Nutrıtıonal knowledge of hemodıalysıs patıents ın unıversıty hospıtals ın Fınland and Turkey

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ABSTRACT

***Objective**:* Nutrition is one of the substantial modifiable risk factors in the prevention and control of many diseases such as chronic kidney diseases. Nutrition knowledge can thus help in prevention. The objective of this study is to assess nutritional knowledge of patients on hemodialysis and determine if this differs and was linked to duration of the therapy in Finland and Turkey.

***Methods**:* The study was conducted in one university hospital dialysis center each in Finland and Turkey with hemodialysis patients with an age of ≥18 years. A questionnaire about demographic and disease characteristics and nutritional knowledge was administered face-to-face. Anthropometric measurements (body weight, edema-free dry weight, height, body mass index) were evaluated.

***Results**:* The study group consisted of 120 adults, 50 patients (14 female, 36 male) from Finland and 70 patients (21 women, 49 men) from Turkey. The mean nutritional knowledge score was 10.1 ± 3.11 for the Finnish patients and 9.2 ± 3.32 for the Turkish patients ($p>0.05$). There was a positive correlation between the nutritional knowledge score and body weight in Turkey and between the nutritional knowledge score and duration of dialysis in Finland ($p<0.05$).

***Conclusions**:* In both countries, the majority of patients with high nutritional knowledge scores (11-15 points) stated that they had received nutritional training from a dietician (in Finland: 58.3%, in Turkey: 66.7%). Thus training and mobilization of dietitians should be the main approach used to increase nutritional knowledge of dialysis patients.

Key Words: Hemodialysis, nutritional knowledge, chronic kidney disease

INTRODUCTION

Chronic kidney disease (CKD) is characterized by a slow, progressive, irreversible loss of exocrine and endocrine function of the kidney. Patients with an end-stage renal disease usually undergo dialysis (1). Dialysis affects the personal, professional, and social life of patients. Health outcomes in dialysis patients are affected by nutritional intake. However, one of the most difficult changes for patients to make is changing their diet and fluid intake habits. Dietary restrictions often result in limited food choices and unappetising meals. However this is essential for keeping fluid, serum phosphorus and potassium levels within healthy ranges (2). Poor appetite influences quality of life on a large scale (3).

When dialysis removes from the blood substances hazardous to the body, a loss of nutrients is also common (4). About 40% of patients undergoing maintenance dialysis suffer from varying degrees of protein-energy malnutrition. After fluid removal, most hemodialysis (HD) patients have a tendency to lose lean tissue and gain adipose tissue, particularly over the first two years of HD (5). This is a problem of substantial importance because many measures of nutritional status correlate with the risk of morbidity and mortality (6).

The global estimated prevalence of CKD is 13.4% (11.7-15.1%), and the number of patients with end-stage kidney disease needing renal replacement therapy is estimated to be between 4.902 and 7.083 million (7). The European Renal Association-European

Dialysis and Transplant Association (ERA-EDTA) reported that the prevalence of CKD in European countries ranges from 3% to 17% (8). According to the Chronic Renal Disease In Turkey (CREDIT) study, the prevalence in Turkey was 15.7% a decade ago (9). Another Finnish study evaluated the temporal trend in estimated glomerular filtration rate (eGFR) of subjects aged from 25 to 74 years between two cross-sectional population surveys in 2002 and in 2007 and the mean eGFR decreased significantly during 2002–2007 in both sexes; however, CKD stage 3–5 increased in women. The prevalences of CKD stage 3–5 in men were 1.4% in 2002 and 1.9% in 2007, and in women 1.8% in 2002 and 3.1% in 2007 (10). In the 65–74-year age stratum, Norway and Finland have lower prevalences than other European countries (9).

