

Prevalence and Determinants of Poor Compliance to Antihypertensive Drugs in Primary Health Care Settings: An Online Survey from Saudi Arabia

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ABSTRACT

Background: Poorly controlled hypertension may lead to several serious health problems, including stroke, aneurysms, coronary artery disease, kidney disease and peripheral artery disease.

Objectives: This study aimed to explore the magnitude of the problem of non-compliance with antihypertensive drugs among patients in Saudi Arabia and identifying the associated factors.

Subjects and Methods: A cross-sectional study was carried out on January, 2017 through social media sites including a sample of adult patients from different regions of the kingdom (Saudi and non-Saudi). Data were collected online through a questionnaire. The questionnaire includes socio-demographic characteristics of hypertensive patients, history of smoking, and hypertension-related history. Adherence of patients to anti-hypertensive drugs was assessed utilizing an 8-item modified Morisky Medication Adherence Scale (8-MMMAS).

Results: The study included 267 hypertensive patients. About half of them (48.5%) aged over 50 years. More than half were females (58%), high educated (62.3%) and employed (46.7%). Approaching half of them (42%) has health insurance and 6 years or more of hypertension (47.6%). About two-thirds of them (68.8%) reported history of taking between one and three drugs/day and one dose of antihypertensive medication/day (64.8%). High level of compliance with anti-hypertensive

medications was observed among 6.2% of patients whereas medium and low levels were observed among 67.4% and 26.4% of them. High level of compliance was reported among patients aged over 50 years ($p < 0.001$), females (0.033), widowed (0.001) and those haven't history of chronic diseases ($p < 0.001$).

Conclusion: High compliance to anti-hypertensive medications in Saudi Arabia is low, particularly among male and young patients.

Keywords: Anti-Hypertensives, Compliance, Saudi Arabia, Online.

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INTRODUCTION

The eighth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC – 8) recommended achieving blood pressure lower than 140/90 mmHg. or 130/80 mmHg in hypertension without diabetes, or <130/80 mmHg in patients with diabetes and chronic kidney diseases.¹ Prevalence of hypertension among general population in western countries ranged between 28 and 44%,² while its prevalence in Saudi Arabia³ was 26% and in other Arabic countries, it was 26.3% in Kuwait,⁴ 20.1% in Egypt,⁵ 33% in Oman⁶ and 32.1% in Qatar.⁷

Hypertension is a major risk factor for cardiovascular diseases morbidity and mortality.⁸ Poorly controlled hypertension may lead to several serious health problems, including stroke, aneurysms, coronary artery disease, kidney disease and peripheral artery disease.^{9,10} It has also a major economic impact ranging from medical costs to decrease in productivity.^{11,12}

The treatment of hypertension depends on drug therapy and non-drug therapy which mean life style modifications to decrease blood pressure and prevent its complications.¹³ Low-compliance with anti-hypertensive medication puts patients a higher risk of

cardiovascular events than high-compliant patients.¹⁴ There are various factors affecting antihypertensive patient's compliance; patient-related, and non-patient related (factors related to physicians, disease characteristics and drugs).¹⁵

Despite the dangerousness of uncontrolled hypertension, many patients are unaware that they have hypertension, and those known to be hypertensive are often not adequately controlled.^{16,17}

This study aimed to explore the magnitude of the problem of non-compliance with antihypertensive drugs among patients in Saudi Arabia and identifying the associated factors to put recommendations to avoid/control them.

SUBJECTS AND METHODS

A cross-sectional study was carried out online on January, 2017 through social media sites including patients from different regions of the kingdom (Saudi and non-Saudi).

A representative sample of hypertensive adult patients (aged over 18 years), both genders, and all nationalities who has an access on any of social media were included in the study provided that he/she were on antihypertensive medication at the time of study conduction.

Sample size was computed utilizing online Roasoft sample size calculator with the assumption that the prevalence of non-perfect compliance with anti-hypertensive drugs of 72.1% (from previous local study),¹⁸ number of hypertensive patients with an online access exceeded 20000, level of confidence 95% and accepted error of 5%. Thus the minimum calculated sample size was 305.

