Medication Beliefs, Cognitive Defusion, and Valued Living in Hypertensive Patients with Varying Medication Adherence

Fatemeh Zargar[(1)], **Parisa Monzavi**[(2)], **Mohammad Javad Tarrahi**[(3)], **Sayed Arash Salehi**[(4)]

Original Article

Abstract

BACKGROUND: One of the most severe problems that patients with Hypertension (HPN) face are lack of medication adherence, which is influenced by psychological factors. Thus, the current survey sought to compare medication beliefs, cognitive defusion and valued living in hypertensive patients with varying medication adherence.

METHODS: A cross-sectional study with 162 HPN patients from three clinics at Isfahan University of Medical Sciences was conducted in 2019. Participants completed the BMQ (Beliefs about Medicines Questionnaire), MMAS (Morisky Medication Adherence Scale), CFQ (Cognitive Fusion Questionnaire), and VLQ (Valued Living Questionnaire). The data were analyzed using descriptive statistics, chi-square, and analysis of variance (ANOVA).

RESULTS: Only 22.2% of patients scored high in medication adherence (MA). MA levels increased with age in a significant correlation (p=0.03). ANOVA results revealed that the three MA levels (low, medium, and high) had substantial differences in both VLQ subscales (importance of person-valued living and allotted time for values; p=0.002 and p=0.023). However, no significant differences in MA levels were found in the CFQ (cognitive defusion and cognitive fusion) and BMQ subscales (specific necessity, specific concern, general overuse, and general harm).

CONCLUSIONS: This study discovered that a higher MA is associated with increasing age. In addition, patients with HPN who value living and devote more time to their values have higher MA.

Keywords: Hypertension, MedicationAdherence, Medication Beliefs, Cognitive Defusion, Valued Living

Introduction

Hypertension (HPN) is a common, chronic, and recurring disease that is also a significant risk factor for other conditions [1]. Adults in the United States had an age-adjusted hypertension prevalence of 45.4% [2]. In Iran, the overall prevalence of HPN was estimated to be between 23.2% [3] and 46.6% [4]. Even though HPN is the leading cause of death in industrialized countries and the most common treatable risk factor [5], only 48.1% of HPN patients in Iran were treated, and only 21.3% were controlled [6]. Furthermore,

1- Associated Professor, Department of Health Psychology , Behavioral Science Research Centre, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
2- Medical Practitionare ,School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
3- Department of epidemiology and biostatistics, School of Health, Isfahan University of Medical Sciences, Isfahan, Iran
4- Department of Pharmacognosy, Isfahan,University of Medical Sciences, Isfahan, Iran
Address for correspondence: Parisa Monzavi; Medical Practitionare ,School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran. Email: pm_manzavi@yahoo.com

statistical studies have revealed that blood pressure is managed in only 57% of HPN patients worldwide [7].

Although appropriate pharmacotherapy can reduce symptoms, complications, and mortality rates, it imposes a healthcare burden and puts patients at risk of side effects [8]. Poor medication adherence (MA) is a global issue in HPN patients, with rates ranging from 10% to more than 60% in different regions. According to studies conducted in the United States, 30-60% of hypertensive patients do not follow their prescribed medication regimen [9]. Another study found that MA was low in HPN patients [10]. Antihypertensive medications were used by 33% of hypertensive patients in Iran [11]. However, Pirzadeh *et al.* discovered that 90% of Isfahanian patients took their medications as prescribed [12]. Noncompliance with treatment plans by patients will result in severe consequences, such as relapse and disability progression, necessitating immediate treatment and hospitalization [13]. However, MA is a significant factor in achieving normal blood pressure [14].

Their beliefs determine the correct use of medications and patients' MA about the medications prescribed (referred to as medication belief, MB) [15]. Several studies have confirmed the link between MA and beliefs [16-18]. According to the findings of one study, MB, such as the dangers of drugs and concerns about drug use, were inversely related to adherence to treatment, and beliefs about the necessity of drug use increased MA [17]. Minaian et al. investigated the role of patients' beliefs in MA in patients with asthma, cancer, and kidney transplantation. They discovered that patients with solid opinions cooperated more with treatment regardless of disease type [19].

