ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

Assessment Of Nutritional Status Of Hemodialysis Patients And Its Associated Factors Using Subjective Global Assessment In Iran

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Abstract

Background: The aim of this study was to assess the nutritional status of hemodialysis patients and its associated factors using subjective global assessment (SGA) in Iran.

Methods: The study was a cross-sectional study that was carried out on 250 hemodialysis patients referred to Imam Reza hospital of Kermanshah city (Iran) in 2016. The data collection tool was a two-part questionnaire related to nutritional status of hemodialysis patients using the Subjective Global assessment (SGA) method. To evaluate the association between nutritional status and its associated factors, Univariate and multiple linear regression analysis were employed then crude and adjusted β with 95% confidence interval were calculated. The data were analyzed by SPSS 22 and P-Value <0.05 was considered as a significant level.

Results: The means (S.D) of age and weight of patients under study were 44.89 (13.90) and 52.50 (7.54); respectively. Also, 56.8% (142) of patients were male and 43.2% (108) were women. In this study, 5.6% (14) and 94.4% (236) of the patients had a normal nutritional status and 94.4% mild to moderate nutritional status ; respectively. The results of multiple linear regression analysis showed that weight, sex, education, patient's employment status, duration of hemodialysis, hemodialysis per week and membership in APRP and taking supplementary medications have a significant statistical association with the nutritional status of hemodialysis patients (P-Value <0.05).

Conclusion: Given that the nutritional status was mild to moderate in the most hemodialysis patients; therefore, accurate and proper diet planning and nutrition counseling to patients can be helpful and effective.

Key words: Hemodialysis, Nutritional Status, Subjective Global Assessment (SGA)

Introduction

The disease is one of the most important health barriers that, by changing the vital functions of the body, lead to a person's distance from the health condition [1]. Among the illnesses, chronic diseases, which have an increasing outbreak in the world due to the development of therapeutic and reduced mortality rates, with a long process, patients need to be cared for, supervised, and reinstated [2]. Chronic diseases are the biggest problem in the health care system and occur in any age group, economic, social and cultural level [3]. Chronic diseases today are the main cause of health problems in developed countries [4]. Chronic kidney disease (CKD) is also among the chronic diseases, which is one of the major problems that most organs of the body are affected by uremic disease [5]. The increasing incidence of this disease is a sign of its importance in community health. According to statistics, the disease affects 16.8 percent of the population aged 20 and over in the United States [6] and it is expected that we will see a 44 percent increase in the prevalence of this disease in all age groups in the coming years globally [7]. Recent advances in medical science and the possibility of kidney transplantation have opened hope for these patients.

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The experience gained during this brief period of time has increased our knowledge and awareness about the problems of this group of patients and the factors affecting their mortality. But all of these patients are not able to get the kidney transplant [8]. Therefore, many patients, due to the conditions for the prohibition of kidney transplantation, are required to wait for a transplant, and because of transplant rejection, they need dialysis to save their lives [6]. For this reason, about 90 percent of people with this disease are undergoing hemodialysis [9]. In addition, most patients will often suffer from poor nutritional status and poor quality of life, due to the need for long-term hemodialysis with frequent 3 times a week. Protein-energy malnutrition is common among hemodialysis patients and is one of the most important factors in cardiovascular disease in hemodialysis patients [10]. Based on this, nutritional assessment of patients is essential for identifying the nutritional needs of different body tissues and their supply. Of course, if the patient is unable to swallow or have a proper level of consciousness (such as those who are admitted to the intensive care unit) or because of nausea or anorexia, they are reluctant to eat food (such as cancer patients), Nutritional interventions are intestinal or venous. Nutrition in patients undergoing hemodialysis also has a major impact on their treatment and their fate, and for these patients to develop proper nutritional conditions, malnutrition prevention or modification is a major nutritional goal. In fact, nutritional assessments are very effective for maintaining quality of life, improving health and reducing the complications of diseases, reducing length of hospitalization and reducing the cost of treatment [11, 12].

