

The Effect of Orem Self-Care Program on Sleep Quality, Daily Activities, and Lower Extremity Edema in Patients Undergoing Coronary Artery Bypass Graft Surgery

Abstract

Background: Postoperative complications of open heart surgery require extensive care, especially by the patient. One of the important strategies in this regard is self-care education and one of the well-known patterns is Orem self-care model. This study aimed to investigating the effect of Orem-based self-care program on sleep quality, daily activities, and lower extremity edema in patients undergoing coronary artery bypass graft surgery. **Materials and Methods:** This clinical trial study was performed on 74 patients with coronary artery bypass graft surgery in Kashani Hospital in Shahrekord. The patients were randomly assigned to intervention and control groups. Data were collected using need assessment form according to the Orem model, quality of life and activity daily living questionnaire and measurement of edema by the meters. Data were analyzed using descriptive and analytical statistics with SPSS software. **Results:** The sleep quality score in the intervention group immediately after the intervention and 2 months after, was significantly lower in the intervention group than in the control group ($P = 0.001$). In the intervention group immediately after the intervention and 2 months after, the daily activity score was significantly higher than the control group ($P < 0.05$) 2 months after intervention, edema score in intervention group was significantly lower than the control group ($P = 0.006$). **Conclusions:** Results of the recent study showed that the implementation of the Orem-based self-care program can reduce the postoperative complications and the use of nursing patterns, such as Orem, to enhance self-care ability in patients who require long-term care can be very effective.

Keywords: Activity daily living, coronary artery bypass graft, Orem model, quality of life, self-care program

Introduction

Coronary artery disease is the most important cardiovascular disorder and a health problem in developing and developed countries. This disease not only has a high mortality rate, but also limits the life of the individuals in long-term. Today, open heart surgery is one of the most effective and valuable techniques in the treatment of cardiovascular diseases. Sixty percent of all open heart surgeries in Iran include coronary artery bypass surgery.^[1] Heart diseases and performing surgeries, such as coronary artery bypass, can reduce quality of life and cause disability. So that studying lifestyle of patients with cardiovascular disease has shown that 35.9% of these patients' experienced reduced physical and exercise activity after surgery and hospital discharge.^[2] On

the other hand, one of the most common problems in these patients is sleep disturbance. To this end, the studies have indicated that 80% of patients suffer from sleep disorders after coronary artery bypass surgery.^[3] In addition, lower extremity edema, i.e. abnormal fluid accumulation in one or more body cavities, is the other common problem in these patients. Almost 52.3% of patients have experienced lower extremity edema following coronary artery bypass surgery (CABG).^[4] On the other hand, the ability to perform daily activities independently is reduced in these patients after surgery, and thus, their ability in self-care is altered. Fears of activity, constraints prescribed by the surgeon and exacerbation of symptoms during exercise are among the most important factors that have been cited in the literature as reasons for the limited activity in these patients

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Received: 16 March 2020

Revised: 06 May 2020

Accepted: 27 February 2021

Published: 14 October 2021

Access this article online

Website: www.advbiores.net

DOI: 10.4103/abr.abr_54_20

Quick Response Code:



How to cite this article: Aliakbari F, Moosaviean Z, Masoudi R, Kheiri S. The effect of Orem self-care program on sleep quality, daily activities, and lower extremity edema in patients undergoing coronary artery bypass graft surgery. *Adv Biomed Res* 2021;10:29.

