

# General Health Status and its Relationship With Health-Promoting Lifestyle Among Patients With Hypertension

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## Abstract

**Background:** Hypertension is a bio-psychological disorder and a major health problem in the developing countries. It is affected by people's lifestyle.

**Objectives:** The current study aimed to examine general health status and its relationship with health-promoting lifestyle among patients with hypertension.

**Methods:** This analytic-descriptive study was conducted on 302 patients with hypertension aged 40 - 70 years who lived in Birjand, Iran. Convenient sampling method was employed and individuals with a systolic blood pressure above 140 mmHg or a diastolic blood pressure above 90 mmHg as well as people with a history of taking antihypertensive agents were recruited. The 28-item general health questionnaire and the health-promoting lifestyle profile were completed for the participants by the interview method. The data were analyzed by the SPSS software ver. 16.0 and through running Mann-Whitney U and Kruskal-Wallis tests, the Spearman correlation coefficient analysis and the logistic regression analysis.

**Results:** The mean age of the participants was 54.81 ± 9.83 years. The hypertension of 28 participants (9.3%) was effectively controlled while 152 ones (50.3%) and 122 ones (40.4%) had moderate and severe hypertension, respectively. More than half of the participants (53.3%) had some forms of impaired general health. The highest and the lowest lifestyle subscale scores belonged to the nutrition and the physical activity subscales, respectively. The Spearman correlation coefficient analysis revealed that except for the score of health responsibility, the scores of other subscales of lifestyle as well as the total score of lifestyle questionnaire were negatively correlated with those of the general health questionnaire and all its subscales ( $P < 0.05$ ). Logistic regression analysis also showed that stress management, spiritual growth and total lifestyle scores were the significant predictors of the participants' general health.

**Conclusions:** Given the significant correlation of lifestyle components such as stress management and spiritual growth with general health, general health of patients with hypertension can be improved through developing and implementing stress management and spiritual growth stimulation programs and techniques.

**Keywords:** Hypertension, General Health, Lifestyle

## 1. Background

Hypertension is a bio-psychological disorder and a major health problem in both industrial and developing countries due to its high prevalence and its association with cardiovascular diseases. It is a risk factor for myocardial infarction, stroke, congestive heart failure, end-stage renal disease, and peripheral vascular disease. It is defined as a systolic blood pressure (SBP) of greater than 140 mmHg and a diastolic blood pressure (DBP) of greater than 90 mmHg (1). According to the world health organization (WHO), 33% of the global adult population has hypertension. This rate increases with age. In the age groups of 20 - 30 and older than 50, one and five out of every ten people

have hypertension, respectively (2). It is estimated that by 2025, about 1.54 billion adults have hypertension (1). The results of a study conducted in 2011 in Iran, showed that 17.5% of 15 - 65 year-old Iranians had hypertension. According to the Iran's ministry of health and medical education, 20 out of every 100 Iranian adults have hypertension out of which only ten people know that they are afflicted by the disease and only five ones receive treatments. In other words, 75% of all Iranian with hypertension receive no treatment (2).

Like most chronic conditions, hypertension affects people mainly in old age, i.e., when they are not in ideal physical and mental health conditions, feel weak in self-confidence, feel empty and are isolated. Elderly people usually develop numerous sensory impairments (such as

hearing and visual problems) which negatively affect their social status and quality of life (3) and give them a sense of psychological burnout. Barati et al. found that 42% of Iranian elderly people with potential general health problems had social dysfunction (4). Mousavi et al. also reported that 62% of Iranian patients who lived in Shahroud, Iran, had fragile general health (5).

Hypertension is inversely correlated with general health and can cause problems such as physical and social dysfunction, depression, anxiety and insomnia (6-8). Thus, effective hypertension management is an absolute prerequisite to improve the health status of patients with hypertension. Hypertension can be managed by medication therapy and lifestyle modifications. Huang et al. found that lifestyle modification and medication therapy are the key strategies to manage hypertension (9).

