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Research Paper

Adherence to Self-Care Behaviors in Hypertensive Patients During the COVID-19 Pandemic Using the Modified Version of the Hypertension Self-Care Activity Level Effects Questionnaire

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ABSTRACT

Background and Aim: High blood pressure is an important global healthcare concern, and its prevalence is increasing worldwide. Self-care practice is a cost-effective method in controlling blood pressure. This study aims to assess the adherence to self-care behaviors among hypertensive patients during the COVID-19 pandemic in Qom, Iran.

Materials and Methods: This is a descriptive-analytical study with a cross-sectional design that was conducted in 2021 on 218 hypertensive patients in Qom City who were selected using a convenience sampling method. The data collection tool was a two-part questionnaire; the first part surveyed demographic characteristics, while the second part was the modified version of the Hypertension Self-Care Activity Level Effects (H-SCALE) questionnaire. Data analysis was performed in SPSS software using independent t-test, ANOVA, Pearson's correlation test, and chi-square test.

Results: The participants had a mean self-care score of 79.32. Among the self-care subscales, smoking exposure (90.1%), medication adherence (85.7%), healthy eating plan (42.8%), weight management (35.1%), and physical exercise (28.5%) showed the highest scores. Only patients with a university education demonstrated higher and more significant self-care scores.

Conclusion: The COVID-19 pandemic has had an impact on hypertensive patients' adherence to self-care behaviors in Qom. Considering the results, particularly in weight management and physical activity with the lowest scores, it is important to implement educational programs to inform hypertensive patients about the seriousness of the complications of the disease and encourage them to adhere to self-care behaviors.

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Journal of Vessels and Circulation
Qom University of Medical Sciences

1. Introduction

Hypertension is one of the critical problems in the world health system. The prevalence and absolute burden of hypertension are increasing worldwide, especially in low- and middle-income countries [1]. The prevalence of hypertension in Iran is 25% to 48.2% [2, 3]. Hypertension is the major modifiable risk factor for cardiovascular disease and premature death worldwide [1]. Lowering blood pressure reduces the incidence of stroke, heart attack, and heart failure [4]. Reducing the prevalence of hypertension can reduce the significant financial burden on the healthcare system. The control of hypertension in Iran is still weak among people who have been diagnosed with the disease. Hypertension will be one of the serious health problems in Iran in the near future [5]. Self-care behavior means blood pressure control [6]. A study conducted in the United States showed that hypertension self-management group classes were effective in reducing blood pressure among a priority population of black men and successful in encouraging re-attendance in the classes [7]. Performing self-care behaviors can reduce blood pressure in patients [8]. Self-care improves patients' ability to face life events and improves people's health [9, 10]. In addition, it makes patients effectively manage their chronic disease [9, 11]. Self-care in patients with chronic diseases reduces the number of patient visits to general physicians by up to 40%, the number of patient visits to specialist physicians by up to 17%, the rate of hospitalization by up to 50%, attendance at emergency centers by up to 50%, and the number of absences from work to 50%. Therefore, healthcare costs are reduced and the quality of life is improved [12]. Concerning hypertension, the level of awareness and control, and also treatment response is unacceptably low worldwide, especially in low- and middle-income countries [1]. During the COVID-19 pandemic, care was compromised due to quarantine and social distancing. Patients with chronic disease are at risk of not receiving the necessary hospital care, and alternative solutions, such as improving the patient's self-care of their chronic disease are needed [13].

Several studies in Iran have evaluated self-care in hypertension patients; in the study conducted by Rezvan et al. the average self-care score was 28, with a minimum score of 14 and a maximum score of 63 [14]. In the study conducted by Zinat Motlagh et al. self-care in terms of adherence to medication, healthy diet, physical activity, and weight management was <50%, and in the case of not smoking, it was >50% [15]. In the study conducted by Pirzadeh et al. >80% of participants adhered to self-care behaviors, such as medication adherence and weight control; however, very few patients followed other behaviors, such as physical activity and low-salt diet [16]. In most of the studies, self-care in patients showed no favorable condition and all mentioned studies were conducted before the COVID-19 pandemic [14-16]. According to healthcare studies, self-care and blood pressure outcomes have been affected by the COVID-19 pandemic [17, 18, 19].

