in the intervention group compared to the results of the laboratory parameters before the intervention and the control group ($p < 0.05$). Based on the results of the present study, it seems that participatory care intervention can be useful in improving diet compliance and fluid restriction in hemodialysis patients. The aim is to improve the quality of life of hemodialysis patients.

Keywords: chronic kidney failure, collaborative care model, diet compliance, hemodialysis

INTRODUCTION

Chronic renal failure is a progressive and irreversible disorder that causes the formation and increase of urea and other toxins in the blood [1]. In other words, chronic renal failure is defined as the progressive and irreversible loss of renal function, often leading to end-stage renal disease (ESRD) [2]. Hemodialysis is the main end-stage treatment for

kidney disease (ESRD). Researchers have not considered the growing number of patients with ESRD as a growing problem in Iran and have estimated it to be a worldwide problem. Unfortunately, in Iran, due to a lack of control over diseases such as diabetes and blood pressure, there has not been significant success in preventing chronic kidney disease [3]. This failure to control the underlying diseases has resulted in an increase of 12% per year in the number of patients requiring hemodialysis nationwide (compared to the 6%

¹ School of Nursing and Midwifery, Urmia University of Medical Sciences, Urmia, Iran

² Department of Community Medicine, School of Medicine, Urmia University of Medical Sciences, Urmia, Iran

Corresponding author: Sahar Kazemi

Kazemi.PHD.20018@gmail.com

average increase in hemodialysis patients worldwide) and thus the rate of renal disease growth. It is much higher than the world average [4-6]. During the hemodialysis process, extra fluids and wastes are extracted from the blood of patients and this improves the patient's life and prolongs their life, but without proper diet, fluid restriction, and appropriate drug therapy, hemodialysis is not effective [7]. Nutrition has a major impact on the treatment and fate of patients undergoing hemodialysis, and diet compliance is associated with mortality in this disease, such that compliance to a low-potassium diet leads to muscle weakness, arrhythmia, and stasis. Cardiac and death and elevated serum phosphate levels lead to hyperparathyroidism and coronary artery disease, as well as fluid compliance in these patients leading to weight gain between two dialysis sessions and complications such as muscle cramps, shortness of breath, Vertigo, anxiety, pulmonary edema, heart failure, and severe hypertension and threaten the patient's lifestyle [8, 9]. Low levels of blood albumin decrease as 1–91 g of the amino acid are lost in each hemodialysis session, increasing the need for hemodialysis patients to have more protein than normal. Decreased blood albumin levels are strongly correlated with hospitalization and mortality rates and are a determinant of mortality in these patients [10]. Therefore, due to the effect of renal failure on different parts of the body, proper nutrition, prevention or correction of malnutrition and dietary restriction are essential, so patients need a special diet to continue living. It includes restrictions on the consumption of food and liquids [11]. Patient compliance to diet is influenced by factors such as personal beliefs, cultural and social characteristics. Most studies on hemodialysis patients do not follow the proper diet regimen [12]. Although patient-centered dietary supplementation is complementary to hemodialysis and is recommended for the effective control of signs and symptoms of uremic syndrome along with the prevention of long-term complications, many patients do not follow the nutritional and fluid restriction plan. This will lead patients to dialysis inadequacy; therefore, to improve dialysis adequacy, educate, justify, and modify patients' attitudes about diet and the need to monitor the complexity of human behaviors in health decision-making and health decisions. Moreover, behavioral health promotion patterns the benefits of dialysis and timely referral are important [13]. The collaborative care model is one of the localized teaching methods that has been used in recent years in the Iranian nursing field. The model of participatory care is the use of participation in the care process. The purpose of this model is to establish and maintain an effective, balanced, and continuous relationship between the members and the therapeutic team and the

patient, to increase collaboration, motivation, and collaboration, and to take responsibility for the treatment team in the treatment and care process [14]. Work-based on a nursing model helps to evaluate patients' status, establish meaningful useful communication between patients and nurses, set goals of care, improve quality of care, guide, and clarify care [15]. Therefore, the concept of "participation" in the care process can be used to improve and maintain an effective care relationship, which then creates an effective care relationship between the three main pillars of the care process: the patient, the nurse, and the physician. Collaborative care is a spectrum from 100% self-care to 100% professional care in which families or health providers, including health personnel, physicians, nurses, social workers, and pharmacists are partnered [16]. Collaborative care encompasses part of the spectrum of care, can be a large or small component of self-care, and can ultimately lead to improved health. It will be necessary to strengthen the caregiver's abilities as a patient with constant stress and anxiety [17]. Also, the use of new participatory teaching methods increases confidence, understanding, and learning, and improves communication skills among members [18]. The purpose of this study was to investigate the effect of the collaborative care model on diet compliance in patients undergoing hemodialysis referred to Urmia Hemodialysis Center of Urmia in 1397.