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after surgery.^[5] Decreasing ability to perform independent activities of daily living can lead to disruption of one's social life, physical performance, and daily activities, and eventually result in diminishing or losing social roles and various psychological problems such as fear, anxiety, depression, isolation, and dependence on others.^[6] To this end, results of previous studies have referred to prevalence of over 30% of daily activity reduction, 80% of sleep pattern disorders, and over 50% of reduced quality of life in these patients.^[2-4] Thus, given the above-mentioned material, these disorders can be the most important and common problems of these patients. Thus, consideration of medical-supportive measures for these patients is crucially important. One of the appropriate measures in this regard is promoting self-care behaviors in the patients. Appropriate self-care behaviors can cause promotion of abilities, better performance of daily activities, and achievement of independence in the patient. Hence, the patient would be more able in performing social functions and gain more hope for life. In other words, his quality of life is improved. In addition, observing self-care activities in individuals with chronic patients plays significant role in reduction of medical costs.^[7]

Unawareness of patients in self-care causes negative outcomes on health of patients and frequent hospitalization in hospital. Self-care activities increase one's compatibility, and inability of patients and medical costs are reduced.^[2] The Orem's Self Care Model is one of the models of self-care education. This model is a good clinical guide for designing and implementing a self-care program and is used as a conceptual framework for guiding self-care programs.^[8] Considering the importance of sleeping and performing daily activities and patients' problems in this field and given that the Orem's self-care model has not been performed on coronary artery bypass patients as well as the researcher experience in caring for these patients and the major problems of these patients in sleeping, performing daily activities, lower extremities edema, and self-care after undergoing surgery, the researcher decided to conduct a study to evaluate the effect of Orem self-care program on sleep quality, daily activities and lower extremity edema in patients undergoing coronary artery bypass graft surgery.

Materials and Methods

The present study is a clinical trial research and the study population includes all patients undergoing coronary artery bypass surgery in Ayatollah Kashani Hospital in Shahrekord in 2019 and it has been registered in www.irct.ir with the code of IRCT20190328043127N1. Based on previous studies,^[9,10] assuming that mean sleep quality in patients undergoing cardiac surgery was 10 ± 2.2 and at intervals, a difference of at least 1.5 points in the sleep quality level of the intervention group was made based on the formula considering the 95% confidence interval and 80% power and sample size in each group at least 34 and

in the whole study 68 individuals. Given the probability of 10% sample loss during the study, 37 individuals in each group was considered.

The inclusion criteria were the age of 55–75, only CABG surgery cases, residence in Chahar-Mahal Bakhtiyari province, lack of auditory and speaking problem, ability to comprehend Persian speaking, the literacy of reading and writing by the patient or at least one of his family members, lack of recognized psychological disease, patients at educational supportive level according to Orem's form, self-care ability calculated below 50% based on Orem's form, and satisfaction to participate in the study.

In case of unusual stressful event such as return to operating room, patient death, patient's unwillingness to continue participation, failure to perform trained self-care measures, self-care ability above 50% based on Orem's self-care need assessment form and receiving other educational programs at the same time, the patients were excluded.

Pittsburgh Sleep Quality Index, Barthel's Index of Activities of Daily Living, and the Orem's Self Care form, as well as another demographic checklist including age, sex, education, marital status, employment status, residence, illness information, duration of disease, frequency of hospitalization and the used medication were completed through Interviews.

Finally, the patient edema was measured by the meter. The Pittsburgh Sleep Quality Index (1989) includes seven dimensions of subjective sleep quality, sleep latency, and sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction over the last month. This Index has 9 items, but since Item 5 itself contains 10 sub-items, the whole questionnaire has 19 items, which is scored on a 4-point Likert scale ranging from 0 to 3.^[11] The total score varies in the range of 0–21. The evaluation of previous studies showed that the validity of the Pittsburgh Sleep Quality Index for the Iranian population was confirmed by a study registered by the Tehran Psychiatric Institute.^[12] To investigate the psychometric properties of this index, Farahi *et al.* conducted a study that resulted in an 83% specificity and a Cronbach's alpha of 98% for the Persian version of the index.^[13] Barthel Index of Activities of Daily Living (1989) was used to measure ADL in patients.^[14] This index includes 11 items that the item "mobility status" or "use of wheelchair" was completed for each individual. In case of taking score zero from item "mobility," the item 'use of wheelchair' was investigated as the alternative item. In this index, a score between 0 and 15 was allocated to each item depending condition of the individual and nature of item. The items "transfer from chair to bed and back" and "mobility" were assigned maximum 15 scores, the items "stairs," "toilet use," "bowel control," "bladder control," "feeding," and "dressing" were assigned maximum 10 scores, and items "use of wheelchair," "bathing" and