Due to the increasing prevalence of hypertension in the world and Iran, the importance and special position of self-care in controlling hypertension, the inappropriateness of self-care behaviors in patients with hypertension, and the impact of the COVID-19 pandemic on the self-care of patient's blood pressure, adherence of hypertension patients with self-care behaviors should be evaluated. Therefore, this study was designed to evaluate the adherence of hypertension patients with self-care behaviors during the COVID-19 pandemic in Qom City.

2. Materials and Methods

This cross-sectional descriptive-analytical study was conducted in 2021 in Qom City. The research population included all hypertension patients referred to medical centers in Qom City. The sample size using Arabshahi et al. [8] study and considering the z-value for a 95% CI of 1.96, d=0.08, and P=0.70, was 164 people and 197 people were estimated considering the drop rate.

A total of 218 patients referred to the mentioned centers were selected by convenience sampling method. The inclusion criteria included the absence of cognitive problems, a known chronic disease, the ability to communicate in Persian and consent to participate in the study. Oral informed consent was obtained from all selected patients to participate in the study. After obtaining permission from the Research Vice-Chancellor of Qom University of Medical Sciences and presenting it to the officials of the medical training centers, the required permissions were obtained to conduct the study. To collect data, the mentioned medical centers were visited every day, and after stating the purpose of the study to the patient and after obtaining consent, the questions were read to him by a trained questioner to answer.

The data collection tools were completed using an interview and included a demographic questionnaire, including age, sex, education level, marital status, residence status, employment status, body mass index, smoking

history, and duration of diagnosis and the revised version of the hypertension self-care activity level effects (HSCALE) questionnaire. This scale was designed by Warren-Findlow et al. (2018) [20] and examines the self-care activities of patients with hypertension. This questionnaire consists of 30 statements, which examine five subscales, such as medication adherence, nutrition, physical activity, smoking, and weight management. Adherence to medication includes three questions that examine adherence to medication in the last seven days. The score of each question is from zero to seven and the total score is from zero to 21. A person who gets a score of 21 has the highest self-care score in medication adherence.

This scale has the following subscales

Nutrition: It includes 11 questions related to a healthy diet (low-fat, low-salt, potassium-rich diet, and fruit and vegetable consumption). The score range of each question is from zero to seven, the total score is from zero to seven, and a score of 52 and above is considered adhering to nutrition.

Physical activity: It includes two questions, the score range of each question is from zero to seven, and the total score range is zero to 14, and those with a score higher than eight have positive behavior. Tobacco: It includes two questions, the range of each question is from zero to seven and the total score is from zero to 14 and those with a score higher than eight have positive behavior.

Weight management: It includes nine questions scoring on a Likert scale from zero to five (strongly agree to completely disagree) that measures weight control behaviors in the past month. The score ranges from nine to 45 and a score above 35 is a positive score in weight management.

The validity and reliability of the original and Persian versions of this questionnaire have been confirmed [8, 19, 20]. The validity of the Persian version of the questionnaire was confirmed by the elite panel and the reliability coefficient was reported as 0.862. Cronbach's α of the subscales of the questionnaire in the present study was between 0.652 and 0.933.

Data were analyzed using SPSS software, version 22 by descriptive and analytical tests (independent t-test, analysis of variance (ANOVA), chi-square test, and Pearson's correlation coefficient). The significance level in all statistical tests was considered <0.05.

3. Results

In this study, 31.92% of the samples (53 people) were men and 82.63% (138 people) were married. The average age of the samples was 58.97 years and their age range was 24 to 88 years; 75% (123 people) of the people in Malik's study and 41.46% (68 people) in our study had primary education. The average duration of the disease was 8.85 years. The duration of the disease ranged from 1 to 30 years (Table 1).

The average self-care score of the participants was 79.32. Table 2 presents the status of self-care subscales of blood pressure among the participants, and among the self-care subscales, non-smoking and adherence to medication with a mean score of 90.1% and 85.7% of the maximum possible score, respectively, had the highest frequency, and weight management and physical activity with 35.1% and 28.5% of the average score, respectively, had the lowest frequency. Table 2 presents more details.

Among the demographic and clinical factors, a significant difference was observed in the average score of self-care behaviors related to the level of education, and patients with academic education obtained a higher self-care score (Table 3).

Table 4 presents the correlation between the subscales of blood pressure self-care behaviors. A significant relationship was observed between the subscales of self-care except smoking. In other words, better nutrition and more physical activity are associated with adherence to treatment and more weight control.