Walker defined health-promoting lifestyle (HPL) as a multi-dimensional pattern of perceptions and activities started by self-motivation and help in the persistence and promotion of their health and self-improvement (10). People with a HPL avoid unhealthy behaviors such as drug abuse, attempt to diagnose their physical, mental and psychological problems as early as possible, maintain their independence, improve their interpersonal relationships and engage in activities such as healthy nutrition, regular physical exercise, emotion and thought control, stress management and accident prevention (10).

One of the main goals of WHO expected to be achieved until 2020 is to promote people's lifestyle. Accordingly, countries need to implement strategies to improve individuals' personal and social lives and minimize the effects of health risks (11). Lifestyle is among the modifiable risk factors for hypertension. On the other hand, hypertension is correlated with general health status. Therefore, lifestyle modifications can help to prevent and manage health problems and improve general health status. Nonetheless, it is unclear which aspects of lifestyle are more effective in improving health.

## 2. Objectives

The current study aimed to examine general health status and its relationship with HPL among patients with hypertension.

## 3. Methods

This analytic-descriptive study was conducted on 302 patients with hypertension aged 40 - 70 who lived in Birjand, Iran. Convenient sampling method was employed. Accordingly, authors referred to the mosques located in Birjand, Iran, and invited people to participate in the study.

Initially, the aims of the study were explained to the participants. Then, their blood pressure was measured in a quiet and calm environment by a mercury sphygmomanometer (Diplomat, Riester, Germany) and a stethoscope (4064, Riester, Germany). Blood pressure measurement was performed once the participants had sat on a chair for five minutes and their arms were on a tabulation level with their hearts. The blood pressure of people who had a SBP of greater than 140 mmHg or a DBP of greater than 90 mmHg or used antihypertensive agents was re-measured after a ten-minute rest in sitting position. Then, the mean of the two measurements was calculated and recorded (12). Hypertension was classified according to the British national institute of health and care excellence classification of hypertension as follows (13):

- Controlled hypertension: a SBP of 120 - 139 mmHg or a DBP of 80 - 89 mmHg.
- Moderate hypertension: a SBP of 140 - 159 mmHg or a DBP of 90 - 99 mmHg.
- Severe hypertension: a SBP of greater than 160 mmHg or a DBP of greater than 100 mmHg.

After blood pressure measurement, the 28-item general health questionnaire (GHQ-28) and the health-promoting lifestyle profile (HPLPII) were completed for the participants by a trained interviewee. The GHQ-28 is a 28-item questionnaire which developed by Goldberg and psychometrically evaluated by Homan (14). It assesses and identifies health problems within the past two weeks and is sensitive to transient health problems which subside without treatment. The subscales of the GHQ-28 are somatic symptoms, anxiety and insomnia, social dysfunction and depression, each with seven items. The scoring system of the questionnaire is Likert-type and includes four points of 0, 1, 2 and 3. Therefore, the possible scores of the subscales are 0 - 21, while the total GHQ-28 score is 0 - 84. Lower scores represent higher general health. In the present study, scores higher than the cutoff points of 23 were considered as impaired general health (14). Hoseininasab et al. reported that the Cronbach's alpha values of the four GHQ-28 subscales were respectively 0.77, 0.77, 0.48, and 0.85 while the Cronbach's alpha value for the questionnaire was 0.90 (15). Taghavi reported the Persian version of GHQ-28 as an appropriate scale to assess the general health Iranians in psychological studies and clinical settings (16).

The HPLPII is the modified version of HPLP. This questionnaire measures HPL based on individuals' innovative activities and perceptions regarding health maintenance or promotion, self-improvement and personal satisfaction. It was developed by Walker et al. (17). Mohammadi Zeidi et al. reported a Cronbach's alpha of 0.94 for the HPLPII and alpha values of 0.79 - 0.94 for its six subscales.

