

Original Paper


# Study of Lifestyle, Sleep Quality, and Related Factors in Hemodialysis Patients



Arezoo Monfared<sup>1,2</sup>, Mostafa Soodmand<sup>3\*</sup>, Golshan Ghasemzadeh<sup>4</sup>, Samane Mirzaee<sup>4</sup>, Mohsen Mohammadi<sup>4</sup>, Nasim Amoozadeh Lichayi<sup>4</sup>

1. PhD. Candidate in Nursing, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran.
2. Instructor, School of Nursing and Midwifery, Rasht Branch, Islamic Azad University, Rasht, Iran.
3. Nursing (MSN), Student Research Committee, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran.
4. Nursing (BS), Student Research Committee, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran.

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## ABSTRACT

**Introduction:** Today, hemodialysis is the most common treatment method for patients with chronic kidney diseases. Patients under hemodialysis, because of their complex treatment regimen, experience fundamental changes in their lifestyle and sleep quality.

**Objective:** This study aimed to investigate lifestyle, sleep quality, and related factors in hemodialysis patients.

**Materials and Methods:** This is an analytical study with cross-sectional design conducted on 126 hemodialysis patients referred to one of the hospitals in Rasht City, Iran, in 2016. The study samples were selected randomly. A three-part questionnaire was used to collect data which included a demographic form, the Persian versions of Health Promoting Lifestyle Profile II (HPLP2), and Pittsburgh Sleep Quality Index (PSQI). After collecting data, they were analyzed using descriptive statistics (mean, standard deviation and percentage) and inferential statistics (The Pearson correlation, ANOVA, and regression analysis).

**Results:** About 50.8% of the patients had a favorable lifestyle, and 55.4% had good sleep quality. There was a significant relationship between lifestyle and sleep quality ( $P=0.02$ ). Also, lifestyle and sleep quality of the patients had a significant relationship with their age and education level, while their sleep quality was significantly correlated to smoking and alcohol consumption ( $P<0.05$ ). Moreover, based on regression analysis results, lifestyle has a significant relationship with educational level ( $\beta=8.32$ ; 95%CI:7.60-26.32;  $P<0.0001$ ), and sleep quality has a significant association with alcohol consumption ( $\beta=2.28$ ; 95%CI:1.66-13.78;  $P<0.01$ ).

**Conclusion:** Hemodialysis patients have good lifestyle except in the areas of stress management and physical activity, and those with higher education have poorer sleep quality. Considering that the limitations resulted from chronic kidney disease can cause problems in lifestyle and sleep quality in these patients, measures should be taken to increase stress management and physical activity and reduce tension in patients with higher education levels to modify their lifestyle and maintain balanced sleep quality in them.

## \* Corresponding Author:

**Mostafa Soodmand, MSN**

**Address:** Student Research Committee, School of Nursing and Midwifery, Guilan University of Medical Sciences, Rasht, Iran.

**Tel:** +98 (911) 6470641

**E-mail:** msudmand@yahoo.com

## Highlights

- Patients undergoing hemodialysis had a good lifestyle, except in the areas of stress management and physical activity.
- Sleep quality was poorer in patients undergoing hemodialysis with a higher educational level.

## Plain Language Summary

Hemodialysis is the most common treatment for chronic renal failure. Patients undergoing hemodialysis experience some limitations in their physical, psychological, and social function because of their complex treatment regimen and fundamental changes in their lifestyle. This study investigated lifestyle and sleep quality in patients under hemodialysis. According to the results, these patients have an unfavorable situation in terms of stress management and physical activity. Those with higher levels of education also had poorer sleep quality. Further studies should be done on the problems of these patients, and measures should be taken to address these problems.

## Introduction

**C**hronic Kidney Disease (CKD) is a destructive and irreversible process that reduces glomerular filtration [1], disables the retention of fluids and electrolytes, and disturbs the balance of water and urea, thus creating uremia [2]. The incidence and prevalence of CKD are increasing dramatically throughout the world [3-5]. Reports have shown that in the United States, the rate of this disease increased from 337 to 355 people per million during 1999-2009 [6] (6% increase per year). The number of patients with CKD in Iran is around 25000, and 52.7% of these patients use hemodialysis [7].

