

Nurses' knowledge of the nutritional management of renal failure in Erbil City, Kurdistan Region, Iraq

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Abstract

Background and objective: Renal failure is a worldwide public health concern due to the significant increase of patients each year. Diet and nutrition play a crucial role in symptom management, quality of life and survival of renal failure patients, as well as the prevention of disease progression. This study aimed to assess nurses' knowledge of the nutritional management of patients with renal failure and to find out the relationship between nurses' knowledge and their socio-demographic characteristics.

Methods: A descriptive cross-sectional research design was used from April to August 2016. A purposive sample of 51 nurses at the Dialysis Unit of Hawler Teaching Hospital and Hawler Dialysis Center, Kurdistan Region, Iraq were recruited and completed a self-reported questionnaire.

Results: Most participating nurses were male (76.5%), and the majority (52.9%) were between 26-32 years old. Most of them were married (68.6%), had a diploma certificate (58.7%) with 37.3% having 4-7 years of working experience at the two above-noted dialysis centers. The majority of nurses (70.6%) had fair knowledge score, while 17.6% had a good knowledge score and 11.8% had a low knowledge score.

Conclusion: The majority of nurses had fair knowledge regarding nutritional management for renal failure patients.

Keywords: Knowledge; Renal failure; Diet; Nurse.

Introduction

One of the main health problems worldwide is renal failure because of its cost burden and treatment complexity.¹ The number of patients diagnosed with renal failure is significantly increasing each year and is equal to the increase in diabetes and hypertension prevalence.² A high mortality rate for renal failure patients with incident dialysis occurs in the first several months. Cardiovascular causes are considered the leading cause of a large proportion of this deaths.³ Renal failure patients suffer from health and lifestyle complications, such as increased risk of malnutrition, cardiovascular disease, and cost burden, particularly for those patients who require dialysis or kidney transplantation.⁴ Peritoneal dialysis, hemodialysis, and kidney transplantation are three important treatment modalities for patients with

end-stage renal disease.⁵ However, hemodialysis is considered one of the most commonly used dialysis methods worldwide.⁶ Patients are also required to obey the correct dietary regimens, such as fluid restriction and decreased phosphate and potassium intake.⁷ Fluid intake must be restricted to approximately 700 to 1000 ml/l because too much fluid intake can cause increased blood pressure and shortness of breath due to the accumulation of fluid around the lung fields.⁸ Diet and nutrition play a crucial role in symptom management, quality of life and the survival of patients suffering from renal failure, as well as the prevention of disease progression.⁹ The restriction of diet is an important factor for renal failure patients to maintain ideal health because damaged kidneys cannot excrete the accumulated certain harmful substances in

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the body, which are contained in some drinks and foods. Therefore, harmful substances that are present in foods and drinks must be regulated and controlled.¹⁰ Hemodialysis patients have a better prognosis with fluid restriction and diet control.¹¹ Many studies confirmed diet-induced malnutrition in renal failure patients, called protein-energy malnutrition, which is related to low protein and energy intake.^{12,13} Developing a nutritional imbalance is considered a major issue in renal failure patients, and it becomes more serious with disease progression due to the insufficient intake of nutrients.¹⁴ Renal failure patients should be instructed to avoid foods with a high amount of potassium, such as beans, chocolate, nuts, coffee, banana, dried fruits, and ice cream.¹⁵ Furthermore, foods that are high in sodium should be avoided, including processed cheese, canned foods, soups, olives, snacks, and prepared foods. Renal failure patients with maintenance dialysis require a variety of supplementation. Vitamin D is recommended. A group of vitamin B-complex and vitamin C are required because many of these vitamins are lost during prolonged cooking methods. Folic acid and iron are usually prescribed to increase their levels in the blood, which is low during continuous hemodialysis.¹⁶⁻¹⁸ High molecular proteins and supplementations, such as vitamin A, is not recommended because the dialyzer machine cannot dialyze it.¹⁹ Nurses have a crucial role in educating patients with renal failure to cope with their condition and also advise them on the most effective management methods for diet and fluid restrictions.^{20,21} Because there is limited data on dialysis nurses' knowledge at Erbil City Kurdistan region, Iraq, this study assessed nurses' knowledge of the nutritional management of renal failure and to find out the relationship between nurses' knowledge and their socio-demographic characteristics.

