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Correlation between Health Literacy and Self-Management in Patients with Hypertension, Province of Hamadan, Iran

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Abstract

Introduction: Hypertension is one of the main causes of mortality and need to managing by the patients. The main question is that, whether patients' health literacy could play a role in management of hypertension; thus this study was conducted to assess correlation between health literacy and self-management in patients with hypertension. Materials and Methods: This is a descriptive-correlational study which was done on 200 patients with hypertension referring to Farshchian hospital of Hamadan during January 2017 to May 2018 by convenience sampling method. The collected data include demographic, health literacy (questionnaire of Iranian health literacy) and hypertension management questionnaire. Mean arterial blood pressure was determined by researcher. The data was analyzed by spss/24 software, T- test, chi-square correlation coefficient and regression analysis tests. Findings: The mean arterial blood pressure in these patient was 98.6 12 mmHg. The status of health literacy was on average level in 89.5 percent of patients. The health literacy had a direct and significant relationship with behaviors of self – regulation ($r=0.482$, $P<0.0001$), self- monitoring ($P<0.0001$, $r=0.387$) reaction to disease ($P<0.001$, $r=0.368$), adherence to pharmaceutical regime ($r= 0.153$, $P=0.03$) and self - care ($r=0.210$, $P=0.003$). Conclusion: Health literacy had a direct relationship with hypertension. the patients with higher health literacy could better control their disease.

Keywords: Health Literacy, Hypertension, Self-Management.

Introduction

The hypertension is the third main mortality factor in the world and is posed as the main health problem of the developed countries. The World Health Organization (WHO) estimates that about 660 million persons in the world suffering from hypertension (Go AS and et al., 2014). In Iran, the prevalence rate of disease has been reported 22.6 percent in 2015 (Mansourian and et al., 2012). Also, it's prevalence in Hamadan province has been described 12.3 percent (Biderafsh and et al., 2014). The hypertension is one of the risk factors of cardiovascular disease and most command reason of stroke and renal failure in adults especially in older people (Barati and et al., 2011). In 90 percent of cases, the reason of primary hypertension was remained unknown. Factors as age race, sex, genetic, obesity, immobility and salty diet are some enabling factors for hypertension (MAHMOUDIRAD and et al., 2006).

In spite of accessibility of suitable treatment in hypertension, only 37 percent of patient could manage their disease and even this controlling is on a disapproving level (Veghari and et al., 2012). In order to prevent side effects and treatment of hypertension, the patient should be able in self- care. In fact hypertension could be controlled by self - managing (World Health Organization, 2005). In successful management of hypertension, the patient participates actively in self- care which caused to improve responsibility and in result, would control the complications of disease (Omidi and et al., 2017).

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It seems, the health literacy could effect on management of disease. The health literacy was defined as the capability to gain, read, realize, and utilization healthcare data in order to make proper health choices and follow education in field of health (La Vonne & Zun, 2008). It is introduced as one of the greatest determinants of health by World Health Organization. Although still, it isn't clear how the health literacy effects on the results of health, but more reasons indicate that most of undesired results relate to healthiness are consequent of inadequate health literacy. Some of researchers believe that health literacy is more important factor than other factors such as age, income, employment, education level and race in relation with health (Artinian and et al., 2003; Jovic-Vranes and et al., 2009). In patients with chronic diseases, low health literacy cause adverse health consequences, especially in hypertension which needs self-care (Jordan and et al., 2010; Kutner and et al., 2006; von Wagner and et al., 2007; Turner and et al., 2008).

Correct management of hypertension is one of the important problems for patients and physicians. In this regard, the knowledge and level of health literacy of patients can play an important role in responding to management of disease in these patients. In fact, awareness and health literacy are self-care requirements. Therefore, by assessing health literacy and thus identifying the strengths of patients, effective steps can be taken to educate patients and thus help them to manage illness and reduce its complications (Turner and et al., 2008).

