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Cognitive Factors Association with Medication Adherence among Hypertension Patients

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Abstract: Poor medication adherence in people with hypertension can lead to the development of cardiovascular complications, quality of life and reduce health care costs will increase. This study was conducted to investigate the factors related to medication adherence using social cognitive theory in hypertensive patients in Kohgiluyeh and Boyer-Ahmad provinces (Iran). This cross-sectional study was conducted among 1836 patients (male and female) with hypertension under the urban and rural health centers in Kohgiluyeh and Boyer-Ahmad provinces who met the inclusion criteria. Data collection tools were an adherence to medication questionnaire based on a modified questionnaire on the measured using the H-hypertension self-care activity level effects and the Bandura social cognitive theoretical constructs questionnaire (including self-efficacy structures, social support, outcome expectation, Outcome Expectancy and self-regulation). Data was analyzed using SPSS-21 at 95% significant level. The rate of medication treatment among participants was 74.8% (75.5% women and 73.7% men). 31.2% of participants had control over their blood pressure. Adherence to medication was weak in patients. So that 35.7% of men and 36.1% of women have medication adherence. Linear regression analysis revealed that outcome expectation, family social support, self-regulation, and outcome Expectancy accounted for a total of 59% of the variance in medication adherence. Findings indicated that the status of medication adherence in the studied patients was poor, which indicates the lack of necessary training on the importance of adherence to drug use to patients. Considering the correlation between the constructs of social cognitive theory and medication adherence, the constructs of this theory can be used in adherence to medication training in hypertensive patients.

Keywords: Adherence to medication, Social Cognitive Theory, Hypertension, Self-Regulation, Self-Efficacy

Introduction

Rapid rise of non-communicable diseases (NCDs) is one of this century's most important global health challenges (Méndez & Muñoz, 2011). So that in 2016, non-communicable diseases accounted for 71% of deaths worldwide and 44% of deaths are related to cardiovascular diseases associated with high blood pressure (WHO.2016). hypertension is known to be the main risk factor for cardiovascular disease, and stroke (Benjamin et al., 2018) and one of the main causes of mortality and disability cause around the world (WHO, 2009). In 2015, a number of people with high blood pressure in the world were one billion one hundred and thirteen thousand people, with the aging of the population and the increase in sedentary lifestyles and obesity, it is predicted that its prevalence will increase by 15-20% by 2025 increase to one and a half billion people (Desormais et al., 2019). Prevalence of high blood pressure in different regions of the world has been reported from 4% to 78% (Salem et al., 2018). The prevalence of high blood

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pressure in South Asia is 27% (Angeli et al., 2019) and in Iran, various studies have reported the prevalence between 22 and 47% (Mirzaei et al., 2016; Poorhoseini & Shafiee, 2020).

Blood pressure control is of particular importance so that the chance of complications can be reduced to a minimum. Despite the fact that the prevention and treatment of high blood pressure have been taken into consideration and certain solutions have been presented for its treatment (Siegel et al., 2007). However, the reported levels of blood pressure control are disappointing. So that this amount is reported between 23 and 63 percent in different countries (Castro et al., 2018) and 30 to 39 percent in Iran.

The first line of treatment for patients with high blood pressure is usually antihypertensive drugs (Wrobel et al., 2011). However, medication has not always been effective in achieving hypertension control, and many patients have poor adherence to antihypertensive medications (Warren-Findlow & Seymour, 2011). Medication adherence means the patient's adherence to the medication instructions, which includes: taking the medication on time, and taking the medication according to the schedule and the way prescribed by the doctor. Adherence to the drug regimen is problematic due to the absence of clinical symptoms of the patient, the high cost of the drug, the use of several drugs at the same time, and the side effects of the drugs. In the studies conducted, not reported complete adherence to the prescribed medication. So that the rate of adherence in studies of other countries is between 27% and 87%, (Hennein et al., 2018) and in Iran, this rate is between 38% and 50% (Mirzaei et al., 2020).

Poor medication adherence can lead to the development of disease complications, reduced quality of life, increased treatment costs, and length of hospital stay (Naderi et al., 2012). Many studies reported that poor medication adherence was significantly associated with uncontrolled hypertension. According to the above findings, it seems necessary to study medication adherence in people with high blood pressure. It is important that such studies are measured based on a more effective framework or model rather than using traditional measures (Castro et al., 2018). In this regard, social cognitive theory, which is a practical model for improving self-care behaviors in patients with chronic diseases, was used in this study.