Unfortunately, there is no accurate information on malnutrition status among hospitalized patients in Iran, Studies indicate that between of 30% to 50% of patients at the time of admission to the hospital are afflicted with protein-energy malnutrition and 25% to 30% of them develop while staying in a hospital [13]. In Europe and the United States, between 50% and 40% of hospitalized patients at the time of admission are malnourished, and these figures are even more pronounced among the elderly. On the other hand, malnutrition intensifies during admission, which is related to underlying diseases or the result of social psychosocial factors [14]. So far, Kermanshah University of Medical Sciences has not completed a comprehensive study on the prevalence of energy-protein malnutrition in hemodialysis patients and only a limited number of studies have shown that in 51% -70% of patients with hemodialysis, there is a lack of energy or protein intake [15]. Meanwhile, kidney disease is one of the diseases that cannot be controlled without nutritional support and only through medical treatments.

Therefore, kidney patients should be monitored permanently, especially those with kidney disease, with other underlying problems, such as diabetes, high blood pressure, high blood lipids, cardiovascular disease, and weight disorders; Therefore, due to the importance of this problem and its preventable nature, the researcher decided that with a detailed and comprehensive study, a research entitled " assessment of nutritional status of hemodialysis patients and its associated factors using subjective global assessment (SGA) in Kermanshah city (Iran).

Methods

The present study is a cross-sectional descriptive-analytic study in which the nutritional status of hemodialysis patients and its related factors in hemodialysis department of Imam Reza hospital in Kermanshah in 2016 was investigated. The sample size was 250 patients who were referred to hemodialysis department of Imam Reza hospital of Kermanshah who were selected by census method. The inclusion criteria included the age of at least 18 years old, a history of at least 6 months of hemodialysis, and a maximum of 3 times per week, no hospitalization, outpatient visits and no intravenous or intestinal nutrition at the time of the study. Exclusion criteria include: Failure to collaborate on the continuation of the study and the death of the patient.

The data gathering tools in this study was a two-part questionnaire, the first part of which was related to demographic factors and factors related to the nutritional status of hemodialysis patients, and the second part relates to the subjective malnutrition scale with dialysis-malnutrition score (DMS). The first part of the questionnaire, which was made by the researcher, consists of two parts: the individual-societal factors including: age, sex, marital status, place of residence, educational level, employment status, family income, spouse's education level, spouse's employment status, status Life, housing status, number of family members, and membership in the society for the support of kidney patients, as well as nutritional status factors including hemodialysis duration, hemodialysis per week, kidney transplantation history, weight changes, duration of knowledge of the condition kidney disease, associated diseases and taking supplementary medications.

In the second part of the questionnaire, the researcher, after confirming the validity of the DMS form completion by a nutrition expert, has been collecting information based on the relevant form (subjective malnutrition scale with dialysis-malnutrition score (DMS)). The scale consists of two parts: evaluating the clinical history and physical examination of the patient. Initial studies based on the validity of comprehensive mental scale as a tool for screening the nutritional status of patients were performed. Validity and reliability of this scale have been confirmed in various studies [16-21]. In

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evaluating the patient's history by means of a comprehensive mental device, five subsets including weight changes in the past 6 months, diet intake, gastrointestinal symptoms, functional capacity, and other associated diseases to the nutritional status of the patient and in physical examination, loss of subcutaneous fat tissue and muscle wasting were investigated. In the DMS form, there is no component related to the presence of edema or ascites [22].

