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The Effects of Educational Program on Self-Care Behavior of the Hypertension Patients in Rural Areas of Minoodasht

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ABSTRACT

Aims Many people with hypertension are unaware of their problem. As hypertension may have no warning signs and causes serious complications, designing effective interventions to sensitize the community towards its control is necessary. The current study aimed to evaluate the effectiveness of self-care educational programs for hypertension in rural areas.

Materials & Methods In this quasi-experimental study, 136 patients with hypertension from rural areas of Minodasht county were studied in 2019. Two-stage random cluster sampling was used to select participants. Data were collected by a self-administered questionnaire whose validity and reliability were assessed. The questionnaire consisted of demographic and related outcomes parts (adherence to diet and drug therapy, physical activity, adherence to control (measurement) of blood pressure, and feelings related to behavior). Data were analyzed using paired t-tests and covariance by SPSS 19.

Findings Based on the paired t-test, the mean of measured dimensions was significantly increased after providing the intervention ($p<0.05$). The covariance analysis was also statistically significant ($p<0.05$), after removing the pre-test effects of variables.

Conclusion This study showed the positive effects of educational interventions on those who suffer from hypertension. Educational programs, as a core component of health promotion, can improve the knowledge, attitudes, and skills of trainees to maintain and adhere to promote their health.

Keywords Self-Care; Hypertension; Educational Early Intervention

CITATION LINKS

[1] Cardiovascular disease, chronic kidney ... [2] Global burden of hypertension ... [3] International Society of ... [4] Poor hypertension control: let's ... [5] Seventh report of the ... [6] Distribution of blood pressure ... [7] Prevalence of hypertension among ... [8] Trends in hypertension prevalence ... [9] Self-care behaviors and related ... [10] Hypertension self-care practice and ... [11] Nutrition literacy and the elderly ... [12] Epidemiology and heterogeneity ... [13] Analysis of quality assessment ... [14] Evaluation of the coverage of national ... [15] Is ambulatory blood pressure monitoring ... [16] Usefulness of a hypertension education ... [17] Self-regulation behaviors of hypertension ... [18] Relationship between self-care ... [19] Physical activity to prevent and treat ... [20] Physical activity and functional ... [21] Dietary management of ... [22] Why are we doing so badly with ... [23] Hypertension knowledge-level ... [24] Assesment of hypertension knowledge ... [25] Dietary sodium intake ... [26] Does vigorous physical activity ... [27] A systematic review of patient ... [28] Perceptions of hypertension and contributing ...

Introduction

According to the World Health Organization, high blood pressure (hypertension) is a leading cause of death worldwide, that accounts for 13.5% of premature mortalities (7.6 million people), 92 million DALYs, 54% of all strokes, and 74% of all ischemic heart diseases events globally [1]. Its incidence is expected to reach 60% by 2025. Currently, the primary prevention of hypertension has become a global challenge [1-3]. As hypertension may have no warning signs and causes serious complications, designing effective interventions to sensitize the community towards its control is necessary [2]. Studies have shown that 32% of those who suffer from hypertension are not aware of their problem, and 15% are not on any therapy [4]. Many of those who suffer from hypertension have a history of taking at least one drug and the majority of them consume at least two drugs, but low compliance to prescribed medical interventions is common among them [5]. Azizi *et al.* reported that only 36% of participants had a history of drug therapy and only 40% had controlled blood pressure [6]. In the study by Barikani, 48.1% of participants were on drug therapy and only 21.3% of them had controlled blood pressure [7]. According to the evidence, sole drug therapy is not effective in controlling blood pressure and special attention should be paid to the patients, as an active part of disease control. Hypertension is a major contributor to cardiovascular diseases (CVDs) globally, and the world has placed special emphasis on self-care to control the disease [8]. Self-care is what people do to both establish and maintain their health, which includes acquired, conscious, and targeted actions. For hypertension, self-care is defined as "a dynamic and active process that requires knowledge, attitude, discipline, commitment, self-regulation, empowerment, and self-efficacy" [9], which includes drug therapy, a low-sodium, and low-fat diet, physical activity, limiting alcoholic beverages and smoking, weight loss, self-monitoring, regular health care visits, and reducing stress [10]. According to the evidence, effective management and self-care play a vital role in preventing and reducing complications caused by hypertension such as stroke up to 30-40% and kidney diseases and cardiovascular complications up to 20-25% [9]. WHO has reported that for those aged 45 to 84 years having a healthy weight and regular physical activity reduces the overall relative risk by 18% [11]. Various studies conducted in Iran have reported controversial results, but overall it can be noted that 25 to 35% of Iranian middle-aged adults are suffering from hypertension [12]. The national plan for prevention and control of hypertension began in 1992 in pilot areas and after 10 years (in 2001) it was expanded to rural areas to decrease the morbidity and mortality of CVDs. Based on the evaluations this plan was not successful. Miri *et al.* showed that only 35% of those who suffer from hypertension receive full care [13]. Also, the implementation of the program was far from the defined standards [14]. Therefore, according to the evidence, it can be argued that controlling hypertension is multi-dimensional by nature, which may include triviality of the disease, financial problems, problems in access to services, failure to regulate interventions, drug-related complications, and non-adherence to treatment [15, 16].

