

Original Article

The Effects of Orem's Self-care Theory on Self-care Behaviors among Older Women with Hypertension: A Randomized Controlled Trial

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ABSTRACT

Background: Lifestyle modification and self-care have potential effects on hypertension management among older women. **Objectives:** The aim of this study was to assess the effects of using Orem's Self-Care Deficit (OSCD) theory on self-care behaviors among older women with hypertension. **Methods:** This clinical trial was conducted in 2018–2019. A Seventy old women with hypertension were conveniently recruited from healthcare centers in Ramsar, Iran, and randomly allocated to a control and an intervention group. Participants in the intervention group received self-care education based on the OSCD theory. The control group received no intervention. Data were collected using a personal characteristics questionnaire, a researcher-made self-care need assessment checklist, and the Hypertension Self-Care Activity Level Effects questionnaire. The Wilcoxon and the Mann–Whitney *U*-tests were used to analyze the data. **Results:** There were no significant differences between the groups respecting the pretest mean scores of medication adherence, weight control, physical activity, and nutrition-related self-care behaviors ($P > 0.05$). However, after the intervention, the between-group difference respecting the mean scores of these behaviors were statistically significant ($P < 0.001$). **Conclusion:** The OSCD theory is effective in promoting self-care behaviors among women with hypertension. Therefore, its use is recommended to improve hypertension management and quality of life and reduce treatment-related costs in these patients.

KEYWORDS: *Aging, Hypertension, Old women, Orem's self-care deficit theory, Self-care behaviors*

INTRODUCTION

Hypertension is one of the common chronic diseases among older people. It affects more than 70% of people over 65 years. It is more prevalent among older women due to age-related physiological changes and hormonal alterations.^[1,2]

Hypertension is a major risk factor for stroke, heart failure, and renal failure. Therefore, hypertension prevention and

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management through lifestyle modification are of great importance.^[1,3,4] Nonetheless, patients with hypertension have limited adherence to hypertension management strategies. A study showed that 53% of patients with hypertension did not have effective control over their disease.^[5] Poor hypertension management is more prevalent among women because they have more limited knowledge about lifestyle modification and hypertension management. Consequently, they are more at risk for hypertension-induced complications and disabilities.^[6,7]

Self-care is a key component of hypertension prevention and management.^[8,9] Self-care among patients with hypertension is defined as a dynamic process that needs knowledge, attitude, commitment, self-regulation, power, and self-efficacy. Self-care among older people with hypertension is associated with positive outcomes such as lower risk for complications, lower hospitalization rate, lower healthcare costs, and higher quality of life.^[10]

Most patients with hypertension have limited self-care knowledge and skills. Therefore, self-care education is a key component of hypertension management. The Orem's Self-Care Deficit (OSCD) Theory is an appropriate framework for self-care education and promotion. Orem considers patients as individuals with potential abilities who can take the responsibility of caring for themselves. Her theory states that nurses can help individuals recover their lost abilities through providing them with whole compensatory, partial compensatory, and educational-supportive care.^[11] Two former studies showed that using the OSCD theory improved self-care behaviors among patients with diabetic foot ulcers^[12] and improved medication adherence among older patients with hypertension.^[11] However, sufficient research has not been conducted on the effectiveness of this theory on all dimensions of self-care behaviors among the elderly women with hypertension.

Despite the higher prevalence of hypertension among older women,^[6,7] there is limited information about the effects of OSCD theory on self-care behaviors among older women with hypertension. Therefore, the present study was designed and conducted to address this gap.

Objectives

The main objective of the present study was to assess the effects of using OSCD theory on self-care behaviors among older women with hypertension.

