

Physicians' knowledge, attitudes, and practice for hypertension management:
A cross-sectional study in Hormozgan province, Iran

Hossein Farshidi⁽¹⁾, Marzieh Nikparvar⁽¹⁾, Iran Rostami-Qeshmi⁽²⁾, Roghaieh Ezzati-Rad⁽³⁾,
Afsoon Piroozan⁽⁴⁾, Elham Boushehri⁽⁵⁾

Original Article

Abstract

BACKGROUND: Hypertension is a common risk factor for developing cardiovascular, brain, and kidney disorders; and today, it affects about one billion people worldwide. Insufficient clinical knowledge of the practitioners and family physicians and not following the guidelines has led to the improper control of hypertension. This study intended to investigate the knowledge, attitude, and practice of general practitioners (GPs) about hypertension in Hormozgan province, Iran.

METHODS: This cross-sectional study used consecutive sampling method. A three-part researcher-made questionnaire was used to collect data on demographic, attitude, knowledge, and practice information from 220 GPs working in Hormozgan province.

RESULTS: The mean and standard deviation (SD) of scores on knowledge, practice, and attitude of GPs about hypertension management were (5.00 ± 0.50) , (10.00 ± 0.02) and (9.00 ± 0.15) , respectively; which present a proper state. Attending training courses and increased work experience have statistically significant effects on the knowledge and attitude of GPs ($P < 0.050$). The only exception was the area of practice, where there was no significant relationship between the practitioners' work experience and their practice ($P = 0.266$).

CONCLUSION: The results of this study can be utilized by decision-makers and general medicine curriculum designers to plan effective training courses for medical graduates to be used in clinical settings for health promotions.

Keywords: Hypertension, Attitude, Knowledge, Practice, General Practitioner

Date of submission: 20 Aug. 2017, *Date of acceptance:* 23 Mar. 2018

Introduction

Hypertension is one of the most common risk factors for cardiovascular, brain, and kidney disorders. Unfortunately, it affects about one billion people worldwide. Hypertension directs attention to itself not only due to its prevalence but also down to the fact that it is asymptomatic, has diverse drugs and treatment procedures, requires long time drug therapy, and demands to be followed up by the medical staff.^{1,2}

According to Joint. National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VII),³ hypertension is defined as systolic blood pressure (BP) level above 140 mmHg and diastolic BP level of 90 mmHg,

under standard conditions. Therefore, the prevalence of hypertension varies slightly between societies; however, in most cases it is reported to be between 20% and 24% of the total population.³ In Iran, its prevalence is reported to be between 22% and 24% among the people over 20 years of age.⁴ Almost the same figure has been reported in Hormozgan province, Iran.⁵

The impact of hypertension treatment on the reduction of mortality rate has been long proved. Yet, the figures provided by different countries indicate insufficient control of BP levels (about 120 mmHg for systolic BP level and 80 mmHg for diastolic BP level). For instance, figures specify a 54% control rate in the United States (U.S.),⁶ and

1- Associate Professor, Hormozgan Cardiovascular Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

2- General Practitioner, Hormozgan Cardiovascular Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

3- Hormozgan Cardiovascular Research Center AND Department of Health Education, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

4- PhD Candidate, Hormozgan Cardiovascular Research Center AND Department of English Language, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

5- Assistant Professor, Department of Medical Education, School of Health, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

Correspondence to: Elham Boushehri, Email: elhamboushehri@yahoo.com

about 50% in European countries;⁷ in other areas such as Africa,⁸ Middle East,⁹ and China¹⁰ figures point out even worse conditions.

