Original Article

Self-care Behavior and Self-care Agency in Lowering Salt Consumption in Hypertensive Older Patients based on Orem's Self-care Theory

Abstract

Introduction: Hypertension is a common chronic disease with multiple systemic complications. Reducing dietary salt intake is one of the most effective and economical methods for managing hypertension. The aim of this study was to investigate self-care agency and self-care behaviors of patients with hypertension in reducing dietary salt and its related factors in Tabriz. **Methods:** In a cross-sectional study, 250 hypertensive adults were selected in June 2016–2017 from a pool of referred patients to the general clinic at one large teaching hospitals in Iran. They were selected through purposive sampling method. The data collection tools included a demographic questionnaire, self-care agency scale, and self-care behaviors scale. Statistical analysis included simple and multiple (multivariable) linear regression. **Results:** For dietary sodium reduction, the mean scores (standard deviation) of self-care agency and self-care behaviors were 37.4 ± 10.04 and 36.5 ± 7.8, respectively. Variables with a significant correlation with self-care agency were marital status, age, and the years of hypertension diagnosis ($P < 0.001$), and for self-care behaviors were marital status and self-care agency ($P < 0.001$). **Conclusion:** The findings of this study showed that single and older patients with a recent diagnosis of hypertension had a low score in self-care agency and self-care behavior. Therefore, health-care providers can focus their educational activities on these individuals to enhance their self-care behaviors and agency.

Keywords: *Diet, hypertension, nursing theory, patients, self-care*

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Introduction

Hypertension is defined as a repeatedly elevated blood pressure exceeding 140/90 mmHg, meaning a systolic pressure above 140 or a diastolic pressure above 90 mmHg;[1] or using antihypertensive drugs.[2] As a chronic condition, hypertension afflicts over 50 million people in the United States and 1 billion people around the world. Nearly 24% of people over the age of 18, develop hypertension and this rate increases with age.[3]

In Iran, hypertension is one of the most common health problems and the prevalence is estimated 23.5%.[4] Self-care concept in chronic illnesses refers to the symptom control, adherence to treatment, maintaining a healthy lifestyle, and daily disease management regarding emotions and social relations;[5,6] that affected by individual experience, skill, motivation, culture, confidence, habits, function, cognition, support from others, and access

to care.[7] Performing self-care behaviorsare affected by factors such as habit, routine, and lifestyle.[8] Various studies have shown that obesity, sedentary lifestyle, high cholesterol, cigarette smoking, stress, alcohol consumption, and high salt intake are associated with hypertension, and identified excessive salt intake as a major culprit.[8,9] In fact, increased salt intake is directly associated with increased blood pressure followed by a higher risk for cardiovascular disease, stroke, heart attacks, and renal failure.[10]

The standard daily salt (sodium chloride) consumption for a human is determined as 0.5–3 g, in which 200–1200 mg is the sodium amount. Research reports have emphasized the benefits of less sodium intake for all ages, especially for patients with hypertension to lower the systolic and diastolic blood pressure.[11] By reducing 1 g of dietary salt, hypertensive patients show a systolic drop of 1 mmHg in their blood pressure reading.[12] According to the World Health Organization report, adults should

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consume <5 g of salt per day.[10] For hypertensive elderly, the safe level of salt intake is 1500 mg/day.[5] Iranian people consume 2–3 times more than the recommended amount yet.[13]

Considering the undesirable effects of high salt intake, it is essential to encourage and empower hypertensive patients to heed the professional recommendations.[10,14] In fact, patient-centered health care has shown improved outcomes when patients assume an active role in their treatment and self-care.[6]

The Orem's Self-care Theory focuses on patient empowerment to promote and maintain personal health,[11] based on the patient's ability to engage in the self-care process.[15] According to Orem, self-care consists of activities to maintain ones' health and well-being. Several factors such as knowledge, motivation, attitude, performance, and skill can influence self-care ability and the absence of any factor could result in incomplete or "self-care defect." Adequate knowledge, positive attitude, and proper skills can help complete the necessary tasks toward self-care.[16]