“grooming” were assigned maximum 5 scores. It should be noted that in this tool, depending on the individual’s capability in each of dimensions, considering the proposed scoring, five-point Likert scale varies for each item (e.g. for “grooming” it is scored as 0, 1, 3, 4, or 5, and for item “mobility” it is scored as 0, 3, 8, 12, or 15). The first option of each item is allocated to inability and the fifth option is allocated to perfect independence. Overall, this tool determines individual ability in different dimensions of daily performance at scale of 0–100, in which higher scores represent better status. Scores of 0–20 were considered as complete dependency, scores 20–60 as severe dependency, scores 61–90 as moderate dependency, scores 91–99 as partial dependency, and score 100 as complete independences.^[14] The Orem’s Self-Care Needs Form has the main items that each item has in its sub-categories, and the subitems of each of the main item can be adjusted to suit different illnesses. This form is based on the needs of patients following coronary artery bypass surgery. This form calculates both the percentage of need for self-care and is used as a source to determine the patients’ self-care needs and to design a self-care plan. The answer to each item is based on Likert-scale, which is divided between one to five scores (totally agree, agree but no idea, disagree, and totally disagree).^[15] In this study, the largest leg circumference in centimeters was measured to measure lower extremity edema using a paper meter.

After receiving permission from Research Vice Chancellor of Shahrekord University of Medical Sciences with IR Code of Ethics (skums. 1397.179) demographic questionnaire, and need assessment form were provided to patients and their companions in cardiac surgery and ICU wards. Needs assessment forms were reviewed and patients with <50% self-care need were excluded. After completing the required sample, they were randomly divided into two groups of control and intervention. A researcher colleague was used to collect the questionnaires, so the researcher had no effect on data collection. The pre-test questionnaires were considered anonymous and assigned a number and only the research colleague knew which number was assigned to each patient and after the intervention, a list was provided by the researcher to match the post-test based on the numbers of the questionnaire. The researcher designed self-care program after investigating self-care questionnaires and determining self-care needs of patients in the framework of Orem model and in the form of educational-supportive system. Educational intervention was a program based on Orem model and patient’s needs, content of which was confirmed by two experts.^[16] In the first session (after transfer of patient to the ward), the research was introduced and general education regarding coronary artery bypass surgery was presented. The second session was at the time of patient’s discharge including education about diet, physical activity, care for ulcer, and social activity. Third session was group discussion,

question, and answer for the patients, which was held in the first visit to clinic.^[16] At the end of sessions, educational CD containing the comprehensive set of all materials of three sessions, was given to patients, and they were asked to implement self-care program within 2 months.^[17] Over 2 months, the way of implementation of self-care program was checked through phone call and/or face-to-face visit (once every 2 weeks) as well as using information collection checklist (self-reporting), and the samples were guided for better implementation of program. The patients in control group received treatments and routine care during this period through visit the doctor and under doctor supervision. The researcher also followed them through phone call (ever 14 days) aiming at investigating treatments and cares for the patients.^[18] Immediately after intervention and after 2 months the sleep quality questionnaire and Barthel’s Index of Activities of Daily Living and edema level (through meter) were evaluated and recorded by the second colleague responsible for data collection by face-to-face visit to the respective clinic. At the end of research, the educational CD given to the patients in intervention group was also provided with the patients in control group. After data collection, data were entered into SPSS 22 statistical software, and indexes such as mean, standard deviation, frequency, and frequency percentage were used at descriptive statistics level. At inferential statistics level, independent *t*-test and pair-wise *t*-test were used. Significance level was considered below 0.05 in all analyses.