The various studies showed different results on relation between health literacy and hypertension (Halladay and et al., 2017; Shi and et al., 2017; Wang and et al., 2017; McNaughton and et al., 2014; Ko and et al., 2013; Aboumatar and et al., 2013; Darvishpour and et al., 2016). In some of studies, there weren't a relationship between health literacy and reduction of hypertension (Halladay and et al., 2017). Vice versa, in some studies there were a relationship between health literacy and effective control of hypertension (Shi and et al., 2017), higher level of self - care (Wang and et al., 2017) and improvement of hypertension control (Darvishpour and et al., 2016). Since there were observed different results about relationship between health literacy and hypertension management in various studies, and in addition, there are limited studies about review the health literacy and it's relation with chronic disease such as hypertension in Iran, therefore the present research has been conducted to assess correlation between health literacy and self-management in patients with hypertension.

Materials & Methods:

The present research was a descriptive-correlational study which has been conducted on 200 patients suffering from Hypertensions referring to outpatient clinic of Frashchian hospital in Hamadan from January 2017 to May 2018. The inclusion criteria of study was suffering from primary hypertension (at least one month passed from diagnosis of disease), age over 20- years old, at least literacy level of reading and writing, lack of surgical history and Severe diseases such as cancer, lack of mental and other chronic complications and lack of cardiovascular and renal failure.

The method of sampling was as convince method. The sample size in the present research was estimated equals to 200 persons by sample size formula in correlational studies and by considering correlation coefficient 0.24 reported in the study of Montazeri and et al (MONTAZERI and et al., 2014) by power 90 percent and estimation error 0.05 percent and also by considering possible exclusion of 10 percent.

The data collection tools included three questionnaires of demographic, Iranian health literacy and hypertensions management. The demographic questionnaire includes age, education level, marriage status, and job. At the end of demographic questionnaire, the patient were asked about duration of the disease, family history of hypertension and cardiovascular disease, physical activity, smoking, and consumption and duration of hypertension medication.

The Iran's Health Literacy Questionnaire, a native version of the Adult Health Literacy Questionnaire, was approved by in an Iranian study with the Cronbach’s alpha coefficient (72 to 89 percent) in 2014 (MONTAZERI and et al., 2014). This questionnaire includes 33 Five- likert scale questions in which the health literacy level is evaluated in 5 sub-dimensions of access (6 items), reading (4 items), understanding (7 items), appraisal (4 items), and decision (12 items). The minimum and maximum score are 33 and 165 respectively. Mean While based on this score, health literacy status of patient was categories on 3 levels of weak (score 33-66), average (score 76-132) and favorable (score 133-165). In the present study, validity of questionnaire was approved by 10 persons of professions of nursing and midwifery faculty and reliability of questionnaire also was obtained with 92 percent Cronbach’s alpha.

The questionnaire of hypertension management is a standard questionnaire which designed by Akhter (Akhter, 2010). this questionnaire contains 43 five- likert scale questions in 5 sub-dimensions including self-regulation (9 question), self- monitoring (5 questions), reaction to disease (8 question), adherence to pharmaceutical regime (9 question) and self- care behaviors (12 questions). In terms of adherence to pharmaceutical regime, the questions were scored reversely. The score of self- regulation behaviors and adherence to pharmaceutical regime include: (minimum 9, maximum 45), Self – monitoring behaviors (minimum 5, maximum 25), reaction to disease (minimum 8, maximum 40) and self care ones (minimum 12, maximum 40) and self – care (minimum 12, maximum 60). In study by Omidi and et al

in Hamadan, the total reliability of the questionnaire has been approved by Cronbach's alpha (78 percent) (8). The reliability of this questionnaire also was assessed again and approved with Cronbach's alpha(77 percent).

In the stage of data collection, agreement was attained from the Ethics Committee of the university at first with no.IR.UMSHA.RES.1396.673, and then researcher went to outpatients clinic of the hospital and explained about the study and the written consent was achieved from whom desire to participate in study, then the questionnaires of study were filled by patients through self- declaration method in a quiet place. The researcher also was present in the clinic, for respond to questions of patients.

The blood pressure of patients were measured and recorded by adult sphygmomanometer in sitting position after 10 minutes rest from right arm of patient while was in parallel with his heart on the flat level. Then average arterial blood pressure of the patients was determined and recorded by formula (double diastole blood pressure + one systole blood pressure) / 3) (Alemohammad & Rahimi, 2009).

The statistical analysis was conducted by SPSS software version 24. In order to compare health literacy level of patients for quantitative and qualitative variables, the T-test and chi- square tests was used respectively. The correlation between health literacy with hypertension management and other variables with Pearson correlation coefficient was conducted. Also to review the relationship between health literacy with hypertension management by adapting effect of other factors, the linear regression was used. The significant level was considered less than 0.05 in total cases.