METHODS

The present study is an experimental study with code IRCT20180730040641N1 in which diet non-compliance is considered as a risk factor for hemodialysis patients. The statistical population in this study was all patients undergoing hemodialysis referred to Urmia Hemodialysis Center of Urmia who was enrolled in the study according to inclusion criteria. Inclusion criteria included no mental illness, cognitive impairment, known hearing, and visual impairment, no use of drugs and psychotropic substances, at least 6 months history of hemodialysis, and ability to stand on weights to control weight between two sessions. Then, of the 175 patients undergoing hemodialysis at the center based on the mean laboratory, sodium, potassium, phosphorus, and albumin parameters in the past 6 months, 60 patients were randomly selected as the study population (patients who did not adhere to their diet). They started studying. After informing the patients about the process of completing the study and completing the informed consent form in these patients, the collaborative care model was administered to the patients in the intervention group for 7 sessions and routine care was performed for the control group patients. The intervention was performed by implementing a collaborative care model. To achieve the

objectives of the model, the following steps were presented in the form of a systematic structure that was followed by a logical and evolutionary set of interconnected and dynamic sequences, consisting of four steps: 1- Motivation; 2- Preparation; 3- Involvement; 4- Evaluation that was anticipated for each stage of the specific action plans.

Motivation Stage: To motivate patients by communicating with them appropriately, familiarizing them with the ward and facilities available, raising awareness of patients with chronic renal failure, its consequences, and dangerous consequences were summarized.

Educational need assessment was also done by reviewing and identifying patients' problems by taking biographies and interviews, which was a 2-hour session after filling out the demographic questionnaire during the hemodialysis process.

Preparation Stage: Model objectives and timing of participatory training programs and follow-up were identified (one-hour session).

Involvement phase: Training sessions and follow-up sessions were held at a stage (each session for 30 minutes) that included:

- 1) The first participatory training session
- 2) Second educational participatory meeting
- 3) Participatory follow-up meeting first (one-month interval between each session half an hour)
- 4) Second follow-up collaborative meeting (one-month interval between each session half an hour)

Evaluation Stage: Achievement of the goals was evaluated in the implementation stages of the model. The evaluation was performed in stages at the beginning and end of each training session as a question and answer session. The training steps were simple and lecture-based.

Implementation of the training program in 4 sessions in the patient's bedside with the nephrologist in the Hemodialysis ward of the Urmia Hemodialysis Center in Urmia for 30 minutes individually and individually for patients.

In the first session, the patient was provided with the necessary information about the nature of the disease, diagnostic methods, and treatment, in each training session after completing the training during the last 20 minutes, in the last 10 minutes, summarizing information, and asking patients questions about problems. The answer was raised. The second session provided information and skills on the importance and how to maintain a proper diet concerning the disease, and the third session on the final evaluation of education, with emphasis on follow-up and participation rates.

Educational information was also provided in the form of educational pamphlets and pamphlets.

Laboratory parameters were measured and reported in two stages, once at the end of the intervention and the second time at one month interval and compared with pre-study values. Also, educational content was collected from accredited hemodialysis and nurse nursing textbooks and approved patient education guidelines, physicians, and nursing professors.

Training sessions were also conducted by the researcher and supervised by the project executives. Data were analyzed using a t-test for independent samples and chi-square and repeated measures in SPSS 23 software.

RESULTS

The statistical population of this study consisted of 60 patients undergoing hemodialysis with laboratory parameters indicating diet compliance who were randomly divided into two equal groups of intervention and control.

The mean age of the patients in the intervention and control groups were (53.60 13 13.27) and (48.63 14 14.88) years, respectively, in terms of the mean duration of dialysis in both groups (intervention and control). It was equal to 31.02 20 20.45 and 33.13 18 18.54 months, respectively.

There was no significant difference between the two groups in terms of age and duration of dialysis. The t-test was homogeneous in terms of mean age ($p = 0.17$), duration of dialysis ($p = 0.84$) and patient weight ($p = 0.16$) (Table 1).

