Research Article

The effect of education based on Health Belief Model in Self-control blood pressure in patients with hypertension health centers in Urmia

Morad Ali Zareipour[1], Rahim Baghaei[2],

Masoumeh Mahdi-akhgar[3], SarvinAbbasi[4],

Mousaghelichighojogh[5] and MahinAlinejad[6*]

[1]PhD Candidate in HealthEducation and HealthPromotion,
Urmia Health Center, Urmia University of Medical Sciences, Urmia, Iran.
[2]Associate Professor, Patient Safety Research Center,
Urmia University of Medical Sciences, Urmia, Iran
[3]MSc Biostatistics, Solid Tumor Research Center,
Urmia University of Medical Sciences, Urmia, Iran
[4]School of management and medical informatics,
Tabriz University of Medical Sciences, Tabriz, Iran
[5]MSc. Graduate of Epidemiology, Urmia Health Center,
Urmia University, Urmia, Iran.
[6]MSc Health Education and Health Promotion, Urmia Health Center,
Urmia University, Urmia, Iran
Corresponding Author[*]: MahinAlinejadEmail: *mahin.alinejad@yahoo.com*

ABSTRACT

Introduction: High blood pressure is one of the diseases that treatment and controlling of it,takes the patient's responsibility, therefore their knowledge on various aspects of the treatment of these patients is very important. This study aimed to evaluate the efficiency of the health belief model on training of patients with hypertension.

Method: In this mid-practical study, 160 patients with hypertension who were under treatment in health centers in Urmia city were randomly divided into two groups of intervention (80 patients) and control (80 patients). Educational intervention was conducted during three 45-minute sessions. All information were collected through the standard questionnaires during direct interviews before and three months after intervention. Data analyzed using independent sample t-test, paired samples t-test and Wilcoxon.

Results: The average age of intervention and control groups, respectively $99/11 \pm 01/56$ and $75/12 \pm 66/53$ years. After intervention, knowledge scores increased in the intervention group compared with the control group. Scores perceived susceptibility, perceived severity, perceived barriers, perceived benefits, clues to action, efficacy and behavior after the intervention in the intervention group compared with the control group increased and difference was significant, but in the control group difference was not significant. Also the average of systolic and diastolic blood pressure was significantly reduced in the intervention group compared to the control group.

Conclusion: Education program based on health belief model has been effective than traditional training in hypertension control. Therefore it is recommended to use this model alongside traditional methods.

Keywords: High blood pressure, HBM (health belief model), health education.

INTRODUCTION

High blood pressure is one of the major health problems in developed and developing countries (1). It is one of the most common cardiovascular disease that often causes stroke, heart attack and kidney failure (2). The most important characteristic of hypertension is its asymptomatic feature and diagnosing of it does not need advanced equipment. It can easily treated and controlled with medication (3). According to the World Health Organization, hypertension, have been introduced as the third main risk factor for non-communicable diseases. The prevalence of hypertension in different societies is different and varies from 10% to more than 60% (4). In Iran 6.26% of people over 15 years old with hypertension (5).

After hypertension control is the so important factor to minimal chance of complications due to high blood pressure, since the prevention and treatment of hypertension is considered before and some strategies has been identified for treatment (6) for example availability of more than a hundred different types of blood pressure medicine and efficiency proved by the way can be considered, however, there is still disappointing rates of blood pressure reports which says blood preassure control is still disappointing (7).

Treatment and control of hypertension is one of the main problems of patients and doctors. Important result of this deficiency is decrease of treatment compliance by patients that is known as a global problem. Non-compliance with this problem not only causes non-compliance of medication, but also effects the follow up and adherence to recommended lifestyle adjustment (8). Advanced statistical analysis results of 87 previous studies, suggest that self-control interventions are potentially useful in cases of high blood pressure, so that use of self-control, decreases the rate of systolic blood pressure by 5 mmHg and diastolic blood pressure ¾ mmHg (9). If we want to define self-control it includes regular control of blood pressure, reducing salt intake, avoid smoking, exercise, avoid mental stress, healthy nutrition, weight loss and is taking medication as prescribed (10). It seems that traditional education is provided without the use of educational models and logical procedure for behavior change in this area were not efficient (11). Hence education to these patients is necessity due to the fact that its major contribution to the treatment and control of disease is patient responsibility. But the value of an education depends on influence and changes of health behavior. Educational effectiveness depends on appropriate use of behavioral science theories. One of the patterns that have been used about self-control of hypertension patients is health belief model (HBM) (12). This pattern knows behavior as a function of knowledge and person's attitude, and with respect to the components, according to these results has been developed that led to the perception of a threat to the health and health behaviors will lead them. HBM is a prevention model that is rooted in the working group of social psychologists. The template has six structures: perceived severity, perceived benefits, perceived barriers, guidelines for action and efficacy that one of the main applications of this pattern for primary prevention of a disease or an injury (13). In a study of Delawary and colleagues' awareness, treatment and control of hypertension in rural communities had been reported lower than in urban areas (14). In a study of Konrady and colleagues the effect of compliance treatment in patients with hypertension were evaluated for changes in lifestyle; in this study, knowledge of trained patients increased and they accept medical treatment better; also their life style changed (15). The results of another study in Nigeria that analyzes knowledge and awareness of patients with high blood pressure, showed the paucity of information. The researchers suggested, to reduce patient's wrong information which can be dangerous, they must be trained (16). Given the above evidence this study's purpose is the effect of teaching using health belief model on self-control of blood pressure in patients with hypertension in health centers of Urmia.