Social cognitive theory is one of the most common theories for improving self-management behaviors in patients with chronic diseases (Vijayaraghavan et al., 2011). The social cognitive theory emphasizes that individual and environmental characteristics affect behavior; And he believes in the opposition of two sides of person, behavior, and environment (Glanz et al., 2008). This theory is a collection of various constructs including knowledge, self-efficacy, social support, outcome expectations, and self-regulation. that many studies have been conducted to identify important factors in determining self-care behaviors in patients based on the constructs of social cognitive theory (Borhaninejad et al., 2017). Based on this, the present study was conducted with the aim of investigating factors related to medication adherence using social cognitive theory in high blood pressure patients.

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Material and Methods

This cross-sectional study was conducted on a1836 sample of men and women with hypertension in urban and rural health centers in Kohgiluyeh and Boyer- Ahmad Province. Patients met the inclusion criteria (six months past the definitive diagnosis disease doctor, a record in health centers, and over the age of 30).

Measures

The questionnaire included three sections: sociodemographic characteristics, Medication adherence questionnaire based on Warren-Findlow et al. (2012) modified questionnaire of hypertension self-care activities, and the scale of constructs of social cognitive theories Bandura.

Demographic information included age, gender, education level, occupation status, family history of hypertension, marital status, medication therapy, and hypertension control.

Medication Adherence were ascertained using the hypertension self-care activity level effects questionnaire(H-scale) (Warren-Findlow et al., 2012). Three items assessed the number of days in the last week that the respondent displayed adherence.1. do you take your blood pressure pills? 2.Do you take your blood pressure pills at the same time every day? 3.Do you take the recommended number of blood pressure pills? The responses were summed (range: 0 - 21), and the participants who reported that they had followed these three recommendations on all weekdays were considered adherent.

The study framework was designed based on the constructs of social cognitive theory. These constructs include self-efficacy, social support Outcome Expectancy, Outcome Expectation, and self-regulation. The self-efficacy construct for medication adherence was assessed taken from the modified scale (Warren-Findlow et al., 2012). The answers to questions were scored using a 5-point Likert scale (strongly agree to strongly disagree). Self-regulation was measured using 4 items through a 5-point scoring scale consisted the answers of never to always. The constructs of social support were evaluated for medication adherence through ng a part of the House translation version of the questionnaire, which measured the subscales related to family and friends (House et al., 1982). Responses were scored using a 5-point Likert scale (never, rarely, sometimes, most of the time, and always), and the higher the score, the higher the perceived social support. Outcome Expectancy, Outcome Expectation were measured using 7 items through a 5-point scoring scale consisting of strongly agree to strongly disagree. The face and content validity of the questionnaire was confirmed by 10 experts in the fields of health education, epidemiology, and medicine. The reliability of the questionnaire was obtained through Cronbach's alpha coefficient for Self-efficacy, social support, Outcome Expectancy, Outcome Expectation and self-regulation constructs between 0.73 and 0.98.

Statistical analysis: Statistical analyses were performed using SPSS windows version 21.0 software (SPSS Inc., Chicago, Illinois, USA). with a significance level of 0.05 through the descriptive statistics and appropriate analytical statistics (Pearson correlation and linear regression). SPSS IBM version 20.0 software (IBM, Armonk, NY, USA) was used for statistical analysis. Chi-square test was used in order to compare qualitative variables among the two groups of medication adherence. Also, Pearson

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correlation coefficient analysis and multiple linear regression analysis with the backward method were used. The significance level was set at p=0.05.

Results

The age range of the participants was 30 to 93 years, and the mean ± SD age was 60.26±12.66 years. 39.3% were men and 60.7% were women. 1149 participants (66.2%) were illiterate and 75 (4.1%) had a university education. 1488 participants (81%) were married. 45.5% had a family history of hypertension (Table 1).

The treatment rates among participants were 74.8% (75.5% of women and 73.7% of men). Adherence to medication was poor in hypertensive patients (35.7% of men and 36.1% of women Adherence to medication). 47.3% of the patients reported they had taken the drugs prescribed to control hypertensive in the last 7 days. 41.7% of patients have taken the prescribed medicines to control their hypertension at the specified time. 41.1% of the patients have taken the prescribed medicines correctly and completely, according to the doctor's prescription. There was a significant relationship between age, education level, Region, and medication adherence (p<0.05; Table 1).

