

DOI: 10.5455/msm.2020.32.258-262

Received: NOV 05 2020; Accepted: DEC 18, 2020

© 2020 Ibrahim Gosadi

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ORIGINAL PAPER

Mater Sociomed. 2020 Dec; 32(4): 258-262

Evaluation of Knowledge and Adherence of Primary Healthcare Physicians Regarding Hypertension Prevention Guidelines in the Jazan Region, Saudi Arabia

Department of Family and Community Medicine, Faculty of Medicine, Jazan University, Jazan, Saudi Arabia

Corresponding author:

Ibrahim M Gosadi.
Faculty of Medicine,
Jazan University.
Mailing Address: P.O.
Box: 2349. Postal Code:
82621, Jazan. Saudi
Arabia. Contact number:
00966562137711. E-mail:
gossady@hotmail.com.
ORCID ID: <http://www.orcid.org/0000-0002-1275-3953>.

Ibrahim Gosadi

ABSTRACT

Introduction: Adherence to hypertension prevention guidelines can aid in better control of blood pressure. **Aim:** This study aims to evaluate knowledge and adherence of Primary Healthcare Centers (PHCs) physicians in the Jazan region, Saudi Arabia about guidelines pertaining to prevention of hypertension. **Methods:** This cross-sectional study targeted PHCs physicians in the Jazan region. A questionnaire was developed based on preventive components of the Saudi Hypertension Management Guidelines (SHMGs) and was completed via interviews to measure demographics, knowledge of PHCs' physicians about prevention of hypertension, and their adherence to guidelines concerning screening for hypertension and provision of lifestyle counselling. **Results:** A total of 234 PHC physicians participated in this investigation. The median age of the physicians was 38 and percentages of male and female physicians were similar. The findings suggest a low level of knowledge and practice adherence concerning prevention of hypertension among PHCs physicians in Jazan region where only 24 physicians (10%) knew the recommended amount of daily sodium intake to reduce blood pressure among pre-hypertensive patients. Similarly, only 30 physicians (13%) reported adherence to the SHMGs concerning annual screening for the disease. None of the associations concerning influence of physicians demographics on level of knowledge or practice adherence were statistically significant (P value >0.05). **Conclusion:** The majority of the recruited physicians were misinformed about several components related to screening for

hypertension and dietary needs for lowering blood pressure levels. The low knowledge may explain the low adherence to recommended SHMGs for prevention of the disease.

Keywords: Hypertension, Primary Healthcare, Prevention.

1. INTRODUCTION

Raised blood pressure is a chronic non-communicable disease which increases the risk of cardiovascular disease development. According to the Saudi Ministry of Health, 15% of the adult population are affected by the disease. Furthermore, 40% of the Saudis were reported to have pre-hypertension (1). The high prevalence of Saudis with hypertension suggests a prospective increase in prevalence of hypertension among Saudis in the upcoming years.

Hypertension has several genetic and environmental risk factors that can contribute to the overall development of the diseases. High levels of obesity, sedentary lifestyle, and high salt intake related to fast food consumption have been suggested to explain the high prevalence of hypertension and pre-hypertension among Saudis (2). Early detection of individuals affected with hypertension via screening and adherence to a healthy lifestyle can aid in better control of blood pressure.

The Saudi Hypertension Management Guidelines (SHMGs) provide guidance on prevention, screening, and management of hypertension (including pharmacological and non-pharma-

cological managements). The guidelines recommend periodic blood pressure monitoring and routine assessment of lifestyle of patients and individuals with pre-hypertension. Lifestyle modifications targeting reduction of blood pressure levels are related to eating habits, body weight reduction, regular physical activity and smoking cessation (3).

There are multiple factors that may influence primary or secondary hypertension prevention efforts. Early detection of hypertensive or pre-hypertensive patients can be influenced by lack of nationwide screening programmes for raised blood pressure (4). Non-pharmacological management options to reduce blood pressure among patients and those who are pre-hypertensive can be subjected to low compliance of patients (5). Similarly, low adherence to lifestyle modification among hypertensive patients has been reported to lead to suboptimal control of blood pressure, despite the pharmacological adherence (6). Low compliance to lifestyle modification among subjects suffering from raised blood pressure signifies the importance of providing lifestyle counselling to enhance overall control of blood pressure (3).