On the other hand, individual psychological characteristics play an essential role in MA. Acceptance and Commitment Therapy (ACT) is one psychotherapy approach used to manage the psychological factors affecting physical illnesses. It has two major components: cognitive defusion and having a valued living. People with excellent cognitive defusion can accept their unpleasant internal experiences (thoughts, feelings, bodily sensations, unpleasant memories, and impulses) in such a way that they see their internal experiences as quick and part of their experience rather than pervasive and comprehensive facts that explain the individuals' entire existence [20]. For example, having anxiety is simply an experience of anxiety in the present moment, not a person who regards himself or herself as anxious and unable to cope with their problems. Similarly, taking medication and having a specific disease does not imply total disability and accepting the patient role [21].

On the other hand, people who are fused with internal experiences (named cognitive fusion) try to eliminate or change their unpleasant internal experiences as soon as they are formed. Not accepting and trying to control these inner experiences causes them to intensify, and the patient expends a lot of energy fighting against them, preventing the patient from moving in the direction of his/her life values [20]. As a result, cognitive defusion and valued living have an essential relationship with MA. Gaudiano *et al.* investigated the effects of valued living on MA in bipolar disorder patients with comorbid substance abuse. They discovered a link between value-action consistency and MA [22]. Furthermore, studies have shown that greater psychological flexibility (one of its essential dimensions is cognitive defusion) is significantly associated with better MA in people with Type 1 diabetes mellitus [23], HIV [24] chronic respiratory diseases [25].

Although several studies have shown that ACT is effective in reducing HPN [26-28], the role of the treatment's mechanisms of effectiveness (such as cognitive defusion and valued living) has not been specifically addressed. However, if it is discovered that people with more cognitive defusion, valued living, and MA adhere to treatment better, more effective treatments can be used for these patients. As a result, the purpose of this study was to compare medication beliefs, cognitive defusion, and valued living in hypertensive patients with varying medication adherence.

Materials and Methods

In July and August 2019, 162 hypertensive patients visited three clinics at Isfahan University of Medical Sciences (Shahid Chamran, Alzahra, and Khorshid) for follow-up and treatment. Based on a similar study [15] with 95% confidence and 80% power (with standard deviations of 4 and 3.1 and a minimum score difference of 2 between individuals with and without drug adherence), the sample size was determined to be at least 51 people in each level of commitment. We need at least 153 samples for comparison because there are three levels of commitment. The following is the sample size formula: The Isfahan University of Medical Sciences Medical Ethics Committee approved the study (IR.MUI.MED.REC.1398.219). By the Helsinki Ethics Principle, the questioner briefly explained the participants after obtaining their informed consent. They were also free to withdraw from the study at any time.

Patients with primary HPN whom a cardiologist and a nephrologist had diagnosed were selected at random equally from the clinics mentioned. The inclusion criteria were:
1- Primary HPN with consumption of at least one antihypertensive medication,
2- No medication-requiring major psychiatric illness (based on SCID-1)
3- Literacy (at least fifth grade),
4- Informed consent, and
5- Absence of secondary HPN (HPN in patients with diabetes, kidney disease, heart disease, and various heart attacks and strokes). The exclusion criteria were failure to complete more than 80% of the questionnaire and willingness to leave the study at any time.

Gender, education, occupation, and age were used to collect demographic information, and data on medication beliefs, medication adherence, cognitive defusion, and valued living were collected using the following four valid questionnaires:
1- BMQ (Beliefs about Medicines Questionnaire),
2- MMAS (Morisky Medication Adherence Scale),
3- CFQ (Cognitive Fusion Questionnaire), and
4- VLQ (Valued Living Questionnaire).

BMQ consists of 18 questions, assesses patients' beliefs about their medications, and is divided into two parts: 1) the BMQ-Specific (10 questions) and BMQ-General (8 questions). BMQ-Specific is divided into subscales (specific necessity and specific concern). So the BMQ-specific evaluates beliefs about the necessity of prescribed medication and concerns about prescribed medication based on assumptions about the dangers of dependence and long-term toxicity and disruptive effects of the drug. The BMQ-General has two subscales (general overuse and general harm). So, the BMQ-General evaluates beliefs that medicines are harmful, addictive poisons that should not be taken continuously and that doctors overuse medicines. Each item was graded on a five-point Likert response scale (1= strongly disagree, 3= uncertain, 5= strongly agree) [29]. The Iranian version was reliable in patients with kidney disorders (Cronbach's α=0.71) [18]. Morisky et al. created eight MMAS items to assess patients' medication adherence, which includes seven yes/no questions and a five-point Likert-type scale [30]. The scores of 8, 6-7, and 0-5 indicate high, intermediate, and poor adherence, respectively. Mohammad et al. confirmed the validity and reliability of the Iranian version. (Cronbach's α=0.697) [31]. Gillanders et al. presented the CFQ, which has 13 items and is divided into two parts: cognitive fusion and defusion. It is scored on seven points Likert scale [32]. Zare et al. investigated the validity and reliability of cognitive fusion and defusion (Cronbach's α=0.76 and 0.85, respectively) [33].