Ethical considerations

All patients participated voluntarily in the study and signed an informed consent. The entire study process was approved by the Research Ethics Committee of the Hamadan University of Medical Sciences (approval no: IR.UMSHA.REC. 1396.673).

Results:

The mean age of patients was 55.7± 7.3 that youngest and oldest ones were 34 and 71 years- old respectively. 43 percent of patients were male and others were female. Most of patients had secondary education (70 percent) most of studied women and men were household (85.1 percent) and self- employment (51.2 percent). 19 percent of patients had smoking history, from whom, 46.5 percent have reported hypertension history in the family. Average suffering duration was about 49 months. Also, mean systole and diastole blood pressure in these patients were 142.1± 16.8 and 76.9± 12.5 mm/Hg respectively. In addition, mean arterial pressure of patients was obtained 98.6± 12 mm/Hg. Average health literacy score of patients was 90.5± 14.7 from total 165 scores, which most of these patient were on moderate level (179 patients, 89.5 percent), 21 patients (10.5 percent) had weak health literacy and none of patients had favorable literacy based on health literacy status grouping.

Table 1 shows comparison results of variables in patients based on health literacy level that patients with moderate literacy level were older that other ones significantly (P= 0.0001). In terms of other variables including sex, education, duration of disease, smoking, hypertension history in family, physical activity, consumption duration of hypertension medication and mean systole and diastole blood pressure between patients with moderate literacy level in comparison with patients with weak level, there wasn't significant variance statistically (P>0.05). Thus, mean arterial (blood pressure in patients with moderate literacy level was higher than patients with weak one significantly (p=0.045).

The results of table 2 in terms of relationship between demographic variables with health literacy of patients show that, there is a direct and significant relationship between age of patients, duration of disease, consumption duration of hypertension medication and mean arterial blood pressure with health literacy score of studied patients (p>0.05). Thus as the age of patient increases, duration of disease, consumption duration of hypertension medication, mean arterial blood pressure, health literacy score increase significantly.

Table 3 shows the comparison of average score of hypertension management based on health literacy of patients. Results show that, behaviors of self- regulation. Self- monitoring, reaction to disease (p<0.0001) and self- care (p<0.004) are high in the patients with moderate literacy level than patients with low one. Thus, in field of adherence to pharmaceutical regime, there wasn't and low health literacy level (P= 0.147).

In terms of relationship between hypertension management with health literacy of patients, the results show that, there is a significant relationship between average score of 5- dimensions of hypertension management (behaviors of self- regulation, self- monitoring, reaction to disease, self- core, adherence to pharmaceutical regime) with health literacy (P- values< 0.05). Among the dimensions of hypertension management, the intensity of lineal relationship between behaviors of self- care (r= 0.482) and dimension of adherence to

with health literacy pharmaceutical regime (r=0.153) with health literacy were higher and weaker (r=0.153) than other dimensions respectively (table 4).

In table 5, results of simple and multiple linear regressions analysis has provided in terms of relationship between hypertension management with health literacy. The results of simple linear regression show that age, duration of disease and physical activity are of effective predictive factors on health literacy level of patients with hypertension. Following adapting the effect of age, sex, duration of disease, smoking, hypertension history in family, physical activity, history of cardiovascular disease in family and mean arterial blood pressure in multiple linear regression analysis, the results show that, health literacy has significant relationship with total hypertension management score.

Discussion:

Based on the results of the present study which reviewed the relationship of health literacy with hypertension management in patients with hypertension one of the findings was that health literacy of studied patient was on moderate level (89.5 percent) and 10.5 percent on weak level.

The health literacy status in different regions and various individuals has been reported. For example, health literacy of most patients with hypertension in the study of McNaughton et al, was same as the present study on moderate level (McNaughton and et al., 2014). However, in the study of Tehrani et al in Iran, in 5 provinces of Bushehr. Mazandaran, Kermashah, Gazvin and Tehran, the health literacy of the population was higher than the results of the present study (Alemohammad & Rahimi, 2009). Also in study of Darvishpoor et al, the health literacy of rural patients with hypertension was reported higher than the results of the present study (Darvishpour and et al., 2016). In a national study in America (Banihashemi and et al., 2007) and also in the study of Holladay et al (Halladay and et al., 2017), Shi et al (Shi and et al., 2017), Wang et al (Wang and et al., 2017), the health literacy of patients with hypertension in most of studied patients has been reported higher than the percent study. The existing variance in the results of studies could be because of age variance, education level, race, culture of patients and differences in utilized tools in these studies.