Moreover, they found that the three-week test-retest reliability coefficient of the questionnaire was 0.89 (18). The current study used the Persian version of the HPLPII which includes 48 items in the six subscales of spiritual growth (10 items), health responsibility (12 items), interpersonal relationships (8 items), stress management (5 items), physical activity (6 items) and nutrition (7 items). The items of the questionnaire are scored on a four-point Likert-type scale as follows: never: 1; sometimes: 2; often: 3; and always: 4. Thus, the total score of the Persian HPLPII is 48 - 192. The mean item score of each subscale is calculated through dividing its sum of scores by the number of its items. Mohammadi Zeidi et al. reported a test-retest correlation coefficient of 0.82 for the Persian HPLPII ( $P < 0.001$ ). Moreover, they reported that the Cronbach's alpha values of the HPLPII subscales were 0.79, 0.91, 0.86, 0.81, 0.79, and 0.81, respectively. They also highlighted that the Persian version of the HPLPII had acceptable reliability and thus, it was suitable for psychological studies and clinical purposes (18).

The collected data were transferred into the SPSS software ver. 16.0. Primarily, the normal distribution of the data was assessed through running the Kolmogorov-Smirnov test. The results of this test illustrated that the study variables did not have normal distribution. Consequently, the non-parametric Mann-Whitney U and Kruskal-Wallis tests, the Spearman correlation coefficient and the logistic regression analysis were used for data analysis at a significance level of less than 0.05. In logistic regression model, the interval variable of lifestyle and the dichotomous variable of general health were entered as independent and dependent variables, respectively.

#### 4. Results

Out of the 302 individuals who participated in the study, 240 (79.5%) were female. The mean age of the participants was  $54.81 \pm 9.83$  years. The means of the participants' SBP and DBP were  $152.3 \pm 14.9$  and  $89 \pm 7.8$  mmHg, respectively. The hypertension of 28 participants (9.3%) had been effectively controlled while 152 (50.3%) and 122 subjects (40.4%) had moderate and severe hypertension, respectively. More than half of the participants (56.7%) reported a positive family history of hypertension. Table 1 shows the participants' demographic characteristics.

The Mann-Whitney U test showed that the mean scores of female participants' somatic symptoms ( $P = 0.001$ ) and total general health ( $P = 0.036$ ) were significantly higher than those of their male counterparts. Moreover, the mean scores of somatic symptoms ( $P = 0.028$ ), anxiety and insomnia ( $P = 0.041$ ), depression ( $P = 0.001$ ) and total general health among the participants who lived alone were significantly higher than those of the married ones (Table

2). According to Table 3, the Kruskal-Wallis test revealed that participants with different classes of hypertension differed significantly from each other in terms of the mean scores of somatic symptoms, anxiety and insomnia, social dysfunction and total general health ( $P < 0.05$ ). The results of the Mann-Whitney post hoc test illustrated that the means of these scores among the participants with severe hypertension were significantly higher than those of the subjects with moderate hypertension ( $P < 0.05$ ).

The scores of nutrition and physical activity subscales were respectively higher and lower than the other subscales of HPLPII. The Spearman correlation coefficient analysis revealed that except for the score of health responsibility, the scores of other subscales of HPLPII as well as the total score of HPLPII were negatively correlated with the scores of GHQ-28 and all its subscales (Table 4). Finally, logistic regression analysis showed that stress management, spiritual growth, and total HPLPII scores were the significant predictors of the participants' general health (Table 5).

#### 5. Discussion

The current study aimed to examine general health status and its relationship with HPL among patients with hypertension. The findings revealed that this population had a moderate general health. In other words, 53% of them had some sort of impairments in their general health. Barati et al. conducted a study on elderly people who lived in Hamedan, Iran, and found that 42% of them had potential problems in their general health (4). This rate in a study made by Mousavi et al. on elderly people who lived in Shahroud, Iran, was 62% (5). The findings of these two studies were in line with those of the current study.

The findings also indicated that among the four subscales of GHQ-28, the highest and the lowest scores belonged to the social dysfunction and the anxiety and insomnia subscales, respectively. Barati et al. also reported the same findings (4). The current study also found that the total GHQ-28 score of male participants was significantly lower than those of their female counterparts, implying males better general health status. This is congruent with the findings reported by Barati et al. and Vahdaninia et al. (4, 19). It seems that due to their role in household management as well as their more extensive interpersonal relationships, males have greater self-confidence and receive firmer social support and thus, their spiritual health is better than those of females. Contrary to the current study findings, Salehi et al. reported that among the elderly Iranians who referred to elderly people foundations located in Tehran, the scores of the social functioning and the general