One of the main factors for the proper control of hypertension is increasing the knowledge of general practitioners (GPs) and family physicians about their duties. A study in Italy revealed that not many physicians are informed enough to assess the risk factors associated with hypertension.¹¹ The same pattern was observed among physicians in Bahrain, in terms of treatment procedures. Another study conducted in Qazvin, Iran, presented that only 61% of the physicians ask for diagnostic tests during the first visit, and others cannot properly examine the patients.¹²

Considering the role of hypertension in the development of other chronic and deadly diseases, and the impact of knowledge, attitude, and practice of GPs, as the first step for health providing care, this study investigated the knowledge, attitude, and practice of GPs of Hormozgan province about hypertension. Obviously, the results of this study can be utilized by decision-makers and general medicine curriculum designers for the most effective training programs in the form of Continuous Medical Education (CME) for medical graduates to be used prospectively in clinical settings and for health promotions.

Materials and Methods

This cross-sectional, descriptive-analytical study included 850 GPs working in Hormozgan province, with the mean and standard deviation (SD) of 5.12 ± 0.3 years of work experience. The sample size was estimated as 300 individuals using Morgan table. Based on the total number of physicians in each city, through proportional sampling method, the sample of GPs was selected randomly from each city.

A three-part researcher-made questionnaire was used to collect data. Reliability and validity of questionnaire was checked and confirmed. First, a preliminary pool of 66 items was developed by a review of existing clinical knowledge related to hypertension management by GPs. These items encompassed three domains: knowledge, attitude, and practice (clinical scenarios). Second, the comprehensiveness, relevance, and clarity of these items were assessed by an expert panel composed of 2 cardiologists, 2 health educationists, and 1 epidemiologist. Based on their responses and comments, a modified pool of 40 items was developed by writing additional items, excluding

irrelevant items, and combining items. Thus, the questionnaire was made with three domains: attitude (10 questions), knowledge (15 questions), and practice (15 questions).

In order to investigate the reliability of the questionnaire, 15 senior medical interns and 10 GPs were asked to fill out the questionnaire twice with the interval of 10 days. The final reliability was confirmed through estimating Pearson correlation coefficient for each domain (knowledge domain's $r = 0.74$, attitude domain's $r = 0.80$, and practice domain's $r = 0.89$). The process led to the displacement of 4 questions in the area of knowledge and awareness, as well as revising two questions in the area of attitude and practice.

Each participant had a chance to present his/her attitude choosing one of the choices of "Yes", "No Idea", and "No" which were graded from 0-2. The minimal and maximal grades on the attitude section were 0 and 20, respectively. The items investigating knowledge and practice were designed as multiple choice items. The obtained grades for the items on knowledge and practice ranged from 0-15.

The questionnaire was distributed among the participants through email, office automation system, and Telegram program. Of the 300 participants, 220 individuals (32% men and 68% women) completed the questionnaire, and 80 persons refused to participate in the study. The reason for the drop out of some of the participants was that 21 individuals moved to other cities before the end of the project, 27 ones did not participate due to their lack of time, and 32 others decided not to take part in the research project for no known reason.

Continuous and categorical data were reported as mean \pm SD and absolute number (percent), respectively. Independent t-test was applied in order to determine the statistically meaningful significance between the means of obtained knowledge, attitude, and practice questioning from different groups. In an attempt to determine the most significant influencing factor on the three areas under research, multiple regression test was applied. The statistically meaningful significance was considered less than 0.05 for all the tests. The collected data were analyzed utilizing SPSS software (version 20, IBM Corporation, Armonk, NY, USA).

Results

The mean and SD of GPs' scores in the areas of attitude, knowledge, and practice on hypertension were 5.00 ± 0.50 , 10.00 ± 0.02 and 9.00 ± 0.15 , respectively.

