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A comparative study on the health-promoting behaviors of patients with and without hypertensive heart disease in Iran

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Abstract:

BACKGROUND: Health-promoting behaviors can affect the psychological and physical consequences of hypertension. For the prevention and control of hypertension, lifestyle modification has been recommended. This study aimed to investigate the health-promoting behaviors of patients with hypertensive heart disease in Iran and compare them with those of healthy people.

MATERIALS AND METHODS: This was a descriptive comparative study with cross-sectional design. Participants were 141 patients with hypertensive heart disease (mean age = 39 ± 10.2 years) referred to the cardiac clinic of Madani Hospital in Khorramabad, Iran, and 141 healthy people selected from those referred to the hospital. The Persian version of the revised Health-Promoting Lifestyle Profile-II (HPLP-II) was used to evaluate the health-promoting behaviors of participants. After collecting data, they were analyzed in SPSS v. 22 software using descriptive statistics and statistical tests including independent *t*-test and one-way ANOVA.

RESULTS: The overall HPLP-II score was 142.34 ± 30.48 in patients and 150.52 ± 37.07 in controls. The highest and lowest HPLP-II dimension scores in both groups were related to health responsibility and stress management dimensions. There was a significant difference between groups only in dimensions of nutrition ($P = 0.017$) and physical activity ($P = 0.016$), and in the overall score ($P = 0.044$), whose scores were lower in patients compared to controls. The difference in HPLP-II score of patients with different demographic characteristics (marital status, place of residence, gender, age, educational level, and occupation) was not statistically significant.

CONCLUSION: Patients with heart disease caused by high blood pressure in Iran have poorer diet and physical activity compared to healthy people. Educational interventions with a focus on the importance of dietary regime and exercise are recommended for them.

Keywords:

Clinical health, comparative study, diet, healthy lifestyle, heart diseases, hypertension, physical activity

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Introduction

Hypertension (raised blood pressure) is a worldwide epidemic and the third leading cause of death in the world such that it is estimated to cause 7.5 million deaths, about 12.8% of the total of all annual deaths.^[1] Hypertension is defined as systolic blood pressure >140 mmHg and diastolic blood pressure >90 mmHg. According to a

study, the prevalence of hypertension during 2015–2016 among adults in the United States was 29.0% and was similar among men (30.2%) and women (27.7%).^[2] In Iran, a meta-analysis reported that the prevalence of hypertension during 2004–2018 was 25%.^[3] The prevalence of hypertension can be affected by demographic factors, such as age, race, gender, and socioeconomic status. In addition to cardiovascular diseases, complications of hypertension

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include heart failure, peripheral vascular disease, renal impairment, retinal hemorrhage, and visual impairment.^[4-6] Hypertensive heart disease is the main cause of death associated with hypertension. It refers to a group of disorders that includes heart failure, ischemic heart disease, and left ventricular hypertrophy (excessive thickening of the heart muscle). There are a variety of drugs for the treatment of high blood pressure in people with heart disease, including diuretics, beta-blockers, angiotensin-converting-enzyme inhibitors, calcium channel blockers, angiotensin receptor blockers, and vasodilators.

Health-promoting behaviors prevent diseases, decrease morbidities, improve the quality of life, and decrease healthcare costs.^[7,8] A health-promoting lifestyle is a multi-dimensional pattern of self-initiated feelings and behaviors aiming at ensuring individual's health, self-actualization, and self-accomplishment.^[9,10] The most common tool for assessment of health-promoting behaviors is the Health-Promoting Lifestyle Profile-II (HPLP-II) developed by Walker and Hill-Polerecky, which has high internal consistency and test-retest reliability,^[11] which assesses six dimensions of health responsibility, spiritual growth, physical activity, interpersonal relationships, nutrition, and stress management. It measures health-promoting lifestyles by focusing on self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization, and fulfillment of the individual.^[12,13] Many versions of this tool have been developed in other languages including the Persian language.