Self-care agency in Orem's theory, refers to the individual's ability to care for self and defined as a set of information, tendency to self-care, and self-care skills.[6] In a study by Koshtarash who examined the self-care behaviors and its related factors among patients with heart failure, reported positive results regarding adherence to medical treatment, lower salt intake, and adequate time to rest. No significant relationship was found between demographic variables and self-care behaviors.[17] Akyol *et al*. examined self-care agency among the hypertensive patients and reported that patients had moderate self-care agency with a significant relationship between education and social security.[18]

Nurses have an important role in promoting health through patient education by emphasizing self-care behaviors and self-care agency for hypertensive patients and design various intervention programs on self-care behaviors toward higher quality of life for patients.[17] The high prevalence of hypertension in Iran, and paucity of self-care concept in nursing care highlights the need to address the chronicity and complications of hypertension and research aimed at determining the effects of self-care behaviors and self-care agency on hypertensive patients through salt intake reduction. Patient education as a major part of nursing care with focus on self-care offers the potential for patient empowerment and improved health. This study aimed to investigate self-care agency and self-care behaviors of patients with hypertension in reducing dietary salt and its related factors in Tabriz.

Methods

Study participants

In this cross-sectional study, 250 hypertensive older patients were recruited from a patient referral pool at the Sheykh Al-Raees Clinic, affiliated to the Tabriz University of Medical Science for follow-up. The study sample size was determined by the Srikan study, standard deviation of dietary sodium reduction and self-care agency scores of 0.7, the 95% confidence interval, and standard error of 0.1 and according to the formula of sample size for estimating the mean.[19] Patient selection was a simple random sampling method (according to their admission number). The inclusion criteria consisted of being 50 years of age and above, history of hypertension diagnosis for at least 1 year, and taking antihypertensive medication. Exclusion criteria included speech, hearing, and mental health impairment, use of psychotropic drugs, and being completely dependent on others for the personal care.

Questionnaires

Data were collected by demographic questionnaire, dietary sodium reduction self-care behavior, and dietary sodium-reduction self-care agency scale. The Data were collected by demographic questionnaire, dietary sodium reduction self-care behavior (DSR-SCB) scale was developed by Phillips and Srikan as they evaluated the ability to reduce sodium intake among hypertensive elderly patients based on Orem's theory, and established validity and reliability of their instrument. The DSR-SCB scale is formatted in a 5-point Likert-type scale with responses ranging from 1 to 5 (never, seldom, sometimes, often, and always). The potential score ranges from 9 to 45. Higher scores indicate better behavior for lowering salt consumption.[20]

Dietary sodium-reduction self-care agency

This scale was developed by Smith and Philips for assessment of dietary sodium reduction self-care agency, it has 11 items with three subscales for proficiency, resourcefulness, and persuasiveness. Using a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree) and scores range from 11 to 55 with a higher score, indicating better self-care agency in lowering sodium consumption.[21]

The scales used in this study were translated from English to Persian and back-translated to English and content validity was established by ten nursing experts. The reliability of dietary sodium reduction self-care behavior scale and self-care agency was calculated using Cronbach's alpha as 0.88 and 0.95, respectively.

Ethical consideration

The ethics committee at the Cardiovascular Research Center of TUMS reviewed and approved this study and issued a reference number (10682). Data were collected through face-to-face interviews by trained interviewers upon obtaininginformed consent from all participants. Informed consent assured participants of their confidentiality, privacy, and the right to withdraw from the study without prejudice.

Statistical analysis

Data analysis was performed using descriptive statistics (frequency and percentage) and analytic statistics simple and multiple (multivariable) linear regression with SPSS 13, (SPSS Inc, 233, south Wacker, Drive, Chicago) software.

Results

The mean age of the participants was 64.15 ± 10.04, with 57.2% females and 42.8% male. Among the participants, 72.4% had another type of chronic disease in addition to hypertension. Demographic characters of the participants are presented in Table 1.