**Table 1.** Demographic Characteristics of the Study Participants

Variable	No.	%
<b>Marital status</b>		
Married	257	85.1
Single	45	14.9
<b>Educational status</b>		
Under high school diploma	217	71.9
Diploma	49	16.2
Associate diploma and higher	36	11.9
<b>Employment status</b>		
Housewife	218	72.2
White-collar worker	33	10.9
Retired	25	8.3
Self-employed	26	8.6
<b>Number of children</b>		
Childless	9	3
1 - 3	88	29.7
4 - 6	160	53.9
7 and more	40	13.4
<b>Self-evaluation of income</b>		
Very high	10	3.3
High	86	28.5
Average	192	63.6
Low and very low	14	4.6
<b>Awareness of having hypertension</b>		
No	50	16.6
Yes	252	83.4
<b>Family history of hypertension</b>		
No	128	42.4
Yes	174	57.6

health subscales of the quality were higher among females than males (20).

The findings of the present study also showed that people with higher educational status had better general health. It seems that higher levels of education clearly highlight the importance of health for people and motivate them to participate in health-promoting activities. Furthermore, higher levels of education enhance chronically-ill patients' perceptions of their illnesses and motivate them to acquire more detailed information about their problems and their management (4,19,20).

Another finding of the present study was better health

status of married participants compared with the participants who lived alone. Sheikholeslami et al. also found that lonely elderly people had lower health status and were more at risk for depression (21). In older ages, elderly people experience stronger feelings of isolation, loneliness and futility due to their reduced physical strength, retirement, and loss of their spouses, friends, peers and others. Joutsenniemi et al. conducted a study in Finland and found that psychological disorders were highly prevalent among people who lived alone or had separated from their spouses (22). Shakeri nia also reported the same findings (3). Poverty and small income are among the major barriers to elderly people's comfort. Household expenditures

**Table 2.** The Scores of GHQ-28 and its Subscales Based on the Participants' Demographic Characteristics<sup>a</sup>

Variables	Somatic Symptoms	Anxiety and Insomnia	Social Dysfunction	Depression	Total GHQ-28
<b>Gender</b>					
Male	6.62 ± 5.38	7.72 ± 5.75	10.06 ± 4.50	2.35 ± 3.57	26.77 ± 17.16
Female	8.71 ± 4.93	8.98 ± 5.57	9.10 ± 0.06	3.44 ± 4.79	30.25 ± 15.89
Mann-Whitney U test	P = 0.001	P = 0.108	P = 0.36	P = 0.07	P = 0.036
<b>Marital status</b>					
Married	8.03 ± 5.09	8.48 ± 5.65	9.13 ± 4.19	2.91 ± 4.36	28.56 ± 15.90
Single	9.75 ± 4.83	10.13 ± 5.30	10.22 ± 4.66	4.97 ± 5.38	35.08 ± 16.86
Mann-Whitney U test	P = 0.028	P = 0.041	P = 0.233	P = 0.001	P = 0.008
<b>Educational status</b>					
Under high school diploma (1)	8.82 ± 4.95	8.86 ± 5.49	9.26 ± 4.20	3.11 ± 4.39	30.07 ± 15.47
Diploma (2)	7.18 ± 5.55	9.49 ± 6.15	9.61 ± 4.90	4.28 ± 5.63	30.57 ± 19.04
Associate diploma and higher (3)	6.52 ± 4.69	6.88 ± 5.47	9.08 ± 3.90	2.39 ± 3.90	24.89 ± 15.94
Kruskal-Wallis test	P = 0.003	P = 0.078	P = 0.757	P = 0.346	P = 0.041
Post hoc test	3, 2 < 1	-	-	-	3 < 1
<b>Self-evaluation of income</b>					
Very high	7.30 ± 5.69	7.60 ± 7.13	11.30 ± 5.83	4.80 ± 6.86	31 ± 24.52
High	6.87 ± 5.23	7.81 ± 5.67	9.41 ± 4.46	2.55 ± 3.82	26.66 ± 16.29
Average	8.70 ± 4.63	8.96 ± 5.44	8.93 ± 3.91	3.06 ± 4.29	29.67 ± 14.49
Low and very low	11.92 ± 7.02	11.58 ± 5.86	12.14 ± 5.56	3.22 ± 4.58	44.28 ± 23.27
Kruskal-Wallis test	P = 0.002	P = 0.045	P = 0.102	P = 0.002	P = 0.006
Post hoc test	2 < 4, 3	2 < 4	-	3, 2 < 4	2 < 3 < 4

Abbreviation: GHQ, general health questionnaire.