Table 1: Comparison of quantitative demographic characteristics of the studied samples in the two intervention and control groups

Variable	Intervention group		Control group		Test statistics Independent t-test	P-value
	Mean	SD	Mean	SD		
Age of patients	53.60	13.27	48.63	14.88	$t=1.36$ $df=58$	0.17
Duration of dialysis	31.02	20.45	33.13	18.54	$t=-0.19$ $df=58$	0.84
Weight of patients	68.83	11.59	72.98	10.98	$t=-1.43$ $df=58$	0.16

SD – standard deviation

Regarding the qualitative demographic characteristics that could influence the outcome of the intervention, based on the results of the Chi-square test in Table 2, no significant difference was observed between the two groups

(intervention and control). In other words, two groups were gender ($P = 0.43$), occupational status ($P = 0.46$), educational status ($P = 0.60$), marital status ($P = 0.71$) and income ($P = 0.51$) were homogeneous.

Table 2: Comparison of qualitative demographic characteristics of the samples in the intervention and control groups

Variable		Intervention group		Control group		Test result
		Number	Percent	Number	Percent	
gender	female	17	56.7	14	46.7	$\chi^2=0.60$ Df=1 $P=0.43$
	man	13	43.3	16	53.3	
job	retired	11	36.7	14	46.7	$\chi^2=1.55$ Df=2 $P=0.46$
	housewife	9	30	5	16.7	
	does not have	10	33.3	11	36.7	
education status	illiterate	10	33.3	10	37	$\chi^2=1/84$ Df=3 $p=0/60$
	high school	15	50	12	44.4	
	diploma	1	3.3	3	11.1	
	above the diploma	4	13.3	2	7.4	
marital status	married	26	86.7	25	83.3	$\chi^2=0.13$ $p=0.71$
	single	4	13/3	5	16.7	
income	more than spending	4	13.3	3	10	$\chi^2=1.34$ Df=2
	spending equal expense	7	23.3	4	13.3	
	less than spending	19	63.3	23	76.7	

Table 3: Comparison of mean scores of laboratory parameters between the intervention and control groups in hemodialysis patients

Variable	Group	Intervention group	Control group	P-value
		Mean $\pm$ SD	Mean $\pm$ SD	
potassium	Before intervention	5.65 $\pm$ 0.68	5.63 $\pm$ 0.43	0.86
	After the intervention	5.11 $\pm$ 0.52	5.41 $\pm$ 0.42	0.017
	After one month of intervention	4.10 $\pm$ 0.26	5.25 $\pm$ 0.40	<0.001
	P-value	<0.001	<0.054	
Phosphorus	Before intervention	5.42 $\pm$ 0.98	5.45 $\pm$ 0.55	0.87
	After the intervention	5.19 $\pm$ 0.7	5.34 $\pm$ 0.54	0.31
	After one month of intervention	4.22 $\pm$ 0.59	5.31 $\pm$ 0.27	0.001
	P-value	<0.001	0.15	
Sodium	Before intervention	139.74 $\pm$ 3.24	138.63 $\pm$ 0.77	0.15
	After the intervention	138.07 $\pm$ 3.25	137.90 $\pm$ 2.33	0.82
	After one month of intervention	136.97 $\pm$ 2.64	138.30 $\pm$ 2.50	0.050
	P-value	<0.001	0.34	
Albumin (protein)	Before intervention	4.07 $\pm$ 0.54	3.93 $\pm$ 0.44	0.28
	After the intervention	4.24 $\pm$ 0.46	3.78 $\pm$ 0.41	<0.001
	After one month of intervention	4.54 $\pm$ 0.42	3.59 $\pm$ 0.52	<0.001
	P-value	<0.001	0.058	

SD – standard deviation

The results of the t-test of two independent groups concerning Table 3 show that before the intervention, the hypothesis of equality of mean laboratory parameters between the two groups at a 5% error level was not significant ($P>0.05$). There was no significant difference

between the two groups in terms of mean laboratory parameters and after the intervention; there was a significant difference between the intervention and control groups ($P<0.05$). The results of the repeated measures test showed that in the intervention group there was a significant

difference between before and after the intervention and after one month of intervention ($P < 0.05$). Therefore, it can be said that the intervention was effective but in the control