In Saudi Arabia, patients diagnosed with hypertension can be treated and followed up in Primary Healthcare Centres (PHCs), family medicine clinics, and specialized governmental and private clinics in secondary and tertiary healthcare facilities. Studies measuring adherence of physicians to hypertension management guidelines in Saudi Arabia are currently limited (7, 8). Nonetheless, studies assessing contribution of PHCs in prevention of hypertension in Saudi Arabia are currently lacking.

2. AIM

This study aims to measure knowledge of PHCs physicians in Jazan region about guidelines pertaining to prevention of hypertension. Furthermore, adherence of the physicians in Jazan region concerning screening for hypertension and provision of lifestyle modifications for prevention and control of raised blood pressure was similarly assessed.

3. METHODS

This cross-sectional study was conducted as a part of a project to assess utilization of preventive services for prevention and control of non-communicable diseases including hypertension in the Jazan region, Saudi Arabia. This investigation targeted PHCs physicians working at 170 PHCs in Jazan region including rural and urban districts. Recruitment took place between October 2019 and January 2020 after securing ethical approval of the Jazan University Research Ethics Board (approval number REC40/3-090).

Data was collected via a questionnaire developed to measure demographics of the physicians, knowledge of PHCs' physicians about prevention of hypertension, and their adherence to the clinical guidelines concerning screening for hypertension and provision of lifestyle counselling for control of raised blood pressure. Knowledge and adherence components were adopted from the SHMGs (3) and were reviewed by a panel including consultants of family medicine, preventive medicine and epidemiology. The questionnaire was piloted on 10 physicians to test the clarity of the questions and time needed to complete the questionnaire.

Questionnaire items measuring knowledge and adherence were open-ended questions. Questionnaires were completed during interviews conducted via trained medical students where the students recorded the responses of the physicians for each item. Physicians were identified upon visiting targeted PHCs. Study's information was provided to the approached physicians and recruitment was initiated after securing the informed consent. Data generated from open-ended questions were screened via a single investigator to identify similar responses and enable coding of answers.

Data analysis

Data was analysed via the statistical package for the social sciences (SPSS) (version 25). Frequency and proportion were used to summarize binary and categorical responses. Similarly, Means and Standard Deviations (SD) were used to report normally distributed data and medians, and minimum and maximum values were used to report non-normally distributed data.

After coding of open-ended responses, levels of knowledge and adherence were computed via calculating a number of correct answers or number of adequate practices. To test the possible influence of physicians demographics on level of knowledge and practice adequacy, levels of knowledge and practice adherence were dichotomized, utilizing means of knowledge and practice adherence scores and calculating odds ratios for higher level of knowledge or higher level of practice adherence. A p value of 0.05 was considered a statistically significant value for the applied statistical tests.

4. RESULTS

A total of 234 PHC physicians participated in this investigation. The demographics of the included sample are described in Table 1. The median age of the physicians was 38 and percentages of male and female physicians were similar. The majority of the physicians were Sudanese and general practitioners as well as holders of an MBBS degree. The median number of years of practice was 10 and the average number of patients seen by the physicians was 40 patients on daily basis.

Table 2 describes the knowledge of the recruited physicians about prevention of hypertension. The majority of the physicians were able to report that pharmacotherapy is not recommended to lower risk of development of hypertension among adolescents with pre-hypertension. However, only 24 physicians (10%) knew the recommended amount of daily sodium intake to reduce blood pressure among pre-hypertensive patients. Similarly, only 53 physicians (23%) were able to report the recommended age to initiate annual screening for hypertension. The mean level of knowledge was 2.4 out of five, suggesting a low level of knowledge, where 56% of the physicians were only able to answer one or two questions correctly.

The practice of recruited physicians concerning prevention of hypertension is detailed in Table 3. The majority of the physicians (74%) reported reading guidelines as a source of information about prevention of hypertension. However, only four physicians (2%) reported using SHMGs as a source of guidelines concerning prevention of HTN.