Wilson et al. developed the VLQ, a two-part instrument to assess valued living or how much time each person was allotted for values (each part has ten items). The first section uses 10 points Likert scale to measure the importance of ten valuable domains of life (such as parenting, friendly relationships, and work). The second section uses 10 points Likert scale to determine how much time a person spends addressing each of their valuable domains [34]. Akbari et al. agreed that the Iranian version was

reliable (Cronbach's α=0.76) [35]. Descriptive statistics were used to analyze the data in SPSS-24 (frequency tables, central indices, and dispersion). The Chi-square test was then used to determine the effects of qualitative variables on medication adherence. Also, ANOVA was used to assess the relationship between medication adherence and the quality variables. The significance level in all tests was <0.05.

Results

Table 1 shows the demographic characteristics of the patients.

The Chi-square test was used to determine the effects of qualitative variables on medication adherence.

In participants with low, medium, and high MA, the mean scores and ±standard deviation were 3.102±1.04, 5.97±0.82 and 8±0.001 respectively. The MA level did not have a significant relationship with gender, occupation, or education ($p>0.05$), but it did increase significantly with age ($p=0.03$) (Table 2).

Table 1. Demographic characteristics of patients with hypertension

Variable		Number (Percent %)
Age group	50>	15(9.3%)
	50-60	45(27.8%)
	60-70	64(39.5%)
	70<	38(23.4%)
Sex	Male	60(37%)
	Female	102(63%)
Work	Freelance job	23(14.2%)
	Employee	5(3.1%)
	Housekeeper	98(60.5%)
	Retired	36(22.2%)
Education	High school and above	37(22.8%)
	Below high school	125(77.2%)
Medication adherence	High	36(22.2%)
	Medium	77(47.6%)
	Low	49(30.2%)

Table 2. Qualitative variables and levels of medication adherence

Variable		Medication adherence			P Value
		High	Medium	Low	
Age group	50>	0(0%)	8(10.4%)	7(14.3%)	0.030
	50-60	7(19.4%)	25(32.5%)	13(26.5%)	
	60-70	15(41.7%)	26(33.8%)	23(46.9%)	
	70<	14(38.9%)	18(23.3%)	6(12.2%)	
Sex	Male	15(41.7%)	27(35.1%)	18(36.7%)	0.794
	Female	21(58.3%)	50(64.9%)	31(63.3%)	
Work	Freelance job	4(11.1%)	11(14.3%)	8(16.3%)	0.701
	Employee	0(0%)	3(3.9%)	2(4.1%)	
	Housekeeper	21(58.3%)	46(59.7%)	31(63.3%)	
	Retired	11(30.6%)	17(22.1%)	8(16.3%)	
Education	High school and above	9(25%)	15(19.5%)	13(26.5%)	0.617
	Below high school	27(75%)	62(80.5%)	36(73.5%)	

ANOWA was used to compare quantitative variables in three MA groups (low, medium, and high). Table 3 shows that the three MA levels differ significantly in both VLQ subscales (importance of person-valued living and allotted time for values; p=0.002 and p=0.023). However, no significant differences in the other variables (cognitive defusion, cognitive fusion, specific necessity, specific concern, general overuse, and general harm; p-values= 0.640, 0.676, 0.103, 0.956, 0.439, and 0.326, respectively) were observed in various groups of MA.

Table 3. Means, standard deviations, and comparisons of the CFQ, BMQ, and VLQ subscales in various levels of medication adherence

Variable	Medication adherence	Number	Average	Variance	p Value
Cognitive defusion	High	36	9.778	6.39692	
	Medium	77	10.5065	4.31528	0.640
	Low	49	107755	4.53810	
Cognitive fusion	High	36	31.2500	18.04815	
	Medium	77	31.9610	12.67866	0.676
	Low	49	33.7551	12.22281	
Specific necessity	High	36	7.8333	2.90320	
	Medium	77	8.0779	2.97696	0.103
	Low	49	9.1020	3.26117	
Specific concern	High	36	12.8889	2.90593	
	Medium	77	12.9870	2.47351	0.956
	Low	49	12.8367	3.25542	
General overuse	High	36	11.1944	3.30312	
	Medium	77	10.9091	2.57611	0.439
	Low	49	10.4082	3.08166	
General harm	High	36	12.5833	3.41739	
	Medium	77	12.0260	2.48137	0.326
	Low	49	11.6939	2.43417	
Importance of person-valued living	High	36	73.4722	15.73801	
	Medium	77	79.5584	11.91582	0.012
	Low	49	73.0612	13.52222	
allotted time for values	High	36	72.2222	15.97697	
	Medium	77	77.0909	12.92711	0.03
	Low	49	68.2041	13.92088	

Discussion

The current study compared medication beliefs, cognitive deficiency, and valued living in hypertensive patients with varying medication adherence.

