



Investigating the Relationship between Self-Care Ability Based on Orem's Self-Care Model and Fatigue in COPD Patients

Iman Reiszadeh¹, Shahla Abolhassani^{2*}, Reza Masoudi³, Farshad Heidari Beni⁴

¹MSc. Student of Nursing, School of Nursing Midwifery, Shahrekord University of Medical Sciences, Shahrekord, Iran

²Assistant professor, Adults health nursing department, faculty of nursing and midwifery, nursing and midwifery care research center, Isfahan university of medical sciences, Isfahan, Iran., Community Oriented Nursing Midwifery Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran

³Assistant professor, Community oriented Nursing Midwifery Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran

⁴PhD. Student of Nursing, Department of Medical Surgical Nursing, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran

DOI: 10.5455/jrmds.20186313

ABSTRACT

Chronic obstructive pulmonary disease (COPD) is a common preventable and treatable disease, ranking the fifth cause of death worldwide. Fatigue is one of the common symptoms induced by this disease. Therapeutic measures cannot prevent fatigue in the long term; therefore, COPD-induced fatigue should be controlled by implementing appropriate methods. The current investigation was attempted to investigate the relationship between self-care ability and fatigue in COPD patients based on Orem self-care model. The present analytical-descriptive study was performed on 101 COPD patients referred to Ayatollah Kashani and Hajar hospitals affiliated to Shahrekord University of Medical Sciences, during 2017. Data were collected using demographic characteristics questionnaire, self-care questionnaire based on Orem self-care model, and Fatigue Severity Scale (FSS). Data were analyzed by SPSS and used descriptive and analytical statistics (independent t-test, one-way ANOVA, and Pearson correlation test). The results suggested a significant relationship between self-care ability and educational level ($P = 0.001$) as well as fatigue and age groups ($P = 0.023$). Furthermore, a significant correlation was observed between fatigue and general self-care ability ($P = 0.046$, $r = -0.19$) as well as fatigue and overall self-care capacity ($P = 0.035$, $r = -0.210$). With respect to results of current study, COPD patients' demographic characteristics should be taken into account in order to help them increase self-care ability in controlling and reducing COPD-induced fatigue.

Key words: Orem Self-Care Model, Fatigue, Chronic Obstructive Pulmonary Disease

HOW TO CITE THIS ARTICLE: Iman Reiszadeh, Shahla Abolhassani*, Reza Masoudi, Farshad Heidari Beni, Investigating the relationship between self-care ability based on Orem's self-care model and fatigue in COPD patients, J Res Med Dent Sci, 2018, 6 (3):85-91, DOI: 10.5455/jrmds.20186313

Corresponding author: Shahla Abolhassani
e-mail✉: abolhasani@nm.mui.ac.ir
Received: 14/01/2018
Accepted: 22/02/2018

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) was the fifth leading cause of death in the world in 2002, and is projected to become the third leading cause of death by 2030 [1]. COPD is a common

preventable and treatable disease that is associated with a persistent airflow limitation [2]. In spite of many efforts, research, and allocation of funds to provide better and more qualified health services to patients with COPD, the global mortality and morbidity rates of this disease have still impressive increasing trend compared to other major causes of death such as cancer and heart disease [3, 4]. The COPD global prevalence was reported to be around 384 million in 2010,