Variables:	
Age : median [minimum-maximum]*	38 years [25–65]
Gender: n [%]	
Male	113 [48.3%]
Females	121 [51.7%]
Nationality: n [%]	
Sudanese	129 [55.1%]
Saudis	28 [12%]
Egyptian	26 [11.1%]
Pakistani	20 [8.5%]
Indian	9 [3.8%]
Syrian	8 [3.4%]
Cuban	8 [3.4%]
Nigerian	5 [2.1]
Palestinian	1 [0.4%]
Specialty: n [%]	
General Practitioners	168 [71.8%]
Family Medicine	66 [28.2%]
Highest Academic degree: n [%]	
MBBS	159 [67.9%]
High Diploma	34 [14.5%]
Masters	27 [11.5%]
Board	10 [4.3%]
Fellowship	4 [1.7%]
Number of years of practice: median [minimum-maximum]	10 years [Less than a year–43]
Average number of patients seen on daily basis*: mean [SD]	40 patients [17.9]

Table 1. Demographic data of 234 primary healthcare physicians in Jazan, Saudi Arabia: *1 missing data for age and 2 missing data for average number of patients seen on daily basis. Note: Reprinted from: Gosadi I, Daghri K, Majrashi A. et al. Lifestyle choices and prevalence of chronic noncommunicable diseases among primary health care physicians in the Jazan Region, Saudi Arabia. *Journal of Family Medicine and Primary Care*. 2020; 9(11): 5699-5704. Copyrights of Journal of Family Medicine and Primary Care.

The majority of the physicians reported screening for hypertension among patients visiting their clinics (94%). However, only 30 physicians (13%) reported adherence to the SHMGs concerning annual screening for adults aged 40 and above, those with pre-hypertension, and overweight or obese individuals. Similarly, the majority of the physicians reported provision of lifestyle interventions for their patients to reduce blood pressure. Nonetheless, only 19 physicians (8%) reported adherence to the guidelines, especially regarding provision of Dietary Approach to Stop Hypertension (DASH).

Table 4 described assessment of the association between

Knowledge items*:	Frequency of correct answers [percentages]
Recommended age to initiate annual screening for hypertension	53 [23%]
Recommended screening interval for Saudis aged 18-39 with normal blood pressure	107 [46%]
Screening for hypertension among children and adolescents	56 [24%]
Recommended daily intake of sodium to reduce blood pressure among pre-hypertensive individuals	24 [10%]
Use of pharmacotherapy among adolescents with pre-hypertension	215 [92%]
Diagnosis of hypertension among children	108 [64%]
Mean level of knowledge : 2.4 [SD:0.9] Minimum score: 0. Highest score: 5	

Table 2. Knowledge of 234 primary healthcare physicians in Jazan, Saudi Arabia about prevention of hypertension

Practice Statement	Frequency [Percentage]
Physicians who reported reading guidelines as a source of information about prevention of HTN	174 [74%]
Physicians who reported use of SHMG as a source for guidelines concerning prevention of HTN	4 [2%]
Physicians who reported screening for hypertension among patients visiting their clinics	221 [94%]
Physicians adherent to the SHMGs concerning criteria for screening for HTN	30 [13%]
Physicians who reported provision of lifestyle interventions for the patients	225 [96%]
Physicians adherent to the SHMGs concerning lifestyle interventions for patients with HTN	19 [8%]

Table 3. Practice of 234 primary healthcare physicians in Jazan region concerning prevention of hypertension

measured demographics and level of knowledge and practice adherence. None of the calculated odds ratios of higher knowledge or odds of practice adherence were statistically significant. This may be due to the low level of knowledge about prevention of hypertension or low level of adherence to the guidelines concerning screening for the disease or provision of lifestyle counselling.

5. DISCUSSION

This study aimed to measure knowledge and adherence of PHCs physicians in the Jazan region concerning guidelines pertaining to prevention and control of hypertension. The majority of the recruited physicians were misinformed about several components related to screening for hypertension and dietary needs for lowering blood pressure levels. This was reflected in their reported adherence to recommended guidelines where the majority of the physicians were not adherent to recommended SHMGs for prevention of the disease.