According to the findings, most participants (nearly 80%) did not have a high MA. Many studies found that HPN patients received less MA than was necessary [9-11]. Unlike our study, Pirzadeh *et al.* found that 90% of patients took their medications as prescribed [12].

These statistical differences can be attributed to patients' sensitivity to MA and their ignorance of the significant lowering effect of medications on blood pressure. Physicians and other healthcare providers should educate patients on the benefits and importance of taking medications as directed.

Only the age qualitative variable was associated with MA in this study. This association implies that younger patients had

low MA. According to Oori et al., older adults have a higher MA prevalence than other age groups [11]. Another study found that MA was higher in patients over 50 than in patients under 50 and that age was a precise predictor of MA in HPN patients [36]. In contrast to our findings, Gast et al. demonstrated that age might have a concave relationship with MA. The lowest rate of MA is seen in very young and very old patients [37].

There was no statistically significant difference between the various levels of MA and the BMQ specific-necessity subscale. Although many studies found substantial differences between MB and multiple levels of MA or an essential relationship between MB and MA [15-19], Tiffe et al. [38] found no meaningful relationship between blood pressure control and BMQ specific-necessity subscale. This result is consistent with this study.

There could be a connection between the need to take prescribed medication and the presence or absence of symptoms. The benefits may be imperceptible when participants suffer from a predominantly asymptomatic condition, such as hypertension. As a result, it is difficult for physicians to advise hypertensive patients to take their medication as directed because they tend to underestimate the long-term benefits of medication adherence. Furthermore, in a mainly asymptomatic condition, medication-related side effects may be perceived as more readily unacceptable [39].

Our findings show no differences in cognitive defusion and fusion between the three groups of MA patients. ACT-related variables have recently been studied in the treatment of medical diseases. As a result, each factor was not examined separately. For example, studies have suggested that psychological flexibility (which, in addition to cognitive defusion and valued living, measures four other variables simultaneously) plays a role in MA [23-25]. Therefore, more research is required to demonstrate the specific part of the cognitive defusion variable in MA.

Finally, there were significant differences between valued living (in both subscales of VLQ) in three levels of MA in the current study, indicating that those who better understand their disease adhere to the treatment regimen more closely and are less likely to suffer from disease complications. In addition, people who pay attention to the critical aspects of their lives believe that their health status is under their control. Therefore, they feel more responsible for their health and are more committed to their treatment [40]. This finding is consistent with previous research, such as that of Gaudiano et al. [22].

The current study had the limitation of being a comparative study. Hence, it could not demonstrate a solid cause-and-effect relationship between the variables, and the self-assessment data obtained did not accurately reflect the participants' actual performance.

Conclusion

This study revealed the role of age and valued living in MA in hypertensive patients, which warrants further investigation. It has also been demonstrated that valued living can help increase MA in patients with chronic diseases. Because many psychological variables influence therapeutic adherence, directly and indirectly, structural equation modeling studies are recommended to determine the role of additional psychological variables. Furthermore, given the specific role of cognitive defusion on the rate of MA in the current study, it is suggested that future experimental research focus on applying cognitive defusion techniques to evaluate their effectiveness on MA in HPN and other medical diseases.

Conflict of Interest

This study's authors reported no conflicts

of interest.

References

1. Filippini T, Violi F, D'Amico R, Vinceti M. The effect of potassium supplementation on blood pressure in hypertensive subjects: a systematic review and meta-analysis. Int J cardiol. 2017; 230: 127-35.

2. Ostchega Y, Fryar CD, Nwankwo T, Nguyen DT. Hypertension prevalence among adults aged 18 and over: United States, 2017–2018. NCHS Data Brief. 2020; (364): 1-8.

3. Nikparvar M, Farshidi H, Madani A, Ezatirad R, Azad M, Eftekhaari TE, et al. Prevalence, awareness, treatment, and control of hypertension in Hormozgan Province, Iran. Int Cardiovasc Res J. 2019; 13(3): 91-5.

