

Lifestyle of Hemodialysis Patients in Comparison with Outpatients

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ABSTRACT

Introduction: Nowadays, the chronic diseases are known to be associated with lifestyle risk factors. Hemodialysis patients encounter considerable amount of physical, mental and social pressure. Lifestyle is important because it affects quality of life and has important role in prevention. This study aimed to compare the lifestyle of hemodialysis patients and outpatients in health clinics of Tabriz. **Methods:** This was a case-control study on 155 hemodialysis patients and 155 outpatients referring to five dialysis centers and clinics, who met the inclusion criteria. Demographic data and some questions about lifestyle in nutrition, stress, physical activity and smoking were asked. **Results:** The history of hypertension among hemodialysis patients was 34.6% greater than outpatients. High daily salt consumption (more than two tablespoons a day) was 40.5% higher among hemodialysis patients than outpatients. In terms of saturated oil intake, it was 30.8% higher among hemodialysis patients. Problem in communicating with family members was 69.8% higher in hemodialysis patients. In terms of physical activity, 46.4% of outpatients had higher physical activity like walking. **Conclusion:** Lifestyle in different dimensions was associated with chronic kidney disease (CKD); therefore, the officials of health system are recommended to develop a program to combat chronic diseases and integrate it with providing the first-level health services. It seems that public education can have a major role in lifestyle modification and in chronic kidney diseases prevention.

Introduction

Lifestyle is a part of life that most people have control over it and such behaviors often are changeable. In fact, healthy lifestyle would help health promotion and bad lifestyle has negative effects on health. Today, changing lifestyle and gradually obtaining good habits as well as replacing helpful processes instead of harmful ones in life are considered as the most important indicators of health in all its dimensions.¹ Yaghamayi quoted from Thomas et al. that "chronic renal failure has mutual effects on physical, psychological and functional status of individu-

als which causes types of deprivation and lifestyle changes including financial problems, unemployment, restriction in fluid intake and diet, change in familial roles and tasks and reduction in achieving long term goals".² Health status and quality of life are very important concepts for patients with chronic kidney disease (CKD) and those undergoing hemodialysis.² At the end of the next decade, the number of patients with end-stage renal disease, who need dialysis therapy may be doubled. Even in developed countries, there are some problems to cope with this increase. Therefore, there is an urgent need to highlight the importance of modifiable risk factors as a

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basis for treatment strategies to prevent from progression of chronic renal failure disease which should include the expansion of our recent knowledge from a healthy lifestyle.³ Nowadays, lifestyle is raised as one of the major factors affecting health by the health experts and professionals and it is estimated that 7 out of 10 death can be prevented through changes in lifestyle.⁴ Estaji quoted from Phipps that "lifestyle is an approach an individual selected during his life which is a very important factor in physical and mental health and also is affected by culture, race, religion, geographical, economic and social factors, beliefs and opinions".⁵

End-stage renal disease is an important public health issue. There are approximately 440000 patients with end-stage renal disease in the U.S. Moreover, almost 8 million American adults have chronic renal disease that are at the risk of end-stage renal disease and its comorbidities.⁶ Out of 40000 renal patients in Iran, almost 15000 individuals undergo dialysis, 10 percent of whom annually die (about 1500 patients) every year.⁷ Imposed financial costs increased from \$5 million in 1991 to \$12 million in 1998⁸ and also to \$23 million in 2001 in the U.S.⁹ The cost of kidney transplantation and dialysis in developed countries averagely is 50 thousand dollars and World Health Organization has recently estimated the staggering figure of 1.1 trillion dollars for the cost of patients with dialysis in recent decade.¹⁰ Seventy two percent of total health budget in the world is spent for renal disease, diabetes, hypertension and cardiovascular diseases each of which can create the possibility of other disease and exacerbation of the comorbidities.⁴ Among the lifestyle factors, appropriate nutrition is an effective one on renal function. Important nutrients like protein, carbohydrates, fats and sodium are correlated with chronic renal disease.^{11,12} Studies on stress have shown that stress can make some complications leading to progression of chronic renal failure. Stress is directly associated with the risk of chronic renal failure such as hypertension. Furthermore, other studies have pointed out that

stress is correlated with low socioeconomic status and such conditions can be a risk factor for progression of chronic renal disease through association with other socio-mental factors and behaviors such as alcohol consumption, smoking and drug use.¹¹ Some studies showed that those with low physical activity are 93% more at the risk of chronic disease than those with higher physical activity. In addition, several studies have indicated that smokers are more at the risk of chronic renal disease. The prevalence of chronic kidney disease in the industrialized world during past two decades has been doubled and a major part of this increase has been due to lifestyle related factors. The association between obesity, smoking, physical activity and renal chronic disease is of high importance.¹³ This study aimed to compare the lifestyle of hemodialysis patients and outpatients referring to health clinics of Tabriz. It is hoped that using the results of the present study, nurses can help those at risk with controlling the risk factors of chronic kidney disease.