MATERIALS AND METHODS

Study design and participations:

This study was a quasi-experimental study to evaluate the effect of education with health belief model in Self-control of blood pressure in patients with hypertension in urban health centers of Urmia 2015-2016. According to previous studies (17) α =5%, 95% confidence level and β =2% sample size of 160 patients (80 in the intervention group and 80 patients in the control group) were considered.

First the city of Urmia is divided into two regions, north and south and among health centers in each district, four of them randomly selected. Two of them considered as intervention centers and the other two as control centers. On the next stage according to the sample of patients, patient records were selected randomly.

Health belief model (HBM)

Data collection tools in this study, questionnaire including demographic, knowledge questionnaire of blood pressure, blood pressure self-control behaviors, health belief model questionnaire. Questionnaire prepared in the form of 12 questions that choices are: yes, no and don't know. And score of "yes always" was 2, the option "do not know" was 1 and "No" was zero. Knowledge Questionnaire scores range from zero to 24. It was examined. Health belief model questions and the scores were as follows: All questions based on the 3-point Likert scale (I agree, and I am not agree and I don't have an opinion) was measured to understand the problem from a wider range, susceptibility felt with 5 questions and minimum and maximum of scores was 5-15, 6 Questions severity rating was 6-18, perceived barriers for 5 questions rated 5-15, perceived benefits of 7 questions rated 7-21 points, Self-efficiency of 10 questions rated 10-30 points, help for action 7 questions rated 7-21 points. To measure self-care, self-care behaviors questionnaire was used in the form of nine questions.

With the options "Yes, always", "Yes, sometimes", and "No". Point for answer "yes always" was 2, point for answer" Yes Sometimes"

was 1, and zero points were given to answer "no". Self-Care Behaviors Questionnaire scores can range from zero to 18. (10)

For validity and reliability respected contents validity and Cronbach's alpha test methods were used.

To determine the validity of the questionnaire, it was sent to 10 experts in health education and heart specialists. According to experts the necessary reforms in the questionnaire was applied. Its validity was higher than 80%. To measure the reliability of a questionnaire it was completed by 30 patients with hypertension who were not part of the intervention and control groups, using Cronbach's alpha reliability coefficient of knowledge questions 75/0, perceived susceptibility 78/0, perceived severity 81/0, perceived barriers 84/0, Guide to action 86/0, perceived benefits of 88/0, efficacy 77/0 was calculated.

Educational intervention was performed only in the experimental group. The pre-test questionnaire completed by the investigator during an interview and educational programs was in three 45-minute sessions based on health belief model contains questions and answers, posters, leaflets, pamphlets and whiteboard beside speeches. Patients were followed for 3 months after intervention that in this time period in addition to holding three classes (every two weeks) to review the content, follow up by phone and track attendance with well trained staff was performed.

Before the intervention in both groups information gathered through questionnaires then, intervention for control group was done and 3 months after the training questionnaires was completed again before performing the project goals, research practices and confidentiality were explained to the subjects and a consent form was completed by participants.

The questionnaire was completed anonymously and only with the registration code.

STATISTICAL ANALYSIS

Data were analyzed using SPSS version 16, and independent sample t-test, paired samples t-test and Wilcoxon test.

RESULTS:

In this study, 160 patients in the intervention group (n=80) and control group (n = 80) were examined that using independent t-test average an standard deviation (DV) age of the patients in the intervention and control groups were 99/11 ± 01/56 and 75/12 ± 66/53 years that does not show a statistically significant difference (p = 0.1). The test also showed that there was no significant difference between intervention and control groups in terms of sex, education level, history of other diseases, occupation, marital status and economic situation (Table 1).