4. Discussion

Among the five evaluated behaviors, self-care for smoking was the most common self-care behavior. Smoking is an important risk factor for hypertension [1]. Our study showed that 90.1% of patients followed self-care behaviors related to smoking. In the study conducted by Arabshahi et al. 73.7% of people (179 people) [8], and in the study conducted by Zinat Motlagh et al. [15], 86.7% did not smoke, which is consistent with our study.

Another dimension, in which the level of self-care was high, was medication adherence. Medication adherence is vital to achieve effective treatment results in patients with high blood pressure [21]. In the study conducted by Worku et al. most participants had good adherence to the medication (68%) [22]. One of the possible reasons for the obtained result that self-care has a high score compared to medication is that adherence to antihypertensive medications is strongly

Table 1. Demographic characteristics of the samples

Variables		No. (%)
Gender	Male	53(31.92)
	Female	113(68.08)
Residence status	Owner	123(75)
	Tenant	41(25)
Marital status	Single	9(5.38)
	Married	138(82.63)
	Widow/Divorced	20(11.99)
Employment status	Non-governmental	28(18.18)
	Employee	16(10.41)
	Unemployed	32(20.77)
	Housewife	78(50.64)
Education level	Illiterate	23(14.02)
	Primary school	68(41.46)
	Secondary school	20(12.19)
	High school	9(5.51)
	Diploma	21(12.8)
	Academic	23(14.02)

influenced by awareness and knowledge [23]. Knowledge is a key factor in improving self-care behavior and can be promoted by various factors, such as health education, counseling, feedback, and informational materials. In the current study, only 14% of the people were illiterate, which can be one of the signs of the high level of knowledge among them.

Another possible reason is that adherence to antihypertensive medications is a behavior with immediate and significant benefits for patients with hypertension, such as lowering blood pressure, reducing symptoms, and preventing complications [24]. These benefits may motivate patients to take the drug and maintain this behavior over time.

Table 2. Mean±SD, attainable score range, and the mean maximum attainable score of the hypertension self-care activity level effects questionnaire subscales

Structures	Mean±SD	Possible Range	Mean Maximum Attainable Score (%)
Adherence to medication	18.73±5.04	0-21	85.7
Nutrition	33.05±10.76	0-77	42.8
Physical activity	4.48±4.54	0-14	28.5
Smoking	1.3±2.84	0-14	90.1
Weight management	21.64±8.63	9-45	35.1

Table 3. Determining the relationship between self-care behaviors and demographic variables of the participants

Variables		Mean±SD	P
Employment status	Non-governmental	80.07±15.00	0.510*
	Employee	83.93±16.13	
	Unemployed	79.00±14.41	
	Housewife	78.26±12.68	
Residence status	Owner	79.13±13.40	0.896**
	Tenant	79.46±14.48	
Gender	Female	78.37±13.60	0.135**
	Male	81.75±13.40	
Education level	Illiterate	74.13±14.46	0.014*
	Primary school	79.66±13.79	
	Secondary school	74.25±11.81	
	High school	82.55±18.29	
	Diploma	79.38±9.76	
	Academic	86.95±11.41	
Marital status	Single	75.11±19.50	0.582*
	Married	79.38±13.29	
	Widow/Divorced	80.80±13.5	

*ANOVA, **T-test.

Journal of Vessels and Circulation
Qom University of Medical Sciences

In terms of adherence to a healthy diet, <50% of the patients in our study considered their diet. Sisay et al. reported that only 22.4% of the people who participated in the study followed a healthy diet [25]. One possible explanation can be the lack of access to healthy food options during the COVID-19 pandemic. Due to quarantine and supply chain disruptions, many people may have limited access to fresh fruits, vegetables, and other healthy food options [26]. As a result, they may rely on processed and unhealthy foods, leading to poor adherence to a healthy diet. Another possible reason can be the psychological impact of the COVID-19 pandemic.

Table 4. Correlation between hypertension self-care activity level effects questionnaire subscales of blood pressure self-care behaviors among the participants

Variables	1	2	3	4	5
Adherence to medication	1	-	-	-	-
Nutrition	0.148*	1	-	-	-
Physical activity	-0.145*	0.141*	1	-	-
Smoking	-0.098	-0.119	0.004	1	-
Weight management	-0.197**	0.258**	-0.141*	0.025**	1

*Significant at a level of <0.05, **Significant at a level of <0.01.

