

**AWARENESS OF HYPERTENSION AMONG PATIENTS IN THE UAE**

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**ABSTRACT**

Hypertension is an important public health challenge in the world and is still on the rise. The low level of awareness and control of the disease is a global phenomenon. This study aimed to evaluate the knowledge, awareness and control of hypertension among adult hypertensive patients attending community pharmacies in Sharjah, UAE. A questionnaire containing standardized questions on various aspects of hypertension was handed to 10 community pharmacies in order to distribute it to patients. Data analysis was performed using SPSS version 20. A total of 300 hypertensive patients were approached, 158 (52.7%) were males and 142 (47.3%) were females. Regarding knowledge and awareness, 81.3% of the patients were familiar with normal blood pressure, 76.3% were aware of hypertension and their own blood pressure levels, and 75% were familiar with the most common symptoms of hypertension. As for control and treatment compliance, only 65.3% of the patients had adequate control of their blood pressure and 63.3% had good compliance. There was no significant difference in the knowledge, awareness and control of hypertension between the male and female patients (all P values were > 0.05). The problem of poor hypertension control was accompanied by a high prevalence of cardiovascular disease risk factors including comorbidities like diabetes (37.7%) and hypercholesterolemia (51%), as well as lifestyle risk factors such as overweight (47.7%) and smoking (46.8% of males and 27.5% of females,  $P < 0.001$ ). Although general knowledge and awareness of hypertension was somewhat adequate, control and treatment compliance were suboptimal. Continuous multifaceted efforts and various educational processes are required to increase awareness, knowledge and control of the disease in the community. Hypertension in the UAE should be approached more aggressively in terms of preventive strategies, regular screening, along with awareness campaigns and health education programs.

**INTRODUCTION**

Hypertension is a common public health challenge in the world and is still on the rise, it is identified as one of the most significant risk factors for cardiovascular (CV) diseases and an important cause of morbidity and mortality accounting for a large proportion of coronary heart diseases. Unfortunately, the low level of awareness and control of the disease is a global phenomenon.

Increasing awareness and diagnosis of hypertension, and improving control of blood pressure with appropriate treatment, are considered critical public health initiatives to reduce CV morbidity and mortality<sup>[1]</sup>.

Patient's knowledge and awareness regarding hypertension and its complications are important factors in achieving better compliance and they play significant roles in the ability to achieve successful control of hypertension.

Compliance involves not only taking the prescribed medications but also adherence to follow up

appointments and maintaining the recommended lifestyle modifications.

In addition, the patient should be an active participant in the plan of care.<sup>[2]</sup>

As systemic arterial hypertension is often totally asymptomatic, it is essential for the patient to receive clear information about both the risks associated with high blood pressure (BP), and the benefits expected from lifestyle changes and antihypertensive treatment. Drug-related side effects also have to be explained. The involvement of the physician in this educational process is essential, but the pharmacist is likely to play a key role in this respect too. Moreover, the pharmacist may be asked by patients to measure their BP level at the pharmacy or be asked for a self-BP-measurement (SBPM) device. It seems important to promote the use of SBPM, which could contribute to improving both patients' education and BP control rate<sup>[3]</sup>.

Significant progress has been made in increasing the awareness, detection, treatment, and control of hypertension; however, it is indicated that about

50%-75% of patients diagnosed with or being treated for hypertension do not have adequate control of their blood pressure. Efforts to control hypertension have included increasing public knowledge and awareness, especially about the risks associated with uncontrolled BP. Improved recognition of the importance of systolic blood pressure has been identified as one of the major public health and medical challenges in the prevention and treatment of hypertension<sup>[4]</sup>.

### Aims of the Research

Articles on the awareness and knowledge of hypertension among hypertensive patients had been reviewed before the analysis of the data. Almost all of the studies have shown that there are low levels of awareness and treatment of hypertension and even lower levels of control. There was generally poor control of hypertension even among patients who were aware of their status and those who were treated. Patient compliance to treatment and the lifestyle modifications were also poor. Some of the studies observed that lower hypertension knowledge was associated with less education.