Important components of nutritional therapy for CKD are the appropriate amount of energy and protein, ensuring and maintaining proper body weight, and correct quantities of liquids, as well as vitamins and minerals, especially sodium, phosphorus, and potassium (11). One-to-one nutritional counselling sessions and teaching guidelines bring about improved nutritional knowledge (12,13). It has been found that nutritional habits affect health and well-being among hemodialysis patients (14). Dietary restrictions are important for preventing malnutrition, cardiovascular diseases, and anemia and in reducing nausea, vomiting, pain and pruritus to a minimum (14-16). Nutritional knowledge level is one of the most predictive parameters in the morbidity and mortality rates of diseases. It was decided to conduct this study in order to compare the nutritional knowledge level of hemodialysis patients from two different countries, Finland and Turkey. So the objective of this study is to analyse the nutritional knowledge of the patients on hemodialysis and assess if the knowledge differs based on the therapy applied in each country.

METHODS

Study conditions and population

The study was conducted in two university hospital dialysis centers – Oulu University Hospital in Finland and Ankara Baskent University Hospital in Turkey, between September 2015 and December 2016. The study included 50 Finnish and 70 Turkish hemodialysis patients with an age of ≥18 years. All patients on hemodialysis treated in the morning and afternoon shifts were invited to join the study. Written informed consent was obtained from all patients before participation. The protocol was approved by the ethics committees of both participating institutions.

Collected Data

Questionnaire

An interviewer-administered questionnaire assessed patients' nutritional knowledge. There were two parts to the questionnaire. In the first part, there were questions about demographic and disease characteristics. Patient age, education level, working status, primary renal problem, relatives with CKD, time on dialysis, time since diagnosis of kidney disease, comorbidities, kidney transplantation status, nutritional education status were questioned by one of the authors while the subjects were on hemodialysis. Educational status was grouped into two categories: less than university and university or greater. In the second part, there were questions related to nutritional knowledge.

This questionnaire is composed of 6 multiple choice questions and 9 true/false questions reflecting knowledge of 4 nutrients relevant to dialysis patients: phosphorus, protein, sodium, potassium as well as knowledge about medical complications. For every correct answer, 1 point was given. Subjects obtained between 0-15 points. After the calculation, participants were divided into three groups based on their scores: 0-5 points, 6-10 points, and 11-15 points.

Anthropometric Measurements

The body weight was measured before and after the HD process and and estimated as edema-free body weight (dry weight). Body mass index (BMI) was obtained by dividing dry weight in kilograms by the square of the height in meters. The BMI was evaluated by the WHO classification for the general population (17).

Statistical Analysis

The Statistical Package for the Social Sciences (SPSS) version 21.0 was used to perform the statistical analysis. Descriptive statistics that used means, medians, proportions, standard deviation, and confidence intervals were performed on all variables where appropriate. Pearson correlation was applied to correlate between the parameters. Comparison of paired and independent means (T test), and the Chi Squared test was used for categorical variables. All statistical tests were 2-sided and a p value of <0.05 was considered statistically significant.

RESULTS

The sample consisted of 120 adults (ages between 18 and 86 years), 50 patients (14 female, 36 male) from Finland and 70 patients (21 women, 49 men) from Turkey. The mean age was 61.2 ± 13.9 years for the the Finnish patients and 54.3 ± 14.6 years for the Turkish patients. The BMI mean was 26.8 ± 5.90 kg/m^2 for Finnish and 25.1 ± 4.99 kg/m^2 for Turkish patients. According to the WHO classifications, 3.4% of the patients were underweight (BMI≤18.5 kg/m^2), 50.4% were normal (BMI=18.5-24.9 kg/m^2), 21.8% were overweight (BMI is between 25.0-29.9 kg/m^2) and 24.4% were obese (BMI ≥ 30.0 kg/m^2). In Finland,54.0% of the patients had studied less than university and in Turkey 85.7% of the patients had not finished university. 16.3% of Finnish patients had a relative with chronic kidney disease, compared to 30% in Turkey. Finnish patients had taken dialysis for a total of 12.1±1.54 hours per week and, Turkish patients 11.1 ± 1.99 hours per week. The duration of dialysis was 40.8 ± 30.1 months in Finnish patients and 82.7 ± 78.6 months in Turkish patients. 83.7% of Finnish patients and 68.6% of Turkish patients had at least one comorbidity. The mean nutritional total score of Finnish patients was 10.1 ± 3.11 whereas for Turkish patients it was 9.2 ± 3.32 points ($p>0.05$) (Table 1).