Data were collected online through a questionnaire. The questionnaire includes socio-demographic characteristics of hypertensive patients (age, gender, educational level, job status, income and marital status), history of smoking, and hypertension-related history (having health insurance, duration of hypertension, history of co-morbid diseases, number of daily medications, types of anti-hypertensives, number of daily anti-hypertensive doses. Adherence of patients to anti-hypertensive drugs was assessed utilizing an 8-item modified Morisky Medication Adherence Scale (8-MMMAS). The scale was proved to be valid and reliable with sensitivity and specificity of 93% and 53%, respectively.¹⁹ Highly adherent patients were identified with a score of 8 on the scale, medium adherers with a score of 6 or <8, and low adherers with a score of <6.¹⁹ The questionnaires were sent online to eligible participants on all social media sites (Facebook, Twitter, Instagram, etc...). A short statement explaining the objectives of the study was included before the questions. Before start of data collection, approval from the Regional Research and ethics committee, King Abdulaziz University in Jeddah was obtained. Statistical Package for Social Sciences (SPSS) software version 23.0 was used for data entry and analysis. Descriptive statistics (number, percentage for categorical variables and mean, standard deviation and range for continuous variables) and analytic statistics using Chi Square tests (χ^2) to test for the association and/or the difference between two categorical variables were applied. P-value equal or less than 0.05 was considered statistically significant.

Table 1: Baseline information of the participants

		Frequency	Percentage
Age in years (n=268)	≤40	64	23.9
	41-45	38	14.2
	46-50	36	13.4
	>50	130	48.5
Gender (n=278)	Male	116	42.0
	Female	160	58.0
Educational level (n=220)	Not educated	6	2.7
	Secondary or less	77	35.0
	Bachelor or above	137	62.3
Job status (n=268)	Employee	125	46.7
	Unemployed	97	36.2
	Retired	36	13.4
	Others	10	3.7
Income (n=249)	≤5000	64	25.7
	5001-10000	64	25.7
	10001-20000	90	36.2
	>20000	31	12.4
Marital status	Single	23	8.3
	Married	214	77.6
	Divorced	11	4.0
	Widowed	28	10.1
Smoking	Yes	77	27.9
	No	199	72.1
Health insurance	Yes	116	42.0
	No	160	58.0
Duration of hypertension in years	1-3	87	32.3
	>3-<5	54	20.1
	≥6	128	47.6
History of chronic diseases	Yes	50	18.1
	No	226	81.9
Number of daily taken drugs (n=260)	1-3	179	68.8
	4-5	35	13.5
	>5	46	17.7
Number of antihypertensive doses (n=256)	One	166	64.8
	Two	56	21.9
	Three	34	13.3

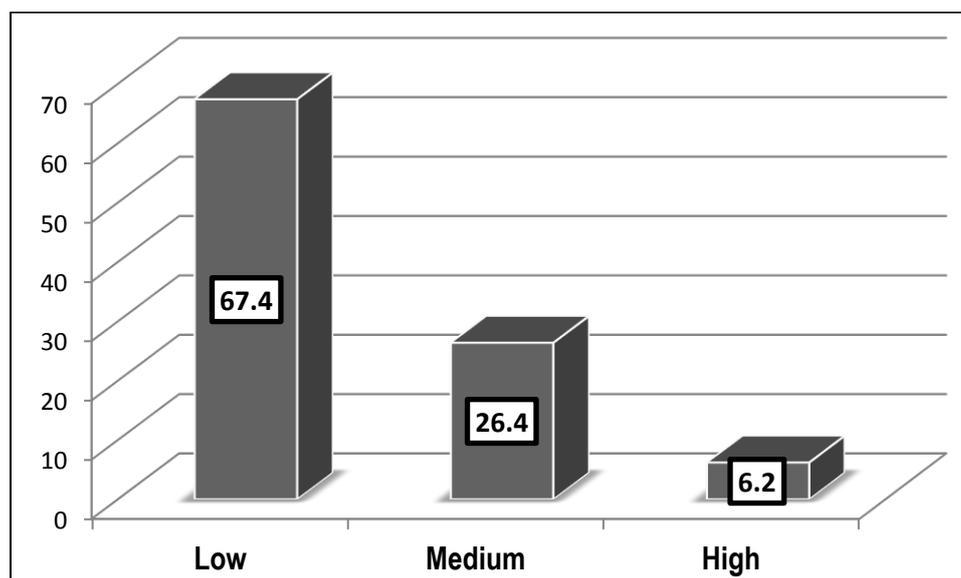


Fig 1: Level of compliance to anti-hypertensive medications among the participants