METHODS

Design, setting, and participants

This clinical trial was conducted during 2018–2019. Participants were seventy old women with hypertension recruited to the study from healthcare centers in Ramsar,

Iran. Primarily, eligible old woman with hypertension who met the inclusion criteria and had electronic documents in the urban health centers of Ramsar were invited to an introduction session through telephone contact. In the session, the aims and methods of the study were explained for them and those who agreed to participate in the study were asked to complete a need assessment checklist developed based on the OSCD theory. Women who obtained a score <50% for the scale were considered to need self-care education and eligible for the study. Other inclusion criteria were age 60–74 years, basic reading and writing skills, access to telephone at home, no hearing or speech impairment, a history of hypertension for at least 6 months, no comorbid debilitating chronic diseases (such as cancer, chronic pulmonary disease, heart failure, rheumatoid arthritis, and lupus erythematosus), no serious physical disability interfering with self-care, ability to speak Persian, ability to communicate as determined by a score of more than 8 for the abbreviated mental test (AMT),^[13] and ability to perform daily activities as determined by a score more than 12 for the Activities of Daily Living Questionnaire.^[14] Previous studies in Iran confirmed the validity and the reliability of the AMT with a Cronbach's alpha of 0.76^[13] and the validity and the reliability of the Activities of Daily Living Questionnaire with a Cronbach's alpha of 0.8.^[14] Exclusion criteria were unwillingness to stay in the study, more than two absences from the intervention sessions, and hospitalization or death during the study.

The sample size was determined based on an earlier study that examined the effect of an educational intervention on self-care behaviors in overweight hypertensive women and reported that after the intervention, the mean self-efficacy of patients in the intervention and control groups were 8.88 ± 1.80 and 7.15 ± 2.15 , respectively.^[15] Then, with $\delta_1^2 = 1.8$ $\delta_2^2 = 2.15$ $\mu_1 = 8.88$ $\mu_2 = 7.15$ and considering a confidence level of 0.95, and a power of 0.9, the sample size for each group was estimated at 28, however, given the possible attrition, was recruited 35 ones per group. Accordingly, 70 eligible old women with hypertension were recruited to the study during 2 weeks through convenience sampling. A numerical list of participants' names was created and women with odd and even numbers were randomly allocated to a control and an intervention group, respectively [Figure 1].

Data collection instruments

Data collection instruments were a personal characteristics questionnaire, a researcher-made self-care need assessment checklist, and the Hypertension Self-Care Activity Level Effects (H-SCALE) questionnaire. The personal characteristics questionnaire

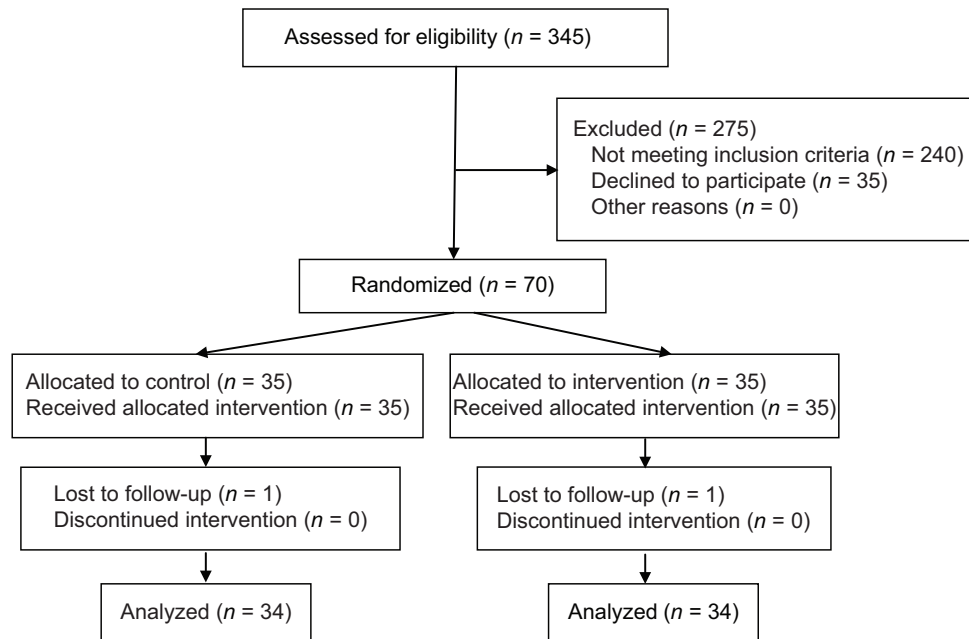


Figure 1: The flow diagram of the study

contained items on age, body mass index, education level, marital status, occupation, comorbid conditions, duration of hypertension, and systolic and diastolic blood pressures.