Results

This study was conducted aiming at investigating impact of Orem model based self-care program on sleep quality, ADL, and lower extremity edema in patients with CABG surgery in Shahrekord on 36 patients in control groups (one patient died and excluded the research) and 37 patients in intervention group. Age range of patients was generally 34–48 years old. In intervention group, 30 patients (81.1%) were males and 7 patients (18.9%) were female with the mean age of 49.63 ± 7.09 , and in control group, 30 patients (83.3%) were males and 6 patients (16.7%) were females with the age of 38.63 ± 7.38 . There was no significant difference between two groups in terms of age ($P = 0.952$) and gender ($P = 0.801$). The other demographic characteristics of patients in comparison of two groups are given in Table 1.

The mean values of sleep quality variables before, immediately after and 2 months of intervention in the two groups shows that sleep quality had no significant difference at the beginning of intervention ($P = 0.207$). In other words, two groups were identical in terms of sleep quality at the beginning of study. In contrast, in the intervention group immediately after the intervention and 2 months after, the sleep quality score was significantly lower ($P = 0.001$). In addition, the rate of decreasing in

Table 1: Demographic characteristic of participants

Characteristics	Frequency (%)		P
	Intervention group	Control group	
Age (years), mean±SD	7.09±63.49	7.38±63.38	0.952
Sex			
Men	30 (81.1)	30 (83.3)	0.801
Female	7 (18.9)	6 (16.7)	
Marital status			
Single	4 (10.8)	0	0.156
Married	31 (86.8)	35 (97.2)	
Divorced	1 (2.7)	0	
Dead	1 (2.7)	1 (2.8)	
Education level			
Primary school	27 (75)	17 (51.5)	0.060
Under diploma	5 (13.9)	14 (42.4)	
Diploma	3 (8.3)	1 (3)	
University	1 (2.8)	1 (3)	
Occupational status			
Employee	15 (40.5)	10 (28.6)	0.687
Unemployed	8 (21.6)	10 (28.6)	
Homemaker	8 (21.6)	10 (28.6)	
Tired	6 (16.2)	5 (14.3)	
Salary, Toman (million)			
>2	6 (16.7)	3 (8.3)	0.559
1-2	15 (41.7)	16 (44.4)	
<1	15 (41.7)	16 (44.4)	
Duration of hospitalization (years)			
<1	22 (59.5)	16 (44.4)	0.413
1-5	12 (32.4)	15 (41.7)	
>5	3 (8.1)	5 (13.9)	
Background diseases			
Yes	24 (64.9)	27 (75)	0.446
No	13 (35.1)	9 (25)	
Type of background diseases			
Diabetes	13 (52)	19 (67.9)	0.287
Osteoporosis	0	1 (3.6)	
Hypertension	11 (44)	6 (21.4)	
Hyperlipidemia	1 (4)	2 (7.1)	
Smoking			
Yes	11 (29.7)	10 (28.6)	0.585
No	26 (70.3)	25 (71.4)	

SD: Standard deviation

the intervention group was significantly different from the control group ($P = 0.035$) [Table 2].

The mean of daily activity of patients before, immediately after and 2 months after the intervention in the two groups revealed that the daily activity was not significantly different between the both groups at the beginning of the intervention ($P = 0.978$). In contrast, immediately after the intervention and 2 months after, the daily activity score in the intervention group was significantly higher than the control group ($P < 0.05$) [Table 3]. In addition, the rate of increasing in the intervention group was significantly different from the control group ($P = 0.006$). In fact, the

level of individual dependency in the intervention group was significantly lower than the control group.