DISCUSSION AND CONCLUSION

Various studies have shown that changes in the lives of individuals following the onset of chronic kidney disease require serious support and support to improve and tolerate behavior change [19]. Non-compliance to treatment regimens is common in chronic kidney patients and is associated with an increased rate of disease progression and mortality in these patients and is directly related [20]. Compliance with a diet is the result of a range of behaviors that are in line with the recommendations made in compliance with the prescribed dietary regimen, including medication, diet, and so on. Compliance with a diet as part of the treatment regimen can be effective in controlling many diseases [21]. Symptoms and symptoms include fluid and electrolyte imbalances, and accumulation of these substances in the body, hyperkalemia, metabolic acidosis, hyper-phosphatemia, anemia, hyperparathyroidism. Malnutrition, etc. are occurring and intensifying over time [22]. Protein-energy nutrition also occurs in 40% of patients with chronic kidney failure. One of the reasons for all these problems is the lack of diet; one of the needs of the patient at this stage is the need to obtain information about nutrition and nutrition. Nutrition in these patients suggests appropriate approaches to reduce the adverse effects of the disease. Increased mortality and morbidity due to toxins in the cassette may also be caused by the increased awareness of these patients in the diet [23]. Today, trying to adhere to a nutritional diet because of its cheapness compared to other health interventions and fewer side effects is considered an important treatment option in the early treatment of patients, and patient education is a valuable method. Compliance with the diet of the patients is considered. The purpose of this study was to evaluate the effect of the participatory care model on diet compliance in patients undergoing hemodialysis referred to Urmia Hemodialysis Center of Urmia in 1397. In the present study, two intervention and control groups, including hemodialysis patients who did not adhere to the diet, were compared after the intervention. The intervention group underwent an interventional process of collaborative care according to the standard model presented in the study method. The control group continued the normal hemodialysis procedure until the end of the study. At first, both groups were compared in terms of demographic characteristics. The results showed that there was no significant difference between the intervention and control groups in terms of demographic variables such as gender, age, marital status, education,

group was significantly higher than 0.05 indicating no significant difference in the control group before and after the intervention and after one month of intervention.

patient occupation, monthly income, which could affect the results of the study. In other words, both groups were homogeneous. After successive steps of intervention, both groups were compared in terms of laboratory parameters related to diet compliance. The results showed that there was a significant relationship between the experimental and control groups in terms of laboratory parameters of phosphorus, potassium, sodium, and albumin. Participatory care reduces the toxicological parameters of patients with chronic kidney disease and reduces the weight difference due to the accumulation of toxic substances in the intervention group. In other words, participatory care has a significant direct relationship with compliance to the diet. Parvinian Nassab et al. 2014 A study "Determining the impact of collaborative care model on the anxiety of adolescents with beta-thalassemia major" by selecting 21 mothers available and randomly sampling in two control and intervention groups at Shahid Hospital Coliseum. Dastgheib Shiraz was designed for 3 months. The results of the study showed that the mean score of worry before intervention in the control and intervention groups was not statistically significant, but there was a significant difference between the mean worry in the intervention group before and after the implementation of the collaborative care model [24].

In 2015, Mamne et al. designed a study to investigate the impact of collaborative care model training on the nutritional behavior of type 2 diabetic patients. In this study, simple random sampling (random numbers) was performed from 411 cases to 42 cases in two experimental (control) and control (21 patients) groups at Tabriz Diabetes Training Center with two samples. The results showed that there was no significant difference in age, sex, educational level, occupation, marital status, and economic status between the two groups. Experimental group after training intervention in the areas of fast food consumption, fruit and vegetable consumption, canned, pastry, solid vegetable oil, sausage and sausage, the usual method of cooking and eating heavy and late dinner better performance than the control group. [25].

A quasi-experimental clinical trial study conducted by Khoshab et al. 2012 aimed to determine the impact of the collaborative care model on depression and anxiety in patients with heart failure in 11 patients with heart failure from CCU, PCCU, and internal heart wards. Afzalipour and Shafa hospitals of Kerman were randomly divided into control and experimental groups. The results of the study showed that the mean scores of anxiety in the intervention

group decreased after implementing the collaborative care model [26].

The Lashkari et al. Study in 2015 aimed to investigate the effect of the collaborative care model on the fatigue of 12 conservative hemodialysis patients by purposeful sampling in two experimental and control groups randomly for 3 months in Golestan and Imam Ahwaz hospitals. According to the results of the study after intervention in the intervention group, the level of fatigue at a mild level increased (from 23.9% to 42.2%) and the level of fatigue at a severe level decreased significantly (from 42.3% to 7%). Severe fatigue in the control group increased from 42.2% before the intervention to 34.2% after the intervention. Results also showed that after the intervention, the mean score of total fatigue severity in the intervention group was reduced and it was statistically significant [27]. Our study was similar in terms of the implementation of the collaborative care model. The results of applying the collaborative care model to the crisis created in these studies were also in line with our study.