Materials and methods

This was a case-control study and the study population included all the hemodialysis patients (155 people) who referred to dialysis centers of Imam Reza, Sina, Shahid Madani, 29 Bahman and Amirmomenin hospitals and also 155 outpatients referred to clinic of Imam Reza Hospital clinic with the following criteria: having two years of dialysis, no mental illness and ability to communicate. Sampling was done through stratified random and systematic random sampling methods. The researcher faced with low number of patients having primary inclusion criteria and therefore all the study population were selected and enrolled as the samples. The samples of the two groups were matched to each other. Data collection tools in this study was a questionnaire including demographic characteristics and some questions related to lifestyle in nutrition, stress, physical activity and smoking extracted from www.nwph.net/lifestylesurvey/ and were used after

modification. In order to determine the validity and reliability, content validity and test-retest methods were used, respectively ($r = 0.98$). Ethical considerations in this study included obtaining a letter of introduction from the President of Aras International University, providing a letter of introduction to the required centers' officials, introducing the researchers to the study subjects, confidentiality of information, observing the ethical principles and integrity in the use of other resources and studies of other researchers. In addition, the participation in the study was voluntarily, thus a written consent form obtained from all the participants according to the principals of Ethics Committee. This article was extracted from an MSc dissertation. The obtained data analyzed by descriptive statistics using SPSS statistical software, ver

17. P value less than 0.05 was considered statistically significant.

Results

The results of demographic characteristics showed that 60% of hemodialysis patients and 62.5% of outpatients were at the age range of 40-65 years. In terms of place of residence, 92.2% of subjects in both groups lived in cities. Considering economic situation of the family, 45.2 and 46.5% of outpatients and hemodialysis patients had semi-desirable economic status, respectively. The observed difference was statistically significant ($p < 0.001$). There was no statistically significant difference between age, sex, place of living, marital status, education and being the head of the household between two groups.

Table 1. Characteristics of participants in terms of nutrition in two groups

Question	Choices	Hemodialysis patients N(%)	Outpatients N(%)	Statistical indicators
Daily fluid intake	1-6 glasses	120 (62.8)	71 (37.2)	$\chi^2 = 30.81$ $p < 0.001$ $df = 2$
	7-12 glasses	29 (30.5)	66 (69.5)	
	13-20 glasses	6 (28.6)	15 (71.4)	
Daily salt intake (tablespoon)	half	34 (36.2)	60 (63.8)	$\chi^2 = 22.42$ $p < 0.001$ $df = 2$
	1	58 (46.8)	66 (53.2)	
	2	62 (70.5)	26 (29.5)	
Red meat	Always	51 (37.8)	84 (62.2)	$\chi^2 = 17.39$ $p < 0.001$ $df = 3$
	Often	95 (62.1)	58 (37.9)	
	Rarely	8 (47.1)	9 (52.9)	
	Never	1 (33.3)	2 (66.7)	
Saturated vegetable oil	Always	85 (65.4)	45 (34.6)	$\chi^2 = 38.95$ $p < 0.001$ $df = 3$
	Often	61 (48.8)	64 (51.2)	
	Rarely	5 (13.2)	33 (86.8)	
Fresh vegetables	Never	4 (25.0)	12 (75.0)	$\chi^2 = 19.48$ $p < 0.001$ $df = 3$
	Always	22 (33.8)	43 (66.2)	
	Often	99 (53.2)	87 (46.8)	
Fresh fruits	Rarely	34 (65.4)	18 (34.6)	$\chi^2 = 9.26$ $p = 0.026$ $df = 3$
	Never	0 (0.0)	7 (100.0)	
	Always	43 (40.6)	63 (59.4)	
Grains	Often	103 (56.9)	78 (43.1)	$\chi^2 = 80.47$ $p < 0.001$ $df = 3$
	Rarely	9 (47.4)	10 (52.6)	
	Never	0 (0.0)	2 (100.0)	
Grains	Always	7 (78.9)	30 (81.1)	$\chi^2 = 80.47$ $p < 0.001$ $df = 3$
	Often	33 (27.5)	87 (72.5)	
	Rarely	114 (76.5)	35 (23.5)	
	Never	1 (50.0)	1 (50.0)	

In terms of history of diseases, the results showed that 32.7% of outpatients and 67.3% of hemodialysis patients had history of hypertension ($p < 0.001$). 26.5% of outpatients and 73.5% of hemodialysis patients had the history of high blood sugar ($p < 0.001$). 38.3% and 61.7% had the history of high cholesterol in outpatients and hemodialysis patients, respectively ($p = 0.01$). However, no significant difference was found for other history of diseases.