with the highest incidence rate of 15.2% in the United States and the lowest incidence rate of 9.7% in South East Asia [5]. Overall, it is estimated that approximately 6% to 10% of adults in the world are affected by COPD [6]. In Iran, as reported in 2008, about 7 million people were affected with chronic respiratory disease [7] and about 10% of general population in Iran was diagnosed with COPD [8]. Cough, shortness of breath, and sputum production are the common symptoms of patients with chronic obstructive pulmonary disease. The other symptom that is associated with this disease includes fatigue (which is often described as a feeling of tiredness or exhaustion and lack of energy), frustration, depression, and concentration problems [9, 10]. Fatigue brings about false beliefs about illness, bad temper, exercise intolerance, physical activities reduction, sleep quality reduction, and consequently reduces quality of life [11, 12]. The results of a study by Khaled Al-Shair *et al.* showed that fatigue is a debilitating condition as much as breathlessness in COPD patients [13]. Another study by Antoniu indicated that fatigue is common in COPD patients and it is associated with progression of the disease; and can also negatively influence disease prognosis [14]. In general, fatigue limits daily living activities and it is experienced by 50% to 70% of patients with COPD. There are a variety of factors that can affect fatigue emergence or maintenance, resulting in inefficacy of airways therapies for preventing aggravation of fatigue over time; therefore, it is necessary to implement methods and programs such as self-care programs to control fatigue [15]. There are variety definitions for self-care and self-management, all of them aim at improving quality of life, increasing health, lowering costs, and using health care [16]. The term self-care refers to any activity that a person performs in a daily life independently and without dependence on others in order to maintain his/her physical, emotional, and social health. Self-care emphasizes the primary and main role of patients in caring themselves [17]. Given the importance of self-care and fatigue in patients with COPD, this study aimed to investigate the relationship between fatigue in COPD patients and self-care ability based on Orem self-care model.

MATERIALS AND METHODS

The present descriptive-analytic study was conducted on 101 patients with COPD who were hospitalized in Internal Wards of hospitals

affiliated to Shahrekord University of Medical Sciences (Ayatollah Kashani and Hajar hospitals) in 2017. Convenience sampling was used for selection of the patients. Inclusion criteria included COPD patients who were in stage II or III of the disease, lack of debilitating disease, lack of mental illnesses and not used psychiatric drugs, do not treated patients fatigue with medication, were able to understand and converse in Farsi, and were willing to participate in the research. Before initiating the research, the study was approved by Ethical Committee of Shahrekord University of Medical Sciences (reference number: IR.SKUMS.REC.1395.315). Since most of the selected patients were illiterate or poorly educated, the questionnaires were filled out through interviewing the patients. Informed consents were obtained from patients when they were informed about the purpose of the study. Patients were ensured about the confidentiality of their information. Data were collected using demographic characteristics questionnaire, self-care questionnaire based on Orem self-care model and Fatigue Severity Scale (FSS). Demographic characteristics questionnaire included information on participant's age, gender, educational level, marital status, and employment status. Assessment self-care questionnaire based on Orem self-care model was designed by the researcher and was adapted to the needs of COPD patients for self-care. To prepare this questionnaire these steps were followed: First, the self-care needs of COPD patients were determined according to findings of articles and books in this regard as well as direct interviews with this patient population. Second, based on the general concepts and dimensions presented in the Orem self-care model, the needs of COPD patients were extracted. Then, findings were converted into questions using 5-point-likert scale. This questionnaire had 61 questions, divided into four general concepts and 13 dimensions. The score obtained from this questionnaire was ranged from 0 to 100 (given that each question could have a score of zero to four and there are 61 questions in total, the highest score (244) was considered 100 and the lowest zero). The validity of this questionnaire was confirmed by ten faculty member of Nursing and Midwifery in Shahrekord University of Medical Sciences. The reliability of the questionnaire was confirmed by considering a sample of 20 patients, other than the research samples, to complete the questionnaire and running test-retest reliability ($r = 0.873$). FSS is a short and reliable tool that enables the researcher

to evaluate fatigue more quickly. The FSS consists of 9 sentences that each sentence is scored according to the severity of the symptoms and the scores range from 1 (a strong opposition) to 7 (a strong agreement). This questionnaire has a high degree of internal consistency and has been investigated in numerous studies (26, 27). In this study, the reliability of FSS was also approved using Cronbach's alpha (0.81). For data analysis, SPSS (version 16) was used and descriptive statistics (mean and standard deviation) and inferential statistics (correlation coefficient) were run. The normality of the data was also assessed by using Kolmogorov-Smirnov test.