4. Bijani M, Parvizi S, Dehghan A, Sedigh-Rahimabadi M, Rostami-Chijan M, Kazemi M, et al. Investigating the prevalence of hypertension and its associated risk factors in a population-based study: Fasa PERSIAN COHORT data. BMC Cardiovasc Disord. 2020; 20(1): 503.

5. Bundy JD, Mills KT, Chen J, Li C, Greenland P, He J. Estimating the association of the 2017 and 2014 hypertension guidelines with cardiovascular events and deaths in US adults: an analysis of national data. JAMA Cardiol. 2018; 3(7): 572-81.

6. Barikani A, Saeedi F. Prevalence of hypertension among women aged 30+ in Minoodar region of Qazvin in 2009. J Inflammatory Disease. 2010; 14(1): 41-8.

7. Kitt J, Fox R, Tucker KL, McManus RJ. New approaches in hypertension management: a review of current and developing technologies and their potential impact on hypertension care. Curr Hypertens Rep. 2019; 21(6): 1-8.

8. Muntner P, Carey RM, Gidding S, Jones DW, Taler SJ, Wright Jr JT, et al. Potential US population impact of the 2017 ACC/AHA high blood pressure guideline. Circulation. 2018; 137(2): 109-18.

9. Masror Roudsari DD, Dabiri Golchin M, Parsa Yekta Z, Haghani H. Relationship between adherence to therapeutic regimen and health related quality of life in hypertensive patients. 2013; 26(85): 44-54.

10. Michel B, Egan B. Adherence in hypertension. Circ Res. 2019; 124(7): 1124-40.

11. Oori MJ, Mohammadi F, Norouzi-Tabrizi K, Fallahi-Khoshknab M, Ebadi A. Prevalence of medication adherence in patients with hypertension in Iran: A systematic review and meta-analysis of studies published in 2000-2018. ARYA Atheroscler. 2019; 15(2): 82-92.

12. Pirzadeh A, Peyman TS, Hassanzadeh A, Mostafavi F. Adherence to self-care behaviors among hypertensive patients. J Health Literacy. 2019;4(3):17-24.

13. Drawz PE, Pajewski NM, Bates JT, Bello NA, Cushman WC, Dwyer JP, et al. Effect of intensive versus standard clinic-based hypertension management on ambulatory blood pressure: results from the SPRINT (Systolic Blood Pressure Intervention Trial) ambulatory blood pressure study. Hypertension. 2017; 69(1): 42-50.

14. Bjertness E, Wu T, Stigum H, Nafstad P. Acute mountain sickness, arterial oxygen saturation and heart rate among Tibetan students who reascend to Lhasa after 7 years at low altitude: a prospective cohort study. BMJ Open. 2017; 7(7): e016460.

15. Hayward KL, Valery PC, Martin JH, Karmakar A, Patel PJ, Horsfall LU, et al. Medication beliefs predict medication adherence in ambulatory patients with decompensated cirrhosis. World J Gastroenterol. 2017;23(40):7321.

16. AlHewiti A. Adherence to long-term therapies and beliefs about medications. Int J family Med. 2014; 2014.

17. Fernandez-Arias M, Acuna-Villaorduna A, Miranda JJ, Diez-Canseco F, Malaga G. Adherence to pharmacotherapy and medication-related beliefs in patients with hypertension in Lima, Peru. PloS One. 2014; 9(12): e112875.

18. Mostafavi F, Najimi A, Sharifirad G, Golshiri P. Beliefs about medicines in patients with hypertension: The instrument validity and reliability in Iran. Mater Sociomed. 2016; 28(4): 298-302.

19. Minaiyan M, Taheri M, Mirmoghtadaee P, Maracy M. Comparative role of patient's belief about prescribed medicine and demographic factors in adherence to drug treatment in asthma, renal failure and cancer diseases. J Isfahan Med School. 2011; 29(156): 1303-11.

20. Hayes SC. Acceptance and commitment therapy: towards a unified model of behavior change. World Psychiatry. 2019; 18(2): 226-227.

21. Zhang C-Q, Leeming E, Smith P, Chung

P-K, Hagger MS, Hayes SC. Acceptance and commitment therapy for health behavior change: a contextually-driven approach. Front Psychol. 2018; 8: 2350.

22. Gaudiano BA, Wenze SJ, Weinstock LM, Tezanos KM, Miller IW. Valued living and its relationship to medication adherence in patients with bipolar and comorbid substance use disorders. J Nerv Ment Dis. 2017; 205(3): 178-181.