Table 1. Compare the subjects in terms of their demographic profile of patients with hypertension in both intervention and control groups

Variable		Intervention group		Control group		Test result
		number	percent	number	percent	
sex	Female	48	60	43	53.7	X2=02/1 DF=1 p=0/41
	male	32	40	37	46.3	
Level of Education	illiterate	27	33.7	24	30	X2=20/1 DF=3 p=0/63
	Primary	28	35	31	38.7	
	Guidance	14	17.5	17	21.2	
	Upper secondary	11	13.75	8	10.1	
History of other diseases	Yes	51	63.7	44	55	X2=86/1 DF=1 p=0/21
	no	29	36.3	36	45	
Job	housewife	50	62.5	46	57.5	X2=82/2 DF=3 p=0/2
	Employee	11	13.7	10	12.5	
	Farmer	7	8.7	6	7.5	
	Free	12	15.1	22	27.5	
Marital status	Married	61	76.2	63	78.7	P fisher=0/37
	single	8	10	1	1.2	
	Widow	11	13.8	16	20.1	
The economic situation	Good	8	10	14	17.5	X2=37/4 DF=2 p=0/12
	Average	49	61.2	39	48.7	
	weak	23	28.8	27	33.8	

The results showed that the average scores of knowledge, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, efficacy and blood pressure treatment and control groups showed no significant difference before intervention, but after intervention show significant differences (table 2).

Table 2. A comparison of the average scores of knowledge, model structures, blood pressure before and after the intervention between the two groups in patients with hypertension

Variable	Before intervention			After intervention		
	Intervention group	Control group	P value	Intervention group	Control group	P value
Knowledge score	13.29±2.39	12.83±2.74	0.76	14.72±3.19	12.87±1.86	0.009
Perceived susceptibility	6.48±2.08	7.33±2.35	0.12	8.88±4.76	6.62±2.86	0.044
Perceived severity	7.46±3.33	8.9±3.32	0.21	10.7±4.24	8.46±3.06	0.009
Perceived barriers	9.96±2.54	9.51±2.58	0.82	11.77±2.89	9.22±2.97	0.001
Perceived benefits	8.96±4.15	9.03±2.32	0.07	10.37±4.35	8.75±2.27	0.014
Help for action	10.22±2.25	10.79±3.09	0.81	12.55±4.18	10.7±3.82	0.024
Efficacy	18.51±3.55	19.33±4.2	0.35	21.44±3.03	19.09±2.39	0.001
behavior	16.98±3.89	17.7±2.92	0.81	20.48±6.68	18.24±4.01	0.003
Systolic blood pressure	155.43±16.92	155.62±15.92	0.25	147.24±14.23	156.27±12.15	0.001
Diastolic blood pressure	93.21±8.72	92.7±7.92	0.15	87.52±6.15	93.8±6.7	0.02

Wilcoxon test results showed that patients in the intervention group between the average scores of knowledge, perceived susceptibility, severity, benefits and barriers, cues to action, efficacy and behavior before and after the intervention showed significant increase in blood pressure and educational intervention was effective however, no significant change was in the control group (table 3).

Table 3. Comparison of average knowledge, model structures, blood pressure before and after the intervention in two groups of patients with hypertension

Dimension			average	Standard deviation	P-value
Knowledge score	Intervention group	Before intervention	13.29	2.39	0.001
		After intervention	14.72	3.19	
	Control group	Before intervention	12.83	2.74	0.33
		After intervention	12.87	1.86	
Perceived susceptibility	Intervention group	Before intervention	6.48	2.08	0.005
		After intervention	8.88	4.76	
	Control group	Before intervention	7.33	2.35	0.095
		After intervention	6.62	2.76	
Perceived severity	Intervention group	Before intervention	7.46	3.33	0.005
		After intervention	10.70	4.24	
	Control group	Before intervention	8.90	3.32	0.095
		After intervention	8.46	3.06	
Perceived barriers	Intervention group	Before intervention	9.96	2.54	0.001
		After intervention	11.77	2.89	
	Control group	Before intervention	9.51	2.58	0.82
		After intervention	9.22	2.97	
Perceived benefits	Intervention group	Before intervention	8.96	4.15	0.014
		After intervention	10.37	4.35	
	Control group	Before intervention	9.03	2.32	0.22
		After intervention	8.75	2.27	
Help for action	Intervention group	Before intervention	10.22	2.25	0.005
		After intervention	12.55	4.18	
	Control group	Before intervention	10.79	3.09	0.095
		After intervention	10.70	3.82	
Efficacy	Intervention group	Before intervention	18.51	3.55	0.001
		After intervention	21.44	3.03	
	Control group	Before intervention	19.33	4.20	0.6
		After intervention	19.09	4.73	
behavior	Intervention group	Before intervention	16.98	3.89	0.006
		After intervention	20.48	2.68	
	Control group	Before intervention	17.70	2.92	0.2
		After intervention	18.24	4.01	
Systolic blood pressure	Intervention group	Before intervention	157.43	16.92	0.01
		After intervention	147.24	14.23	
	Control group	Before intervention	155.62	15.92	0.01
		After intervention	156.24	12.15	
Diastolic blood pressure	Intervention group	Before intervention	93.21	8.72	0.03
		After intervention	87.52	6.15	
	Control group	Before intervention	92.7	7.92	0.4
		After intervention	93.8	6.7	