RESULTS

In this study, 101 patients with age range of 43 to 74 years old and mean age of 61.34 ± 8.31 were investigated. The maximum and minimum means of self-care ability found for these patients was 50.82 and 31.97, respectively, with an overall mean of 37.44 ± 3.9. The maximum and minimum fatigue scores obtained for patients were 53 and 37, respectively, with an overall mean of 46.06 ± 3.67 (Table 1).

Table 1: Descriptive Table for quantitative variables (age, self-care ability, and fatigue)

Variable	NO	MAX	MIN	Mean±SD
Age	101	74	43	61.34±8.39
Self-care	101	50.82	31.97	37.44±3.59
Fatigue	101	53	37	46.09±3.67

In Table 2, the relationship between demographic characteristics and the mean of self-care ability score has been depicted. According to the results reported in this table, there is a significant relationship was found merely between educational level and self-care ability (p = 0.001). Concerning the mean of self-care ability, there is a statistically significant difference between subgroups; namely, illiterate group and academic group (P = 0.002) as well as elementary group and academic group (P = 0.005) according to TUKEY test. There is no statistically significant relationship between other demographic characteristics (sex, age group, marital status, and job status) and self-care ability.

In Table 3, the relationship between demographic characteristics and the mean of fatigue scores has been demonstrated. According to Table 3, there is a statistically significant relationship between the mean of fatigue scores and age groups (P = 0.023).

Based on the results of TUKEY test, this difference is seen between patients aged 70≥, patients aged ≤49 (p = 0.44), and patients aged 50 to 59 years (p = 0.033).

Table 2: Mean and standard deviation of patients' self-care ability based on demographic characteristics

Variable	NO.(%)	Self-care Mean(SD)	Test Results
Sex	Male	63(62.4) 37.34(3.71)	t = -.397
	Female	38(37.6) 37.62(3.44)	P = .693
Age group	≤49	13(12.9) 38.78(4.18)	F = 1.573 P = 0.201
	50-59	23(22.8) 38.19(4.8)	
	60-69	48(47.5) 36.73(2.8)	
	≥70	17(16.8) 37.46(3.02)	
Education level	Illiterate	56(55.4) 36.83(2.43)	F = 5.639 P = 0.001
	High school diploma	15(14.9) 38.88(5.04)	
	University degree	5(5) 42.56(4.17)	
Marital status	Single	5(5) 40(4.96)	F = 2.082 P = 0.108
	Married	78(77.2) 37.21(3.35)	
	Divorced	5(5) 40.16(6.26)	
Job status	Widow	13(12.9) 36.85(2.88)	F = 1.375 P = 0.255
	Employee	20(19.8) 38.79(4.17)	
	Retired	30(29.7) 37.17(4.23)	
	housewife	20(19.8) 36.6(2.62)	
	Others	31(30.7) 37.4(2.94)	

Table 3: Mean and standard deviation of patients' fatigue based on demographic characteristics

Variable	NO.(%)	Fatigue Mean(SD)	Test Results
Sex	Male	63(62.4) 45.95(3.7)	t = -.299
	Female	38(37.6) 46.17(3.69)	P = .766
Age group	≤49	13(12.9) 44.92(3.01)	F = 3.315 P = 0.023
	50-59	23(22.8) 45.26(3.49)	
	60-69	48(47.5) 45.98(3.79)	
	≥70	17(16.8) 48.41(3.28)	
Education level	Illiterate	56(55.4) 46.77(3.55)	F = 1.678 P = 0.177
	High school diploma	15(14.9) 44.73(3.45)	
	University degree	5(5) 44.8(3.7)	
Marital status	Single	5(5) 44(3)	F = 0.626 P = 0.6
	Married	78(77.2) 46.14(3.41)	
	Divorced	5(5) 46(2.55)	
Job status	Widow	13(12.9) 46.62(5.55)	F = 1.867 P = 0.14
	Employee	20(19.8) 44.55(3.41)	
	Retired	30(29.7) 46.33(3.79)	
	housewife	20(19.8) 45.9(3.61)	
	Others	31(30.7) 46.97(3.61)	

No significant relationship is seen between the mean of fatigue scores and other demographic characteristics (gender, educational level, marital status, and job status).