The researcher-made self-care need assessment checklist was developed based on the OSCD theory. It included 44 items on self-care needs in three dimensions. The first dimension included eighteen items on universal self-care needs related to nutrition, smoking, physical activity, stress, sleep, and sexual activity. The second dimension included five items on developmental self-care needs and the third dimension included 21 items on health deviation self-care needs. Items were scored either 1 (“Yes”) or 0 (“No”). This checklist was developed through a literature review. Then, its content validity was checked by ten nursing instructors and their comments were used for its revision. For test-retest reliability assessment, 20 older women with hypertension twice completed the checklist with a 2-week interval ($r = 0.82$).

The third study instrument was the H-SCALE questionnaire.^[16] This questionnaire assesses self-care behaviors in the past 7 days. It includes 29 items in six dimensions, namely medication adherence (3 items), weight control (10 items), physical activity (2 items), nutrition (10 items), smoking (1 item), and alcohol consumption (3 items). A study in Iran evaluated the validity and the reliability of the Persian H-SCALE questionnaire and omitted the alcohol consumption subscale. Therefore, the Persian scale has 26 items in five dimensions of medication adherence (3 items), weight control (9 items), physical activity (2 items), nutrition (10

items), and smoking (2 items). All items are responded on an eight point Likert scale ranging from 0 to 7, except for the items in the weight management subscale that are responded on a 5-point Likert scale (strongly agree = 4 to strongly disagree = 0). The sum scores in the medication adherence, weight control, physical activity, nutrition, and smoking subscales can range from 0 to 21, 0–36, 0–14, 0–70, and 0–14, respectively. The Cronbach’s alpha values of its different dimensions were reported 0.91, 0.85, 0.96, 0.72, 0.91, respectively.^[17] In the present study, the Cronbach’s alpha of the questionnaire and its medication adherence, nutrition, smoking, physical activity, and weight control dimensions were 0.78, 0.79, 0.76, 0.76, 0.73, and 0.71, respectively.

The personal characteristics questionnaire and the self-care need assessment checklist were completed at the start of the study by all participants and the H-SCALE questionnaire was completed both at baseline and at the end of the study.

Intervention

Study intervention was a 12-week educational program developed and implemented based on the OSCD theory. This program included five main steps which are shown in Table 1 and explained in the following.

In the first step, participants’ universal, developmental, and health deviation self-care needs were assessed based on the OSCD theory using the self-care need assessment questionnaire. In the second step, needs, limitations, deficiencies, disabilities, abilities, available sources, nursing diagnoses, and goals were determined

Table 1: The content of the educational intervention of the study

Steps	Content
First	Self-care need assessment using the need assessment checklist developed based on OSCD theory
Second	Determination of needs, limitations, deficiencies, disabilities, abilities, available sources, nursing diagnoses, and goals based on the data collected in the first step
Third	Determination and preparation of self-care educational materials based on participants' self-care needs
Fourth	Self-care education based on the OSCD theory Session 1 (60 min): Education about hypertension, its symptoms, risk factors, complications, management, and medication side effects Session 2 (60 min): Education about lifestyle modification (such as physical activity and nutrition) Session 3 (60 min): Techniques for managing emotions such as stress, fear, and disappointment and techniques for blood pressure measurement
Fifth	Self-care assessment

OSCD: Orem's self-care deficit

based on the data collected in the first step. In the third step, self-care educational materials were determined and prepared based on participants' self-care needs. In the fourth step, participants in the intervention group were provided with self-care education based on the supportive-educative system of the OSCD theory. Accordingly, they were grouped into three small groups and participants in each group were provided with self-care education in three 60-min sessions held in 2 weeks. Educations were about hypertension, symptoms, risk factors, complications, management, medication side effects, lifestyle modification, and self-care behaviors such as healthy nutrition, weight control, physical activity, stress management, smoking cessation, and accurate blood pressure measurement. Several educational pamphlets were also provided to participants. Educational materials were developed based on a national guideline for hypertension prevention, assessment, and management approved by the Ministry of Health and Medical Education of Iran.^[18] Besides group education, individual educational sessions were held for each participant and one of his/her family members based on his/her own educational needs. In order to ensure the continuity of educations, a checklist was used to weekly assess participants' self-care behaviors from the third to the 12th weeks of the study. Based on the results of weekly assessments, necessary education and counseling were provided to participants. Weekly assessments were performed face-to-face in the study setting. Moreover, follow-up telephone contacts were made with participants twice weekly to provide them and their family members with necessary education and counseling.