For the prevention and control of hypertension, lifestyle modification has been recommended by means of dietary behaviors, regular physical activity, and weight loss.^[14] Unhealthy lifestyle behaviors such as inactivity, poor eating habits, smoking, alcohol consumption, stress, high sodium uptake, and substance abuse can prolong the recovery period. In hypertensive patients, lifestyle modifications can serve as initial treatment before the start of drug therapy or as an adjunct to medication therapy. Lifestyle modification may facilitate drug step-down and drug withdrawal in highly motivated individuals who achieve and maintain lifestyle changes.^[10,14,15] Adoption of healthy lifestyle is necessary for the prevention of high blood pressure and is an indispensable part of the management of patients with hypertension. There are few studies that have conducted on surveying health-promoting behaviors of hypertensive patients using the HPLP. In one study conducted in China by Cao *et al.*,^[16] it was reported that hypertensive elderly had significantly lower scores in the spiritual growth and stress management dimensions. Kemppainen *et al.*^[17] conducted a study on health-promoting behaviors in patients with hypertension in Japan and the United

States. The HPLP-II subscale scores for participants from both countries were lowest for physical activity. For the participants from the United States, the HPLP II subscale scores were highest for spiritual growth and interpersonal relationships. In Iran, only three related studies were found on patients with hypertension. In one study conducted in Gorgan city by Mansoorian *et al.*,^[18] it was shown that unhealthy behaviors particularly in nutrition, stress management, and physical activity had a relationship with hypertension. The study by Fatourehchi and Sotoodeasl^[19] on comparing the lifestyle of patients with hypertension and healthy people in Tehran city showed that individuals with hypertension had poor lifestyle, and also the overall lifestyle score in patients with hypertension and healthy individuals were significantly different. The other study was conducted in Isfahan city by Samiei Siboni *et al.*^[20] who reported that the highest and lowest HPLP scores in hypertensive patients were in nutrition and physical activity dimensions, respectively. The results of above-mentioned studies indicate the cultural variations in the health-promoting behaviors of people with hypertension. Iran is a large country in the eastern half of the Middle East with approximately 70 million people with different ethnicities. Further studies are necessary for presenting up-to-date information to be used by health authorities to increase self-care and health-promoting behaviors in hypertensive patients and increase the generalizability of the findings. Moreover, in the above-mentioned studies, the patients had no history of heart disease. Therefore, this study aims to investigate health-promoting behaviors of patients with hypertensive heart disease in Iran compared to healthy people.

Materials and Methods

Study design and setting

This was a descriptive comparative study with cross-sectional design using a control group conducted in 2020 before the outbreak of COVID-9 in Khorramabad, Iran.

Study participants and sampling

Study population consisted of all patients with hypertensive heart disease and all healthy people referred to the Cardiac Clinic of Madani Hospital in Khorramabad, Iran. Using the formula for a comparative study and considering an alpha level of 0.05 and a selected power (β) of 80%, the sample size was determined 282. In this regard, those who met the inclusion criteria were selected using a convenience sampling technique and were divided into two groups of patients ($n = 141$) and controls ($n = 141$). Inclusion criteria were: Age 20–60 years, having hypertension according to a self-report (for patients), literacy to read

and write, willingness to participate, and no mental illness. Exclusion criteria were other chronic diseases for patients (e.g., diabetes) and returning incomplete questionnaires. No samples were excluded from the study in any groups.

Data collection tool and technique

Data collection tools were a demographic form (surveying age, gender, occupation, education, type of heart disease, and place of residence) and the Persian version of the revised HPLP (HPLP-II). It has 49 items rated on a 4-point Likert scale (1 = Never, 2 = sometimes, 3 = often, and 4 = always) measuring responsibility (14 items), spiritual growth (nine items), physical activity (six items), interpersonal relationships (eight items), nutrition (seven items), and stress management (five items). The total score is obtained by summing up of the scores of all subscales ranging from 49 to 196; a higher score indicates a better lifestyle. The psychometric properties of Persian HPLP-II were evaluated by Mohammadi Zeidi *et al.*^[21] They reported a Cronbach's alpha of 0.82 for the whole instrument, and a Cronbach's alpha of 0.64–0.91 for the subscales. They also reported its high test-retest reliability. After explaining the study objectives and method to the participants, assuring them of the confidentiality of their information, and obtaining their informed consent, questionnaires were distributed among them. After collecting data, they were analyzed in Statistical Package for the Social Sciences (IBM Corp., USA), using descriptive statistics (mean, standard deviation, frequency, and percentage) and statistical tests including Independent *t*-test and one-way ANOVA. The significance level was set at 0.05 ($P < 0.05$).

Ethical consideration

Prior to study, a written informed consent was obtained from the participants. They were free to leave the study at any time and were assured of the confidentiality of their information. This study obtained its ethical approval from the Research Ethics Committee of Lorestan University of Medical Sciences (Code: IR.LUMS.REC.1399.133).