Methods

This descriptive cross-sectional study design aimed to assess nurses' knowledge of the nutritional management of patients with renal failure. This study was conducted at the Dialysis Unit of Hawler Teaching Hospital and Hawler Dialysis Center, Kurdistan Region, Iraq. A sample of 51 nurses was obtained as follows: all nurses at the Dialysis Unit of Hawler Teaching Hospital (40 nurses) and Hawler Dialysis Center (11 nurses) were recruited except rotating nurses, as they have less than three months of experience in this work area. This study was approved by the Scientific and Ethical Committee at the College of Nursing, Hawler Medical University. Before data collection, permission was obtained from the director of administration of both dialysis centers. After explaining the aim of the study, written informed consent was obtained from each participating nurse. They were also assured that their information will be kept confidential using codes instead of their personal information. In the current study, after reviewing the related literature, a self-reported questionnaire was constructed based on a questioner that was developed by Munuo et al.²⁷ with a few modifications to collect necessary data, which consisted of two parts. The first part was about the socio-demographic characteristics of nurses who work in dialysis units, such as sex, age, marital status, professional qualifications and working experience per year in a dialysis unit. The second part concerned with nurses' knowledge regarding diet and sources of nutrients. It consists of 14 questions related to nurses' knowledge regarding diet and sources of nutrients, with six multiple-choice questions and eight short answer questions. The questionnaire was extensively reviewed by the scientific committee at the college of nursing for its validity and relevancy. The nurses' responses to each question were scored and tabulated. A key answer sheet was used to evaluate nurses' answers. Nurses'

knowledge of the nutritional management of renal failure was scored as follows: one point for every correct multiple-choice answer, whereas zero was given for wrong multiple-choice answers. Two points were awarded for complete, correct short answers, one point for incomplete, correct short answers and zero for wrong short answer questions. The total questions related to nurses' knowledge was 14. The six multiple-choice questions were scored six for correct answers, and the eight short answer questions were scored 16 for complete, correct answers. The range of nurses' total knowledge scores was zero to 22. This was classified into the following three categories: poor knowledge with a total score of 0 to 7, fair knowledge ranging from 8 to 15 grades and good knowledge ranging from 16 to 22 grades. Data were entered and analyzed using the statistical package for the social sciences (version 23.0).

Descriptive statistics were performed to the socio-demographic characteristics information of the participating nurses. Chi-square test was used to test the relationship between nurses' socio-demographic characteristics and their level of knowledge of the nutritional management of renal failure. A *P* value was considered significant when it was less than 0.05 and highly significant when it was equal to or less than 0.01.

Results

According to the nurse's socio-demographic characteristics shown in Table 1, most of the nurses were male (76.5%), and 23.5% were female. Concerning their age, 52.9% of nurses were aged between 26 to 32 years, and 21.6% were aged between 40 to 46 years. However, only 13.7% and 11.8% were aged between 33 to 39 and 47 to 53 years, respectively.

Table 1: Nurses' distribution according to their socio-demographic characteristics.