The disease is associated with continuous hospitalization, reduced quality of life, high mortality, and high health costs [8, 9]. The definitive treatment for CKD is kidney transplantation, but since finding a suitable kidney is not easy, most patients should undergo hemodialysis until they have kidney transplantation [2]. In this regard, hemodialysis is currently the most common treatment for CKD [9]. Patients undergoing hemodialysis have some limitations in their physical, psychological, and social functions because of their complex treatment regimen and fundamental changes in their lifestyle [10].

According to the World Health Organization, lifestyle changes, along with adjustment of risk factors, are important factors to reduce mortality [11]. In this regard, health care professions have focused on providing health through lifestyle modification [12]. Among essential domains of a healthy lifestyle are factors such as weight and nutrition control, exercise and physical

activity, psychological health, spiritual growth, improvement in interpersonal relations, and sleep. All affect the promotion and achievement of health and reduce complications of disease and mortality [11].

In the studies conducted on nutrition as one of the lifestyle domains, consumption of vegetables are recommended, and results have shown a negative relationship between the severity of CKD and consumption of vegetables [12-14]. Also, the avoidance of excessive consumption of proteins and using a balanced carbohydrate intake are associated with a reduction in the rate of CKD [15]. Other domains of a healthy lifestyle are stress and anxiety management. According to the studies, depression, and anxiety are common in patients with CKD and in particular, 25% of hemodialysis patients.

This condition causes behavioral disorders and failure to follow the treatment and increases the mortality rate and duration of hospitalization in these patients [7, 16, 17]. Physical activity is another domain of lifestyle that can make the person feel good and improve mood by reducing the symptoms of depression and anxiety [7]. It also increases the quality of life because of maintaining the function and autonomy of the person [18].

Inadequate sleep is one of the common complications in CKD patients undergoing hemodialysis [19]. In some studies, the results have shown that insomnia can increase the risk of depression and substance abuse [20], and a direct relationship exists between sleep disorder and increased recovery time after hemodialysis [21, 22]. Although sleep disorders in pa-

tients with hemodialysis are a common complication [23], the results of various studies conducted on sleep disorders of hemodialysis patients have been different [11, 19]. Considering the cultural and geographical differences in sleep quality and lifestyle, it is essential to pay attention to this issue in CKD patients under hemodialysis in different countries.

In intensive care units, the most crucial element is the trained nursing staff [24]. Hemodialysis patients have regular contact with health care providers, especially nurses, and lack of attention to lifestyle and quality of sleep in these patients can lead to unsatisfactory results. This study aimed to investigate lifestyle, sleep quality, and related factors (individual, social, clinical) in hemodialysis patients so that health care providers, especially nurses, use its results to plan for care, promoting, and improving the lifestyle of these patients.

## Materials and Methods

This is an analytical study with a cross-sectional design. The study population consisted of all hemodialysis patients referred to one of the hospitals in Rasht City, Iran (n=187). The sample size was determined 126 according to the study of Rezaie and Naji who reported a correlation coefficient of  $r=-0.29$  between sleep quality and lifestyle considering 95% confidence interval and 90% test power [11].

For selecting the samples, the researcher first visited the hospital in the morning and night to collect the names of the patients ready for hemodialysis. After writing down their names in small cards and putting them in a bag, a person blind to the study was asked to select the number of subjects (5 patients per shift) from the cards. Despite the possibility of duplicate samples in some shifts, duplicate samples were not replaced with new ones. To observe the principle of randomness, the step was continued until the number of samples for the study was completed. Of 187 patients, 137 were entered into the study. Of this, 4 patients due to an unwillingness to cooperate and 7 because of meeting the exclusion criteria were withdrawn from the study. In the end, 126 patients remained.