Table 4: Correlation between fatigue and self-care ability and its four general dimensions

Self-care	General Self-care		general knowledge about disease		evolutionary self-care		health deviation self-care		requisites overall self-care	
	P	r	P	r	P	r	P	r	P	r
Fatigue	0.046	-0.199	0.208	-0.126	0.246	-0.117	0.167	-0.139	0.035	-0.210

In Table 4, the correlation between the mean of fatigue scores and different dimensions of self-care ability has been demonstrated. Based on Table 4, there is a significant correlation between the mean of fatigue scores and the mean overall self-care ability scores ($p = 0.035$). However, the correlation is inversed so that with increase of self-care ability score, the fatigue score decreases ($r = -0.21$). With respect to correlation between fatigue and the four general concepts reported in self-care ability, there is a correlation only between general self-care ability and fatigue ($r = -0.199$ and $p = 0.046$).

DISCUSSION

The aim of this study was to primarily examine the relationship between fatigue and self-care ability using Orem self-care model, and secondly to investigate the relationship between fatigue and some of demographic characteristics. According to results of this study, the mean of fatigue scores was 46.09, indicating a high level of fatigue in COPD patients. Fatigue as a common symptom of COPD has been confirmed in most studies, but high level of fatigue observed in the present study have been reported in some of previous studies [15, 18-20]. Regarding the results of this study on the effect of demographic characteristics on fatigue, only age had a significant correlation with the patients' fatigue level ($P = 0.023$) in a way that in older age groups, fatigue levels were higher. It seems that the incidence of fatigue in COPD patients is due to reduction of oxygen delivery to tissues, ultimately resulting in muscle wasting and weakness. In other words, older patients in this study experienced more fatigue because their muscles faced reduction in tissue oxygenation for longer time. In a study conducted by Ganbari *et al.* on the predictors of fatigue in patients with COPD, age was presented as one of the factors affecting fatigue [7]. Mollaoglu *et al.* also indicated that with increase of age, fatigue increased; however, they found no statistically significant relationship between age and fatigue [21]. It this discrepancy can be due to different levels of oxygenation experienced at different stages of the disease and our inclusion of patients who were in stages II and III to homogenize studied patients (based on Global Initiative for Obstructive Lung Disease). In

other studies, lack of significant correlation between fatigue and age was also reported [7, 21-25], that can be due to difference in the research population. Considering the relationship between fatigue and sex, the results of the present study indicated higher level of fatigue in men than women; however, the difference was not significant. In line with this study, Ganbari *et al.* [7] and Mollaoglu *et al.* [21] investigated similar research population and confirmed this lack of relationship. In addition, Chehragosa *et al.* [4] in their study on cancer patients and Ziaerad *et al.* [25] in their study on patients with heart failure showed lack of significant relationship between sex and fatigue. Nevertheless, Anne *et al.* reported a significant relationship between fatigue and sex in patients with systolic heart failure [24]. This difference can be arisen from the difference between men and women in various cultures considering emotional expression; for example, in some societies, expressing emotion and fatigue, as part of it, can be difficult for people and they do not easily express their emotions, but in other societies people can express their feelings more easily. On the other hand, the activity and role of women in different societies vary, that can affect the level of their fatigue. We found that with increase of educational level, the mean of fatigue score decreased; however, the observed correlation was not significant ($p = 0.17$). In this regard, it can be argued that older people had lower educational level; therefore, fatigue level was significantly higher in patients with lower educational level. On the other hand, it can be said that having a higher level of education contributed patients to find strategies to control and reduce their fatigue; therefore, the mean of fatigue score in patients with higher educational levels was lower. In the present study, no statistically significant relationship was reported between the level of fatigue and marital status ($P = 0.6$). although some studies found no significant relationship between fatigue level and marital status [23-25], others have reported significant relationship between these two variable [21, 22, 24]. One of the most important reasons for this discrepancy is the difference across various cultures concerning family supporting; that is, families are more likely to support each other in some societies and countries, that certainly affects fatigue. No

statistically significant relationship was observed between fatigue and job status in this study, which is in line with previous studies [7, 21-23, 25]. In the present investigation, employees (40.33) had the lowest level of fatigue in comparison with other groups.