The mean of edema variables in patients before, immediately after, and 2 months after the intervention is presented in Table 4. As shown in Table 4, the mean values of edema in the two groups at the beginning of the intervention and immediately after intervention showed no significant difference ($P > 0.05$), but, 2 months after intervention, edema score in intervention group was significantly lower than the control group ($P = 0.006$). In addition, although scores of edema in both groups showed significant changes over the study, total reduction in edema

Table 2: Determination and comparison of average sleep quality in two research groups

Variables	Phase	Intervention group		Control group		Between group <i>P</i>
		Mean±SD	Median	Mean±SD	Median	
Sleep quality	Before intervention	8.00±2.09	7 (7-10)	8.72±2.90	8 (7-10.75)	0.207
	Immediately after intervention	5.49±1.63	5 (4-6.5)	7.47±2.80	7 (5-9)	0.001
	2 months after intervention	3.70±1.61	3 (2-5)	5.39±2.45	5 (4-7)	0.001
Within group <i>P</i> value		<0.001		0.008		-
Changes during the intervention		4.29±2.98	4 (2-6.5)	3.30±2.28	3 (1.25-5)	0.235

SD: Standard deviation

Table 3: Determination and comparison of the average daily activity of patients in the two research groups

Variables	Phase	Intervention group		Control group		Between group <i>P</i>
		Mean±SD	Median	Mean±SD	Mean±SD	
Daily activity	Before intervention	66.62±18.53	70 (48.5-84.5)	65.44±13.41	67.5 (48-71.25)	0.978
	Immediately after intervention	68.43±23.38	72 (40.5-90.5)	65.00±12.30	67 (50-73.50)	<0.001
	2 months after intervention	81.14±15.29	86 (95-97)	68.53±11.94	70 (50.5-90.25)	0.045
Within group <i>P</i> value				0.096		-
Changes during the intervention		5 (9.5-47.5)		6.25±3.9	1.5 (2.50-10.25)	0.006

SD: Standard deviation

Table 4: Determination and comparison of average edema in two research groups

Variables	Phase	Intervention group		Control group		Between group <i>P</i>
		Mean±SD	Median	Mean±SD	Median	
Edema	Before intervention	34.31±2.86	3 (31.75-36)	34.65±3.97	34 (31.63-36)	0.812
	Immediately after intervention	32.77±2.45	33 (30.5-35)	34.65±3.96	34 (31.63-36)	0.056
	2 months after intervention	32.14±2.87	33 (30-34)	34.63±4.08	34 (31.25-36)	0.006
Within group <i>P</i> value				0.028		-
Changes during the intervention		2 (1.25-3)		0.02±0.03	0	<0.001

SD: Standard deviation

was significantly higher in intervention group than control group ($P < 0.001$).

Discussion

Given the importance of the confounding role of these variables on the results of the study, many previous studies have also paid attention to the homogeneity of the intervention and control groups.^[18-21] In relation to the impact of implementing Orem based self-care program on sleep quality of patients undergoing coronary artery bypass graft surgery, results indicated that sleep quality of patients in two groups showed no significant difference at the beginning of intervention. In other words, both groups were identical in terms of sleep quality at the beginning of study. While immediately after intervention and 2 months after intervention, score of sleep quality in intervention group was significantly better than control group. In fact, educational intervention had significant role in improvement of sleep quality in these patients. To this end, Ranjbaran *et al.* investigated impact of cardiac rehabilitation program on improvement of sleep quality in patients after coronary artery bypass graft surgery, and found that implementation of this program can improve sleep quality of patients after

coronary artery bypass graft surgery.^[21] Although this study did not use Orem self-care model, the rehabilitation-based educational program was implemented for the patients, which is regarded a part of Orem's self-care model. Thus, overall, it can be stated that providing education for these patients can be effective in their sleep quality, and results of this study are consistent with our findings. On the other hand, one of the prevalent problems of patients after coronary artery bypass surgery is poor sleep quality. Previous studies have indicated that average sleep scores and adequacy of night sleep of patients in different stages of surgery (before, 6 and 10 weeks after surgery) were at nonoptimal level.^[22-26] In this regards, some studies have investigated different methods for improving sleep in these patients. Nurbas *et al.* conducted a study on 57 patients following coronary artery bypass surgery. They showed that massage therapy is an effective way for improvement after surgery since it reduces fatigue and improves sleep quality.^[26] Johnson *et al.* in their work aiming at the evaluation of impact of a customized program for self-care promotion in different aspects of sleep activities of patients undergoing coronary artery surgery, studied 47 patients in two groups. The first group was treated by a referee for 3 weeks before surgery and the second group (intervention