In both countries, the determinants of CKD are shown in Table 1. 78% of the patients had at least one comorbidity. Hypertension was the most common disease concomitant to the kidney disease, followed by heart diseases and diabetes mellitus.

Table 1. Demographic Characteristics of Patients

	FINLAND N (of 50) (%)	TURKEY N (of 70) (%)
Gender		
Women	14 (28.0)	21 (30.0)
Men	36 (72.0)	49 (70.0)
Education		
<University	27 (54.0)	60 (85.7)
≥University	23 (46.0)	10 (14.3)
Relatives with CKD history	8 (16.3)	21(30.0)
Etiological Factors		
Kidney Diseases (vesicoureteral reflux, morphological deformation etc.)	23 (46.0)	45 (64.3)
Diabetic Nephropathy	15 (30.0)	15 (21.4)
Hypertensive Nephropathy	1 (2.0)	10 (14.3)
Unknown	11 (22.0)	0 (0.0)
CKD Comorbidities	41 (83.7)	48 (68.6)
CKD Comorbidities		
Hypertension	44 (28.6)	26.8 (26.8)
Heart diseases	36 (23.4)	23.4 (23.4)
Diabetes mellitus	35 (22.7)	22.7 (22.7)
Thyroid disease	7 (4.5)	4.5 (4.5)
Other	32 (20.8)	22.6 (22.6)
	X̄±SS	**X̄±SS**
Age (years)	61.20 ± 13.87	54.34 ± 14.57
BMI (kg/m^2)	26.83 ± 5.90	25.13 ± 4.99
Dialysis hours per week	12.09 ± 1.54	11.11 ± 1.99
Duration of Dialysis (months)	40.84 ± 30.08	82.71 ± 78.55
Total nutrition knowledge score	10.14 ± 3.11	9.22 ± 3.32

CKD: Chronic Kidney Disease, BMI: Body Mass Index

Table 2 shows the relationship between nutritional knowledge score by BMI and educational status. Total scores were grouped into three categories: 0-5, 6-10 and 11-15 points. In Finland 36.0% of the patients who had 11-15 points have studied less than university and 64.0% have studied university or greater. In Turkey 83.3% of the patients who had 11-15 points have studied less than university and 16.7% have studied university or greater. From the Finish patients who had educated about nutrition, among the patients who got 0-5 points 33.3% are educated by nurses, 66.7% of them educated by dietitians. Among the patients who got 11-15 points; 8.4% were educated by doctors, 33.3% by nurses, 58.3% by dietitians. From the Turkish patients who had educated about nutrition, among the patients who got 0-5 points 14.3% are educated by doctors, 85.7% of them educated by dietitians. Among the patients who got 11-15 points; 30.3% were educated by doctors, 3.0% by nurses, 66.7% by dietitians (Table 2).

Table 2. The distribution of the mean total nutritional knowledge of the patients by BMI and educational status

	FINLAND				TURKEY			
	X̄±SS	X̄±SS	X̄±SS		X̄±SS	X̄±SS	X̄±SS	
Total Score	**0-5**	**6-10**	**11-15**	**p**	**0-5**	**6-10**	**11-15**	**p**
Total Score Means	2.66 ± 2.51	8.41 ± 1.36	12.56 ± 1.32	0.000	2.14 ± 2.03	8.34 ± 1.14	12.56 ± 1.12	0.000*
BMI Means	32.20 ± 3.59	25.80 ± 4.87	27.11 ± 6.71	0.204	25.73 ± 4.74	24.28 ± 4.49	26.28 ± 5.67	0.286
	n (%)	**n (%)**	**n (%)**		**n (%)**	**n (%)**	**n (%)**	
Educational status								
< University	3 (%100.0)	14 (%66.7)	9 (%36.0)	0.007	31 (%96.9)	4 (%50.0)	25(%83.3)	0.000*
≥ University	0 (%0.0)	7 (%33.3)	16 (%64.0)		1 (%3.1)	4 (%50.0)	5 (%16.7)	
Education about nutrition								
Doctor	0 (%0.0)	1 (%.2.8)	3 (%8.4)		1 (%14.3)	7 (%16.0)	10 (%30.3)	
Nurse	1 (%33.3)	9 (%34.6)	12 (%33.3)		0 (%0.0)	2 (%4.5)	1 (%3.0)	
Dietititan	2 (%66.7)	16 (%61.5)	21 (%58.3)		6 (%85.7)	35 (%79.5)	22 (%66.7)	