The dependent variable was the nature of the treatment, and the predictor (independent) variables were self-efficacy, family support, and self-regulation. Multiple regression assumptions were examined. The lack of collinearity between the predictor variables was assessed by the variance inflation factor (VIF), and VIF<5 was obtained in the final model for the predictive variable. The normality hypothesis was tested using standardized residual graphs versus standardized values of predictor variables, and the normality was confirmed. Also, linear regression analysis showed that in the third step, 59% of the variation in the medication adherence is predictable from the independent variable outcome expectation, social support, self-regulation, and Outcome Expectancy (Table 3).

Table 1. Demographic Factor (n=1836)

Variables		Medication Adherence		**P**	**Variables**		Medication Adherence		P
	n	n	%			n	n	%	
Gender					**job**				
Male	722	258	38.9	P =0.413	Farmer	201	79	11.9	
Female	1114	405	61.1		employment	111	38	75	P =0.683
Age groups					Retired	184	63	9.4	
30-39	95	25	3.8		Unemployed	269	91	13.7	
40-49	262	81	12.2	P =0.013	Housekeeper	1071	393	59.9	
50-59	534	188	28.4		**Family history**				
60<	945	369	55.7		Yes	832	307	46.3	P =0.227
Marital status					No	1004	356	53.7	
Single	348	130	19.6	P =0.316	**(BMI)**				
Married	1488	533	80.4		18.5<	15	4	0.6	
Region					25-18.5	655	239	36	P =0.234
Urban	822	279	42.1	P =0.045	30-25	736	250	37.7	
Rural	1014	384	57.9		30≥	430	170	25.6	
Education level					**Treatment**				
Illiterate	1149	448	67.6		Yes	1373	646	97.6	P =0.000
Primary school	476	144	21.7	P =0.008	no	463	17	2.6	
Diploma	136	45	6.8						
University	75	26	3.9						

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Table 2. Correlation between the studied constructs and medication adherence among patients

Variable	X1	X2	X3	X4	X5	X6
X1. Outcome Expectation	1					
X2. Self-efficacy	0.237	1				
X3. Support Family	0.159	0.104	1			
X4. Support Friend	0.049	0.021	0.316	1		
X5. Outcome Expectancy	0.344	0.226	0.202	0.092	1	
X6. Self-Regulation	0.495	0.238	0.188	0.077	0.444	1
X7. medication adherence	0.598	0.222	0.223	0.079	0.490	0.689

Table 3. Linear regression analysis to determine the predictor's medication adherence

Variable	B	SE B	Beta	T	P-value
Step 3					
Outcome Expectation	0.990	0.056	0.307	17.591	<0.0001
Subjective Norms	0.157	0.044	0.055	3.551	<0.0001
Self-Regulation	0.402	0.039	0.174	10.229	<0.0001
Outcome Expectancy	1.015	0.041	0.450	24.591	<0.0001
R^2 = 0.56 & P <0.001					

Discussion

The aim of the study was to investigate the relationship between cognitive factors and medication adherence in patients with hypertension. The results of the study showed that 36.1% of the patient's medication adherence, which shows low medication adherence among patients. There was no significant difference in medication adherence between men and women, which is consistent with the results of the study by Mirzaei et al. (2020). The rate of adherence to medication in studies conducted in other countries has been reported between 54 and 87 percent. 77.6%, Uchmanowicz et al. (2019) 68.8%, by Hennein et al. (2018), and 87.8% by Abegaz et al. (2017). It seems that this difference in medication adherence was attributed to cultural factors, such as cultural health perception of high blood pressure, self-care behaviors, social support, and low literacy and illiteracy of a high percentage of participants, as well as the time of disease diagnosis.

Age, place of residence, and education had a significant relationship with higher levels of medication adherence. The patients who lived in the village had higher adherence than the patients who lived in the city. It seems that implementing the rural family doctor plan and the active care of high blood pressure patients in the villages by health workers can effectively control high blood pressure and adherence to medication.

The results of the study showed that older people are more likely to adhere to the use of antihypertensive drugs. The relationship between medication adherence and older age may be related to more learning opportunities, patients' experience in self-care in blood pressure control, and more diseases in the elderly. Abegaz et al. (2017) and Nielsen et al. (2017) reported in their studies that older people are more likely to adhere to antihypertensive medications which is consistent with the findings of this study. The findings of this study recommend intervention measures for young patients and patients who have recently been diagnosed with high blood pressure.