To assess the patient's weight changes, any reduction or increase in weight of the patient during the last 6 months as well as the current weight of the patient has been recorded. All weight data are collected through patient records, patient interviews and weighing scales with the digital balance available in the department (DS200 model calibrated every three months by a representative of the Dara electronics company). In a diet study, the patient's diet in the past 24 hours, unchanged, has a solid diet lower than the recommended dose for the patient, a diet of liquids, a low calorie diet (soups and herbal based foods such as hives, vegetable and all types of cereals) and hunger have been investigated. Gastrointestinal problems, such as nausea, vomiting and diarrhea, have occurred in the past 2 weeks based on the patient's report. To determine the status of the functional capacity, patients were also asked to describe their physical abilities, such as normal activity, difficulty with heavy activity (fast walking, running, cycling, swimming, and other heavy and heavy aerobic activities), difficulty with regular activity (such as doing homework, shopping, short walking), difficulty light activity (such as walking and standing) or resting on the bed and moving with a chair ridden [23, 24].

Finally, the presence of associated diseases with nutritional needs has also been studied using the Charlson associated diseases Index and the duration of hemodialysis. This index includes 19 conditions that each disease is rated according to its potential impact on mortality as follows: Myocardial infarction, congestive heart failure, peripheral vascular disease, cerebrovascular disease, dementia, chronic obstructive pulmonary disease, connective tissue disease, peptic ulcer disease, mild liver disease, non-complicated diabetes (score 1), hemiplegia, moderate to severe kidney disease, Diabetes with end-organ damage, any type of tumor (over the past 5 years), lymphoma, leukemia (score 2), moderate-severe liver disease (score 3), metastatic solid tumors, AIDS (score 6). Scores derived from the Charleson Index can be matched to the age. So that every decade of age (starting at age 50) is considered as an additional score, which is as follows: 5 = 99-90, 4 = 89-80, 3 = 79-70, 2 = 69- 60, 1 = 59-50 and 0 = Age less than 50 years. The total score of the sum of scores for each associated diseases is obtained, whose range is in the case of non-matching age of 0 to 37, and if the match is between 0 and 43. Finally, scores were ranked as four degrees of illness 0, 1-2, 3-4, 5 ≤. Diseases recorded in patients' files or illnesses treated as a disease are considered as associated diseases. Higher scores represent the greater number of associated diseases [25].

The second part is related to physical examination of patients. Subcutaneous fat tissue has been studied in two areas (below eyes and around the muscles of the triceps and biceps of the arm) and then the results of the survey were calculated in each area, and then the sum and the mean of them were calculated. Finally, according to the score, it was classified in one of three categories: severe reduction (score 5), average decrease (score 3) and unchanged (score 1).

In the study of muscle wasting, the areas (temporal, clavicle, scapula, ribs, quadriceps, knee, interosseous) were examined and the results of the study were calculated for each area and their mean and average Then, according to the points earned in one of three categories: severe wasting (score 5), mild to moderate (score 3) and unchanged (score 1) [26]. Each component of the 5-score SGA was awarded from 1 to 5 score. If each component was completely normal, score 1 and, if they were the most severe, were rated 5 scores. So the hemodialysis score of each person can range from 7 to 35.

In this study, if the score was 7-13, the nutritional status of the normal patient was considered. If the score ranges between of 14-23, the patient has a mild to moderate malnutrition and if the score ranges from 24 to 35, the patient is considered to have severe malnutrition [18]. Data were collected and analyzed using Stata14. To evaluate the association between score of nutritional status of hemodialysis patients and related factors, Univariate and multiple linear regression analysis were employed. Finally, the crude and adjusted β with 95% confidence interval (CI) were calculated. And also P-Value <0.05 was considered as a significant level.

Results

In our study, 250 patients referred to hemodialysis department of Imam Reza Hospital of Kermanshah were examined. The means (S.D) of age and weight of patientsunder study were 44.89 (13.90) and 52.50 (7.54); respectively. Also, 56.8% (142) of patients were male and 43.2% (108) were women. In this study, 32.4% (81) and 67.6% (169) of patients were single and married; respectively. The results of this study show that 14/7% of our patients were diabetic, while 53/9% of them were hypertensive and 27.3% of them had both diseases. (**Table 1**)

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Table 1. Demographic Characteristics of Hemodialysis Patients Under Study