group) was trained by nurses on a self-care program related to different aspects of sleep and the content of the training was delivered as a CD. Results of this study over a 3–4-month follow-up showed a significant improvement in the quality, duration, and impact of sleep in the intervention group.^[23] The results of the investigation of the effect of self-care program based on Orem self-care model on the daily activity of patients undergoing coronary artery bypass surgery indicated that the daily activity of patients in the two groups at the beginning of the intervention was not significantly different. In other words, both groups were identical in terms of the daily activities at the beginning of study. While the daily activity score in the intervention group was significantly higher than the control group immediately after the intervention and 2 months after the intervention. To this end, Siyavashi *et al.* in their study concluded that self-care program could influence daily activity and physical performance of patients undergoing coronary artery bypass surgery.^[27] Fathani *et al.* in their semi-experimental research concluded that educational intervention could influence physical performance of patients with heart failure.^[28]

In addition, findings of previous studies in investigation of impact of self-care program based on Orem model on daily activities of patients with different diseases such as multiple sclerosis, stroke, rheumatoid arthritis, chronic obstructive pulmonary disease, and diabetes,^[29-33] have shown that application of Orem's self-care program based on the patient's educational needs as a non-invasive, low-cost nursing intervention can affect patients' daily activities. The results of this study showed that the implementation of self-care program based on Orem self-care model on patients with lower extremities edema in patients undergoing coronary artery bypass surgery there was no significant difference in the average edema of patients in the two groups at baseline and immediately after intervention. In other words, both the groups were the same at the beginning and immediately after intervention in terms of average edema. In contrast, 2 months after intervention, edema score in intervention group was significantly lower than control group.

Although the current study is among the first ones that evaluates edema improvement under educational intervention, many other researchers have also evaluated role of educational intervention on patient's recovery process and his clinical parameters. For example, Zeynali *et al.* have indicated that awareness and training patients with Hyper laxity Joint Syndrome can significantly affect speed of their recovery.^[34] In addition, Chesser *et al.* referred to significance of training in health of patients and their proper self-care.^[35]

One of the other main problems is pain and infection in the surgical site and vein of the foot, paresthesia, and edema of the extremities. After surgery because of its chronic

nature, these patients need proper care to promote health, compliance to diet, return to preoperative performance, prevent exacerbation, and help the family adapt to changes. Therefore, treating these patients without the patient's own participation and some self-care activities may not be effective. Sustainable success in controlling risk factors in patients with coronary artery bypass surgery requires their active participation in treatment. This partnership requires patients to believe that they can adhere to lifestyle changes and lifelong drug use. Hence, self-care and self-efficiency is one of the basic concepts in this group of patients. To this end, implementing self-care educational program based on Orem model can be effective. Overall, it can be stated that researchers in different studies have investigated impact of implementing self-care program based on Orem's model on quality of life in patients with different diseases, and results have indicated that implementing Orem's self-care program can lead to increasing and improvement of quality of life of patients.^[20,34,35]

Conclusions

Because the main purpose is training patients to create proper and stable behaviors, and if self-care activities and provision of educational material are based on the needs and beliefs of the patient and optimal environmental conditions and understandable, it causes increasing quality of life in these patients. To this end, nurses can have determining role through training patients and their families for eliminating problems of patients after coronary artery bypass surgery and increasing their quality of life.

Financial support and sponsorship

Shar-e-Kord University of Medical Sciences

Conflicts of interest

There are no conflicts of interest.