The inclusion criteria were willingness to complete the questionnaire, at least 18 years of age [12], a history of dialysis for at least 3 months, no physical and behavioral disabilities, ability for self-care according to the patient's report, no mental retardation and mental illness based on medication records, and no digestive problems (problems that directly affect the nutrition

of subject). On the other hand, the exclusion criteria were weakness and restlessness during the completion of the questionnaire.

The collection tool was a three-part questionnaire. The first part was a demographic form surveying age, sex, education, smoking, alcohol consumption, marital status, and duration of hemodialysis. The second part was the Persian version of health-promoting lifestyle profile II (HPLP2) which has 52 items measuring health promoting factors under six subscales: Health responsibility (items 3, 9, 15, 21, 27, 33, 39, 45, 51), physical activity (items 4, 10, 16, 22, 28, 34, 40, 46), nutrition (items 2, 8, 14, 20, 26, 32, 38, 44, 50), stress management (items 5, 11, 17, 23, 29, 35, 41, 47), interpersonal relations (items 1, 7, 13, 19, 25, 31, 37, 43, 49), and spiritual growth (items 6, 12, 18, 24, 30, 36, 42, 48, 52).

The questions are rated based on a 4-point Likert-type scale (from 1 to 4), and the total score ranges from 52 to 208; scores higher than 130 indicate good lifestyle. Hosseini et al. studied the reliability and validity of its Persian version [25]. The third part is the Pittsburgh Sleep Quality Index (PSQI) with 9 items assessing the sleep pattern [26]. The questions are rated on a 4-point Likert-type scale (from 0 to 3), and the total score ranges from 0 to 27. The scores higher than 5 indicate poor sleep quality.

Before collecting data, the study received approval from the Research Ethics Committee of Guilan University of Medical Sciences, and the study objectives were explained to the participants, and a written consent form was obtained from them. After collecting data, they were analyzed in SPSS V. 20. First, the Kolmogorov-Smirnov test was performed, whose results showed a normal data distribution. Then, the descriptive statistics (mean, standard deviation and percentage) and inferential statistics (The Pearson correlation, ANOVA, and regression analysis) were performed.

## Results

According to the results, the Mean $\pm$ SD age of the samples was 54.9 $\pm$ 16.1 years. Table 1 presents the other characteristics of the samples. Their Mean $\pm$ SD duration of hemodialysis was 38.98 $\pm$ 41.51; Mean $\pm$ SD lifestyle score was 127.3 $\pm$ 25.5 (50.8% had good lifestyle) and Mean $\pm$ SD sleep quality of 13.2 $\pm$ 8.01 (55.4% had good sleep quality) (Table 2). The Pearson correlation test results showed a significant correlation between lifestyle and sleep quality ( $r=-0.21$ ,  $P=0.02$ ). Also, a significant correlation was found between lifestyle and

**Table 1.** Demographic characteristics of the study participants

Variables		N (%)
Gender	Male	77(61.1)
	Female	49(38.9)
Marital status	Single	19(15.1)
	Married	99(78.6)
	Divorced	6(4.8)
	Widow	2(1.6)
Educational level	Junior high school	83(65.9)
	High school	32(25.4)
	College	11(8.7)
Smoking	Yes	23(18.3)
	No	78(81.7)
Alcohol consumption	Yes	11(8.7)
	No	115(91.3)

age factor ( $r=-0.29$ ,  $P=0.001$ ), and between sleep quality and age factor ( $r=0.22$ ,  $P=0.01$ ). But lifestyle and sleep quality had no significant relationship with the duration of hemodialysis.