<sup>a</sup>Values are expressed as mean ± SD.**Table 3.** Comparing Patients With Different Classes of Hypertension Regarding the Scores of GHQ-28 and its Subscales<sup>a</sup>

Hypertension Severity	Somatic Symptoms	Anxiety and Insomnia	Social Dysfunction	Depression	Total GHQ-28 Score
<b>Controlled</b>	8.78 ± 4.47	10.50 ± 6	9.39 ± 4.42	3.75 ± 5.26	32.42 ± 17.20
<b>Moderate</b>	7.25 ± 4.65	7.57 ± 4.94	8.57 ± 3.61	2.72 ± 4.16	26.11 ± 13.60
<b>Severe</b>	9.46 ± 5.47	9.76 ± 6.05	10.18 ± 4.83	3.72 ± 4.87	33.13 ± 18.04
<b>Kruskal-Wallis test</b>	P = 0.005	P = 0.004	P = 0.010	P = 0.217	P = 0.005
<b>Post hoc test</b>	S > M	C > M, S > M	S > M	-	S > M

Abbreviation: GHQ, general health questionnaire.

<sup>a</sup>Values are expressed as mean ± SD.

alongside the expenses of medications gradually cause low-income people to feel that a large amount of their income is spent on expenses which have no significant positive outcome for their families. Such reality gives them a sense of shameful, causes them anxiety and stress and undermines their mental health. Besides the current study findings, the findings of previous studies also confirmed

this reality (4, 19, 20).

The study findings also indicated that compared with patients who had moderate hypertension, the mean scores of GHQ-28 and its subscales, except for the depression subscale, were significantly higher among patients with severe hypertension. In other words, increases in the level of blood pressure were associated with the aggravation of

**Table 4.** Correlation Between the Subscales of HPLPII and GHQ-28

General Health	X, mean ± SD	Somatic Symptoms	Anxiety and Insomnia	Social Dysfunction	Depression	Total GHQ-28 Score
HPL						
Spiritual growth	2.85 ± 0.71	**0.353	**0.362	**0.316	**0.371	**0.420
Health responsibility	2.44 ± 0.71	-0.92	-0.017	-0.073	-0.059	-0.072
Interpersonal relationships	2.67 ± 0.75	**0.126	**0.147	*0.94	*0.097	-0.143
Stress management	2.17 ± 0.64	**0.284	**0.339	**0.244	**0.276	**0.343
Physical activity	1.52 ± 0.61	**0.181	**0.126	**0.146	**0.128	**0.162
Nutrition	3.06 ± 0.58	**0.183	**0.212	**0.136	**0.20	**0.226
Total HPLPII score	74.14 ± 80.2	**0.280	**0.276	**0.231	**0.261	**0.315
				*P < 0.05	**P < 0.001	

Abbreviations: HPLPII, health-promoting lifestyle profile.

**Table 5.** Relationship Between the Subscales of HPLPII and GHQ-28

HPLPII Subscales	*OR	**CI 95%	P-Value
Spiritual growth	23.0	136.0 - 396.0	< 0.001
Health responsibility	45.1	938.0 - 24.2	0.095
Interpersonal relationships	27.1	833.0 - 94.1	0.26
Stress management	47.0	269.0 - 833.0	0.010
Physical activity	95.0	587.0 - 559.1	0.85
Nutrition	68.0	412.0 - 14.1	0.14
Total HPLPII score	73.0	663.0 - 80.0	< 0.001