Although the prevalence of hypertension is almost similar in rural and urban areas, the evidence shows that those in rural areas have both lower awareness of the importance of treating hypertension and less controlled blood pressure [17]. Also, the prevalence of hypertension is high in Minodasht county (6%). Therefore, regarding the rising importance of education as one of the core components of controlling chronic diseases and maintaining health, the current study aimed to evaluate the effectiveness of self-care programs for hypertension in rural areas.

Materials and Methods

The current quasi-experimental study contained an intervention group with pre-and-post measurement. The study population was those who suffer from hypertension in rural areas of Minodasht county, Iran in March 2019. The sample size was calculated based on the following formula:

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}}+Z_{1-\beta}\right)^2 [P_1(1-P_1)+P_2(1-P_2)]}{(P_1-P_2)^2}$$

Where the confidence interval was considered as 95% (α=0.05) and test power was β= 80%. The sample size was calculated as 136 subjects. Research units were determined using random numbers table. Two-stage cluster sampling was used to select participants. Six health care centers were covering the research, and each of them was considered a cluster. Then, 4 clusters were randomly selected. Afterward, proportional to the population of each cluster, samples were randomly selected. Inclusion criteria were definitive diagnosis of hypertension by a physician, having a medical record at a health care center, at least six months of definitive diagnosis, willingness to participate, and not having specific physical conditions and diseases which require a specific diet.

Data were collected using a researcher-made questionnaire that contained two parts: demographic information (age, sex, occupation, education, marital status, smoking and alcohol consumption, weight and height, and history of hypertension in the family) and the outcomes. The second part included measuring outcomes in four dimensions of adherence to diet and drug therapy

during the past seven days (9 items), physical activity during the past seven days (2 items), regular measurement of blood pressure during the past seven days (4 items), and feelings related to behavior (10 items). The first three domains were on an eight-point Likert scale, while the fourth dimension was a five-point Likert scale, ranging from "never" to "most often". The content validity method was used to evaluate the validity of the data collection tool. To do this, 10 health education experts were asked to evaluate the questionnaire. After applying their opinions, scientific validity was confirmed. Cronbach's alpha coefficients were calculated for each subscale as follows diet and drug therapy (0.79), physical activity (0.76), managing blood pressure (0.78), and feelings related to behaviors (0.80). The questionnaire was filled either as face-to-face interviews or self-reporting.

The study was performed in three stages: measurements before providing the intervention, providing the intervention, and post-intervention measurements. Blood pressure was measured before (as baseline blood pressure) and after the intervention and then within one month after the intervention. Before measuring the blood pressure, subjects were asked to rest for 5 minutes and not to drink coffee and tea or smoke during the past 24h. Blood pressure was measured by a mercury barometer on the left hand. In the pre-intervention stage, after completing the questionnaires and analyzing the data, matching was performed for both groups. Then, the intervention group received four 35-45 minutes sessions of face-to-face training. The contents of the training sessions were arranged to cover the following areas: diet and drug therapy, physical activity, blood pressure control, and mental health. Regarding useful physical activities, training was practiced practically and in groups. The educational contents on acute complications of hypertension, the importance of good nutrition, physical activity, and wrong beliefs were provided to the staff of health care centers. The training was provided by lecture, question and answer, and group discussion. Eventually, four weeks after providing the intervention, the effect of the educational program on promoting patients' self-care behaviors was measured. The target behaviors included the patient's performance regarding diet and drug therapy, physical activity, regular measurement of blood pressure, and feelings related to the behavior.