In this study, the mean of scores obtained from self-care questionnaire was 37.44, indicating that these patients were poorly self-care ability and did not have the necessary knowledge for self-care and control of disease progression. Abedi *et al.* examined the relationship between self-efficacy and self-care in patients with COPD and reported moderate self-care ability in these patients. To some extent, the results of aforementioned study are consistent with the current research. The minor difference between two studies considering self-care ability of COPD patients can be due to various self-care assessment tools in two studies; however, both studies, acknowledged the need for self-care ability improvement in patients with COPD [8]. However, there are studies that reported high and sufficient self-care ability in COPD patients. For instance, Kara *et al.* reported 73% self-care ability in patients with COPD [26] and Alberto *et al.* presented high self-care ability in these patients [27]. The discrepancy between the results of these studies and the present study can be justified by the fact that the studying population in these studies were from different support and educational systems, which affects the self-care ability of patients. We also examined the relationship between self-care ability of patients with COPD and demographic characteristics. The results of the study demonstrated that only the level of education was significantly correlated with self-care ability. Other demographic characteristics were not significantly correlated with self-care ability, although these variables could have different effects on self-care ability under different environments and communities or at the presence of confounding variables. For example, Morovati *et al.* reported a statistically significant relationship between self-care and the level of education and other variables such as age, marital status, sex, and occupation in patients with rheumatoid arthritis [28]. Moreover, Albright *et al.* presented a significant statistical relationship between age and self-care [29] and Bai *et al.* indicated a significant statistical relationship between marital status and self-care [30]. However, other studies consistent with the present study, reported no relationship between

age and self-care [30] or sex and self-care [31]. According to results of this study, self-care ability increased with increasing level of education and patients with university education had the highest mean of self-care ability score (42.56), which is in similar vein with some of previous studies [30, 32-34]. Nevertheless, Toljamo *et al.* investigated the relationship between self-care and blood glucose control and observed no significant correlation between self-care ability and educational level [31]. This difference, as mentioned above, can be arisen due to various research population as well as presence of confounding variables. The results of this study concerning the relationship between fatigue and four dimensions of self-care ability (based on Orem model) and overall self-care ability suggested that general self-care ability and overall self-care ability were significantly associated with fatigue; however, there was no statistically significant relationship between fatigue and general knowledge about the disease, evolutionary self-care ability, and health deviation self-care requisites. General self-care ability evaluates the level of awareness and knowledge of patient about the disease, do's and Don'ts in relation with airways, general health, disorders of body system, nutrition and water intake, how to bath, excretion and bowel movements, daily activity, sleep and rest, loneliness and social interactions, and life-threatening factors. Therefore, it can be concluded that items examined in general self-care ability can both affect the level of fatigue and decrease it since as the level of general self-care ability increases, fatigue level decreases. In addition, with increase of overall self-care ability, the level of fatigue decreases. In a nutshell, it can be concluded that due to low self-care ability of these patients and the importance of self-care ability in controlling the symptoms of COPD (especially fatigue as one of the most common COPD symptoms), overcoming and controlling the panic attacks, and preventing the progression of the disease, it seems necessary to target our attention toward improvement of COPD patients' educational level in order to help them increase their self-care ability.

CONCLUSION

Based on the results of this study, there was a significant relationship between fatigue and age group as well as self-care ability and educational level. Accordingly, attention should be targeted toward demographic characteristics while

providing care to COPD patients. With respect to correlation observed between self-care and fatigue, improvement of self-care ability in order to control and reduce fatigue level in these patients is suggested.