Table 1. The mean and standard deviation of general practitioners' scores in the areas of attitude, knowledge, and practice, in terms of gender

| Areas | Gender | n (%) | Mean ± SD | P* |
|-----------|--------|----------|--------------|-------|
| Attitude | Women | 70 (32) | 4.50 ± 0.50 | 0.098 |
| | Men | 150 (68) | 4.82 ± 0.50 | |
| Knowledge | Women | 70 (32) | 10.20 ± 0.02 | 0.083 |
| | Men | 150 (68) | 11.00 ± 0.02 | |
| Practice | Women | 70 (32) | 8.50 ± 0.25 | 0.332 |
| | Men | 150 (68) | 8.20 ± 0.10 | |

* Used independent t-test; SD: Standard deviation

The mean and SD of GPs' scores in the areas of attitude, knowledge and practice on hypertension, based on their gender, history of attending training courses, and work experience are presented in tables 1, 2, and 3, respectively. Accordingly, no relation between GPs' scores in the areas of attitude, knowledge, and practice on hypertension and gender was found (Table 1). History of attending training courses during the last two years had positive meaningful effects on the knowledge and attitude of GPs (P = 0.003 and 0.005, respectively) (Table 2). Table 3 shows that work experience has also positive meaningful effects on the knowledge and attitude of GPs (P = 0.003 and 0.001, respectively). However, the history of attending training courses and work experience have no effect on the practitioners' practice (P = 0.266 and 0.332, respectively).

Multiple regression analysis was also used to determine the most important factor affecting the attitude, knowledge, and practice of GPs. In this sense, the relationships between obtained scores in each of the three areas were investigated separately and the relationships between the dependent variable and other factors such as work experience, history of the last training course, and gender were also investigated. The results are presented in table 4.

Table 4 shows the relationship between the attitude, knowledge, and practice of GPs with their gender, work experience, and history of attending training courses. Gender and work experience have

not significant relationship with attitude, knowledge, and practice (P > 0.050). However, having passed courses in increasing attitude in hypertension has significant relationship with increasing attitude ($\beta = 0.420$, P = 0.017). Similarly, having passed course in increasing knowledge and practice for controlling hypertension has significant relationship with posttest knowledge and practice (P = 0.018, P = 0.021, respectively).

Discussion

Nowadays, due to significant medical advances, especially in the areas of medication and surgical interventions, a majority of diseases have become treatable or their incidence rates have decreased. Hypertension, unfortunately, has been an exception and is not appropriately controlled worldwide. In European, American, and some Asian countries, hypertension control rates are to some extent acceptable;^{13,14} however, undesirable figures have been reported in other countries.¹⁵⁻¹⁷ In some cities of Iran, Isfahan for instance, there has been continuous community plans with convincing results aiming at controlling hypertension through the enhancement of individuals' awareness and knowledge.¹⁸

Factors such as long-term medication use, medication complications, high treatment costs, unhealthy lifestyles, occupational and familial stress, alcohol use, and smoking have made hypertension difficult to control. During the process of

Table 2. The mean and standard deviation of general practitioners' scores in the areas of attitude, knowledge, and practice, in terms of history of attending training courses in the last two years

| Areas | History of attending related continuous medical education courses in the last two years | n (%) | Mean ± SD | P* |
|-----------|---|----------|--------------|-------|
| Attitude | Positive | 125 (56) | 5.50 ± 0.05 | 0.005 |
| | Negative | 95 (43) | 4.12 ± 0.50 | |
| Knowledge | Positive | 125 (56) | 11.20 ± 0.24 | 0.003 |
| | Negative | 95 (43) | 9.00 ± 0.32 | |
| Practice | Positive | 125 (56) | 8.50 ± 0.25 | 0.266 |
| | Negative | 95 (43) | 8.20 ± 0.10 | |

* Used independent t-test; SD: Standard deviation

Table 3. The mean and standard deviation of general practitioners' scores in the areas of attitude, knowledge, and practice in terms of work experience

| Areas | Work experience (year) | n (%) | Mean ± SD | P* |
|-----------|------------------------|----------|--------------|-------|
| Attitude | ≤ 3 | 106 (48) | 4.20 ± 0.05 | 0.001 |
| | > 3 | 114 (52) | 5.82 ± 1.50 | |
| Knowledge | ≤ 3 | 106 (48) | 10.10 ± 0.13 | 0.003 |
| | > 3 | 114 (52) | 11.00 ± 1.12 | |
| Practice | ≤ 3 | 106 (48) | 9.50 ± 1.55 | 0.563 |
| | > 3 | 114 (52) | 8.12 ± 1.11 | |

* Used independent t-test; SD: Standard deviation

hypertension diagnosis and treatment, medical personnel who are mostly GPs constitute the main element.² Therefore, their medical awareness, appropriate communication skills with the patients, and sufficient knowledge of the disease are essential for hypertension control.