Results also showed that lifestyle had no significant relationship with smoking, alcohol consumption, and marital status. Male patients had better lifestyle (Mean $\pm$ SD=131.3 $\pm$ 26.8) while female patients had better sleep quality (Mean $\pm$ SD=14.8 $\pm$ 8.6). ANOVA was used for examining the relationship between lifestyle and sleep quality with an educational level of samples. Based on the results, the patients with higher educational level had a better lifestyle (Mean $\pm$ SD=144.09 $\pm$ 25.06,  $P=0.000$ ), while those

with a lower level of education had better sleep quality (Mean $\pm$ SD=15 $\pm$ 6.85,  $P=0.003$ ). Based on the multivariate regression model, among individual/social factors, education had a significant relationship with lifestyle ( $P=0.0001$ ) where the mean lifestyle score of those with high school education and more was higher as 0.32 unit (Table 3). Furthermore, alcohol consumption had a significant association with sleep quality ( $P=0.01$ ), where patients without alcohol consumption had a better sleep quality than alcohol users as 0.28 unit (Table 4).

## Discussion

According to our study findings, the mean score of lifestyle in hemodialysis patients was higher than the

**Table 2.** The Mean $\pm$ SD of lifestyle dimensions of the samples

Lifestyle Dimensions	Min	Max	Mean $\pm$ SD
Spiritual growth	9	36	22.73 $\pm$ 6.41
Health responsibility	9	36	24.93 $\pm$ 7.77
Interpersonal relations	10	36	25.61 $\pm$ 5.19
Stress management	8	32	18.73 $\pm$ 5.88
Physical activity	8	32	12.92 $\pm$ 5.68
Nutrition	9	36	22.82 $\pm$ 4.81

**Table 3.** Regression coefficients for factors related to the lifestyle of the samples

Variables	B	SD	Beta	t	P	95% CI	
						Lower	Upper
Age	-0.22	0.14	-0.14	-1.57	0.11	-0.49	0.05
Education					Ref.		
Junior high school							
High school diploma and higher	16.99	4.71	8.32	3.60	0.0001	7.66	26.32
Sleep quality	-0.23	0.27	-0.07	-0.84	0.40	-0.77	0.31

score of HPLP2 tool in all areas except stress management and physical activity. Regarding the dimension of nutrition, this result is consistent with the results of Rezaie and Naji and Rambod et al. studies [11, 14]. In the study of Zabel et al. on the relationship between appetite and quality of life in hemodialysis patients, it was also shown that proper nutrition could reduce dialysis problems and improve their quality of life [27]. Considering that nutritional change is the first issue to be considered in hemodialysis patients by health care providers, it can be helpful in the desirability of this area in the patients studied in this study and other studies.

Results of this study show that hemodialysis patients do not follow a regular physical activity, while in the study of Rezaie and Naji, the study patients are relatively good at physical activity and exercise (walking or cycling) [11]. Consistent with our result, Gomes et al. also found out that hemodialysis patients spent less time on physical activity compared to the control group [28]. Different results obtained on the physical activity of hemodialysis patients can be due to climatic factors and poor weather conditions in northern cities of Iran as well as cultural conditions governing the Iranian society which make it dif-

ficult to do physical activity and exercises such as cycling. Also, the physiological changes caused by chronic diseases can affect the interest of these patients in exercise and physical activity [29].

In the present study, more than 50% of patients had good sleep quality which is consistent with the results of Rezaie and Naji but disagrees with the results of other studies [11, 19, 23, 30]. The difference in the findings can be due to physiological changes in different ages, the difference in hemodialysis duration, the presence of other illnesses, and the use of certain medications that can affect the quality of sleep in these patients.

In this study, the findings showed a significant relationship between lifestyle and quality of sleep in hemodialysis patients. Rezaie and Naji also reported that sleep quality in hemodialysis patients had a reverse and significant relationship with some aspects of lifestyle such as nutrition, interpersonal relations, and stress management. Hence, it can be said that sleep quality is a factor affecting the dimensions of the patient's lifestyle and is directly associated with it.