Acknowledgements

Researchers are thankful of patients participating in this study. The information contained in this article was extracted from a Master's thesis for a nursing degree approved by Shahrekord University of Medical Sciences.

REFERENCES

- Hillas G, Perlikos F, Tsiligianni I, Tzanakis N. Managing comorbidities in COPD. *International journal of chronic obstructive pulmonary disease*. 2015;10:95.
- Laratta CR, Van Eeden S. Acute exacerbation of chronic obstructive pulmonary disease: cardiovascular links. *BioMed research international*. 2014;2014.
- World Health Organization. Chronic obstructive pulmonary disease (COPD). 2011. Available from: <http://www.who.int/respiratory/copd>. Accessed September 25.
- Tselebis A, Pachi A, Ilias I, Kosmas E, Bratis D, Moussas G, et al. Strategies to improve anxiety and depression in patients with COPD: a mental health perspective. *Neuropsychiatric disease and treatment*. 2016;12:297.
- Adeloye D, Chua S, Lee C, Basquill C, Papana A, Theodoratou E, et al. Global and regional estimates of COPD prevalence: Systematic review and meta-analysis. *Journal of global health*. 2015;5(2).
- Azargoon A, Gholami M, Farhadi A, Chegini MH, Zendedel A. Evaluation of the Persian Transcript of the COPD Assessment Test in the Measurement of COPD Health Status in Iranian COPD Patients. *Global journal of health science*. 2016;8(5):225.
- Ghanbari1 A, Shirmohamadi2 N, Paryad3 E, Kazemnejad Leily4 E. Predictors of Fatigue in Patients with Chronic Obstructive Pulmonary Disease. 2016.
- Abedi H, Salimi S, Feizi A, Safari Vaghasloo S. ASSESSMENT OF RELATIONSHIP BETWEEN SELF-EFFICACY AND SELF-CARE IN COPD PATIENTS. *Journal of Nursing and Midwifery Urmia University of Medical Sciences*. 2012;10(1):0-.
- Spruit MA, Vercoulen JH, Sprangers MA, Wouters EF. Fatigue in COPD: an important yet ignored symptom. *The Lancet Respiratory Medicine*. 2017;5(7):542-4.
- van der Valk P, Monnikhof E, van der Palen J, Zielhuis G, van Herwaarden C. Management of stable COPD. Patient education and counseling. 2004;52(3):225-9.
- Baghai-Ravary R, Quint JK, Goldring JJ, Hurst JR, Donaldson GC, Wedzicha JA. Determinants and impact of fatigue in patients with chronic obstructive pulmonary disease. *Respiratory medicine*. 2009;103(2):216-23.
- Al-Shair K, Kolsum U, Dockry R, Morris J, Singh D, Vestbo J. Biomarkers of systemic inflammation and depression and fatigue in moderate clinically stable COPD. *Respiratory research*. 2011;12(1):3.
- Al-shair K, Kolsum U, Singh D, Vestbo J. The Effect of fatigue and fatigue intensity on exercise tolerance in moderate COPD. *Lung*. 2016;194(6):889-95.
- Antoniou SA, Petrescu E, Stanescu R, Anisie E, Boiculese L. Impact of fatigue in patients with chronic obstructive pulmonary disease: results from an exploratory study. *Therapeutic advances in respiratory disease*. 2016;10(1):26-33.
- Peters JB, Heijdra YF, Daudey L, Boer LM, Molema J, Dekhuijzen PR, et al. Course of normal and abnormal fatigue in patients with chronic obstructive pulmonary disease, and its relationship with domains of health status. *Patient education and counseling*. 2011;85(2):281-5.
- Nici L, Donner C, Wouters E, Zuwallack R, Ambrosino N, Bourbeau J, et al. American thoracic society/European respiratory society statement on pulmonary rehabilitation. *American journal of respiratory and critical care medicine*. 2006;173(12):1390-413.
- Cicutto L, Brooks D, Henderson K. Self-care issues from the perspective of individuals with chronic obstructive pulmonary disease. *Patient education and counseling*. 2004;55(2):168-76.
- Zakerimoghadam M, Shaban M, Kazemnejad A, Tavasoli Kh. The effect of