Data were analyzed by using SPSS version 19. The descriptive statistics (i.e. variable's mean, standard deviation, percentage, and absolute and relative frequency) are used to summarize the characteristics of a data set. Inferential statistics (such as paired t-tests, and covariance analysis) are used to assess the intervention effects. The Paired t-test is used to compare the mean sizes before and after the intervention and whether the difference is statistically significant between variables' scores on pre and post-measures. Analysis of covariance (ANCOVA) is suitable for adjusting post-test scores for pre-test variability. In other words, ANCOVA reduces the noise caused by the experimental design and eliminates the effect of the pretest.

Findings

The mean age of participants was 60.00±1.26, and the mean duration disease of them was 70.00±1.03 days. Most of the participants were female, housewives, educated up to primary only, and did not use contraceptives. Only one subject reported alcohol consumption (Table 1). During the study period, only one-third of participants (33.3%) had high blood pressure. The mean body mass index of participants was 28.78±0.00. Data were distributed normally, and skewness and kurtosis were equal to -2 and -2, respectively.

All scores of measured dimensions were improved after providing the intervention ($p<0.05$; Table 2).

Table 1) The demographic characteristics of the participants

Variable		Number	Percent
Gender	Men	114	83.8
	Female	22	16.2
Education	Illiterate	57	41.9
	School and diploma	77	54.6
	Academic	2	1.5
Marital status	Married	3	2.2
	Single	108	79.4
History of oral contraceptive consumption	yes	8	7.1
	No	104	92.9
Hypertension on study time	Has it	44	33.3
	Does not have	88	66.7
Alcohol or cigar intake	Has it	1	0.7
	Does not have	135	99.3
Job	House-worker	112	82.4
	Farmer	18	13.2
	Other	24	4.4

Table 2) Scores of different dimensions before and after providing the intervention

Intervention Stage	Mean±SD	t	p-value
Blood pressure Control (Measurement compliance)			
Before	2.03±1.48	-4.53	0.001
After	2.67±1.65		
Physical activity			
Before	1.57±0.50	-4.06	0.001
After	2.31±0.25		
Feeling related to behavior (Mental)			
Before	2.15±0.59	-3.28	0.001
After	2.31±0.69		
Drug and diet adherence			
Before	3.07±1.29	-2.16	0.03
After	3.44±1.61		

Covariance analysis was used to remove the effect of pre-test values of research variables. After controlling for pre-test values of research variables, the intervention could significantly improve the patients' performance (Table 3).

Table 3) Covariance analysis to investigate the effects of the intervention after removing of pre-test the effect

Source	df.	Mean Square	F	p-value
Blood pressure control (measurement compliance)				
Corrected model	2	68.13	39.31	0.007
y-intercept	1	72.59	41.88	0.030
Pre-test	1	126.59	73.04	0.029
Control	1	20.02	11.55	0.001
Error	132	1.73	-	-
Physical activity adherence				
Corrected model	2	98.94	27.12	0.010
y-intercept	1	133.21	36.52	0.009
Pre-test	1	93.75	25.70	0.040
Control	1	82.80	22.70	0.004
Error	133	3.65	-	-
Feeling related to behavior (mental)				
Corrected model	2	17.24	90.71	0.027
y-intercept	1	2.99	15.72	0.008
Pre-test	1	28.71	151.08	0.001
Control	1	0.1107	58.23	0.005
Error	131	0.19	-	-
Drug and diet adherence				
Corrected model	2	73.002	47.84	0.011
y-intercept	1	128.211	84.02	0.003
Pre-test	1	16.32	10.69	0.012
Control	1	144.68	94.81	0.001
Error	133	1.53	-	-