The mean self-care behavior scores for reducing dietary sodium was 36.5 ± 7.8, and the mean score for self-care agency was 37.4 ± 7.0 [Table 2]. The highest score for self-care behavior was related to the fourth statement indicating, "I prefer home-made foods to buying ready-to-eat food" and for self-care agency the 11th item had the highest score by stating, "I know people who can advise me regarding the reduction of dietary salt."

Examining the relationship between demographic factors and self-care agency and self-care behaviors after using univariate analysis, we found variables with significant correlation with the dependent variable or P value with <%20. When using multiple linear regression model and the correlation for each variable, we found the dependent variable was controlled by other variables. Since the variables in the multiple linear regression model had to be quantitatively introduced, we included all of the qualitative variables (multivariable) as a dummy variable and our results are presented in Tables 3 and 4.

As shown in Table 3, there is a significant relationship between marital status, age, and duration of hypertension diagnosis with self-care agency. These findings show that married patients have a better self-care agency score than single people (beta = −0.12, standard error (SE) = 2.29; P = 0.026), but they have low scores compared to widowed or divorced patients (beta = 0.18, SE = 1.26; P = 0.045). Furthermore, age had an inverse relation with self-care agency, where with an increase of 1 year, the average self-care agency score decreases. 0.14 in older patients (beta = −0.14, SE = 0.04; P = 0.009). This study showed that with an increase of 1 year in duration of hypertension diagnosis, the average self-care agency score decreases. 15 unite in patients (beta = −0.15, SE = 0.06; P = 0.005). These findings show that these variables explain the 33% variance of self-care agency score inthe multiple linear regression model.

As shown in Table 4, the self-care behavior had a significant relation with the marital status, patient's age, and self-care agency in lowering sodium consumption in hypertensive patients. These variables explain the

Table 1: Distribution of sociodemographic characteristics of patients (*n*=250)

Variable	Frequency (%)
Gender	
Female	143 (57.2)
Male	107 (42.8)
Marital status	
Married	209 (83.6)
Single	7 (2.7)
Divorced	1 (0.4)
Widow	33 (13.2)
Education	
Diploma and less	210 (84)
Academic education	40 (16)
Living location	
Urban areas	216 (86.4)
Rural areas	34 (13.6)
Other chronic disease	
None	69 (27.6)
Diabetes	34 (13.6)
Heart disease	68 (26.8)
Renal disease	14 (5.6)
More than one of above	13 (5.2)
Others	54 (21.6)
Ability to cook	
Yes	99 (39.6)
No	151 (60.4)
Cooking skills	
None	83 (33.2)
Weak	20 (8)
Moderate	22 (8.8)
Good	49 (19.6)
Very good	76 (30.4)
Food supplier	
Myself	130 (52)
Spouse	81 (32.4)
Children	11 (4.4)
Bride	13 (5.2)
Others	15 (6)
Age*	64.15±10.4
Duration of hypertension*	8.27±6.27

*Mean±SD. SD: Standard deviation

68% variance of self-care behavior score in multiple linear regression model. As shown in Table 4, married patients have a better self-care behavior score than single people (beta = −0.09, SE = 1.83; P = 0.035). The findings also showed that dietary salt reduction self-care agency had a significant relation with dietary salt reduction self-care behavior and with increase of self-care agency in one unit; the self-care behavior mean score increase 0.86 in patients (beta = 0.86, SE = 0.05; P < 0.001).

Discussion

The foundation of nursing care is based on helping patients balance their abilities and needs on self-care. To achieve

this goal, nurses are educated to develop awareness of patients' ability in caring for themselves and any related factors. The findings of this study show that self-care agency and self-care behaviors are essential for lowering dietary sodium among the hypertensive patients. Patients in this study met and exceeded the acceptable score of 35 and

reached 67% for self-care agency and 68% for self-care behaviors.

In Akyol *et al*. study, the score for self-care behavior reached a moderate level,[18] and in another study by Akyol and Karadakovan found a high score for self-care behavior among the hemodialysis patients.[22] Alvare in 2006 explained the self-care agency among the hypertensive patients in Colombia and reported a desirable 47% level of self-care agency.[23] Self-care behaviors such as health behaviors could be understood and defined more appropriately by considering variations in cultures,[24] and this likely to explain the difference between previous studies.