The results related to nutrition, physical activity, stress and smoking are illustrated in tables 1 to 4. Salt ($p < 0.001$), saturated oil ($p < 0.001$) and red meat intake ($p < 0.001$) was higher among the hemodialysis patients. Fluid ($p < 0.001$) and grains consumption ($p < 0.001$) was higher among outpatients (Table 1).

Problem in communicating with family ($p < 0.001$), anxiety in communicating with

important people ($p < 0.001$) and concern about health ($p < 0.001$) were significantly more among outpatients. Coping methods with stress, easy acceptance with problems ($p < 0.001$) and avoiding mental pressure in the workplace ($p < 0.001$) were significantly higher among outpatients; however, prolonged life's discomfort and pressure ($p < 0.001$) was higher among hemodialysis patients (Table 2).

In terms of physical activity, having physical activity such as walking ($p < 0.001$), allocating more days of a week for walking ($p = 0.01$) and having a dynamic physical activity ($p = 0.04$) was higher among the outpatients and there was a statistically significant difference between the two groups (Table 3). Finally, the results of the study showed that smoking was higher among the hemodialysis patients but the difference was not statistically significant ($p = 0.4$) (Table 4).

Table 2. Characteristics of participants in terms of stress and adaptability methods with stress in two groups

Question	Choices	Hemodialysis patients N (%)	Outpatients N (%)	Statistical indicators
Problem in communicating with family	Always	2 (15.4)	11 (84.6)	$\chi^2 = 19.85$ $p < 0.001$ $df = 3$
	Often	31 (60.8)	20 (39.2)	
	Rarely	96 (56.8)	73 (43.2)	
	Never	26 (33.8)	51 (66.2)	
Anxiety in communicating with important people	Always	0 (0.0)	11 (100.0)	$\chi^2 = 18.36$ $p < 0.001$ $df = 3$
	Often	31 (43.7)	40 (56.3)	
	Rarely	94 (59.1)	65 (40.9)	
	Never	30 (44.1)	38 (55.9)	
Concern about health status	Always	4 (18.2)	18 (81.8)	$\chi^2 = 25.95$ $p < 0.001$ $df = 3$
	Often	27 (34.2)	52 (65.8)	
	Rarely	74 (61.7)	46 (38.3)	
Things you could change or can change and those you could not easily accept.	Always	15 (30.0)	35 (70.0)	$\chi^2 = 45.40$ $p < 0.001$ $df = 3$
	Often	55 (41.7)	77 (58.3)	
	Rarely	84 (73.0)	31 (27.0)	
	Never	1 (7.7)	12 (92.3)	
How many working problem you tried to take care based on priority?	Always	23 (37.1)	39 (62.9)	$\chi^2 = 6.45$ $p = 0.091$ $df = 3$
	Often	110 (53.7)	95 (46.3)	
	Rarely	21 (53.8)	18 (46.2)	
	Never	1 (25.0)	3 (75.0)	
Asking others to help you in life's problems?	Always	1 (4.3)	22 (95.7)	$\chi^2 = 54.20$ $p < 0.001$ $df = 3$
	Often	54 (46.6)	62 (53.4)	
	Rarely	93 (69.4)	41 (30.6)	
	Never	7 (18.9)	30 (81.1)	

Table 3. Characteristics of participants in terms of physical activity in two groups

Question	Choices	Hemodialysis patients N (%)	Outpatients N (%)	Statistical indicators
Did you have walking as exercise during past 10 years?	Yes	27 (26.2)	76 (73.8)	$\chi^2 = 35.44$ p < 0.001 df = 1
	No	128 (62.1)	78 (37.9)	
How many days a week do you have walking as exercise?	4 days a week or less	12 (42.9)	16 (57.1)	$\chi^2 = 5.74$ p = 0.01 df = 1
	5 days a week or more	14 (19.4)	58 (80.6)	
Physical activity in past 10 years	High active	97 (49.9)	110 (53.1)	$\chi^2 = 6.19$ p = 0.045 df = 2
	Sedentary	54 (60.7)	35 (39.3)	
	Inactive	4 (33.3)	8 (66.7)	

Table 4. Characteristics of participants in terms of cigarettesmoking, pipe and water pipe (hookah) in two groups