DISCUSSION

The findings showed that the use of HBM in educating patients with high blood pressure has led to increase awareness and scores of model structures and to reduce systolic and diastolic blood pressure in the intervention group compared with the control group. The results showed a significant increase in mean knowledge score of Educational intervention group after the intervention; which reflects the positive effect of education in this field. This finding matches the findings Sharifirad and cooperation in the field of nutritional education to patients with type 2 diabetes (18). So awareness of the risk factors of hypertension and changes in health behaviors can be an effective step in reducing infectious

diseases. In the health belief model, all the structures modeled after the intervention in the intervention group showed significant difference. Average scores on perceived susceptibility in intervention and control groups before intervention had not significantly different. In other words, both the intervention and control groups were equally alarmed about hypertension. Similar results had been showed before Sharifirad and colleagues have been studying the intervention (19). In this study, the average scores for perceived susceptibility increased in the intervention group after the intervention. The mean scores increased for perceived susceptibility after training observed in several studies. The results Canbulat and colleagues's study found that women who may had higher perceived susceptibility, had more practice in for mammography (20). This study showed a significant increase in perceived severity of the intervention group after intervention this increase could be due hypertension patients involving in classes. In this sense, the awareness of the seriousness of risks such as heart attack and stroke, kidney and eye complications and treatment costs is an important factor in this regard to improve the level of perceived severity. Lin studied among immigrants in Taiwan showed that there is a significant relationship between the perceived severity and threat of AIDS and reduce risky behaviors (21) after the intervention, the average score of perceived barriers between the two groups showed a positive effect on boosting perceived barriers in the intervention group. The results gained the study of Rakhshanderou and colleagues (22) increase in average score perceived barriers suggests that people after the intervention become more aware of the obstacles which prevent them from carrying out preventive behaviors and have tried to solve them. Given that the perceived barriers hindering the potential of preventive action, the patient required an analysis of the benefits of action against the costs, risks, and possible complications and accordingly adopt health behaviors. Take action to control the disease or to act on a disease depends on understanding the benefits of it. In this study after

training the mean score of perceived benefits in patients of the intervention group was significantly increased than the control group. Study of BaghianiMoghadam revealed on saving exercise for people at risk of cardiovascular disease that perceived benefits play an important role in the exercise group than non-practitioners group.(23) Average score of help for action was not significant in the pre-test scores in the intervention and control groups but it had increased in the intervention group after the intervention. Study of Sharifirad and colleagues also showed that the results of guide for action scores significantly increased after the intervention (24). A high score of guide for action indicates that subjects of both groups in the pre-intervention phase had external stimuli and good guide behavior for preventing disease. In this study, the average score of self-efficacy increased in the experimental group, after the intervention. Avci 's study in Turkey showed that self-efficacy and motivation of health are two important components of health belief model that had more powerful predictor of BSE in women than any other model.(25) Canbulat study results also demonstrate the effect of education based on health belief model are increasing the score of efficacy (20). The results showed that blood pressure control applications that require constant adherence to drug and nutrition regimens and control of individual behavior, in addition to the patient, health care providers, families and individuals who are for him as reference behavioral must contribute to their health interventions. Based on the findings in this study and positive relationship with the self-control of blood pressure and health belief model we recommend using health belief model in the preparation, development and implementation of training programs, and planners use individual interviews and group patient education to achieve the goal of avoiding complications of this disease in long-term periods.

Competing Interest
The authors declare no conflict of interest

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