Hypertension, even severe, is commonly under-diagnosed and under-treated in the UAE, and levels of awareness and control are below the optimal levels. Also, the prevalence of obesity and other lifestyle risk factors is high. It is important to uncover the reasons behind these low levels of awareness and treatment, and especially control of hypertension, in order to improve treatment outcomes of hypertensive patients.

The aims of the research are as follows:

- To improve the awareness of hypertensive patients in community pharmacies.
- To see how the patients control their blood pressure and how they do regular monitoring.
- To assess the level of awareness with regard to risk factors.
- To see how life style modifications and antihypertensive drugs improve the patient's blood pressure readings and what are the complications and side effects of these medications.

## METHODS

### Overall Design

A cross-sectional survey of hypertensive patients was conducted from July 20th, 2013 till November 10th, 2013. A structured questionnaire containing standardized questions on the awareness of hypertension was constructed. The questionnaire was handed to ten community pharmacies in different districts in Sharjah. Each pharmacy was given 40 copies of the questionnaire so it was distributed to around 400 hypertensive patients attending the pharmacies. The patients were asked to complete the questionnaire in the pharmacy and they were helped by the pharmacists if they had any problem filling it. Some of the patients were also interviewed and helped to answer the questionnaire carefully.

### Questionnaire

At enrollment, patients completed a 2-page questionnaire containing standardized questions on various aspects of hypertension and other health conditions. The primary goal of the questionnaire was to explore the awareness of hypertensive patients and their health status. The 2-page questionnaire contained 19 standardized questions on hypertension, chronic conditions, health habits, and demographic items. The questionnaire was developed in both English and Arabic to overcome language barriers among patients.

Data obtained included age, gender, knowledge of hypertension and its symptoms, years of diagnosis, educational level, employment status, family history of hypertension, knowledge regarding heart diseases, blood sugar and cholesterol, smoking status, antihypertensive drug use, compliance and side effects. Inquiry was also made regarding lifestyle changes (decrease in salt intake, weight reduction, regular exercise and use of cooking oil).

### Statistical Analysis

Data entry and statistical analysis were performed using the Statistical Package for Social Sciences software, SPSS version 20, frequencies of different variables were determined and data were expressed as percentages. Chi-square test was applied to find if there was a significant difference between the variables of male and female patients at  $P$  value  $< 0.05$ .

- $P < \text{or} = 0.05$  (there is significant difference in the results).
- $P < \text{or} = 0.01$  (there is high significant difference in the results).
- $P < \text{or} = 0.001$  (there is very high significant difference in the results).

## RESULTS

### Characteristics of Hypertensive Patients

A total of 300 hypertensive patients who attended the selected 10 community pharmacies completed the questionnaire, giving a response rate of 75% (300 of 400 patients). The number and percentage of males and females were 158 (52.7%) and 142 (47.3%) respectively, and the male to female ratio was 1:0.9. The majority of patients were between the age of 40 and 69 (72.7%). The characteristics of the patients are shown in Table 1.

80.4% of males and 71.8% of the females were university graduates ( $P > 0.05$ ). Overall, 76.3% of the patients were university graduates.

Regarding employment status, 73.4% of males were employed and only 46.5% of females were in a job. So there was a very high significant difference in the employment status between the two genders ( $P < 0.001$ ). The overall employment percentage in the patients was 60.7%.

70% of the patients stated that they have a family history of hypertension (65.8% of males and 74.6% of females,  $P > 0.05$ ).

Regarding co-morbidities, 28.7% of the patients were diagnosed with one or more heart disease (32.9% of males and 23.9% of females,  $P > 0.05$ ), 37.7% of the patients were diabetic (39.2% of males and 35.9% of females,  $P > 0.05$ ).

As for hypercholesterolemia, the percentage of males with high cholesterol levels was significantly higher than the percentage of females (57.6% versus 43.7% respectively,  $P < 0.05$ ). In total, half of the

patients (51%) have hypercholesterolemia along with hypertension, and that increases the risk of atherosclerosis and stroke significantly.