In the fifth step (at the end of the 12th week), the educational program was ended and the self-care behavior assessment checklist was used to reassess the self-care behaviors of all participants in both groups. After the posttest assessment of self-care behaviors, participants in

the control group were provided with self-care education through a face-to-face session and a pamphlet.

Ethical considerations

This study was approved by the Ethics Committee of Babol University of Medical Sciences, Babol, Iran (code: R. MUBABOL.HRI.REC.1397.115). Moreover, the study was registered in the Iranian Registry of Clinical Trials (code: IRCT20180831040911N1). At the beginning of the study, participants were ensured that their data would be kept confidential and their participation in and withdrawal from the study would be voluntary. Informed consent was obtained from all participants.

Data analysis

Study data were analyzed using the SPSS software version 16.0 (SPSS Inc., Chicago, IL, USA). The normality of the data was tested using the Kolmogorov–Smirnov test. Variables with normal distribution were analyzed using parametric tests, while variables with non-normal distribution were analyzed using the Chi-square, Fisher's exact, Wilcoxon's, and Mann–Whitney *U*-tests. Tests with $P < 0.05$ were considered statistically significant.

RESULTS

Overall, 68 older women with hypertension completed the study. Age mean in the control and the intervention groups was 64.33 ± 3.64 and 64.10 ± 3.6 years, respectively. Most participants in both groups were homemaker (94.2%) and had primary education (67.64%). The majority of participants in the control (79.4%) and the intervention (82.35%) groups were married. All participants took antihypertensive medications and none of them was cigarette smoker. The two groups did not significantly differ respecting their personal characteristics ($P > 0.05$) [Table 2].

The most important nursing diagnosis in terms of universal self-care needs was “ineffective management

of the treatment regimen.” Respecting developmental self-care needs, the most important nursing diagnoses were “ineffective management of the side effects of antihypertensive medications” and “self-care deficit regarding age-related physiological changes.” Most participants had inadequate knowledge concerning the side effects of antihypertensive medications (76.9%) and had poor side effect management practice [92.6%; Table 3].

At baseline, the mean score of medication adherence was 16.34 ± 2.6 in the intervention group and 15.8 ± 2.18 in the control group. Three months after the intervention onset, these values were 19.74 ± 1.48 and 16.51 ± 2.12 , respectively. The pretest mean score of weight control was 33.54 ± 2.62 in the intervention group and 32.06 ± 2.78 in the control group. Three months after the intervention onset, these values were 43.11 ± 2.79 and 33.4 ± 2.21 , respectively. Moreover, the pretest mean score of physical activity was 3.37 ± 1.78 in the intervention group and 2.97 ± 1.22 in the control group. The posttest mean score of physical activity in these groups was 6.71 ± 1.4 and 3.4 ± 2.06 , respectively. The pretest mean score of smoking was 0.37 ± 0.49 in the intervention group and 0.37 ± 0.48 in the control group. Three months after the intervention onset, these values were 0.37 ± 0.49 and 0.34 ± 0.48 , respectively. The pretest mean score

of nutrition was 41.2 ± 4.81 in the intervention group and 41.44 ± 7.19 in the control group. Three months after the intervention, these values were 54.06 ± 1.92 and 42.32 ± 7.13 , respectively.

The results of the Wilcoxon test showed that the study groups did not significantly differ from each other respecting the pretest mean scores of medication adherence, weight control, physical activity, and nutrition ($P > 0.05$). However, the Mann–Whitney *U*-test showed that the groups significantly differed from each other respecting the posttest mean scores of medication adherence, weight control, physical activity, and nutrition [$P < 0.05$; Table 4].