Quantitative Variables		**Number**	**Mean**	**S.D***	**Minimum**	**Maximum**
Age (Year)		250	44.89	13.90	19	70
Weight (Kg)		250	52.50	7.54	36	70
Qualitative Variables		**Number**	**%**			
Sex	Male	142	56.8			
	Female	108	43.2			
Marital Status	Single	81	32.4			
	Married	169	67.6			
Education level	Non –Academic	196	78.4			
	Academic	54	21.6			
Patient's Occupation Status	Employed	140	56			
	Unemployed	110	44			
Wife's Employment Status	Employed	73	29.2			
	Unemployed	92	36.8			
	Unknown	85	34			
Place of Residence	City	215	86			
	Village	35	14			
Type of Housing	Rental	23	9.2			
	Personal	227	90.8			
Monthly Income	<10,000,000 Rails	61	24.4			
	>10,000,000 Rails	189	75.6			
Household of Size	≤5	45	18			
	>5	205	82			
History of Kidney Transplant	Yes	94	37.6			
	No	156	62.4			
Duration of Kidney Disease (Months)	≤12	39	15.6			
	>12	211	84.4			
Duration of Hemodialysis (Year)	> 1	5	2			
	1 -5	151	60.4			
	5 -10	69	27.6			
	10 -15	25	10			
Hemodialysis per Week (Number)	≤2	10	4			
	3	240	96			
**Membership in APRP	Yes	220	88			
	No	30	12			
Taking Supplementary Medications	Yes	250	100			
	No	0	0			

*S.D: Standard Deviation

** APRP : Association for the Protection of Renal Patients

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Table 2 shows nutritional status of hemodialysis patients understudy using subjective global assessment (SGA) and its different dimensions. As it is shown, the mean and S.D of score obtained from the SGA questionnaire 250 hemodialysis patients under study were 15.84 and 2.02; respectively. Also, based on the score obtained from the questionnaire 5.6% (14) patients had a normal nutritional status and also 94.4% (236) had mild to moderate nutritional status.

Univariate linear regression analysis was applied to determine the effect of factors affecting the

Table 2. Nutritional Status of Hemodialysis Patients Under Study Using Subjective Global Assessment (SGA) and Its Different Dimensions

Variables	Number	Mean	S.D *	Minimum	Maximum
Weight Changes over the Past 6 Months	250	2.14	0.40	1	3
The Amount of Diet Intake (Last 24 Hours)	250	2.04	0.44	1	4
Gastrointestinal Symptoms (In the Last 2 Weeks)	250	1.16	0.61	1	5
Functional Capacity	250	2.14	0.48	1	3
Associated Disease	250	3.61	0.60	1	4
Reduce Fat Stores or Lose Subcutaneous Fat	250	2.40	0.49	2	3
Symptoms of muscular Atrophy	250	2.34	0.47	2	3
Total Score of SGA Questionnaire	250	15.84	2.02	11	23

nutritional status of hemodialysis patients. In order not to ignore any important variables, the first significance level for α error was set at 0.2. The results of this analysis showed that variables of weight (Kg), sex, education, patient's employment status, wife's employment status, type of housing, household of size, duration of hemodialysis (Year), hemodialysis per week (Number), membership in APRP and taking supplementary medications have a significant effect on the nutritional status of hemodialysis patients **(P-Value <0.20).** For example**,** the value of β for weight was - 0.057 (CI 95%: - 0.090 **to** - 0.024), this means that each one kilogram of weight gain causes the mean score of SGA decreased by an average of 0.057 units (**Table 3**). After Univariate linear regression analysis, in order to eliminate potential confounding variables, we introduced all the significant variables in Univariate linear regression analysis (P<0.2) simultaneously into a multiple linear regression model. In the multiple linear regression model, using the stepwise method (backward stepwise) and after adjusting for the confounders, variables of weight, sex, education, patient's employment status, duration of hemodialysis, hemodialysis per week and membership in APRP and taking supplementary medications have a significant statistical association with the nutritional status of hemodialysis patients **(P-Value <0.05).** For example**,** the value of β for sex was- 0.85 (CI 95%: - 1.27 **to** - 0.44), this means that mean score of SGA in women is 0.85 unit lower than men if all other variables remain constant (**Table 4**).