Characteristics	Frequency (N=51)	Percentage (%)
Sex		
Male	39	76.5
Female	12	23.5
Age group		
26-32	27	52.9
33-39	7	13.7
40-46	11	21.6
47-53	6	11.8
Marital status		
Single	16	31.4
Married	35	68.6
Professional qualifications		
Trained nurse	1	2
High school	6	11.8
Diploma	30	58.7
Bachelor degree	14	27.5
Working experience /year		
1-3	16	31.3
4-7	19	37.3
8-11	8	15.7
12-14	8	15.7

The highest percentage (68.6%) of nurses were married, and 31.4% were single. Furthermore, for the respondents' educational background or professional qualifications, the greatest number (58.7%) had a diploma certificate, whereas there was only one (2%) trained nurse among the participants. In addition, 27.5% and 11.8% graduated from the college of nursing and high school nursing, respectively. A total of 37.3% of nurses have four to seven years of experience, and 31.3% have one to three years of experience. By contrast, the same proportion (15.7%) of nurses have 8-11

years and 12-14 years of experience in the dialysis center. Most nurses shown in the Table 2 were best able to address diet-related risk factors for renal failure (90.2%), rich food source of potassium (86.3%), function of carbohydrate (58.8%) and high biological value protein foods (56.9%). However, more than half of participating nurses were unfamiliar with the following questions: if a large dose of some vitamins is frequently taken, may accumulate to a dangerous level in the body (45.1%) and vitamin, which is not a required supplement for renal failure patients (49%).

Table 2: Percent distribution of nurses' responses related to nutrition knowledge and sources of nutrients.

Nutrition knowledge	Frequency (N=51)	Percentage (%)
Function of carbohydrate		
Correct	30	58.8
Incorrect	21	41.2
High biological value protein foods		
Correct	29	56.9
Incorrect	22	43.1
Vitamin which is not a required supplement for dialysis patients		
Correct	25	49
Incorrect	26	51
If a large dose of some vitamins are frequently taken, may accumulate to a dangerous level in the body		
Correct	23	45.1
Incorrect	28	54.9
Diet-related risk factors for renal failure patients		
Correct	46	90.2
Incorrect	5	9.8

As shown in the Table 3, the best response was obtained for questions of recommendation to increase the intake of carbohydrate (84.3%) and fluid restriction for renal failure patients (51%). However, only (17.6%) correctly answered functions of the protein. Aims of nutritional management and the restriction of minerals were poorly answered (19.6% and 9.8%,

respectively). Furthermore, more than three-quarters of respondents were unable to explain sodium-rich foods that should be avoided by renal failure patients and recommendations of proteins with high biological value to renal failure patients. Less than half of participating nurses (39.2%) clearly addressed signs of a patient with fluid excess.

Table 3: Proportion of nurses who provided correct answers on nutritional management of renal failure

Questions	Correct answer No.(%) N=(51)
Aims of nutritional management of renal failure patients	10(19.6)
Signs of a patient with fluid excess	20(39.2)
Functions of protein	9(17.6)
Rich sodium foods that should be avoided by renal failure patients	6(11.8)
Aims of the recommendation of high biological value protein for renal failure patients?	6(11.8)
Aims of fluids restriction for renal failure patients?	26(51)
Aims of recommendation to increase carbohydrate intake for renal failure	43(84.3)
Aims of restriction of minerals for renal failure patients?	5(9.8)

Table 4 shows the relationship between nurses' socio-demographic characteristics and their knowledge level. No significant differences were observed among nurses' sex, age group, and working experience. Female nurses had higher knowledge (33.3%) than male nurses (12.8%), and nurses who were aged between 26 to 32 with one to three years of experience in dialysis center had the higher knowledge than those aged between 33

to 39 and 40 to 46 with 12-13 years of working experience in dialysis center. Differences were found among professional qualifications, which indicates that a high level of education is significantly associated with high nutrition knowledge score with a $P < 0.05$. Nurses' who had a bachelor's degree had a higher knowledge score than trained nurses, high school nurses and those who had a diploma.

Table 4: The relationship between nurses' socio-demographic-characteristics and nutrition knowledge levels.