The other finding of the study was that there was direct and significant relationship between health literacy with hypertension management, thus as health literacy increases, the hypertension of patients is controlled well. In terms of the relationship between health literacy with hypertension management in these patients, limited studies have been conducted. But various studies have shown different relationships (Halladay and et al., 2017-22). In an interventional study, which was conducted by aim to raise literacy level in hypertension patients, there wasn't significant variance in blood pressure of patients having inadequate health literacy with patients having adequate one during 12 months. (Halladay and et al., 2017) thus, the results of other retrospective cohort study showed that, in patients with higher health literacy benefited from the better hypertension control and risk of heart- failure (infarct) in these patients is low (Shi and et al., 2017). Besides that, the results of other cross- sectional study showed that health literacy in the patients with hypertension was related to their self- care, so as patients with higher health literacy were benefited from more self- care behaviors (Wang and et al., 2017). In the study of McNaughton et al, also there was a significant relationship between uncontrolled hypertension had inadequate literacy (McNaughton and et al., 2014).

In cross–sectional study of Darvish poor and et al, health literacy of patients had a significant relationship with the improvement of this hypertension and having high health literacy had a significant effect on referral of patients to clinics and participation in training programs (Darvishpour and et al., 2016). The results of the present research were consistent with results of some given studies and showed that, there was a significant relationship between hypertension of patients with their health literacy and high health literacy in these patients causes to suitable reaction against disease through influence on self- care and self- monitoring behaviors and increasing adherence to pharmaceutical regime of patients and leads to management of this disease, although there are variances in methodology and utilized of tools in studies.

Another one of the findings was that age of patients, duration of disease and physical activity were related factors with health literacy in studied patients and only these variables were suitable for prediction of health literacy level of patients. In terms of the relationship between demographic variable of patients with their health literacy, the studies has reported different results. Age was one factor which had a significant relationship with health literacy in some studies (Halladay and et al., 2017; Wang and et al., 2017; McNaughton and et al., 2014; Darvishpour and et al., 2016; Akhter, 2010), but, not in some other studies (Shi and et al., 2017; Ko and et al., 2013; Aboumatar and et al., 2013) (Halladay and et al., 2017; Wang and et al., 2017; McNaughton and et al., 2014; Ko and et al., 2013; Aboumatar and et al., 2013; Darvishpour and et al., 2016). Other studies have reported there is a significant relationship between sex and health literacy of patients (Shi and et al., 2017; McNaughton and et al., 2014; Ko and et al., 2013; Aboumatar and et al., 2013; Darvishpour and et al., 2016; Akhter, 2010). Also, education (Shi and et al., 2017; Wang and et al., 2017; McNaughton and et al., 2014; Ko and et al., 2013; Darvishpour and et al., 2016; Akhter, 2010), employment (Shi and et al., 2017) and race (Halladay and et al., 2017; McNaughton and et al., 2014; Aboumatar and et al., 2013) were of related factors with health literacy, In the present study, among the

reviewed demographic factors, only age of patient had a significant relationship with health literacy, In terms of sex, education level and employment status, there wasn't a significant relationship in the present study, which it may because of low number of patients in subgroups of health literacy, has caused to reduced potential of study in determination of relationship between health literacy with these variables.

From limitations of the present study, could refer to the disproportion of patient number in the groups based on health literacy status in three groups of low, moderate and adequate health literacy, that only 10.5 percent of patients were set in low literacy, and there wasn't any patient inadequate health literacy group. Thus, there wasn't possible to review the relationship between high health literacy with variables and also, low number of patients in the low literacy group has led to a reduced potential of study in accurate determination of relationships, therefore the results of study should be interpreted carefully.