Based on the results of this study, it can be concluded that the participatory care model has been successful in explaining dietary compliance behavior. Therefore, it is suggested to implement a participatory care model of patients undergoing hemodialysis in planning to change dietary behaviors. Although the findings of this study provide an accurate description of the relationship between the incubation care model and diet compliance, it also has some limitations, including the ability to accurately and sequentially monitor laboratory parameters by a laboratory

apparatus and an expert operator who can be useful to achieve better results. It is also recommended to consider the role of other standardized behavioral models in identifying the effective aspects of behavioral or behavioral changes in treatment planning and to consider effective educational methods to increase compliance with dietary restrictions. To improve both the quality of treatment and to reduce the cost of treatment for the consequences of noncompliance.

CONCLUSION

The findings of this study in general indicate the usefulness and effectiveness of the participatory care model in the process of compliance to diet in patients with hemodialysis. Therefore, participatory care intervention seems to play a key role in improving diet compliance and fluid restriction in hemodialysis patients, requiring comprehensive plans focusing on participatory model steps by health care professionals and hemodialysis patients. The effectiveness of the model as well as its simplicity is one of the strengths and weaknesses of this model compared to other models.

Acknowledgment

This article derives from a research project with a code of ethics IR.UMSU.REC.1397.176. The authors would like to express their gratitude to the Research Deputy of Urmia University of Medical Sciences, the authorities, and nurses of the Hemodialysis Hemodialysis Center of the Urmia Dialysis Center in Urmia, as well as to all patients undergoing hemodialysis who could not have been enrolled without their participation.

Conflicts of Interest

No conflict of interest is declared by the authors.

References:

1. Ghaffari M, Morowatisharifabad MA, Mehrabi Y, Zare S, Askari J, Alizadeh S. What Are the Hemodialysis Patients' Style in Coping with Stress? A Directed Content Analysis. *International journal of community based nursing and midwifery*. 2019 Oct; 7(4):309.
2. Kara B. Health beliefs related to salt-restricted diet in patients on hemodialysis: Psychometric evaluation of the Turkish version of the Beliefs About Dietary Compliance Scale. *Journal of Transcultural Nursing*. 2014 Jul;25(3):256-64.
3. Tranter S. Review of Haemodialysis for Nurses and Dialysis Personnel. *Renal Soc Australasia J* 2016; 12(1):34.
4. Motedayen M, Sarokhani D, Ghiasi B, Khatony A, Hasanpour Dehkordi A. Prevalence of Hypertension in Renal Diseases in Iran: Systematic Review and Meta-Analysis. *Int J Prev Med*. 2019 Jul 5;10:124..
5. Rezaei Z, Jalali A, Jalali R, Khaledi-Paveh B. Psychological problems as the major cause of fatigue in clients undergoing hemodialysis: A qualitative study. *International J Nursing Sciences* 2018;5:262-7
6. Ebrahimi H, Sadeghi M. The effect of dietary regimen education on the laboratory variables in hemodialysis patients. *J Nurs Educ* 2014; 2(4):12– 22. (Persian).
7. Park OL, Kim SR. Integrated self-management program effects on hemodialysis patients: A quasi-experimental study. *Japan Journal of Nursing Science*. 2019 Jan 22.
8. Kalantar-Zadeh K, Tortorici AR, Chen JLT, Kamgar M, Lau W-L, Moradi H, et al. Dietary restrictions in dialysis patients: is there anything left to eat? *Semin Dial* 2015;28(2):159–68. (Persian)
9. Montilla CM, Duschek S, del Paso GA. Health-related quality of life in chronic kidney disease: Predictive relevance of mood and somatic symptoms. *Nefrología (English Edition)*. 2016 May 1;36(3):275-82.
10. Royani Z, Rayyani M, Vatanparast M, Mahdaviar M, Goleij J. The relationship between self-care and self-efficacy with empowerment in patients undergoing hemodialysis. *Military Caring Sci* 2015;1(2):116–22. (Persian).
11. Beerendrakumar N, Ramamoorthy L, Haridasan S. Dietary and Fluid Regime Compliance in Chronic Kidney Disease Patients. *J Caring Sci*. 2018 Mar 1;7(1):17-20.
12. Rysz J, Franczyk B, Ciałkowska-Rysz A, Gluba-Brzózka A. The