Variable	Poor knowledge No.(%)	Fair knowledge No.(%)	Good knowledge No.(%)	χ^2	P value
Sex					
Male	5(12.8)	29(74.4)	5(12.8)	2.41	0.300
Female	1(8.3)	7(58.4)	4(33.3)		
Age group					
26-32	1(3.7)	19(70.4)	7(25.9)	12.2	0.060
33-39	2(28.6)	5(71.4)	0(0.0)		
40-46	2(18.2)	9(81.8)	0(0.0)		
47-53	1(16.7)	3(50.0)	2(33.3)		
Professional qualifications					
Trained nurse	1(100.0)	0(0.0)	0(0.0)	17.2	0.009
High school	1(16.7)	4(66.7)	1(16.7)		
Diploma	4(13.3)	24(80.0)	2(6.7)		
Bachelor degree	0(0.0)	8(57.1)	6(42.9)		
Working experience/year					
1-3	2(12.5)	8(50.0)	6(37.5)	34.3	0.08
4-7	2(10.5)	16(84.2)	1(5.3)		
8-11	0(0.0)	8(100.0)	0(0.0)		
12-14	2(25.0)	4(50.0)	2(25.0)		

Discussion

Renal failure is a worldwide public health concern characterized by glomerular infiltration, total loss of kidney function and cardiovascular disease risks.^{1,22} Nutritional assessment and therapies are well-defined as an important approach for renal failure patients.²³ Nurses and other health care professionals who work in renal units and have direct interaction with ESRD patients have a greater responsibility to inform and provide instructions to patients who are at risk of renal failure regarding proper and practical dietary therapies.²⁴ However, the ability of nurses and other healthcare providers to provide scientific and appropriate dietary plans to those patients who are in need is limited.²⁵ Appropriate treatment is not delivered when unqualified healthcare providers work in dialysis centers with no experience with renal failure patients.²⁶ The present study assessed nurses' knowledge regarding nutritional management of renal failure patients at Hawler City, Kurdistan region, Iraq. Nurses who work in renal units with a good or moderate knowledge level play an important role in patient education.²⁷ In our study, the overall nurses' knowledge related to the nutritional management of renal failure was fair. The majority of nurses (70.6%) had fair knowledge score and (17.6%) had a good knowledge score. However, only 11.8% had a low knowledge score. The mean score of nutrition knowledge for 51 dialysis nurses was 2.06 ± 0.54 . Most nurses were best able to address diet-related risk factors, food sources rich in potassium and foods with high biological value for protein. However, less than half of nurses were unable to recognize vitamins, which may accumulate to a dangerous level in the body if large doses are frequently taken.²⁸ In the present study, no significant differences were found between nurses' working experience and their level of knowledge. Instead, nurses who had fewer years of experience had a higher knowledge score. The study performed by Munuo et al.²⁷ recognized

that the knowledge level is not related to the increase in working experience. Similar results were found in another evaluation study, which was conducted among licensed nurses working at a nursing home in the United States.³ The results of the present study were consistent with Yalcin et al.,²⁹ who explained that practical experience in specific fields without some related nutrition education programs does not increase nurses' knowledge level of nutritional intervention. In the present study, the highly significant difference was found between nurses' professional qualifications and their knowledge level regarding nutritional management, with a $P < 0.005$. Nurses with a bachelor's degree were more knowledgeable than those with a diploma certificate, high school nurses and trained nurses. This could be because nurses who studied for four years at a college of nursing have gained more knowledge than those who studied for two years. Furthermore, the nutrition knowledge score was higher among nurses aged between 26-32 and 47-53 years compared to those aged between 33-39 and 40-49 years, but this was not statistically significant. This study is paralleled with that reported by Crogan and Evans²⁸ who noted a significant relationship between participants' educational background and their knowledge level. They also found no statistical significance between the age group and knowledge score.

Conclusion

The nutrition knowledge score was fair among dialysis nurses. Nurses with a bachelor's degree were more knowledgeable than trained nurses, high school nurses and nurses with diplomas. An education program of the nutritional management of renal failure is recommended for nurses who are in direct contact with renal failure patients to ensure that they give accurate and updated information to the patients.

Competing interests

The authors declare that they have no competing interests.

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