Results

Patients were 63 men (44.7%) and 78 women (55.3%) with a mean age of 39 ± 10.2 , mostly ranged 40–49 years (28.4%). Controls were 64 men (45.4%) and 77 women (54.6%) with a mean age of 38.6 ± 9.8 years, mostly ranged 40–49 years (38.3%). Most of the participants had university degree (52.5% patients and 34% controls) and were married (70.9% patients and 55.3% controls) living in urban areas (90.1% patients and 67.4% controls). Most of the patients were employee (45.4%) while controls were self-employed (40.4%). Hypertensive patients had a history of heart attack ($n = 22$), arrhythmia ($n = 9$), and congestive heart failure ($n = 8$). For more

Table 1: Demographic characteristics of participants

Characteristics	Patients, n (%)	Controls, n (%)
Gender		
Male	63 (44.7)	64 (45.4)
Female	78 (55.3)	77 (54.6)
Marital status		
Single	41 (29.1)	63 (44.7)
Married	100 (70.9)	78 (55.3)
Age (years)		
20-29	13 (9.2)	22 (15.6)
30-39	40 (28.4)	41 (29.1)
40-49	48 (28.4)	54 (38.3)
50-60	40 (28.4)	24 (17)
Educational level		
Primary education	3 (2.2)	11 (7.8)
Middle school	5 (3.5)	14 (9.9)
High school	34 (24.1)	22 (15.6)
High school diploma	25 (17.7)	46 (32.6)
Academic degree	74 (52.5)	48 (34)
Occupation		
Self-employed	44 (31.2)	57 (40.4)
Employee	64 (45.4)	6 (4.3)
Housekeeper	10 (7.1)	51 (36.2)
Unemployed	23 (16.3)	27 (19.1)
Place of residence		
Urban areas	127 (90.1)	96 (67.4)
Rural areas	14 (9.9)	45 (32.6)

information [Table 1]. The mean score of the dimensions of HPLP-II in the two groups is presented in Table 2. As can be seen, the highest and lowest scores in both groups were related to health responsibility (43.10 ± 10.17 in patients and 43.05 ± 10.10 in controls) and stress management (15.49 ± 3.89 in patients and 15.47 ± 3.86 in controls) dimensions. The overall HPLP-II score was 142.34 ± 30.48 in patients and 150.52 ± 37.07 in controls (out of 196). The results of independent *t*-test showed a significant difference between groups only in dimensions of nutrition and physical activity and in the overall score ($P < 0.05$). The scores of these variables were lower in patients compared to controls, indicating that the health-promoting behaviors of patients were at low level in these two areas.

Regarding demographic factors, results showed that HPLP-II scores were higher in married female patients aged 50–60 years, unemployed with middle school education living in rural areas. However, independent *t*-test results showed no difference in overall HPLP-II scores between them in terms of marital status ($P = 0.681$), place of residence ($P = 0.104$), and gender ($P = 0.444$) [Table 3]. The results of one-way ANOVA also showed no difference in the overall scores between patients with different ages ($P = 0.380$), educational levels ($P = 0.947$), and occupations ($P = 0.497$) [Table 3]. This indicates that demographic factors had no significant effect on the

Table 2: Independent t-test results of examining the difference in the mean HPLP-II scores between groups

Dimensions	Mean±SD		T	Df	Significance
	Patients	Controls			
Spiritual growth	27.58±7.17	27.55±7.13	0.042	280	0.967
Health responsibility	43.10±10.17	43.05±10.10	0.041	280	0.967
Stress management	15.49±3.89	15.47±3.86	0.046	280	0.963
Interpersonal relationships	24.48±6.60	24.46±6.56	0.036	280	0.971
Physical activity	16.86±4.50	18.25±5.10	-2.425	280	0.016
Nutrition	20.09±5.50	21.72±5.87	-2.395	280	0.017
Total	142.34±30.48	150.52±37.07	-2.025	280	0.044

SD=Standard deviation

Table 3: Comparing the overall HPLP-II scores of patients in terms of demographic factors

Characteristics	mean±SD	Test results
Gender		
Male	140.14±31.22	$t=-0.768$, $df=139$, $P=0.444^*$
Female	144.11±29.94	
Marital status		
Married	143.02±29.85	$t=0.412$, $df=139$, $P=0.681^*$
Single	140.68±32.28	
Age (years)		
20-29	141.69±33.26	$F=1.033$, $P=0.380^{**}$
30-39	143.40±30.24	
40-49	136.79±30.73	
50-60	148.15±29.45	
Educational level		
Primary education	137.33±18.50	$F=0.183$, $P=0.947^{**}$
Middle school	145.20±42.63	
High school	145.35±34.93	
High school diploma	139.08±34.55	
Academic degree	142.06±26.81	
Occupation		
Housekeeper	131.20±31.01	$F=0.799$, $P=0.497^{**}$
Unemployed	148.86±37.93	
Employee	141.96±26.23	
Self-employed	142±32.04	
Place of residence		
Urban areas	140.95±29.11	$t=-1.638$, $df=139$, $P=0.104^*$
Rural areas	154.92±40.02	

*Independent t-test, **One-way ANOVA. SD=Standard deviation, HPLP-II=Health-Promoting Lifestyle Profile-II, SD=Standard deviation

health-promoting behaviors of patients.