There is a limited evidence about knowledge and adherence of PHCs physicians in Saudi Arabia regarding hypertension prevention guidelines. However, the findings of this investigation can be compared to studies measuring overall

Variables	Odds of higher Knowledge: n [%]	P value	Odds of practice adherence: n [%]	P value
Age:				
Less than 38 years	1.2	0.41	0.8	0.62
38 years or older*				
Gender: n [%]				
Male*	0.74	0.26	1.3	0.36
Female				
Nationality according to language: n [%]				
Native Arabic speakers	0.8	0.52	1.5	0.37
Non-native Arabic speakers*				
Specialty: n [%]				
General Practitioners*	1.2	0.46	0.9	0.79
Family Medicine				
Highest Academic degree				
MBBS*	0.8	0.50	1.07	0.83
Postgraduate education				
Number of years of practice				
Less than 10 years	1.2	0.33	1.17	0.62
10 years or more*				
Average number of patients seen on daily basis				
Less than 40 patients	1.2	0.33	0.84	0.61
40 patients or more*				

Table 4. Factors associated with level of knowledge and adherence to guidelines of 234 primary healthcare physicians in Jazan region concerning prevention of hypertension: * reference group for each test

level of knowledge and adherence of physicians to hypertension management guidelines. In a recent investigation by Shnaimer and Gosadi conducted in the Jazan region, 316 PHCs physicians answered a self-administered questionnaire to measure overall knowledge and adherence to management of hypertension. In their investigation, PHCs physicians scored higher levels of knowledge and higher levels of adherence to items related to pharmacological management of the disease in comparison to items related to lifestyle modification of the patients. Their findings support the notion raised by the current study indicating limited engagement of PHCs physicians in Jazan region with prevention and control of hypertension.

There are similar studies conducted in other regions in Saudi Arabia to measure adherence of PHCs physicians concerning hypertension management guidelines. A study was conducted by Al-Gelban et al. in Aseer region, in the south of Saudi Arabia, involving 322 PHCs physicians to measure their adherence to Joint National Committee's Seventh Report (JNC-7) on hypertension guidelines. Their study measured utilization of pharmacological and non-pharmacological agents to improve blood pressure control. Al-Gelban et al. reported that the majority of the physicians in their samples induced lifestyle modification of their patients via encouraging weight reduction, lowering salt intake and encouraging engagement in higher levels of physical activity. However, it was not clear whether the practice of physicians recruited in their sample concern-

ing lifestyle modification was adherent to the hypertension management guidelines.

A similar study conducted by Alfaleh et al. in Al-Jouf region, in the north of Saudi Arabia measured 59 PHCs physicians' adherence to the Joint National Committee's Seventh Report (JNC-7) on hypertension guidelines. The study by Alfaleh did not measure adherence to prevention of the disease (9). However, they asked the physicians for their opinion concerning establishing screening programmes for hypertension and offering lifestyle modifications to the patients. The majority of the physicians had favourable responses, indicating their appreciation for the importance of early detection and reducing blood pressure via non-pharmacological agents. This notion can be compared to our findings where the majority of the physicians reported screening and offering lifestyle modification interventions to their patients. However, a minority of the physicians in our sample were actually adherent to the recommended guidelines.

There is an accumulating body of evidence suggesting increased prevalence of risk factors related to raised

blood pressure in Saudi Arabia (10-12). The current evidence suggests a need to ensure early detection of hypertension and raising awareness of Saudis to the risk factors of the disease. However, the contribution of PHCs physicians in control of blood pressure has been questioned and suggested to be less optimal in PHCs in Riyadh region in Saudi Arabia (13). Inadequate control of blood pressure in primary healthcare settings has been similarly reported in other international settings, including American or European countries (14, 15).

This study has areas of strength and limitations. Interviewing the physicians and using an open-ended approach may have enabled better measurement of knowledge. However, reported adherence to practice may not indicate actual adherence. Nonetheless, the study was able to identify a major lack of adherence concerning screening for hypertension and lifestyle modification of the patients.

6. CONCLUSION

Since PHCs are major contributors of healthcare services in the country, PHCs physicians are mandated to have higher engagement with early detection of the disease and proper control of raised blood pressure. This can be properly achieved via utilizing an evidence-based approach including promotion of lifestyle modification. However, this can only be maintained if the PHCs physicians are properly oriented about clinical guidelines, and through facilitating adherence toward the recommended practice.