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Table 3. The Association Between Nutritional Status of Hemodialysis Patients and Its Associated Factors by Univariate Liner Regression Model

Variable		β	95% CI	P-Value
Age (Year)		0.0001	- 0.018 **to** 0.018	**0.991**
Weight (Kg)		- 0.057	- 0.090 **to** - 0.024	0.001
Sex	Male	Reference	-	0.019
	Female	-0.605	- 1.11 **to** - 0.101	
Marital Status	Single	Reference	-	**0.214**
	Married	-0.340	-0.878 **to** 0.197	
Education level	Non -Academic	Reference	-	0.013
	Academic	0.765	0.159 **to** 1.372	
Patient's Occupation Status	Employed	Reference	-	0.016
	Unemployed	0.619	0.116 **to** 1.122	
Wife's Employment Status	Employed	Reference	-	0.001
	Unemployed	-0.865	- 1.393 **to** - 3.338	
Place of Residence	City	Reference	-	**0.967**
	Village	0.015	-0.712 **to** -0.742	
Type of Housing	Rental	Reference	-	0.046
	Personal	0.881	0.015 **to** 1.748	
Monthly Income	<10,000,000 Rails	Reference	-	**0.970**
	>10,000,000 Rails	- 0.011	- 0.599 **to** 0.576	
Household of Size	≤5	Reference	-	0.002
	>5	1.029	0.385 **to** 1.673	
History of Kidney Transplant	Yes	Reference	-	**0.814**
	No	-0.062	- 0.583 **to** 0.458	
Duration Kidney Disease (Months)	≤12	Reference	-	**0.103**
	>12	0.574	- 0.117 **to** 1.266	
Duration of Hemodialysis (Year)	> 1	Reference	-	**-**
	1 -5	4.337	2.785 **to** 5.889	<0.001
	5 -10	5.667	4.085 **to** 7.247	<0.001
	10 -15	6.6	4.927 **to** 8.272	<0.001
Hemodialysis per Week (Number)	≤2	Reference	-	0.003
	3	1.920	0.654 **to** 3.186	
Membership in APRP	Yes	Reference	-	<0.001
	No	-2.095	- 2.826 to -1.363	
Taking Supplementary Medications	Yes	Reference	-	<0.001
	No	0.157	15.592 **to** 16.095	

CI : Confidence Interval
β : Coefficient of Regression

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Table 4. The Association Between Nutritional Status of Hemodialysis Patients and Its Associated Factors by Multiple Liner Regression Model

Variable		β	95% CI	P-Value
Weight (Kg)		0.05	0.01 – 0.09	**0.016**
Sex	Male	Reference	-	**<0.001**
	Female	- 0.85	- 1.27 **to** - 0.44	
Education level	Non -Academic	Reference	-	**0.002**
	Academic	-0.79	-1.28 **to** - 0.30	
Patient's Occupation Status	Employed	Reference	-	**<0.001**
	Unemployed	1.61	1.08 **to** 2.14	
Duration of Hemodialysis (Year)	> 1	Reference	-	**-**
	1 -5	8.74	7.53 **to** 9.96	**<0.001**
	5 -10	8.54	7.54 **to** 9.56	**<0.001**
	10 -15	10.14	8.78 **to** 11.51	**<0.001**
Hemodialysis per Week (Number)	≤2	Reference	-	**0.004**
	3	1.19	0.38 **to** 2.001	
Membership in APRP	Yes	Reference	-	**<0.001**
	No	-1.22	- 1.86 to – 0.58	