DISCUSSION

Findings revealed that the use of the OSCD theory was effective in significantly improving medication adherence, weight control, physical activity, and nutrition self-care behaviors among older women with hypertension. According to the findings of this study, implementing the OSCD theory based on the needs of the elderly women with hypertension along with follow-ups can be effective in improving the self-care behaviors of these patients. The OSCD is an appropriate framework for self-care education and promotion.^[11] This is consistent with the findings of former studies.^[19,20] A study showed that limited self-care ability is associated with severe disability and low self-care and thereby, recommended educational interventions based on self-care models for patients with limited disease control.^[19,21]

In the present study, the implementation of a training program based on the Orem’s self-care model caused some positive changes in the self-care behaviors of the elderly women with hypertension. Due to the fact that the implementation of educational programs in the elderly is more difficult than the young age groups, so for more effective education, education with the family can increase the efficiency of education with the Orem’s self-care model.

The findings showed that participants were unable to effectively manage the side effects of antihypertensive medications and the use of the OSCD theory significantly improved their self-care behaviors in the area of medication adherence. A former study also showed that using the OSCD theory was effective in promoting medication adherence and disease management among older patients with hypertension.^[11]

Similar to these findings, previous studies show that Orem’s self-care model had a positive effect on drug adherence and diabetic foot ulcers in patients with Type 2 diabetes and colorectal cancer.^[12,22] Elderly

Table 2: Between-group comparisons respecting participants’ characteristics

Characteristics	Group		P
	Intervention	Control	
Age (years)	64.10 ± 3.6	64.33 ± 3.64	0.15 ^a
BMI	29.4 ± 4.77	29.47 ± 3.63	0.94 ^a
Educational level			
Elementary	23 (67.6)	23 (67.6)	0.99 ^a
Guidance or high school	5 (14.7)	5 (14.7)	
Diploma	4 (11.8)	4 (11.8)	
Academic	2 (5.9)	2 (5.9)	
Marital status			
Single	1 (2.9)	2 (5.9)	0.83 ^a
Married	28 (82.4)	27 (79.4)	
Widowed	5 (14.7)	5 (14.7)	
Employment status			
Farmer	1 (2.9)	0	0.509 ^a
Laborer	0	1 (2.9)	
Housewife	30 (88.2)	30 (88.2)	
Self-employed	1 (2.9)	2 (6)	
Retired	2 (6)	1 (2.9)	
Suffering from other disease			
Yes	17 (50)	15 (44.1)	0.47 ^b
No	17 (50)	19 (55.9)	

^aChi-square test, ^bFisher’s exact test. BMI: Body mass index

Table 3: Nursing diagnoses and the prevalence of universal, developmental, and health deviation self-care needs in supportive-educative system

Nursing diagnosis	Percentage
Self-care deficit regarding weight control	
Irregular weight control	63.5
Lack of knowledge about ideal weight	78
Unwillingness to control weight	65.3
Self-care deficit regarding physical activity	
Inadequate physical activity (30-45 min daily)	68.2
Inadequate knowledge about the effects of physical activity on hypertension management and treatment outcomes	12
Self-care deficit regarding nutrition	
Imbalanced nutrition: Dietary intake more than body needs	61.8
Lack of knowledge about healthy nutrition for hypertension	34.5
Ineffective management of the side effects of antihypertensive medications	
Refusal of the recommended treatments	22.5
Poor medication adherence due to fear over dependence and side effects	34.6
Lack of knowledge about the importance of timely intake of medications	32.6
Lack of knowledge about medication side effects	76.9
Lack of knowledge about the effective management of medication side effects	92.6
Self-care deficit regarding age-related physiological changes	
Limited physical activity due to age-related problems	50.6
Inability to independently control hypertension due to age-related problems	23.4
Poor treatment adherence due to forgetfulness	6.5
Ineffective coping with hypertension	
Indifference towards treatments	6.7
Denial of hypertension	18.8
Underestimation of hypertension	25.4
Stress due to ineffective hypertension management	64.4

Table 4: Between-group comparisons respecting the mean scores of self-care behaviors