- **Ethical approval:** Ethical approval was granted by Jazan University Research Ethics Board (approval number REC40/3-090).
- **Informed consent:** Participation of the physicians was voluntary and they had the right to refuse or withdraw. Physicians recruitment was initiated after securing the informed consent.
- **Authors contributions:** IG was responsible for the study concept, design, conduct, data analysis and drafting of the manuscript.
- **Conflict of Interest:** None declared.
- **Financial support and sponsorship:** None

REFERENCES

1. Saudi MoH. Saudi Ministry of Health: Health Information Survey 2013 [Available from: <https://www.moh.gov.sa/Ministry/Statistics/Documents/Final%20book.pdf>].
2. Gosadi IM. Assessment of the environmental and genetic factors influencing prevalence of metabolic syndrome in Saudi Arabia. *Saudi Medical Journal*. 2016; 37(1): 12-20.
3. SHMS. Saudi Hypertension Management Guidelines: SHMS; 2018.
4. Gosadi IM. National screening programs in Saudi Arabia: Overview, outcomes, and effectiveness. *Journal of infection and public health*. 2019; 12(5): 608-614.
5. Alefan Q, Huwari D, Alshogran OY, Jarrah MI. Factors affecting hypertensive patients' compliance with healthy lifestyle. Patient preference and adherence. 2019; 13: 577-585.
6. Kimani S, Mirie W, Chege M, Okube OT, Muniu S. Association of lifestyle modification and pharmacological adherence on blood pressure control among patients with hypertension at Kenyatta National Hospital, Kenya: a cross-sectional study. *BMJ open*. 2019; 9(1): e023995.
7. Shnaimer JA, Gosadi IM. Primary health care physicians' knowledge and adherence regarding hypertension management guidelines in southwest of Saudi Arabia. *Medicine*. 2020; 99(17): e19873.
8. Al-Gelban KS, Khan MY, Al-Khaldi YM, Mahfouz AA, Abdelmoneim I, Daffalla A, et al. Adherence of primary health care physicians to hypertension management guidelines in the Aseer region of Saudi Arabia. *Saudi journal of kidney diseases and transplantation: an official publication of the Saudi Center for Organ Transplantation, Saudi Arabia*. 2011; 22(5): 941-948.
9. Alfaleh AS, Alsaidan AMA, Alsaidan AA, Albadi AMM, Wani FA, Banday AH. Adherence of Primary Health Care Physicians to Hypertension Management Guidelines in Aljouf Region of Saudi Arabia. *International Journal of Scientific Study*. 2015; 3(9): 7.
10. Al-Mohaissen MA, Al-Obaid QY, AlGhamdi WA, Al-Alyani HS, Dahman SM, Al-Wahhabi NA, et al. Prevalence and Determinants of Hypertension and High Normal Blood Pressure Among Young Adult Saudi Females: Insights Into Preventive Strategies. *Family and Community Health*. 2017; 40(3): 221-230.
11. Mohamed NA. Prevalence of Risk Factors for Diabetes Mellitus and Hypertension Among Adult in Tabuk–Kingdom of Saudi Arabia. *Open access Macedonian journal of medical sciences*. 2019; 7(5): 831-837.
12. Saeed AA, Al-Hamdan NA, Bahnassy AA, Abdalla AM, Abbas MA, Abuzaid LZ. Prevalence, Awareness, Treatment, and Control of Hypertension among Saudi Adult Population: A National Survey. *International journal of hypertension*. 2011; 2011: 174135.
13. Al-Tuwijri AA, Al-Rukban MO. Hypertension control and comorbidities in primary health care centers in Riyadh. *Annals of Saudi medicine*. 2006; 26(4): 266-271.
14. Wolf-Maier K, Cooper RS, Kramer H, Banegas JR, Giampaoli S, Joffres MR, et al. Hypertension treatment and control in five European countries, Canada, and the United States. *Hypertension (Dallas, Tex: 1979)*. 2004; 43(1): 10-17.
15. Banegas JR. Control of high blood pressure in primary health care. *American journal of hypertension*. 2006; 19(2): 146.