References

1. Fayyazi S, Sayadi N, Gheyzadeh M. Comparison of quality of life before and after open heart surgery. *Zahdan J Res Med Sci* 2012;14:98-100.
2. Abedi H, Salimi S, Feizi A. A survey on the relationship between self-efficacy and self-care in patients with COPD. *J Urmia Nurs Midwifery Fac* 2012;1:1-10.
3. Tahereh D. Design and evaluation of theorybased educational program for reducing patients anxiety after CABG. *Tarbiat Modares Univ School Med Sci* 2007;5:10-8.
4. Belczak CE, Tyszka AL, Godoy JM, Ramos RN, Belczak SQ, Caffaro RA. Clinical complications of limb undergone harvesting of great saphenous vein for coronary artery bypass grafting using bridge technique. *Rev Bras Cir Cardiovasc* 2009;24:68-72.
5. LaPier TK, Wintz G, Holmes W, Cartmell E, Hartl S, Kostoff N, Rice D. Analysis of activities of daily living performance in patients recovering from coronary artery bypass surgery. *Physical and Occupational Therapy In Geriatrics*. 2008;27:16-35.
6. Koch CG, Khandwala F, Cywinski JB, Ishwaran H, Estafanous FG, Loop FD, *et al.* Health-related quality of life after coronary artery bypass grafting: A gender analysis using