Table 2: Factors contributing to compliance with anti-hypertensive medications among patients

		Compliance level			χ ²	p-value
		Low N=186 N (%)	Medium N=73 N (%)	High N=17 N (%)		
Age in years (n=268)	≤40 (n=64)	60 (93.8)	3 (4.7)	1 (1.6)	37.29	<0.001
	41-45 (n=38)	26 (68.4)	11 (28.9)	1 (2.6)		
	46-50 (n=38)	26 (72.2)	8 (22.2)	2 (5.6)		
	>50 (n=130)	66 (50.8)	51 (39.2)	13 (10.0)		
Gender (n=278)	Male (n=116)	82 (70.7)	32 (27.6)	2 (1.7)	6.81	0.033
	Female (n=160)	104 (65)	41 (25.6)	15 (9.4)		
Educational level (n=220)	Not educated (n=6)	5 (83.3)	1 (16.7)	0 (0.0)	5.88	0.208
	Secondary or less (n=77)	49 (63.6)	25 (32.5)	3 (3.9)		
	Bachelor or above (n=137)	99 (72.3)	27 (19.7)	11 (8.0)		
Job status (n=268)	Employee (n=125)	90 (72)	28 (22.4)	7 (5.6)	5.83	0.443
	Unemployed (n=97)	65 (67)	27 (27.8)	5 (5.2)		
	Retired (n=36)	21 (58.3)	10 (27.8)	5 (13.9)		
	Others (n=10)	7 (70)	3 (30)	0 (0)		
Income (n=249)	≤5000 (n=64)	48 (75.0)	11 (17.2)	5 (7.8)	5.56	0.475
	5001-10000 (n=64)	45 (70.3)	15 (23.4)	4 (6.3)		
	10001-20000 (n=90)	56 (62.2)	28 (31.1)	6 (6.7)		
	>20000 (n=31)	18 (58.1)	11 (35.5)	2 (6.5)		
Marital status	Single (n=23)	19 (82.6)	4 (17.4)	0 (0)	21.77	0.001
	Married (n=214)	145 (67.8)	59 (27.6)	10 (4.7)		
	Divorced (n=11)	10 (90.9)	0 (0.0)	1 (9.1)		
	Widowed (n=28)	12 (42.9)	10 (35.7)	6 (21.4)		
Smoking	Yes (n=77)	57 (74)	19 (24.7)	1 (1.3)	4.92	0.085
	No (n=199)	129 (64.8)	54 (27.1)	16 (8.1)		
Health insurance	Yes (n=116)	73 (62.9)	36 (31.0)	7 (6.1)	2.19	0.335
	No (n=160)	113 (70.6)	37 (23.1)	10 (6.3)		
Duration of hypertension in years	1-3 (n=87)	64 (73.6)	19 (21.8)	4 (4.6)	5.32	0.256
	>3-<5 (n=54)	38 (70.4)	14 (25.9)	2 (3.7)		
	≥6 (n=128)	77 (60.2)	40 (31.3)	11 (8.6)		
History of chronic diseases	Yes (n=50)	22 (44)	26 (52)	2 (4)	20.49	<0.001
	No (n=226)	164 (72.6)	47 (20.8)	15 (6.6)		
Number of daily taken drugs (n=260)	1-3 (n=179)	116 (64.8)	53 (29.6)	10 (5.6)	2.20	0.699
	4-5 (n=35)	22 (62.9)	9 (25.7)	4 (11.4)		
	>5 (n=46)	32 (69.6)	11 (23.9)	3 (6.5)		
Number of antihypertensive doses (n=256)	One (n=166)	109 (65.7)	48 (28.9)	9 (5.4)	3.81	0.433
	Two (n=56)	39 (69.6)	13 (23.2)	4 (7.1)		
	Three (n=34)	18 (52.9)	12 (35.3)	4 (11.8)		

RESULTS

The study included 267 hypertensive patients. Their baseline information are summarized in table 1. About half of them (48.5%) aged over 50 years. More than half were females (58%), high educated (62.3%) and employed (46.7%). The income of more than one-third of them (36.2%) ranged between 10001 and 20000 SR/month. Majority were married (77.6%), not smoking (72.1%) and have no chronic diseases (81.9%). Approaching half of them (42%) has health insurance and 6 years or more of hypertension (47.6%). About two-thirds of them (68.8%) reported history of taking between one and three drugs/day and one dose of antihypertensive medication/day (64.8%).