The present study investigated the mean score of GPs' knowledge about various aspects of prevention, diagnosis, and treatment of hypertension which showed undesirable results. The reason could be explained through poor levels of work experience and not having attended any training courses. The same finding was observed in some other studies^{16,17} in different parts of the world as well.

In addition, the mean score of GPs' practice measured based on the evaluation of 15 written clinical scenarios related to hypertension which examined various diagnostic and therapeutic aspects of practitioners' work, was 0.15 and had no significant relationship with their work experience.⁹ This finding suggests that the need for updating knowledge has not been properly institutionalized among GPs. Meanwhile, some physicians in their written comments expressed lack of proper communication between provincial health centers, health departments, and healthcare networks with physicians who are directly in contact with patients.

For example, more than half of the physicians stated that they had never received any hypertension treatment guideline approved by the Ministry of Health and Medical Education, or declared their unawareness of the existence of such guidelines.

In a somewhat similar study, the same results as those of the present study were achieved. A cross-sectional study was conducted on 1000 GPs in urban areas of Pakistan. Thirty six percent of the GPs used an improper classification to diagnose hypertension among patients less than 60 years of age and those over 60 years old. Out of the whole participants, 34.7% performed good practices for hypertension treatment for the elderly patients.¹⁷

Moreover, in another study conducted in Shanghai, the knowledge and practice of 160 GPs on hypertension was studied. The findings indicated poor levels of knowledge and practice of the urban physicians on hypertension; thus, the study revealed an urgent need for conducting continuous education courses on high BP levels.¹⁶

A retrospective study, the results of which were consistent with the present study, was conducted in 15 health centers in Bahrain. 115 GPs (including 77 family physicians and 38 general physicians) participated in the study who accounted for 74% of all GPs in Bahrain. In general, 1266 diabetic patients with high BP levels were examined.

Table 4. The relationship between the attitude, knowledge, and practice of general practitioners with their gender, work experience, and history of attending training courses

| Dependent Variables | Independent Variables | β | SE (β) | P* |
|---------------------|--|-------|--------|-------|
| Attitude | Gender (reference category: women) | 0.040 | 0.020 | 0.123 |
| | History of attending training courses (reference category: no attending) | 0.420 | 0.380 | 0.017 |
| | Work experience (year) | 0.040 | 0.010 | 0.189 |
| Knowledge | Gender (reference category: women) | 0.030 | 0.010 | 0.117 |
| | History of attending training courses (reference category: no attending) | 0.490 | 0.360 | 0.018 |
| | Work experience (year) | 0.030 | 0.010 | 0.082 |
| Practice | Gender (reference category: women) | 0.090 | 0.010 | 0.160 |
| | History of attending training courses (reference category: no attending) | 0.390 | 0.300 | 0.021 |
| | Work experience (year) | 0.040 | 0.020 | 0.205 |

SE: Standard error

The most common drugs included angiotensin converting enzyme (ACE) inhibitors (37.9%) and beta-blockers (38.3%). Calcium channel blockers were prescribed by one-third of physicians; and generally, a significant number of physicians prescribed drugs without reviewing available standard guidelines.¹⁹ This is worth mentioning that in the study from Bahrain, a checklist was handed out to the physicians to assess their pharmaceutical choice from a list of related drugs and their contraindications.