Discussion

Based on the results of the paired t-test, educating patients concerning adherence to diet and drug therapy is beneficial for those who suffer from hypertension. This finding is consistent with studies by Bairami *et al.* [18] and Barati *et al.* [17]. A review and meta-analysis study on nutritional interventions reported that observing nutritional principles and regular physical activity can reduce blood pressure in the long term [19]. Another review study by Warburton DE showed that following a DASH diet along with low consumption of salt (i.e. 1.5 g/d) could significantly reduce blood pressure compared to drug therapy. Nutrients such as potassium, calcium, protein, and magnesium also lower blood pressure [20]. Many of those who suffer from hypertension had a history of taking at least one drug, and the majority of them were consuming two drugs, but almost none of them had full adherence to prescribed drugs [5]. Moreover, reported blood pressures were very disappointing [21, 22].

Awareness plays an important role in dietary adherence of those who suffer from hypertension [23], so "unawareness" is emphasized as an important factor for not controlling blood pressure [24]. According to the evidence, awareness about the nature of the problem and changing the lifestyle, and following self-care behaviors such as healthy nutrition can be effective in preventing and managing the complications caused by hypertension, because those with more knowledge are more likely to reduce the sodium intake. Therefore, poor awareness affects patients' attitudes and behaviors [24, 25].

Concerning the physical activity, the results of the paired t-test showed an increase in the duration of physical activity following the training. Several review studies are conducted in 2010, 2013, and 2018 on the effect of physical activity and its amount and intensity on blood pressure, all of which reported a negative association; however, results on the effect of exercise intensity are controversial [19, 20]. In a review study, Pescatello [19] reported the following results after reviewing various meta-analyses:

In total, 17 meta-analyses with a population of 594,129 ≥ aged 18 years are investigated. The evidence indicated:

1) an inverse dose-response association between hypertension and sudden incidence of hypertension in adults with normal blood pressure;

2) Physical activity reduces the risk of CVDs in adults with high blood pressure;

3) Physical activity reduces blood pressure in adults who suffer from hypertension and those with normal blood pressure.

Besides, the effect of physical activity on high blood pressure was different. This finding can be attributed to various reasons such as differences in exercise regimens, environmental factors, and genetic factors. A study reported that in 20 to 25% of those who were suffering from hypertension the blood pressure didn't change after physical activity. Cohen *et al.* investigated the moderating factors. For example, does age influences the association between physical activity and hypertension. They reported that physical activity was more effective on blood pressure in younger women than in their older counterparts. However, since the incidence of hypertension increases by age, increased physical activity among younger people should be associated with a lower prevalence of hypertension among adults. Therefore, the authors speculated that the overall benefit of public health from adopting healthy lifestyles is similar for all ages [26].

Since hypertension is asymptomatic, regular monitoring of blood pressure is the best way to detect changes in blood pressure. The present study showed that self-care improves managing hypertension through regular measurement of blood pressure. Studies have shown that 32% of those who suffer from hypertension are not aware of their problem [27]. Nowadays, most patients receive the necessary professional and specialized care in their homes.

Based on the findings, after providing the intervention, patients' psychological feeling concerning their success to control blood pressure

was improved. Chronic diseases not only are a threat to physical health but also negatively affect the mental health and social lives of patients, which in turn negatively affects the quality of life of those suffering from hypertension. The findings of the study. Which reported that the mean score of total quality of life in patients with hypertension was moderate [27, 28].

The WHO has mentioned changing the lifestyle and regular measurement of blood pressure as the main interventions to control hypertension [1]. In this line, four changes in lifestyle are recommended: weight loss, reduced sodium intake, increased physical activity, and reduced alcohol consumption [10, 12, 28]. Self-care education is a core component of health promotion that can increase the knowledge, attitude, and skills of participants.

The current study had limitations, including filling questionnaires through self-reporting and not training all participants in similar conditions (due to dispersion of health care centers and long distances). Another important limitation is merging nutrition and drug therapy in one dimension, which may have caused bias in responses. Hence, the results should be generalized with caution.

Conclusion

This study demonstrated that training self-care improves the behaviors of patients. Since hypertension is asymptomatic, and most of those who suffer from hypertension are unaware of their problem, training self-care behaviors can improve blood pressure control and reduce the chronic and acute complications, which in turn reduces the economic burden of hypertension.

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