High level of compliance with anti-hypertensive medications was observed among 6.2% of patients whereas medium and low levels were observed among 67.4% and 26.4% of them as illustrated in figure 1.

As shown in table 2, high level of compliance was reported among patients aged over 50 years ($p < 0.001$), females (0.033), widowed (0.001) and those haven't history of chronic diseases ($p < 0.001$).

DISCUSSION

Among all other non-communicable diseases, hypertension has a specific importance because it is a major contributing factor for cardiovascular mortality.²⁰ Therefore, compliance of patients to treatment is essential in prevention of fatal cardiovascular diseases and poor compliance is associated with adverse outcomes and waste of resources.²¹ This study aimed to assess the compliance of hypertensive patients in the Kingdom of Saudi Arabia to anti-hypertensive medications and identifying factors affecting adherence to these medications.

In the present study, the high compliance to anti-hypertensives was reported among only 6.2% of patients. This figure is extremely lower than those reported in another study carried out in Saudi Arabia (53%),²¹ and other studies conducted in Lebanon (50.5%),²⁰ USA (71.6%)²² and China (65.1%).²³ The extremely lower rate reported in the present study could be due to the fact that we depend in our analysis for definition of adherence on the consideration of high adherence of 8-MMMAS which identified with a score of 8 on the scale, however most of other studies depend on a cut-off level of 6 out of 8. Also, the difference between our study and others could be due to different cultural factors.

Regarding significant factors associated with high compliance; older (over 50 years), females, and widowed were more compliant with anti-hypertensives compared to others. These results are consistent with others who reported that younger patients and males were found to be less compliant.²⁴ However, older patients has been reported to be less compliant in other studies carried out in Tabuk, Saudi Arabia,²¹ Lebanon,²⁰ and Brazil.²⁵

Regarding medication-related factors, none of the studied factors in the current study was significantly associated with medication compliance. In studies carried out in Lebanon²⁰ and china,²³ the number of antihypertensive medications was also not related to compliance behaviors. In France, it has been reported that taking a combination of antihypertensive drugs rather than multiple single drugs may improve compliance levels.²⁶

Previous studies have shown that the relationship between dose frequency and low compliance is inconsistent as Claxton et al had reported that compliance rates decreased as the number of daily

dose increased,²⁷ whereas, in contrast, Hashmi et al. had observed that adherence rates increased as the number of daily dose increased.²⁸ However, in accordance with the present study, Inkster et al., found non-significant differences between level of adherence and daily dose frequency.²⁹

Duration of hypertension was not associated with compliance with anti-hypertensive medications in the present study. This finding is inconsistent with what has been reported by Paul (2008) who observed that most chronic hypertensive patients have difficulty adhering to a prescribed regimen.³⁰

It has been documented that patients with other chronic diseases may have to take more drugs that necessitate medication adherence.²⁰ However, in the present study, having no co-morbid diseases was significantly associated with high adherence to medications which means that having only hypertension was associated with higher compliance to therapy.

This study is not without limitations that should be considered. The design of the study as a cross-sectional one allowed testing association and not causation between compliance to antihypertensive drugs and associated factors. The non-inclusion of the level of blood pressure in order to associate between compliance with anti-hypertensive medications and blood pressure control is a limitation. The relationship between patients and their healthcare providers which could affect their compliance with medications was not included in the study. Finally, self-reporting questionnaire used as a method of collecting data in the present study has potential disadvantages regarding recall bias.

The present study concluded that high compliance to anti-hypertensive medications in Saudi Arabia is low, particularly among male and young patients.

In the light of the study results, we recommended that health promotion and patient education programmes as well as social support networks should be implemented in order to enhance compliance to drugs for hypertension.

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