- the Duke Activity Status Index. *J Thorac Cardiovasc Surg* 2004;128:284-95.
7. Sheikhezadeh S. Self-care activities among women referred to health care centers in Kerman. *Journal of Health Based Research*. 2016;2:55-67.
 8. Mohammadpour A, Rahmati Sharghi N, Khosravan S, Alami A, Akhond M. The effect of a supportive educational intervention developed based on the Orem's selfcare theory on the self care ability of patients with myocardial infarction: A randomised controlled trial. *J Clin Nurs* 2015;24:1686-92.
 9. Buysse DJ, Reynolds CF 3rd, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Res* 1989;28:193-213.
 10. Farrahi J, Nakhaee N, Sheibani V, Garrusi B, Amirakfi A. Psychometric properties of the Persian version of the Pittsburgh Sleep Quality Index addendum for PTSD (PSQI-A). *Sleep Breath* 2009;13:259-62.
 11. Esmaeeli M, Kazem Nejad A. The effect of supportive educational intervention on sleep before coronary artery bypass graft surgery. *Iranian Journal of Cardiovascular Nursing*. 2016 Mar 10;4:40-7.
 12. Blättler W, Zimmet SE. Compression therapy in venous disease. *Phlebology* 2008;23:203-5.
 13. Parker PP, Dunbar SB. Sleep in cardiac surgery. In: Woods SL, Froelicher ES, editors. Vol. 5. Philadelphia: Lippincott; 2005. p. 197-212.
 14. Oveisgharan S, Shirani S, Ghorbani A, Soltanzade A, Baghaei A, Hosseini S, *et al.* Barthel Index in a Middle-East country: Translation, validity and reliability. *Cerebrovasc Dis* 2006;22:350-4.
 15. Pooladi SH, Dehghan-Azad F, Yazdankhahfard MR, Tahmasbi R, Ahmadi A. Design and psychometric measurement of the questionnaire on attitude, knowledge and utilization of self-care for patients undergoing coronary artery bypass graft surgery based on Waltz model. *Cardiovas Nurs J* 2017;6:14-23.
 16. Dahmardeh H, Vagharseyyedin SA, Amiri Fard H, Sharif-Zadeh GH, Rakhshani-Zabol F. Effect of self-care educational program based on Orem's theory on hope in patients with multiple sclerosis. *Med Surg Nurs J* 2015;4:57-63.
 17. Sampaio F, Aquino P, Araújo T, Galvão M. Nursing care to an ostomy patient: Application of the Orem's theory. *Acta Paul Enferm* 2008;21:94-100.
 18. Hamedanizadeh F, Ebadi A, Zandi A, Kachuyee H. Effectiveness of implementation of Orem self-care program on headache indices in Migraineur. *Trauma Mon* 2010;3:155-61.
 19. Aghakhani N, Alizadeh S, Hemmati Maslakkpak M, Alinejad V, Khademvatan K. Study of the effect of self -care program model based on Orem's pattern on the quality of life in patients with heart failure. *J Urmia Nurs Midwifery Fac* 2018;16:65-72.
 20. Shahbaz A, Hemmati Maslakkpak M, Nejadrahim R, Khalkhali H. The effect of implementing Orem's self-care program on self-care behaviors in patients with diabetic foot ulcer. *J Urmia Nurs Midwifery Fac* 2016;14:108-17.
 21. Ranjbaran S, Dehdari T, Sadeghniai-Haghighi K, Mahmoodi Majdabadi M, Geravand A. The survey of knowledge and attitude status in patients with poor sleep quality about sleep problems after coronary artery bypass Surgery. *Mil Caring Sci J* 2015;1:99-108.
 22. Sadeghi H, Azizzadeh Forouzi M, Haghdst AA, Mohammad Alizadeh S. Effect of implementing continuous care model on sleep quality of hemodialysis patients. *J Nurs Care* 2011;1:13-8.
 23. Johansson A, Adamson A, Ejdebäck J, Edéll-Gustafsson U. Evaluation of an individualised programme to promote self-care in sleep-activity in patients with coronary artery disease – A randomised intervention study. *J Clin Nurs* 2014;23:2822-34.
 24. Karimi S, Vanaki Z, Bashiri H, Hassani SA. The effect of self-care plan based on Orem's self-care model on self-care improvement in patients with gastrointestinal cancer. *Sci J Hamadan Nurs Midwifery Fac* 2016;24:105-12.
 25. Behrouzifar S, Nezafati M, Esmaily H. The relationship between sleep patterns and the quantity of life in coronary artery bypass graft patients. *J Sabzevar Univ Med Sci* 2007;14:53-61.
 26. Nerbass FB, Feltrim MI, Souza SA, Ykeda DS, Lorenzi-Filho G. Effects of massage therapy on sleep quality after coronary artery bypass graft surgery. *Clinics (Sao Paulo)* 2010;65:1105-10.
 27. Siavashi S, Roshandel M, Zareiean A, Etefagh L. The effect of the cardiac rehabilitation program on the quality of life of patients undergoing coronary artery bypass surgery. *J Alborz Univ Med Sci* 2013;4:217-26.
 28. Fathani M, Afzal AM, Tadayonfar M. Effectiveness of education based on self-care needs on quality of life of patients with heart failure. *J Sabzevar Univ Med Sci* 2015;22:893-902.
 29. Omatreza S, Moshtagh Eshgh Z, Eshagh M, Hekmatafshar M, Naieni M. Effect of educational program based on "Orem Self Care Model" on quality of life in patients with migraine. *JHPM* 2014;3:7-13.
 30. Samah Elsayed GH, Marwa Mosaad A, Soha Kamel M. Effectiveness of planned discharge instructions on patients' recovery following coronary artery bypass graft surgery. *IOSR J Nurs Health Sci* 2018;7:1-12.
 31. Masoudi R, Kheiri F, Ahmadi F, Mohammadi I. The effect of self-care program base on the Orem frame work on fatigue and activity of daily living in multiple sclerosis patients. *J Rehab* 2009;10:12-20.
 32. Shi XP, Wu FY, Li YY. The effect of dialectical nursing according to the Orem self-nursing theory applied to patients with sequelae of stroke. *Pract J Card Cerebral Pneum Vasc Dis* 2012;4:96.
 33. Babakhani B. The Effect of Orem's Self-Care Pattern on Daily Activities of Life in Chronic Obstructive Pulmonary Patients Admitted to Treatment Centers of Urmia University of Medical Sciences in 1395, Master's Thesis, Urmia University of Medical Sciences; 2014.
 34. Zeinali V, Riahinia N, Javadi PV, Asadi S. Effect of health information prescription (HIP) on caregiver's self-care ability. *Hum Inf Interact* 2017;4:1-12.
 35. Chesser AK, Woods NC, Davis AA, Bowers CJ. Prescribing information therapy: Opportunity for improved physician-patient communication and patient health literacy. *J Prim Care Community Health* 2012;3:6-10.