**Table 4.** Regression coefficients for the factors related to the sleep quality of samples

Variables	B	SD	Beta	t	P	95% CI	
						Lower	Upper
Age	0.05	0.04	0.11	1.22	0.22	-0.03	0.15
Education					Ref.		
Junior high school							
High school diploma and higher	-2.18	1.68	-.13	-1.29	0.19	-5.52	1.15
Smoking	-.72	2.31	-0.03	-0.31	0.75	-5.31	3.85
Alcohol consumption	7.72	3.05	2.28	2.52	0.01	1.66	13.78
Lifestyle	-0.03	0.03	-0.01	-1.21	0.22	-0.09	0.02

There was a significant relationship between lifestyle, age, and education level of hemodialysis patients where older patients had less favorable lifestyle, and patients with higher education had a better lifestyle. In this regard, it can be said that with aging, due to underlying diseases followed by specific diets, reduced mobility, and social connections, the lifestyle in older patients is more affected than in young patients. Moreover, higher levels of literacy and medical and general information are effective in improving lifestyle.

In the present study, there is also a significant relationship between sleep quality and age, where the quality of sleep in hemodialysis patients increases with the higher ages. Inconsistent with this result, Edalat-Nejad and Qlich-Khani reported no significant relationship between sleep quality and age, but it correlated with lifestyle [23]. In the present study, improvement in the quality of sleep with increasing age can be related to reducing the responsibility of the patients in various occupational and family areas, which can play an important role in reducing stressors. In the study of Menon et al. low level of education and consequently, the lack of proper occupation and low income were the factors that reduce the quality of sleep in hemodialysis patients [19].

In this study, the sleep quality of hemodialysis patients had a significant relationship with smoking and alcohol consumption, where those who did not have alcohol and smoke had better sleep quality. However, in the study of Menon et al. smoking had no significant relationship with sleep quality [19]. This difference can be attributed to the low number of smokers in the current study.

Another finding of this study was the better quality of sleep in female patients, which is against the results of Menon et al. where women with CKD had poor sleep quality [19]. Since women have less contribution to household expenses, they have less mental preoccupations and hence better sleep quality. The reason for the different results in this regard can also be due to differences in the type of disease, as well as cultural and social conditions and hormone fluctuations in different periods in the studied female patients.

Based on the mentioned results, some aspects of lifestyle in hemodialysis patients need modifications, and the quality of sleep in these patients is affected by several factors. Since CKD is a chronic illness, these patients are continually in contact with health care providers, including nurses, down to the last moments of their life. So, nurses can influence, change, and promote all domains of lifestyle and sleep quality in these

patients. In this regard, educating nurses about lifestyle dimensions and how to improve sleep quality to provide correct and practical counseling to hemodialysis patients, is essential and requires special attention. Thus, it is recommended that interventional studies be carried out to assess the effect of lifestyle changes on the quality of sleep in hemodialysis patients.

This study has some limitations. For example, due to having illiterate participants, a person was selected to read the questions to them who was blind to the content and study subject. Since this can influence the understanding of the questions by the participants, further studies should be designed to remove this limitation.

## Ethical Considerations

### Compliance with ethical guidelines

This study was approved by the Ethics Committee of Guilan University of Medical Sciences (Code: IR.GUMS.REC.1395.309). The study objectives were explained to the participants, and a written consent form was obtained from them.

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### Authors' contributions

All authors contributed in designing, running, and writing all parts of the research.

### Conflict of interest

The authors declared no conflict of interest.

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## References

- [1] Hinkle JL, Cheever KH. Brunner & Suddarth's Textbook of Medical-Surgical Nursing (Textbook of Medical-Surgical Nursing (Brun-