- breathing exercises on fatigue level of COPD patients. *Hayat*. 2006;12(3):17-25.
19. Heidari M, Fayazi S, Borsi H, Moradbeigi K, Akbari Nassaji N. Effect of a Self-Management Program based on 5A Model on Dyspnea and Fatigue Severity among Patients with Chronic Obstructive Pulmonary Disease: a Randomized Clinical Trial. *Hayat*. 2015;20(4):89-99.
 20. Tödt K, Skargren E, Kentson M, Theander K, Jakobsson P, Unosson M. Experience of fatigue, and its relationship to physical capacity and disease severity in men and women with COPD. *International journal of chronic obstructive pulmonary disease*. 2014;9:17.
 21. Mollaoglu M, Fertelli TK, Tuncay FÖ. Fatigue and disability in elderly patients with chronic obstructive pulmonary disease (COPD). *Archives of gerontology and geriatrics*. 2011;53(2):e93-e8.
 22. Safaee A, Tabatabaee SH, Moghimi-Dehkordi B, Zeighami B. Cancer-related fatigue in breast cancer patients under chemotherapy. *koomesh Journal*. 2010;11(4):317-22.
 23. Chehrehgosha M, Dastourpour M, Sanagu A, Mohamadi A. Cancer-related Fatigue and its Relationship with Demographic and Clinical Characteristics. *Jorjani Biomedicine Journal*. 2013;1(2):24-31.
 24. Fink AM, Sullivan SL, Zerwic JJ, Piano MR. Fatigue with systolic heart failure. *The Journal of cardiovascular nursing*. 2009;24(5):410.
 25. Ziaeirad M, Ziaei G, Mohammady M. Correlation of fatigue intensity with demographic and clinical characteristics of patients with congestive heart failure. *Journal of Clinical Nursing and Midwifery*. 2017;6(3):72-81.
 26. Kara Kaşıkçı M, Alberto J. Family support, perceived self-efficacy and self-care behaviour of Turkish patients with chronic obstructive pulmonary disease. *Journal of clinical nursing*. 2007;16(8):1468-78.
 27. Alberto J, Joyner B. Hope, optimism, and self-care among Better Breathers Support Group members with chronic obstructive pulmonary disease. *Applied nursing research*. 2008;21(4):212-7.
 28. Morowatisharifabad M, Nadrian H, Soleimani Salehabadi H, Mazloomy Mahmoodabad S, Asgarshahi M. The Relationship between Predisposing Factors and Self-care Behaviors among Patients with Rheumatoid Arthritis. *Hayat*. 2009;15(3):39-51.
 29. Albright TL, Parchman M, Burge SK. Predictors of self-care behavior in adults with type 2 diabetes: an RRNeST study. *FAMILY MEDICINE-KANSAS CITY*. 2001;33(5):354-60.
 30. Bai YL, Chiou CP, Chang YY. Self-care behaviour and related factors in older people with Type 2 diabetes. *Journal of clinical nursing*. 2009;18(23):3308-15.
 31. Toljamo M, Hentinen M. Adherence to self-care and glycaemic control among people with insulin-dependent diabetes mellitus. *Journal of advanced nursing*. 2001;34(6):780-6.
 32. Ailinger RL, Dear MR. Self-care agency in persons with rheumatoid arthritis. *Arthritis & Rheumatology*. 1993;6(3):134-40.
 33. Moore JB, Pichler VH. Measurement of Orem's basic conditioning factors: A review of published research. *Nursing Science Quarterly*. 2000;13(2):137-42.
 34. Callaghan D. Healthy behaviors, self-efficacy, self-care, and basic conditioning factors in older adults. *Journal of community health nursing*. 2005;22(3):169-78.