In a similar study by Lee *et al*., hypertensive Korean-American patients showed that advancing age and longer duration of disease significantly influenced self-care behaviors,[3] while Hu *et al*. identified a significant relation between the disease

Table 2: Scores of self-care behavior, self-care agency and its dimensions for reducing dietary sodium in hypertensive patients

	Mean±SD	Range of scores
Self-care behavior	36.5±7.8	9-45
Self-care agency	37.4±7.0	11-44
Subscale of proficiency	16.9±3.4	5-20
Subscale of persuasiveness	10.2±2.0	3-12
Subscale of resourcefulness	10.3±1.9	3-12

SD: Standard deviation

Table 3: Self-care agency in lowering dietary sodium and its related factors using regression models

Variable	Unmodified univariate simple linear regression		Multiple (multivariable) linear regression	
	B (SE) β	*P*	*B* (SE) β	*P*
Gender				
Female	Reference	-	-	-
Male	−0.01 (0.89) −0.16	0.85		
Marital status		-		-
Married	Reference	-		-
Single	−0.15 (2.61) −6.53	0.013	−0.12 (2.29) −5.13	0.026
Widow or divorced	0.12 (1.21) 2.43	0.004	0.18 (1.26) 3.63	0.045
Education				
Illiterate	Reference	-	-	-
High school	0.06 (1.13) 1.01	0.37	-	-
Diploma	0.32 (1.27) 0.62	0.63	-	-
Academic education	−0.03 (1.61) −0.85	0.59	-	-
Living location				
Urban areas	Reference	-	-	-
Rural areas	0.007 (1.29) 0.14	0.92	-	-
Income (Rials)				
<6,000,000	Reference	-	Reference	
60,000,000-12,000,000	−0.19 (0.98) −2.77	0.005	−0.05 (0.88) −0.75	0.39
>120,000,000	−0.13 (1.55) −3.02	0.05	0.04 (1.41) −0.83	0.56
Other chronic disease				
No	Reference	-	-	-
Yes	0.07 (0.98) 1.09	0.27	-	-
Ability to cook				
No	Reference		-	-
Yes	0.03 (0.90) 0.43	0.63	-	-
Cooking skills				
Poor	Reference	-	-	-
Moderate	0.06 (1.64) 1.46	0.37	-	-
Good	0.02 (0.93) 0.31	0.74	-	-
Barriers in eating		-		
No	Reference		-	-
Yes	−0.008 (1.4) −0.18	0.89	-	-
Age (years)	−0.19 (0.043) −0.12	0.003	−0.14 (0.04) −0.1	0.009
Duration of hypertension (year)	−0.15 (0.061) −0.17	0.032	−0.15 (0.06) −0.17	0.005

Adjusted R^2 for multiple (multivariable) regression=33%. *B*: Standard beta, SE: Standard error

Table 4: Self-care behaviors in lowering dietary sodium and its related factors using regression models				
Variable	Unmodified univariate simple linear regression		Modified multiple (multivariable) linear regression	
	B (SE) β	P	B (SE) β	P
Gender				
Female	Reference	-	-	-
Male	−0.05 (1.0) −0.78	0.43	-	-
Marital status				
Married	Reference	-		-
Single	−0.05 (2.97) −2.32	0.43	0.09 (1.83) 3.88	0.035
Widow or divorced	0.16 (1.43) 3.64	0.012	0.04 (0.95) 0.86	0.37
Education				
Illiterate	Reference			-
High school	0.03 (1.27) 0.65	0.37	-	-
Diploma	0.08 (1.43) 1.63	0.63	-	-
Academic education	−0.004 (1.8) −0.13	0.59	-	-
Living location				
Urban areas	Reference	-	-	-
Rural areas	−0.03 (1.45) −0.68	0.64	-	-
Income (Rials)		-		
<6,000,000	Reference		Reference	
60,000,000-12,000,000	−0.14 (1.11) −2.16	0.052	0.03 (0.71) 0.41	0.56
>120,000,000	−0.09 (1.75) −2.38	0.17	0.01 (1.13) 0.17	0.88
Other chronic disease				
No	Reference		-	-
Yes	−0.01 (1.1) −0.25	0.82	-	-
Ability to cook				
No	Reference		-	-
Yes	0.1 (1.01) 1.63	0.11	0.06 (1.1) 0.94	0.39
Cooking skills				
Poor	Reference	-	-	-
Moderate	0.07 (1.84) 2.07	0.26	0.004 (1.24) 0.01	0.99
Good	0.09 (1.04) 1.44	0.16	−0.006 (1.11) −0.1	-
Barriers in eating		-		
No	Reference		-	-
Yes	0.01 (1.57) 0.32	0.84	-	-
Age (years)	−0.33 (2.11) −5.26	0.01	−0.05 (1.28) −0.78	0.54
Duration of hypertension (year)	−0.15 (0.08) −0.18	0.02	−0.03 (0.05) −0.04	0.39
Self-care agency	0.8 (0.04) 0.89	<0.001	0.86 (0.05) 0.97	<0.001