- ner & Sudarth's). Philadelphia: Lippincott Williams & Wilkins; 2014.
- [2] Atashpeikar S, Jalilazar T, Heidarzadeh M. Self-care ability in hemodialysis patients. *Journal of Caring Sciences*. 2012; 1(1):31-5.
- [3] Kara B. Validity and reliability of the Turkish version of the third distress scale in patients on hemodialysis. *Asian Nursres*. 2013; 7(4):212-8. [DOI:10.1016/j.anr.2013.10.001] [PMID]
- [4] Firoozjahi AR, Akbari R, Heidari B, Ghazimirsaeed AM, Hajian K, Satvati J. [Evaluation of serum omentin concentration and its association with cardiovascular risk factors in patients undergoing hemodialysis (Persian)]. *Journal of Babol University of Medical Sciences*. 2015; 17(11):28-34.
- [5] Esmailivand M, Mohammadi M, Khatony A, Najafi F. Comparison of dialysis adequacy in permanent catheter, fistula, and graft vascular access types. *Journal of Babol University of Medical Sciences*. 2016; 18(3):14-8. [DOI:10.22088/jbums.18.3.14]
- [6] Salesi M, Pooranfar S, Jahromi MK, Roozbeh J. [The effect of a selected exercise on, stress, anxiety and depression in kidney transplant patients (Persian)]. *Journal of Jahrom University of Medical Sciences*. 2014; 51(2):208-16. [DOI:10.1016/j.jjnurs-tu.2013.05.012] [PMID]
- [7] Salesi M, Shakoore E, Koushkie Jahromi M. [The effect of a selected exercise on, stress, anxiety and depression (Persian)]. *Journal of Jahrom University of Medical Sciences*. 2014; 12(3):31-8. [DOI:10.29252/jmj.12.3.38]
- [8] Rayner HC, Zepel L, Fuller DS, Morgenstern H, Karaboyas A, Culleton BF, et al. Recovery time, quality of life, and mortality in hemodialysis patients: The Dialysis Outcomes and Practice Patterns Study (DOPPS). *American Journal of Kidney Diseases*. 2014; 64(1):86-94. [DOI:10.1053/j.ajkd.2014.01.014] [PMID] [PMCID]
- [9] Sajjadi M, Akbari A, Kianmehr M, Atarodi AR. [The relationship between self-care and depression in patients undergoing hemodialysis (Persian)]. *The Horizon of Medical Sciences*. 2008; 14(1):13-7.
- [10] Vosoughi N, Aboutalebi Gh, Karimollahi M. [The study of self-care agency in patients undergoing hemodialysis referred to boali hospital of Ardabil in 2013 (Persian)]. *Avicenna Journal of Nursing and Midwifery Care*. 2015; 23(2):24-31.
- [11] Rezaie Z, Naji SA. Survey the relation between life-style and quality who take hemodialysis treatment in Shiraz medical foundation in 2014. *The Journal of Novel Applied Sciences*. 2015; 4(3):286-93.
- [12] Kosravizad M. [Survey the relation between Life-style related to nutritional behaviour and severity of chronic renal failure in Shiraz MRI Hospital at 2013 (Persian)]. *Nursing of the Vulnerables*. 2015; 2(2):49-59.
- [13] Kusumoto L, Marques S, Haas VJ, Rodrigues RA. Adults and elderly on hemodialysis evaluation of health related quality of life. *Acta Paulista de Enfermagem*. 2008; 21(SPE):152-9. [DOI:10.1590/S0103-21002008000500003]
- [14] Rambod M SM, Shokrpour N, Rafii F, Mohammadalliha J. Quality of life of hemodialysis and renal transplantation patients. *Health Care Manag (Frederick)*. 2011; 30(1):23-8. [DOI:10.1097/HCM.0b013e3182078ab6] [PMID]
- [15] Tuttle KR, Sunwold D, Kramer H. Can comprehensive lifestyle change alter the course of chronic kidney disease. *Seminars in Nephrology*. 2009; 29(5):12-23. [DOI:10.1016/j.semnephrol.2009.06.008] [PMID]