CI : Confidence Interval
β : Coefficient of Regression

Discussion

Malnutrition is a frequent complication which affects quality of life and is associated with increased risk of mortality and morbidity in maintenance hemodialysis patients [27]. In fact, nutritional assessment is very effective in improving the quality of life, promoting health and reducing the complications of diseases, reducing length of hospitalization in treatment centers and reducing the cost of treatment [5, 12]. The aim of this study was to evaluate the nutritional status of hemodialysis patients with SGA and its related factors in Imam Reza Hospital in Kermanshah in 2016. The results of this study showed that the means of age and weight of patients under study were 44.89±13.90 and 52.50 ±7.54; respectively. Also, 56.8% (142) of patients were male and 43.2% (108) were women. In the findings of Mohammed et al. study in 2015, the mean age of hemodialysis patients was 51.16 ± 15.03 [28] and in the study of Tayyem and Mrayyan, the mean age of hemodialysis patients was 43.9 ± 14.6 and of 178 patients, 94 cases were female and 84 cases were male [29]. In the study of Amir Khanlu et al. in Gorgan in 2015, the mean age of hemodialysis patients was 55.59 ± 17.29 years with a history of dialysis for at least 6 months and a maximum of 288 months, and their mean weight was 95.9 ± 16.59 65 [30].

The results of this study show that 14/7% of our patients were diabetic, while 53/9% of them were hypertensive and 27.3% of them had both diseases. The results of the Amir Khanlu et al. study, showed that 34.48% of hemodialysis patients, had diabetes, 4.4% hyperlipidemia, 1.8% had coronary artery disease, 1 person had Alzheimer's and 1 person with Down syndrome [30]. In a study by Mohammed et al. 32% of patients had diabetes, 68% had hypertension and 23% had coronary artery disease [28]. Also, the results of the study Vansantha et al. showed that 27.27% of patients with hemodialysis had diabetes, 54.54% had hypertension and 18.18% had both of them. The results of these studies are consistent with the present study and this indicates high levels of diabetes and hypertension in hemodialysis patients. Therefore, these two diseases can be the cause of CKD and need to be hemodialized.

The results of my study show, the mean of score of SGA were 15.84 ±2.02. Of the 250 hemodialysis patients under study, 6.5% of patients had normal nutritional status and 94.4% had mild to moderate malnutrition. On the other hand, SGA score in women was significantly lower than in men, which shows malnutrition rates in male patients more than female patients. Amir Khanlu et al. in their study showed that 29.66% of patients had normal nutritional status, 69.82% had mild to moderate

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malnutrition and 9% had severe malnutrition [30]. Also, the results of a study by Morais et al. in 2005 in Brazil showed that 90.9% of patients had mild to moderate malnutrition and 4.6% had severe malnutrition [31] which is in agreement with the results of this study. While the mean score of malnutrition in the study of Mohammed et al. 18.61 ± 6.17 and in Soodeh et al. in 2010, in Iran, 16.6 ± 5.19 [32], while the mean score of malnutrition in the study of Mohammed et al. 18.61 ± 6.17 [28] and in Soodeh et al. In 2010, in Iran, 16.6 ± 5.19 [32] and in the Vansantha et al. study in India in 2011 was 17.9 ± 4.85 [23]. In all of these articles, malnutrition rates were higher than our study. The reason for the difference in these results can be due to the fact that several factors can affect the level of malnutrition in hemodialysis patients that, these factors vary in different studies in different regions and cultures.