Concerning overweight status, about half of the patients (47.7%) were overweight. There was no significant difference in the overweight status between the two genders (45.5% of males and 50% of females,  $P > 0.05$ ). As for smoking, 46.8% of the males were smokers and 27.5% of the females were, so there was a very high significant difference in smoking status between males and females ( $P < 0.001$ ). The overall percentage of smokers was 37.7%.

**Table 1. Characteristics of the hypertensive patients.**

Variables	Male		Female		P value Males/ Females	All	
	N	%	N	%		N	%
<b>Age Groups</b>							
<30	4	2.5	5	3.5	> 0.05	9	3
30-39	19	12	19	13.4		38	12.7
40-49	38	24.1	35	24.6		73	24.3
50-59	44	27.8	33	23.2		77	25.7
60-69	36	22.8	32	22.5		68	22.7
≥70	17	10.8	18	12.7		35	11.7
<b>Education</b>							
Graduated	127	80.4	102	71.8	> 0.05	229	76.3
Not Graduated	31	19.6	40	28.2		71	23.7
<b>Working state</b>							
Employed	116	73.4	66	46.5	< 0.001	182	60.7
Unemployed	42	26.6	76	53.5		118	39.9
<b>Family history of HTN</b>							
Family history	104	65.8	106	74.6	> 0.05	210	70
No family history	54	34.2	36	25.4		90	30
<b>Heart disease patients</b>							
Have heart disease	52	32.9	34	23.9	> 0.05	86	28.7
No heart disease	106	67.1	108	76.1		214	71.3
<b>Diabetic patients</b>							
Diabetic	62	39.2	51	35.9	> 0.05	113	37.7
Non diabetic	96	60.8	91	64.1		187	62.3
<b>Hypercholesterolemic patients</b>							
Hypercholesterolemic	91	57.6	62	43.7	< 0.05	153	51
Non Hypercholesterolemic	67	42.4	80	56.3		147	49
<b>Overweight patients</b>							
Overweight	72	45.5	71	50	> 0.05	143	47.7
Not overweight	86	54.4	71	50		157	52.3
<b>Smokers</b>							
Smoker	74	46.8	39	27.5	< 0.001	113	37.7
Non smoker	84	53.2	103	72.5		187	62.3

**Table 2. Knowledge and attitude of patients regarding hypertension.**

Variables	Male		Female		P value Males/ Females	All	
	N	%	N	%		N	%
<b>Years of HTN</b>							
<5 years	66	41.8	67	47.2	> 0.05	133	52.7
5-10 years	53	33.5	41	28.9		94	31.3
>10 years	39	24.7	34	23.9		73	24.3
<b>Knowledge of normal HTN</b>							

Known	134	84.8	110	77.5	> 0.05	244	81.3
Unknown	24	15.2	32	22.5		56	18.7
<b>Knowledge of patient's HTN</b>							
Known	127	80.4	102	71.8	> 0.05	230	76.3
Unknown	31	19.6	40	28.2		70	23.7
<b>Knowledge of HTN symptoms</b>							
Known	122	77.2	103	72.5	> 0.05	225	75
Unknown	36	22.8	39	27.5		75	25
<b>Control of HTN</b>							
Controlled	109	69	87	61.3	> 0.05	196	65.3
Uncontrolled	49	31	55	38.7		104	34.6
<b>Lifestyle modifications</b>							
More than one	158	100	142	100	> 0.05	300	100
Quit smoking	14	8.8	15	10.6		29	9.6
Reduce salt intake	85	53.7	80	56.3		165	55.1
Lose weight	32	20.2	30	21.1		62	20.6
Exercise regularly	27	17	17	12		44	14.7
<b>Patient compliance</b>							
Regular	96	60.7	90	63.3	> 0.05	191	63.3
Sometimes forget	40	25.4	31	21.8		66	22
Too expensive	10	6.3	15	10.6		25	8.4
Hard to follow plan	12	7.6	6	4.2		18	6
<b>Side effects</b>							
Yes	42	26.6	35	24.6	> 0.05	77	25.7
No	116	73.4	107	75.4		223	74.3