Self-care behaviors subscales	Time group	Mean±SD		P ^a	Pretest-posttest mean difference	P ^a
		Pretest	Posttest			
Medication adherence	Intervention	16.34 ± 2.6	19.74 ± 1.48	0.001	3.4 ± 2.04	0.001
	Control	15.8 ± 2.18	16.51 ± 2.12	0.007	0.71 ± 2.07	
	P ^b	0.56	0.001			
Smoking	Intervention	0.37 ± 0.49	0.37 ± 4.49	0.99	0	0.99
	Control	0.37 ± 0.48	0.34 ± 0.48	0.99	0.03 ± 0.0	
	P	0.80	0.80			
Weight control	Intervention	33.54 ± 2.62	43.11 ± 2.79	0.001	9.57 ± 3.16	0.001
	Control	32.06 ± 2.78	33.4 ± 2.21	0.004	1.34 ± 2.76	
	P	0.081	0.001			
Physical activity	Intervention	3.37 ± 1.78	6.71 ± 1.4	0.001	3.34 ± 1.51	0.001
	Control	2.97 ± 1.22	3.4 ± 2.06	0.098	0.42 ± 1.38	
	P	0.34	0.001			
Nutrition	Intervention	41.2 ± 4.81	54.06 ± 1.92	0.001	12.85 ± 4.98	0.001
	Control	41.44 ± 7.19	42.32 ± 7.13	0.36	0.88 ± 4.65	
	P	0.81	0.001			

^aThe results of the Mann–Whitney *U*-test. ^bThe results of Wilcoxon Test. SD: Standard deviation

people with hypertension need continual medication to control their blood pressure, and sometimes they have to take several medications. To control polypharmacy, the elderly need education based on a coherent model so that the drug can be taken regularly and correctly.

Among nursing models, Orem's self-care model is one of the most complete nursing models to meet the needs of self-care in various aspects of life.^[11]

We also found that the most important nursing diagnosis in the area of universal self-care needs was related to

lifestyle. The use of the OSCD theory significantly enhanced participants' self-care behaviors in the areas of nutrition and weight control. In line with this finding, a former study found that using the OSCD theory helped significantly reduce nutrition-related self-care needs among older patients with hypertension.^[23] Another study showed that using the OSCD theory significantly improved nutrition-related self-care and increased the daily intake of fruits and vegetables among patients with hypertension.^[22] Similarly, two studies reported the significant effects of using the OSCD theory on nutrition among patients with hypertension,^[24] diabetic foot ulcers,^[12] and colorectal cancers.^[22] However, a study showed that the use of this theory had no significant effects on nutrition among patients with thalassemia major.^[25] This contradiction may be due to the difference between the studies regarding their participants' characteristics. Adherence to dietary regimen among older patients is more strict than adolescents with thalassemia because based on their direct and indirect experiences, older patients have better understanding about the complications of their diseases and the consequences of limited treatment and dietary adherence and hence, attempt to more closely adhere to their regimens in order to prevent disabilities.

Findings also showed self-care deficit regarding age-related physiological changes. Several earlier studies also reported the same findings.^[19,21,26] Disability caused by aging and comorbid conditions such as osteoarthritis reduces older people's ability to engage in physical activity. Consequently, self-care deficit in terms of physical activity is more prevalent among older people with HP.^[26-28]

We also found the effectiveness of using the OSCD theory in significantly improving self-care behaviors in the area of physical activity. This is in line with the findings of a former study^[29] and contradicts the findings of another study.^[30] This contradiction is attributable to the difference between the studies respecting their interventions. In that study, participants were divided into four groups, namely face-to-face self-care education, educational self-care pamphlet, self-care short messages, and control,^[30] while our intervention included face-to-face education together with face-to-face and telephone-based follow-up assessments and education.

Among the limitations of the study was the probable effects of participants' psychological characteristics and financial problems on their motivation and willingness to participate in the study. We attempted to encourage participation through informing eligible participants about the benefits of learning self-care behaviors. Then, in the future studies, the effectiveness of the

Orem's self-care model in patients with hypertension should be compared in terms of individual, social and psychological characteristics.

CONCLUSION

This study shows that education based on the OSCD theory is effective in significantly improving self-care behaviors in the areas of medication adherence, weight control, nutrition, and physical activity among older women with hypertension. Thereby reducing the risks and the costs associated with the management of hypertension and its complications. Nurses in the outpatient care units are recommended to apply Orem self-care model for patients with hypertension. Physicians and nurses can help patients with appropriate behavioral changes in nutrition, medication adherence, weight control, and lifestyle by implementing the Orem's model for older women with hypertension.

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Conflicts of interest

There are no conflicts of interest.

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