Question	Choices	Hemodialysis patients N (%)	Outpatients N (%)	Statistical indicators
Smoking cigarette in past 10 year?	Yes	31 (54.4)	26 (45.6)	$\chi^2 = 0.49$ p = 0.48 df = 1
	No	124 (49.2)	128 (50.8)	
Smoking pipe and water pipe in past 10 year?	Yes	9 (60.0)	6 (40.0)	$\chi^2 = 0.57$ p = 0.45 df = 1
	No	145 (50.0)	145 (50.0)	

Discussion

This study showed that history of hypertension, high blood sugar and high cholesterol were significantly different between two study groups; however, there was no significant difference between the other disease records. Vupputuri and Sandler showed that patients with chronic kidney disease also had hypertension and diabetes.⁸

In line with this study findings about high intake of salt, saturated oil and red meat among the hemodialysis patients, another study also indicated that dietary combination particularly protein intake is very important.⁶ Accordingly, consumption of carbohydrates and fats should be modified. Thus, combination of reducing sodium intake with modified intake of protein, carbohydrates and fats is a framework for controlling blood pressure for chronic kidney disease. In addition, it was indicated that high intake of protein, carbo-

hydrate, fat and sodium can cause

the progression of chronic kidney disease.¹¹

According to Ritz and Schwenger,¹⁴ high intake of protein and salt can increase the progression of renal disease. Other studies showed that restricting dietary protein reduces the progression of kidney disease, the reduction in sodium intake can reduce blood pressure, high salt intake can exacerbate the progression of kidney disease and salt limitation can prolong and delay its progression.¹⁴ In the present study, high salt and protein intake was seen in hemodialysis patients.

A review study indicated that high salt intake harmfully affect on blood pressure and diet and emphasized that consumption of fruits, vegetables and low-fat foods was associated with blood pressure reduction. Moreover, vegetarian diets were associated with lower blood pressure,¹² which is in accordance with the results of the present study.

In terms of stress, this study showed that outpatients had higher stress and anxiety than hemodialysis patients; however, they used better adaptation methods for coping with stress. The review study of Bruce *et al.*¹⁵ in the U.S. in 2009 indicated that stress directly was associated with risk factor of chronic kidney disease (CKD) similar to hypertension. The relationship between stress and chronic diseases like CKD has not been widely investigated and further studies should explain the association between stress and progression of CKD. Another review study showed that those who lived alone or had very low relation with friends and others were more at the risk of cardiovascular diseases and mortality than those with higher social relations.¹⁵ However, the correlation between social relations and kidney disease has not been investigated comprehensively and requires future studies.¹⁵ Hemodialysis patients in the present study did not have so much stress and anxiety which was not in accordance with previous studies; however, they did not have good adaptability methods for coping with stress and the majority of them asked others to help them for problem solving. It can be said that this problem was seen in them due to the lack of social relation that was in accordance with previous studies.¹⁵

The results of the present study indicated that outpatients had higher physical activity than hemodialysis patients and dedicated more time in a day to exercise. Valencia *et al.* indicated that lifestyle factors were major determinants of kidney disease that was because Indian Mexican people had high activity and lower obesity, therefore their diabetes, hypertension and consequently kidney disease was lower in spite of their similar potential for exposure compared to Indian American people¹⁶ which was in accordance with the present study. Appel showed that high physical activity is helpful to reduce blood pressure¹² which was in accordance with the present study considering that physical activity and walking was higher in outpatients.

Smoking was higher in hemodialysis patients rather than outpatients; however, the

difference was not significant. The results of Hallan *et al.* showed that smokers with smoking 25-29 packs of cigarette per year were 42% more at the risk of CKD compared to non-smokers. People with smoking 50 or more packs of cigarette per year were 10 percent more at the risk of CKD compared to non-smokers¹³ which was not in accordance with the present study. While the findings of Ejerblad showed that there was no significant relationship between smoking and CKD.¹⁷

Considering findings of this study that showed different dimensions of lifestyle can be considered as risk factors of renal diseases, the officials of Health System are recommended to encourage people to develop healthy lifestyle.

This study had some limitations. Since the onset of kidney disease trend causing dialysis not detectable like any other chronic disease, separating the two groups based on the start of exposing with risk factors was not possible. Moreover, in most of the cases, patients already had underlying disease such as diabetes and etc. before reaching the dialysis stage. Consequently, they were recommended by their own physician to adopt some limitations in lifestyle. In this study, such limitations considered as a part of lifestyle before dialysis of patients.

Conclusion

Considering that we faced many problems during the study pertaining to multiplicity of variables, it is suggested to evaluate lifestyle factors separately in next studies. Considering differences in lifestyle factors in various patients, further studies should be done comprehensively for hemodialysis patients, other patients and healthy people.

Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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