BMI: Body Mass Index
**p<0.05*

It was found that there was positive correlation between the nutritional knowledge score and body weight, BMI, CKD diagnosis period and dialysis period, as well as a negative correlation with age (Table 3).

Table 3. Factors associated with the nutritional knowledge total score

	FINLAND		TURKEY	
	Total Score		Total Score	
	r	p	r	p
Age, years	-0.106	0.463	-0.154	0.204
Body weight, kg	0.142	0.326	0.279	0.019*
BMI, kg/m^2	0.047	0.751	0.164	0.175
Period scineCKD was diagnosed	0.302	0.062	0.218	0.069
Weekly hours of Dialysis	0.334	0.050*	0.140	0.940

CKD: Chronic Kidney Disease, BMI: Body Mass Index
**p<0.05*

DISCUSSION

We compared of dialysis patients in Finland and Turkey. In both countries, chronic kidney failure was the primary cause of CKD. Hypertension was frequent among our CKD patients. Our results were also in concordance with other studies where hypertension was frequent in CKD patients (12,13,18,19).

Research conducted in Italy showed that there is a significant effect of undernutrition on bioelectrical impedance vector analysis(20). Another study showed that patients who received nutritional intervention have improved the physical health components (21). In our study, age, BMI, the length of time since CKD diagnosis, and the duration of dialysis per week were linked to nutritional knowledge.

The most frequent cause of malnutrition in HD patients is poor nutrient intake (22). In HD patients, nutrition counselling and nutritional support positively affect nutritional status (23). There is a relationship between nutritional habits and health and well-being among HD patients (14). Promoting regular contact with a dietitian may result in improved outcomes (24). Patients' conforming with a prescribed diet increases after nutrition education (25). Improvement in patient's knowledge about proteins, fluids, potassium, sodium and phosphorus was associated with levels of creatinine, urea, calcium and phosphorus of end-stage renal failure patients (12). Medical nutrition therapy based on anthropometric, laboratory and clinical parameters and nutrition education is essential for dialysis patients (12). Studies showed that the poorest knowledge is phosphorus compared to other nutrients such as protein, sodium, and potassium (26,27). 61% of patients with hyperphospatemia explained that they consume more phosphorus than they should (28).

The renal dietician plays a vital role; regular dialogue between the doctor and the dietetic team is associated with a decrease in mortality, yetonly 40% of dialysis centers in Europe meet this criterion (29). The patient entering hemodialysis should be

"nutritionally investigated" and the dietitian should supervise nutrient intake.(30) Some studies have found that the provision of both face to face training and training pamphlets increase patients' nutritional knowledge and adherence to dialysis treatment (31). The level of knowledge of the diet in relation to the disease improves in follow up assessments with frequent meetings (32). Avoiding some foods (accepting restrictions) and following the recommended diet are effective measures to control blood nutrients (33). The patients who were required to restrict potassium, phosphorus and fluid tended to have better knowledge of which foods which are high in those nutrients (34).

Our study was limited by its small size and there is no standardized test available in the literature that has been validated to test nutritional knowledge relevant to dialysis patients.

CONCLUSIONS

As in every chronic disease, medical nutrition therapy and nutrition education are extremely important in patients with end-stage renal disease. Adequate and balanced nutrition suitable for hemodialysis treatment prevents worsening of the course of the disease and generally improves the quality of life of patients; mortality and morbidity are also reduced. Therefore, the importance of nutritional knowledge developed with nutrition education in patients receiving hemodialysis treatment is very important and further studies are needed to determine methods of applying dietary restrictions and nutritional education of HD patients in different demographic areas.

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