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Outcome Expectancy, self-regulation, social support, and outcome expectation have predicted 59% of the variance of medication adherence in high blood pressure patients, which can be indicative of the fact that medication adherence is less predicted by self-efficacy among examined patients. which is not consistent with the findings of Warren-Findlow et al. (2012), Omidi et al. (2017) and Criswell et al. (2010) who reported self-efficacy predicting self-care behaviors and adherence to medication recommendations.

Self-regulation is the process of self-control that is applied through a set of mechanisms such as goal setting, receiving feedback, rewarding oneself, establishing personal guidelines, and identifying with social support (Safari & Shojaeizadeh, 2009). Several studies have introduced self-regulation as one of the important determinants of self-care behaviors (Barati et al., 2011; Borhaninejad et al., 2017). Self-regulation based on self-belief is essential for hypertensive patients to control blood pressure and prevent complications.

In this study, social support was a predictor of medication adherence in patients, which is consistent with other studies. Researchers have stated that the involvement of family members, friends, and healthcare providers can help reduce the burden of patients in managing chronic diseases. A large number of patients participating in this study were over 60 years old and need the support of their families, especially their children. It seems that due to the fact that a large number of studied patients lived in the village and the rapid growth of economic and social changes, urbanization and the separation of children from their parents could not weaken the performance of families in caring for patients.

Several limitations can be stated for this study. Being a self-reporting tool for collecting information was one of the limitations that made reporting and correcting the transmission of some behaviors related to medication adherence a challenge. The influence of the mental and psychological conditions of the participants at the time of completing the questionnaireswas beyond the researcher's control , although it was tried to include the appropriate time and place for data collection as much as possible. The high age of the participants in the study and the illiteracy of a high percentage of the participants, these two factors can affect answering the questions of the questionnaire.

Conclusion

The results of the study showed that adherence to medication was poor in the examined patients. There was a positive significant relationship between medication adherence and social cognitive factors (outcome expectations, self-efficacy, social support, outcome evaluation, and self-regulation), especially the self-regulation factor. Regression analysis with a high predictive percentage of the variance of medication adherence confirmed that a high level of cognitive factors in patients is related to a high level of adherence to self-care behaviors, self-regulation, and medication adherence. Therefore, it seems that the implementation of treatment-intervention programs, training in self-regulation and self-efficacy strategies to increase adherence to medication and improve patients' beliefs about health and hypertension disease.

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References

Abegaz, T. M., Shehab, A., Gebreyohannes, E. A., Bhagavathula, A. S., & Elnour, A. A. (2017). Nonadherence to antihypertensive drugs: a systematic review and meta-analysis. *Medicine*, *96*(4).

Angeli, F., Reboldi, G., Trapasso, M., Aita, A., & Verdecchia, P. (2019). Managing hypertension in 2018: which guideline to follow? *Heart Asia*, *11*(1).

Barati, M., Darabi, D., Moghimbeigi, A., & Afsar, A. (2011). Self-regulation behaviors of hypertension and related factors among hypertensive patients. *Journal of Fasa University of Medical Sciences*, *1*(3), 116-122.

Benjamin, E. J., Virani, S. S., Callaway, C. W., Chamberlain, A. M., Chang, A. R., Cheng, S., . . . Deo, R. (2018). Heart disease and stroke statistics—2018 update: a report from the American Heart Association. *Circulation*, *137*(12), e67-e492.

Borhaninejad, V., Iranpour, A., Shati, M., Tahami, A. N., Yousefzadeh, G., & Fadayevatan, R. (2017). Predictors of self-care among the elderly with diabetes type 2: using social cognitive theory. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, *11*(3), 163-166.

Castro, L. L., Lanna, C. C. D., Rocha, M. P., Ribeiro, A. L. P., & Telles, R. W. (2018). Recognition and control of hypertension, diabetes, and dyslipidemia in patients with rheumatoid arthritis. *Rheumatology International*, *38*(8), 1437-1442.

Criswell, T. J., Weber, C. A., Xu, Y., & Carter, B. L. (2010). Effect of self-efficacy and social support on adherence to antihypertensive drugs. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*, *30*(5), 432-441.

Desormais, I., Amidou, S. A., Houehanou, Y. C., Houinato, S. D., Gbagouidi, G. N., Preux, P. M., . . . Lacroix, P. (2019). The prevalence, awareness, management and control of hypertension in men and women in Benin, West Africa: the TAHES study. *BMC cardiovascular disorders*, *19*(1), 1-12.