Abbreviations: GHQ, general health questionnaire; HPLPII, health-promoting lifestyle profile; \*OR, odd ratio; CI95%, confidence interval

somatic symptoms, anxiety and insomnia and social dysfunction. Agheli and Hajaran also found that the severity of anxiety was significantly correlated with DPB and SBP (7). According to the American heart association, hypertension is directly associated with sleep disorders such as insomnia or hypersomnia as well as long-term psychological stress and tension. In other words, all these problems can finally result in developing hypertension and vice versa (6). Nonetheless, the study findings revealed that the correlation of hypertension with depression was statistically insignificant. This finding can be attributed to the fact that contrary to anxiety and insomnia which are immediate reactions to stressful conditions, depression develops over a long period of time and in response to persistent problems. Therefore, since all of the current study participants had hypertension, insignificant correlation between depression and hypertension was rationale. However, the levels of anxiety, insomnia, somatic symptoms and social dysfunction which are physiologically correlated with the

severity of hypertension differed significantly among patients with different levels of hypertension.

Regarding the participants' lifestyle, it was found that the highest- and the lowest-scored subscales of HPLPII were nutrition and physical activity, respectively. Babak et al. assessed the lifestyle of the elderly people who lived in Isfahan, Iran, and reported exactly the same findings (23). The results of a study by Namjoo et al. in Rasht, Iran, showed that the highest HPLPII subscale score was related to the interpersonal relationships subscale while the lowest score belonged to the physical activity subscale (24). Lifestyle and health-promoting behaviors have close relationship with people's rituals, geographical and cultural contexts, local conditions, and accessible facilities. Therefore, the difference between the aforementioned studies seems rationale since they were conducted in different areas. Nonetheless, Moodi et al. found that people from different contexts had poor physical activity status (25).

The findings of the study also indicated that except for the health responsibility subscale, the scores of HPLPII and all its other subscales were inversely correlated with the scores of GHQ-28 and its subscales. This finding denotes that promotion in spiritual growth, interpersonal relationships, stress management, physical activity, and nutritional aspects of lifestyle alleviates somatic symptoms, anxiety and insomnia, social dysfunction, and depression and thus, improves general health. Besides, the findings showed that compared with other subscales of HPLPII, stress management and spiritual growth had stronger correlation with the general health status of the participants with hypertension.

Some of previous studies also examined the correlation of health-promoting behaviors with general health status. For example, Aghabarari et al., reported the signif-

icant role of regular physical activity in alleviating stress, anxiety and depression among females with breast cancer and received chemotherapy (26). Physical activity effectively reduces emotional stress and its negative effects. Moreover, it enables people to cope with psychological pressures and prevents such pressures from turning into chronic health problems. In agreement with the current study findings, Samimi et al. also found a negative correlation between nutrition and general health (27).

Some studies highlighted the role of stress management training in improving general health of patients with asthma (28) and diabetes mellitus (29). These studies reported that relaxation exercises, stress management techniques and communication skills can enhance general health and psychological well-being. These psychological interventions reduce negative psychological reactions such as anger, hostility and anxiety, cause positive emotional reactions, bring calmness to patients, give them positive attitudes and enhance their general well-being (28).

Williams and Sternath also emphasized the role of religion and spiritual growth in physical and mental health (30). Spirituality and spiritual health may be manifested in different ways such as daily interaction with others, purposefulness of life, work-recreation balance, and relationship with a supreme power which manages the world or with God. Spiritual growth is a step in life during which people understand the meaning of life. In fact, spirituality is something that provides calmness and convenience. Kalthornia-Golkar et al. reported that strong spiritual affiliations and positive attitudes promote health and help patients recover from hypertension, cardiac problems and surgeries (31). Generally, lifestyle can be considered as a significant predictor of general health (27). In other words, unhealthy lifestyle can endanger health.

### 5.1. Conclusion

Based on the findings of the present study, the spiritual growth, interpersonal relationships, stress management, physical activity and nutrition subscales of HPLPII significantly correlate with general health and its subscales. In addition, the correlation of spiritual growth and stress management with general health is stronger than the other subscales of HPLPII. Therefore, general health of patients with hypertension can be improved through developing and implementing stress management programs and techniques (such as distraction, positive self-talks, relaxation, etc.) and spiritual growth stimulation techniques (such as spirituality therapy).

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