- [16] Heshmatifar N, Sadeghi H, Mahdavi A, Shegarf Nakhaie MR, Rakhshani MH. The effect of Benson relaxation technique on depression in patients undergoing hemodialysis. *Journal of Babol University of Medical Sciences*. 2015; 17(8):34-40.
- [17] Masoodi Alavi N, Sharifi Kh, Ali Akbarzadeh Z. [Depression and anxiety in patients undergoing renal replacement therapy in Kashan (Persian)]. *Feyz*. 2008; 12(4):46-51.
- [18] Habibi A, Taghi Savadpoor M, Molaei B, Samshiri M, Ghorbani M. [Survey of physical functioning and prevalence of chronic illnesses among the elderly people (Persian)]. *Iranian Journal of Ageing*. 2009; 4(3):68-78.
- [19] Menon VB, Alla P, Madhuri S, Sanathan SR, Shetty MS, Ram D. Sleep quality in end-stage renal disease patients on maintenance hemodialysis: A six month prospective survey. *International Journal of Pharmaceutical Sciences and Research*. 2015; 6(2):660-8. [DOI:10.13040/IJPSR.0975-8232.6(2).660-68]
- [20] Pigeon WR. Diagnosis, prevalence, pathways, consequences and treatment of insomnia. *Indian Journal of Medical Research*. 2010; 131:321-32. [PMID] [PMCID]
- [21] Unruh M, Tamura MK, Larive B, Rastogi A, James S, Schiller B, et al. Impact of sleep quality on cardiovascular outcomes in hemodialysis patients: Results from the frequent hemodialysis network study. *American Journal of Nephrology*. 2011; 33(5):398-406. [DOI:10.1159/000326343] [PMID] [PMCID]
- [22] Carpi A, Tramonti G. Progress in hemodialysis. In: Mollaoglu M, editor. *Sleep in Patients With ESRD Undergoing Hemodialysis*. London: IntechOpen; 2011. [DOI:10.5772/21597]
- [23] Edalat-Nejad M, Qlich-Khani M. Quality of life and sleep in hemodialysis patients. *Saudi Journal of Kidney Disease and Transplantation*. 2013; 24(3):514-8. [DOI:10.4103/1319-2442.111031] [PMID]
- [24] Monfared A, Soodmand M, Ghasemzadeh G. Knowledge and attitude of intensive care units nurses towards delirium working at Guilan University of Medical Sciences in 2015 elirium. *Preventive Care in Nursing & Midwifery Journal*. 2017; 7(1):1-7.
- [25] Hosseini M, Yaghmaei F, Hosseinzade S, Alavi MH, Sarbakhsh P, Tavousi M. [Psychometric evaluation of the "health promoting life style profile 2 (Persian)]. *Payesh*. 2012; 11(6):849-56.
- [26] Manavipour D. Psychometric properties of the sleep questionnaire. *The Neuroscience Journal of Shefaye Khatam*. 2015; 3(3):16-20. [DOI:10.18869/acadpub.shefa.3.3.15]
- [27] Zabel R, Ash S, King N, Juffs P, Bauer J. Relationships between appetite and quality of life in hemodialysis patients. *Appetite*. 2012; 59(1):194-9. [DOI:10.1016/j.appet.2012.02.016] [PMID]
- [28] Gomes EP, Reboredo MM, Carvalho EV, Teixeira DR, Carvalho LF, Oliveira JC, et al. Physical activity in hemodialysis patients measured by triaxial accelerometer. *BioMed Research International*. 2015; 2015(2015):1-7. [DOI:10.1155/2015/645645] [PMID] [PMCID]
- [29] Sajjadi A, Farmahini Farahani B, Esmailpoor Zanjani S, Dormanesh B, Zare MO. [Effective factors on fatigue in patients with chronic renal failure undergoing hemodialysis (Persian)]. *Journal Critical Care Nurse*. 2010; 3(1):13-4.

- [30] Unruh ML, Larive B, Eggers PW, Garg AX, Gassman JJ, Finkelstein FO, et al. The effect of frequent hemodialysis on self-reported sleep quality: Frequent Hemodialysis Network Trials. *Nephrology Dialysis Transplantation*. 2016; 31(6):984-91. [[DOI:10.1093/ndt/gfw062](https://doi.org/10.1093/ndt/gfw062)] [[PMID](#)] [[PMCID](#)]

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