Journal of Vessels and Circulation
Qom University of Medical Sciences

Journal of Vessels and Circulation
Qom University of Medical Sciences

This epidemic has caused significant stress and anxiety among people [27], which can lead to unhealthy eating habits. Emotional eating or over-eating can be a coping mechanism to deal with stress, which can lead to poor adherence to a healthy diet [28]. Additionally, a lack of social support during a pandemic can lead to low adherence to a healthy diet. Social support, such as the encouragement of family and friends, can be a crucial factor in maintaining healthy eating habits [29].

Physical activity and weight management had the lowest level of adherence among the five evaluated behaviors. In a similar study, less than half of the participants adhered to recommended levels of physical activity (44.9%) and only 21.4% adhered to weight management recommendations [30]. In the study conducted by Abdisa et al. 29.6% of participants engaged in the recommended level of physical activity, and 50.2% of people adhered to weight management practices [31]. In another study conducted by Arabshahi et al. in Qom City, physical activity showed the lowest self-care score among the evaluated behaviors, which is consistent with our study [8]. Several factors, including lack of motivation and cultural factors, may contribute to poor adherence to weight management; therefore, health policy makers should pay special attention to this point [32]. According to studies during the COVID-19 pandemic, the physical activity of people was limited due to the closing of gyms, fitness centers, and parks. Quarantine measures also affected people's physical activity levels [32]. On the other hand, the COVID-19 pandemic caused increased sedentary behavior so that people spent more time at home due to social distancing. This sedentary behavior is associated with weight gain and decreased physical activity [33].

In terms of demographic factors, the level of education was the only significant predictor of adherence to self-care behaviors, and other demographic factors, such as age, gender, employment status, and marital status had no significant relationship with self-care behaviors. Patients with a higher level of education adhered to self-care behaviors more than patients with a lower level of education. This result is consistent with previous studies indicating a positive relationship between education level and adherence to self-care behaviors [34, 35]. Warren-Findlow et al. showed that in terms of overall adherence to the set of self-care behaviors, no significant difference was observed in terms of age, gender, or race according to the average number of behaviors that the participants adhered to [36]. These results are consistent with the results of our study. Ajani et al. showed that educated patients showed better adherence to diet and weight management than those with less education. Also, higher education was often associated with better economic status [37]. Improving economic status may increase patients' access to healthier food choices and physical activity programs. This issue may facilitate self-care behavior. One of the factors that may explain the relationship between blood pressure self-care behaviors and education level is the doctor-patient relationship. Khairy et al. showed that less patient-doctor communication is independently related to the patient's education level [38]. On the other hand, self-efficacy is one of the influential factors in increasing physical activity. Hu et al. showed that an increased level of education is related to an increased sense of self-efficacy, and on the other hand, increased self-efficacy leads to increased physical activity in patients with hypertension [39]. An increased level of education may be effective in adhering to self-care behaviors through the reasons mentioned.

This study had limitations. The study only covered Qom City and did not examine rural areas. Another point is no answer to some questions, such as smoking, which can affect the validity of the information obtained from this component. It is suggested that future studies investigate psychosocial factors affecting self-care.

5. Conclusion

This study was conducted to determine self-care behaviors in patients with hypertension using the revised version of the H-SCALE scale during the COVID-19 pandemic. The results showed that adherence to self-care behaviors among patients with hypertension during the COVID-19 pandemic in Qom City is 79.32% on average. It seems that the COVID-19 pandemic has affected the mental and economic burden of society and the restriction of access to some places and social distancing on the self-care of patients with hypertension. Considering the results of self-care, especially in the two subscales of weight management and physical activity, which received the lowest score, educational programs and informing patients with blood pressure about the seriousness of the disease complications and encouraging them to adhere to self-care seem necessary.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of Qom University of Medical Sciences (Code: IR.MUQ.REC.1400.009).

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Authors' contributions

Study design: Zahra Taheri Khorameh, Mohammad Amin Shabani and Mohammad Sina Mirjani; Data collection: Mohammad Amin Shabani, Mohammad Sina Mirjani and Fatemeh Raayai; Data analysis: Zahra Taheri Khorameh and Mohammad Amin Shabani; Drafting the manuscript, review and editing: All authors.

Conflict of interest

The authors declared no conflict of interest.

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