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[DOR: 20.1001.1.25884395.2022.4.4.18.4]

[DOI: 10.52547/ieepj.4.4.204]

Glanz, K., Rimer, B. K., & Viswanath, K. (2008). *Health behavior and health education: theory, research, and practice*. John Wiley & Sons.

Hennein, R., Hwang, S. J., Au, R., Levy, D., Muntner, P., Fox, C. S., & Ma, J. (2018). Barriers to medication adherence and links to cardiovascular disease risk factor control: the Framingham Heart Study. *Internal medicine journal*, *48*(4), 414-421.

House, J. S., Robbins, C., & Metzner, H. L. (1982). The association of social relationships and activities with mortality: Prospective evidence from the Tecumseh Community Health Study. *American journal of epidemiology*, *116*(1), 123-140.

Méndez, M. J. M., & Muñoz, C. P. (2011). Adaptación al español de la «Escala de apoyo social percibido específico para la enfermedad» de Revenson et al., 1991. *Psicothema*, *23*(4), 795-801.

Mirzaei, M., Mirzaei, M., Bagheri, B., & Dehghani, A. (2020). Awareness, treatment, and control of hypertension and related factors in adult Iranian population. *BMC Public Health*, *20*, 1-10.

Mirzaei, M., Moayedallaie, S., Jabbari, L., & Mohammadi, M. (2016). Prevalence of hypertension in Iran 1980–2012: a systematic review. *The Journal of Tehran University Heart Center*, *11*(4), 159.

Naderi, S. H., Bestwick, J. P., & Wald, D. S. (2012). Adherence to drugs that prevent cardiovascular disease: meta-analysis on 376,162 patients. *The American journal of medicine*, *125*(9), 882-887. e881.

Nielsen, J. Ø., Shrestha, A., Neupane, D., & Kallestrup, P. (2017). Non-adherence to anti-hypertensive medication in low-and middle-income countries: a systematic review and meta-analysis of 92443 subjects. *Journal of human hypertension*, *31*(1), 14-21.

Omidi, A., Khodaveisi, M., Mirzaei, Z., Rezvani, M., & Moghimbeighi, A. (2017). The Effect of Education Self-Care Behaviors on the Hypertension in Postmenopausal Women. *Avicenna Journal of Nursing and Midwifery Care*, *25*(4), 121-130.

Poorhoseini, H.-R., & Shafiee, A. (2020). A general Report of the National Plan for High Blood Pressure Control at Tehran Heart Center in 2019. *Commonity Health*, *7*(3), 340-344.

Safari, M., & Shojaeizadeh, D. (2009). Theories Models and methods of health education and promotion. *Asar-E Sobhan Publishing, Iran*, 22-24.

Salem, H., Hasan, D. M., Eameash, A., El-Mageed, H. A., Hasan, S., & Ali, R. (2018). Worldwide prevalence of hypertension: A pooled meta-analysis of 1670 studies in 71 countries with 29.5 million participants. *Journal of the American College of Cardiology*, *71*(11S), A1819-A1819.

Siegel, D., Lopez, J., & Meier, J. (2007). Antihypertensive medication adherence in the Department of Veterans Affairs. *The American journal of medicine*, *120*(1), 26-32.

Uchmanowicz, B., Jankowska, E. A., Uchmanowicz, I., & Morisky, D. E. (2019). Self-reported medication adherence measured with morisky medication adherence scales and its determinants in

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[DOR: 20.1001.1.25884395.2022.4.4.18.4]

[DOI: 10.52547/ieepj.4.4.204]

hypertensive patients aged≥ 60 years: a systematic review and meta-analysis. *Frontiers in Pharmacology*, *10*, 168.

Vijayaraghavan, M., Jacobs, E. A., Seligman, H., & Fernandez, A. (2011). The association between housing instability, food insecurity, and diabetes self-efficacy in low-income adults. *Journal of Health Care for the Poor and Underserved*, *22*(4), 1279-1291.

Warren-Findlow, J., & Seymour, R. B. (2011). Prevalence rates of hypertension self-care activities among African Americans. *Journal of the National Medical Association*, *103*(6), 503-512.

Warren-Findlow, J., Seymour, R. B., & Brunner Huber, L. R. (2012). The association between self-efficacy and hypertension self-care activities among African American adults. *Journal of community health*, *37*, 15-24.

Wrobel, M. J., Figge, J. J., & Izzo Jr, J. L. (2011). Hypertension in diverse populations: a New York State Medicaid clinical guidance document. *Journal of the American Society of Hypertension*, *5*(4), 208-229.

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