Discussion

Lifestyle modification has been recommended for the prevention and control of hypertension. It involves weight reduction, regular physical exercise, reduction of salt intake, healthy eating (diet rich in fruits, vegetables, and dairy products with reduced saturated and total fat), restriction of alcohol intake, and cessation of smoking.^[14] Despite the effect of lifestyle modification programs, including appropriate physical activity on reducing blood pressure, lack of easy access to sports facilities, transportation problems, child care,

lower income levels, and education levels can reduce physical activity.^[17,20] The purpose of this study was to investigate the health-promoting behaviors of patients with hypertensive heart disease in urban areas of Khorramabad city in Iran compared to healthy people. The results showed that hypertensive patients had poorer health-promoting behaviors than healthy people. This is consistent with the results of Fatourehchi and Sotoodeasl.^[19] The highest and lowest HPLP-II subscale scores in both groups were in health responsibility and stress management dimensions, respectively. Cao *et al.*^[16] examined health-promoting behaviors of 543 elderly people with hypertension in China compared to 550 with normotension using the HPLP-II tool, and found that hypertensive elderly had significantly lower scores in spiritual growth and stress management dimensions which is consistent with our study. Samiei Siboni *et al.*^[20] evaluated health-promoting behaviors of 93 patients with hypertension in a cardiology clinic in Isfahan, Iran and reported that the highest HPLP-II score was in the nutrition and the lowest score in the physical activity dimension. In Kemppainen *et al.*'s study^[17] on health-promoting behaviors of rural residents with hypertension in Japan ($n = 212$) and the United States ($n = 105$) using the HPLP-II scale, the lowest score was for the physical activity dimension, while the highest score was for spiritual growth and interpersonal relationships. Our results showed a significant difference between groups only in HPLP-II dimensions of nutrition and physical activity and in overall HPLP-II score. This is consistent with the findings of Mansoorian *et al.*^[18] for 200 hypertensive patients in rural areas of Gorgan city in terms of physical activity and total score, but against their results in dimension of spiritual growth, interpersonal relationships, and stress management. In Saber Moghaddam *et al.*'s study^[22] on the lifestyle of 380 administrative employees with hypertension in rural areas of Bojnurd city in Iran, high blood pressure was also significantly related to nutrition. Hosseini *et al.*^[23] in a study on the lifestyle of forty hypertensive patients in rural areas of Jahrom County in Iran also stated that poor behavioral habits in physical activity and nutrition (salt intake) were common in patients with hypertension.

Although there were differences in health-promoting behaviors of hypertensive patients and healthy people in terms of marital status, place of residence, gender, age, educational level, and occupation, the difference between them was not statistically significant. Samiei Siboni *et al.*^[20] also found no significant differences in HPLP-II dimensions between hypertensive patients in terms of gender and marital status, but Buda *et al.*^[15] in a study on lifestyle modification practice of 205 hypertensive patients in South Ethiopia showed that age and educational status were factors significantly associated with lifestyle modification. The difference between the results of previous studies and the present study highlights the role of cultural variables influencing health-promoting behaviors in patients with hypertension.

Limitation and recommendation

The present study is the first study that conducted on the health-promoting behaviors of patients with heart disease caused by high blood pressure in Khorramabad city. There were some limitations and disadvantages in this study. We used a self-report tool which can affect the results. Some patients had less cooperation in assessing their health-promoting behaviors. Moreover, we conducted this study only on hypertensive patients referred to a selected hospital. Hence, the generalizability of the results to the hypertensive patients in other cities of Iran should be done with caution. Further studies on the health-promoting behaviors of hypertensive heart disease patients in other cities of Iran are recommended. Moreover, we recommend an empirical study based on the Health Belief Model in these patients.

Conclusion

Lifestyle modification practices among patients with hypertensive heart disease in Iran are moderate. Their health-promoting behaviors in terms of nutrition and physical activity are poorer compared to healthy people. Educational interventions with a focus on the importance of dietary regime and exercise are recommended for them. The results of this study can be helpful for caregivers and the health care managers to provide necessary trainings and interventions for improving the nutrition and physical activity of hypertensive patients to help modify their healthy behaviors.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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