- Effect of Diet on the Survival of Patients with Chronic Kidney Disease. *Nutrients*. 2017;9(5):495. Published 2017 May 13. doi:10.3390/nu9050495.
13. Goraya N., Wessona D.E. Dietary interventions to improve outcomes in chronic kidney disease. *Curr. Opin. Nephrol. Hypertens*. 2015;24:505–510.
 14. Andersen-Hollekim TE, Kvangarsnes M, Landstad BJ, Talseth-Palmer BA, Hole T. Patient participation in the clinical pathway-Nurses' perceptions of adults' involvement in haemodialysis. *Nurs Open*. 2019 Feb 14;6(2):574-582.
 15. Hashemi MS, Irajpour A, Abazari P. Improving Quality of Care in Hemodialysis: a Content Analysis. *J Caring Sci*. 2018 Sep 1;7(3):149-155.
 16. Roumelioti ME, Steel JL, Yabes J, Vowles KE, Vodovotz Y, Beach S, Rollman B, Weisbord SD, Unruh ML, Jhamb M. Rationale and design of technology assisted stepped collaborative care intervention to improve patient-centered outcomes in hemodialysis patients (TACCare trial). *Contemp Clin Trials*. 2018 Oct;73:81-91.
 17. Shamsi A, Amiri F, Ebadi A, Ghaderi M. The effect of partnership care model on mental health of patients with thalassemia major. *Depression research and treatment*. 2017;2017.
 18. Snaie Neda, Alahani Fatemeh, Zolfagari MITRA. The Effect of Education with the partnership approach on the self- efficacy and self-esteem of family caregivers of patients undergoing Coronary Artery Bypass Graft (CABG). *Journal of Medical-Surgical Nursing*. 2015;21-28.
 19. Carrero J.J., Cozzolino M. Nutritional Therapy, Phosphate Control and Renal Protection. *Nephron Clin. Pract*. 2014;126:1–7.
 20. Donderski R, Miśkowiec-Wiśniewska I, Kretowicz M, Grajewska M, Manitijs J, Kamińska A, Junik R, Siódmiak J, Stefańska A, Odrowąż-Sypniewska G, Pluta A. The fructose tolerance test in patients with chronic kidney disease and metabolic syndrome in comparison to healthy controls. *BMC nephrology*. 2015 Dec;16(1):68.
 21. Ricardo AC, Anderson CA, Yang W, Zhang X, Fischer MJ, Dember LM, Fink JC, Frydrych A, Jensvold NG, Lustigova E, Nessel LC. Healthy lifestyle and risk of kidney disease progression, atherosclerotic events, and death in CKD: findings from the Chronic Renal Insufficiency Cohort (CRIC) Study. *American Journal of Kidney Diseases*. 2015 Mar 1;65(3):412-24.
 22. Aghakhani N, Hoseini SL, Kamali K, Vahabzadeh D. Effects of Appropriate Nutrition Training in Small Groups on Laboratory Parameters in Hemodialysis Patients from Iran. *Maedica (Buchar)*. 2017;12(4):276–280.
 23. Karavetian M, Vries N, Rizk R, et al. - Dietary educational interventions for management of hyperphosphatemia in hemodialysis patients: a systematic review and meta-analysis. *Nutrition reviews*. 2014;7:471–482.
 24. Parviniannasab A, rosta S, vejdani M, dehghani A, keshtkar Z, anshorshori N, et al . The Effects of the Group Reminiscence on Cognitive Status of Mild Cognitive Impaired Elders. *IJPN*. 2014; 1 (4) :25-36.
 25. Mamene M, Rahmani A, Behshid M. The effect of teaching based collaborative care model on diet habits in diabetes type II: A clinical trial study. *Scientific Journal of Hamadan Nursing & Midwifery Faculty*. 2014 May 15;22(1):41-51.
 26. Khoshab Hadi, Bagheryan Behnaz, Abbaszadeh Abbas, Mohammadi Eesa, Kohan Simin. The effect of partnership care model on depression and anxiety in the patients with heart failure. *Evidence Based Care*. 1021;1(1):24.-57.
 27. Lashkari F, Brazparandjani S, Latifi S M, Chahkhoei M, Khalili A, Paymard A, et al . The Effect of Collaborative Care model on the Fatigue in Patients Undergoing Maintenance Hemodialysis: A Randomized Clinical Trial. *Qom Univ Med Sci J*. 2016; 10 (8) :71-79.