The present study shows no significance between malnutrition and age of the patients, this agrees with study of Mohammed et al. [28] and Vansantha et al. [23]. Also, the results of this study showed that among the variables studied, gender, weight, educational level, employment status, hemodialysis duration, number of dialysis per week, and membership in the Association for the Protection of Renal Patients with SGA score and malnutrition in Hemodialysis patients have a significant relationship. According to the results of this study, the malnutrition rate was higher in men than in women. Weight gain has a direct correlation with malnutrition in hemodialysis patients, so that in patients with a higher weight, the level of malnutrition is higher. The level of education has been reversed with the severity of malnutrition and malnutrition has significantly decreased with increasing education. The rate of malnutrition in unemployed people is higher than those employed. Also, the results of our study showed that with increasing duration of hemodialysis, the level of malnutrition has increased and as well as the severity of malnutrition in patients whose dialysis was 3 times a week more than patients who were dialyzed twice a week. The rate of malnutrition has also been higher in patients who have been members of the Association for the Support of Kidney Patients. In a study by Marcén et al. in Spain in 1997, the prevalence of malnutrition was higher in men than in women [33], which is in agreement with the present study. But in a study by Janardhan et al. in India in 2011 with a view to assessing the nutritional status of patients with end-stage renal failure in 66 hemodialysis patients, there was not a significant difference between men and women for malnutrition [23]. Also, Mohammed et al. showed in their study that there was no statistically significant relationship between malnutrition and gender [28] that the results of these studies contradict this study. The reason for this difference can be due to of the difference in the research method and the sample size. The results of our study showed that malnutrition rate in hemodialysis patients increases with weight gain. In the study Alharbi et al. in Saudi Arabia in 2012, there was a significant statistical relationship between the nutritional status of hemodialysis patients and their weight [34] which is in agreement with the present study. But in some studies such as Mohammed et al. [28] and Demirağ et al. [35] in their study showed that there was no significant relationship between nutritional status and BMI of hemodialysis patients and in Vansantha et al. showed that there was a significant negative correlation between weight of hemodialysis patients and their nutritional status and malnutrition in patients has decreased with weight gain [23] that these results contradict this study. The reason for this difference can be due to cultural and nutritional differences in different regions.

The other results of the present study were that the level of malnutrition has significantly decreased with increasing education level. Also, the rate of malnutrition among unemployed people is higher than those employed. In the results of two studies Al-Jahdali et al. in 2010 [36] and Alharbi et al. in 2012 in Saudi Arabia as well as study by Mohammed et al. [28] showed that there was a significant relationship between the education level and the status of occupational patients with their nutritional status [36,37] which contradicts the results of this study. The reason for this difference is probably due to cultural and educational differences among different communities in the study. Therefore, further studies are needed to obtain more accurate results in this regard. In our study, we found that with increasing hemodialysis duration, malnutrition rates have also increased. In studies Vansantha et al. [23] Al-Jahdali et al. [36] Alharbi et al. [37] and Ashabi et al. [38], the results showed that there was no significant relationship between hemodialysis duration of patients and their nutritional status which contradicts the results of this study. The reason for this difference may be due to differences in the method of study and cultural differences in different societies as well as other factors affecting the nutritional status, such as education, etc. Also, the results of this study showed that the severity of malnutrition in patients whose dialysis rate was 3 times a week was more than those who were dialyzed twice a week that these results are consistent with the study results of Mohammed et al.[28].

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Conclusion

The results of this study showed that the nutritional status of hemodialysis patients referring to Imam Reza Hospital in Kermanshah compared to other studies was at the optimum level and it can be due to the culture and training of the hospital to the referrals to the center. On the other hand, considering that malnutrition rates were mild to moderate in most patients; therefore, accurate and proper diet planning and nutrition counseling to patients can be helpful and effective.

Consent for publication

Not Applicable

Ethics approval and consent to participate

The study was approved by Ethics Committee of Kermanshah University of Medical Sciences. We obtained informed written consent from all participants

Availability of data and material

The identified datasets analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

The study was funded by Kermanshah University of Medical Science grant (No. 95534)

Authors' contributions

BH, SM, MF, AF, MC and KV contributed in designing the study MF, AF, KV, BH, MC and SM collected the data, and analyzed by KV, MC, BH, AF, SM and MF. The final report and article were written by BH, SM, MF, AF, MC and KV. The paper were read and approved by all the authors

Acknowledgements

The authors appreciate all co-workers of deputy of research and technology of KUMS and all the patients who patiently participated in our study. The authors would like to appreciate all the patients who participated in the study. We highly appreciate the Clinical Research Development Center of Imam Reza Hospital for kindly advices.

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