Another consistent study was performed in Egypt to evaluate the knowledge and practice of primary health care (PHC) physicians for the identification and treatment of hypertension and other risk factors of cardiovascular diseases (CVDs). The study included a four-part questionnaire, an interview for each physician, and a checklist of their daily activities. Based on the results, dealing with hypertension was a primary problem for two-thirds (62.9%) of the physicians and only 19% had the relevant guideline. The level of knowledge of physicians in different areas was evaluated as follows: regarding the definition of BP (61.3%: good), measurement method (43.5%: poor), referral cases (43.5%: poor), consultation with patients (61.3%: good) and effectiveness of treatment methods (59.8%: good).²⁰

In another study conducted in 47 health centers in Spain with an intention of determining the extent of disease control, BP levels of 4049 patients were measured. Forty two percent of the patients had a desirable BP (140/90). Thirteen percent of the diabetic patients and seventeen percent of renal patients had a desirable BP (130/80).²¹

Another study was conducted in the U.S. to evaluate the knowledge, attitude, and practice of 10000 cardiologists, internal medicine specialists, and GPs in the area of patients with hypertension. Emails were sent to the physicians and 1023 of them sent back their answers. Only 37.3% of them answered to all the four questions of knowledge correctly, where cardiologists acquired the highest scores.²²

A cross-sectional study was conducted in Fars province, Iran, to evaluate the knowledge, attitude, and practice of 300 GPs in the area of treatment and complications of high BP levels, which revealed that 99% of the physicians believed in the importance of hypertension as a public health condition, 12% requested proper tests, and 20% properly controlled patients. Only 45% of the GPs had measured their own BP the same year. Based on the findings, the physicians' improper attitude

toward the significance of the disorder was reported;²³ therefore, the same results as those of the present study were achieved.

A cross-sectional study was conducted in Saudi Arabia to evaluate the compliance of treatment methods used by GPs with hypertension treatment guidelines. In this study, the need for conducting continuous education courses, on the basis of available guidelines, for GPs was proposed.²⁴

In an intervention study in Italy, it was shown that increasing the knowledge of GPs about available guidelines was associated with an increase in controlling BP levels.²⁵

In two intervention studies conducted in Pakistan and Spain, results showed that an increase in the knowledge of GPs could be effective in controlling BP levels.^{26,27} Over a six-year period of community interventions through 10 research projects which were carried out in Isfahan, it was detected that the extent of awareness and disease control had increased compared with other parts of the country that did not gain any interventions.¹⁸

One of the main findings of this study is the physicians' improper attitude toward treatment and disease control which reduces their tendency for self-promotions through attending training courses.²⁷⁻³⁰ The physicians' attitude and willingness for participation in training courses have also been evaluated in Qazvin, Iran.¹²

In the present study, no significant difference was observed in the levels of attitude of GPs with higher work experience, compared to those with lower work experience. On the other hand, an improvement was observed in the attitude of those with a history of attending retraining courses. This issue highlights the important role of retraining courses in the improvement of attitude of physicians for the diagnosis, treatment, and prevention of hypertension, and can be considered as the first step toward treating the disease.

The limitation of this study include: no question was designed to determine the alternative guideline used by the physicians once they complain of the inaccessibility of the treatment guideline provided by the Ministry of Health. Due to the prolonged process of data collection, the researchers did not manage to substitute more participants for the ones who had dropped out. This might have influenced processing the data and in turn the findings.

Conclusion

The results of this study highlight the improvements in all areas of knowledge, attitude,

and practice of physicians, after attending retraining educational courses. Providing guidelines and holding regional workshops and seminars on the utilization of the guidelines will improve physician's practice. In Iran's vast healthcare network, GPs are among the first levels of communication; therefore, it is suggested to organize retraining courses to upgrade their levels of knowledge, skills, and attitudes, and to consider BP control as a priority in the Ministry of Health.

Acknowledgments

None.

Conflict of Interests

Authors have no conflict of interests.

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How to cite this article: Farshidi H, Nikparvar M, Rostami-Qeshmi I, Ezzati-Rad R, Piroozan A Boushehri E. **Physicians' knowledge, attitudes, and practice for hypertension management: A cross-sectional study in Hormozgan province, Iran.** *ARYA Atheroscler* 2018; 14(3): 132-8.