Conclusion:

Results showed that, in studied patients, health literacy of some ones was moderate and there was a direct relationship between health literacy level in patients with hypertension with hypertension management and also high health literacy has led to improvement of hypertension management in these patients. Also, age, duration of disease, duration of consumption of hypertension medication and mean arterial blood pressure were only variable related with health literacy of these patients, thus whit regard to these results and effective relationship between health literacy and hypertension. It seems, it is necessary to conduct further research in terms of determination of health literacy in the patients with hypertension

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Table 1: characteristics of 200 studied patients with hypertension by health literacy status

		Low health literacy	Moderate health literacy	P-value
Age (year)		50.3 ± 7.4	56.3 ± 7	0.0001
Sex	male	8 (38.1)	78 (43.6)	0.631
	female	13 (91.9)	101 (56.4)	
Education	Elementary school	6 (28.6)	14 (66.7)	0.491
	Middle School	14 (66.7)	126 (70.4)	
	Diploma and upper	1 (4.8)	19 (10.6)	
Disease duration (month)		35.7 ± 44.8	50.4 ± 54.8	0.240
Smoking		2 (9.5)	36 (20.1)	0.380
Family history of hypertension		10 (47.6)	76 (42.5)	0.650
Physical activity		16 (76.2)	110 (61.5)	0.180
Family history of CHD		4 (19)	18 (10.1)	0.260
Duration of anti- hypertension drug		32.9 ± 45.5	49.5 ± 53.6	0.171
Systolic hypertension		132 ± 15.5	173.9 ± 13.1	0.059
Diastolic hypertension		74.5 ± 10.7	77.2 ± 12.7	0.353
Mean arterial pressure		93.4 ± 10.7	99.2 ± 12.1	0.045
Data are mean ± SD or number (%)				

Table 2: Correlation between health literacy and studied variables in 200 studied patients with hypertension

	Pearson correlation coefficients	P-value
Age (year)	0.294	0.0001
Disease duration (month)	0.173	0.014
Duration of anti- hypertension drug	0.186	0.008
Mean arterial pressure	0.126	0.075

Table 3: Comparison of hypertension management score in regard to health literacy status in 200 studied patients with hypertension

	Low health literacy	Moderate health literacy	P-value
Self-regulation	35.2 ± 4.2	39.5 ± 4	0.0001
Self- monitoring	19 ± 2.2	21.3 ± 2.7	0.0001
Disease response	28.8 ± 3.2	32.5 ± 3.7	0.0001
Adherence to the drug regimen	24.3 ± 2.6	23.4 ± 3.5	0.147
Self-care behaviors	49.7 ± 3.9	52.3 ± 3.2	0.004
Data are mean ± SD			

Table 4: Correlation between Health literacy and hypertension management score in 200 studied patients with hypertension

	Pearson correlation coefficients	P-value
Self-regulation	0.482	0.0001
Self- monitoring	0.387	0.0001
Disease response	0.368	0.0001
Adherence to the drug regimen	0.153	0.03
Self-care behaviors	0.210	0.003

Table 5: Factor associated with Health literacy in patients with hypertension by linear regression

	Simple linear regression		Multiple linear regression	
	Coefficients (SE)	P-value	Coefficients (SE)	P-value
Age	0.59 (0.14)	0.0001	0.71 (0.12)	0.0001
Sex (male)	0.76 (2.1)	0.718	5.45 (1.92)	0.005
Disease duration (month)	0.05 (0.02)	0.014	0.002 (0.02)	0.924
Smoking	-2.82 (2.65)	0.288	-0.25 (2.38)	0.917
Family history of hypertension	1.62 (2.10)	0.442	1.50 (1.67)	0.370
Physical activity	6.14 (2.11)	0.004	4.89 (1.76)	0.006
Family history of CHD	0.28 (3.33)	0.932	-3.27 (2.67)	0.223
Mean arterial pressure	0.15 (0.09)	0.075	0.13 (0.07)	0.054
Hypertension management score				
Self-regulation	1.61 (0.21)	0.0001	1.27 (0.21)	0.0001
Self- monitoring	2.42 (0.41)	0.0001	1.36 (0.43)	0.002
Disease response	1.57 (0.28)	0.0001	0.52 (0.26)	0.044
Adherence to drug regimen	0.82 (0.38)	0.030	0.59 (0.28)	0.044
Self-care behaviors	0.79 (0.26)	0.003	0.45 (0.21)	0.004