Adjusted R^2 for multiple (multivariable) regression=68%. B: Standard beta, SE: Standard error

duration and self-care behaviors.[25] Peters and Templin stated that patients with a longer history of hypertension had more knowledge of their condition and scored higher on self-care. In their study on African and American patients with hypertension, they found that knowledge of hypertension was an important predictor of self-care.[26] Thus, these findings are in agreement with the findings of the current study. The length of having hypertension is likely increased patient's self-care agency through more learning and more knowledge about their health condition.

Although in this study, we found an inverse relation between age and self-care agency in hypertensive patients, Akyol *et al*. reported no significant difference between age and self-care agency.[18] However, Lukkarinen and Hentinen did find a significant relationship between age

and self-care agency.[27] Other studies have emphasized the importance of age and its direct impact on social support and self-care ability. According to Ören *et al*. as patients aged, their perceived social support and self-care agency declined.[28]

Perhaps, lower self-care agency in association with age is linked to the physiological changes in vision, hearing, and cognitive status. Findings of this and other studies suggest the need for nursing intervention to promote self-care among the elderly diagnosed with hypertension.

In this study, we found no significant relation between socioeconomic status and educational level with self-care agency and self-care behaviors. This finding verifies adequate and effective public health intervention programs

at the health-care centers across Iran, where access to health information has deleted boundaries among all income groups.

Similar to the study by Shojaee *et al*. and Azarapad, where no relation was found between sex and self-care behaviors,[29,30] in this study, there was no significant relation between gender and self-care behavior and self-care agency. We found that married couples had a better self-care agency and self-care behaviors than single and widowed patients. In fact, Shojaee *et al*. reported that married couples had better self-care behaviors than single females and widows. In other studies, researchers showed that marital status significantly improved self-care behaviors.[28,31]

In the final model, the findings also showed that self-care behaviors have a significant relationship with self-care agency ($r = 0/79$, Pv $< 0/0001$). With regard to the scope of self-care agency that includes the level of resourcefulness, proficiency, and persuasiveness, the impact of these components on self-care behaviors can be justified.

Limitations

This study faced several limitations, one being the cross-sectional design, which did not reveal the cause and effect for the variables, another was the participants' age of over 50, which excluded other age groups with hypertension. Overall, the findings of this study supported by the results of the previous studies with a more robust design and larger samples determine a notable relationship between the variables.

Conclusion

Improving self-care agency can enhance self-care behavior. Meanwhile, health and self-care are linked to multiple factors such as economic, social, political, health institutions, health system structure in different countries, attitudes, beliefs, and the prevailing values. These factors can profoundly influence people's life, their basic needs, and their ability to engage in self-care. Such knowledge and understanding among the nurses as the primary health-care providers can improve acceptance of responsibility for patients' plan of care, treatment, and the implementation of appropriate nursing activities as a mentor, counselor and advocate. Nurses provide essential health information to the caregivers of hypertensive patients and introduce them to the concept of self-care, self-care activities, and appropriate methods for improving self-care behaviors.

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Conflicts of interest

There are no conflicts of interest.

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