23. Kamody RC, Berlin KS, Rybak TM, Klages KL, Banks GG, Ali JS, et al. Psychological flexibility among youth with type 1 diabetes: relating patterns of acceptance, adherence, and stress to adaptation. Behav Med. 2018; 44(4): 271-9.

24. Harrison A, Scott W, Timmins L, Graham CD, Harrison AM. Investigating the potentially important role of psychological flexibility in adherence to antiretroviral therapy in people living with HIV. AIDS Care. 2021; 33(3): 337-46.

25. Cheung KW, Mak YW. Association between psychological flexibility and health beliefs in the uptake of influenza vaccination among people with chronic respiratory diseases in Hong Kong. Int J Environ Res Public Health. 2016; 13(2): 155.

26. Kalbasi R, Hatami M, Seyrafi M, Hakemi MA, Sabet M. The effectiveness of acceptance and commitment therapy in quality of life and blood pressure index of hemodialysis patients. EBNESINA. 2021; 23(1): 25-34.

27. Baradaran M, Zare H, Alipour A. Farzad V. Effectiveness of Acceptance and commitment therapy (ACT) on cognitive fusion and physical Health Indicators in essential hypertensive patients. J Cognitive Psychol. 2016; 4(1): 1-9. [Persian]

28. Haddadi S, Malihi Alzakerini S, Tajbakhsh R, Tajvidi M, Kakavand A. Comparing the Effects of Acceptance and Commitment Therapy and Metacognitive Therapy on Blood Pressure in Hemodialysis Patients. Qom Univ Med Sci J. 2021; 15(1): 10-9.

29. Karbownik MS, Jankowska-Polańska B, Horne R, Górski KM, Kowalczyk E, Szemraj J. Adaptation and validation of the Polish version of the Beliefs about Medicines Questionnaire among cardiovascular patients and medical students. PloS One. 2020; 15(4): e0230131.

30. Ben AJ, Neumann CR, Mengue SS. The Brief Medication Questionnaire and Morisky-Green test to evaluate medication adherence. Rev Saude Publica. 2012; 46: 279-89.

31. Moharamzad Y, Saadat H, Shahraki BN, Rai A, Saadat Z, Aerab-Sheibani H, et al. Validation of the Persian version of the 8-item Morisky Medication Adherence Scale (MMAS-8) in Iranian hypertensive patients. Glob J Health Sci. 2015; 7(4): 173-183.

32. Gillanders DT, Bolderston H, Bond FW, Dempster M, Flaxman PE, Campbell L, et al. The development and initial validation of the cognitive fusion questionnaire. Behav Ther. 2014; 45(1): 83-101.

33. Zare H. Standardizing of the social scale of cognitive fusion Gillanders based on Bohrnstedt model. Social Psychology Research. 2014; 4(15): 16-28. [Persian]

34. Wilson KG, Sandoz EK, Kitchens J, Roberts M. The Valued Living Questionnaire: Defining and measuring valued action within a behavioral framework. Psychol. Rec. 2010; 60(2): 249-72.

35. Akbari M. The Reliability and Validity of Persian version of the Valued Living Questionnaire: based on Acceptance and Commitment approach. 2018; 16: 239-249.

36. Maguire LK, Hughes CM, McElnay JC. Exploring the impact of depressive symptoms and medication beliefs on medication adherence in hypertension—a primary care study. Patient Educ couns. 2008; 73(2): 371-6.

37. Gast A, Mathes T. Medication adherence influencing factors—an (updated) overview of systematic reviews. Sys Rev. 2019; 8(1): 112.

38. Tiffe T, Morbach C, Rücker V, Gelbrich G, Wagner M, Faller H, et al. Impact of patient beliefs on blood pressure control in the general population: findings from the population-based STAAB cohort study. Int J Hypertens. 2019; 2019.

39. Scala D, Menditto E, Caruso G, Monetti VM, Orlando V, Guerriero F, et al. Are you more concerned about or relieved by medicines? An explorative randomized study of the impact of telephone counseling by pharmacists on patients' beliefs regarding medicines and blood pressure control. Patient Educ Couns. 2018; 101(4): 679-86.

40. Saarti S, Hajj A, Karam L, Jabbour H, Sarkis A, El Osta N, et al. Association between adherence, treatment satisfaction and illness perception in hypertensive patients. J Hum Hypertens. 2016; 30(5): 341-5.