**Table 3. The relationship between hypertensive patients' gender and medications.**

Variables	Male		Female		P value Males/ Females	All	
	N	%	N	%		N	%
Diuretics	10	6.1	7	5	> 0.05	17	5.7
Calcium Channel Blockers (CCBs)	14	8.7	9	6.4	> 0.05	23	7.7
Herbals	6	3.6	6	4.3	> 0.05	12	4
ARBs	22	13.7	17	12.1	> 0.05	39	13
ACE Inhibitors	24	15	20	14.2	> 0.05	44	14.7
Beta Blockers	19	11.8	26	18.4	> 0.05	45	15
Don't take medications	5	3	4	2.9	> 0.05	9	3
Diuretics & CCBs	6	3.6	7	5	> 0.05	13	4.4
Diuretics & ARBs	21	13.1	14	10	> 0.05	35	11.7
Diuretics & ACE inhibitors	14	8.7	9	6.4	> 0.05	23	7.7
Diuretics & Beta Blockers	6	3.6	7	5	> 0.05	13	4.4
CCBs & ARBs	5	3	5	3.6	> 0.05	10	3.4
CCBs & Beta Blockers	10	6.1	9	6.4	> 0.05	19	6.3

### Knowledge and Attitude of Patients Regarding Hypertension

Knowledge, awareness and attitude of the patients regarding hypertension are presented in Table 2. Regarding the duration of hypertension, over half of the patients (52.7%) were diagnosed with hypertension less than 5 years ago, 31.3% of them were diagnosed between 5 to 10 years ago, and 24.3% were diagnosed more than 10 years ago.

When asked about awareness and knowledge of normal blood pressure, hypertension and own blood pressure values, 81.3% of the patients answered that they know what normal blood pressure was (84.8% of males and 77.5% of females,  $P >$

0.05). 76.3% of the patients stated that they are aware of hypertension and that they know their own blood pressure levels (80.4% of the males and 71.8% of females,  $P >$  0.05).

As for hypertension symptoms, 75% of patients answered that they are familiar with the most common symptoms of hypertension (77.2% of males and 72.5% of females,  $P >$  0.05).

Regarding the control of hypertension, 65.3% of patients believed that they have adequate control of their blood pressure (69% of males and 61.3% of females).

There was no significant difference in the knowledge, awareness and control of hypertension between the male and female patients (all  $P$  values were  $> 0.05$ ), but the percentages of the above variables in the male patients were slightly higher than percentages in the female patients.

Concerning life style modifications (smoking cessation, salt reduction, weight loss and exercise), all of the patients (100%) chose more than one choice. Only 9.6% of all the patients stated that they have quit smoking, more than half of the patients (55.1%) reduced salt in their diet, 20.6% of the patients said that they lost weight, and only 14.7% of the patients answered that they exercise regularly.

When the patients were asked about their compliance with hypertension treatment using antihypertensive medications, 63.3% of patients answered that they take their medications regularly, 22% of patients said that they sometimes forget to take them, 8.4% of patients stated that the medications are too expensive so they won't buy them, and 6% of patients said that the treatment plans were confusing and hard to follow.

As for side effects, 25.7% of patients stated that they have experienced side effects when they take their antihypertensive medications. No significant difference was observed between male and female patients regarding lifestyle modifications and compliance (all  $P$  values  $> 0.05$ ).

#### **The Relationship between Patients' Gender and Medications**

Regarding the relationship between the gender of the hypertensive patients and the antihypertensive medications that they were taking, we found that there was no significant difference between the males and females regarding their antihypertensive medication groups upon applying the Chi-square test (all  $P$  values  $> 0.05$ ).

Only the percentage of females taking beta-blockers alone was slightly higher than the percentage of males (18.4% of females versus 11.8% of males,  $P > 0.05$ ). The relationship is displayed in Table 3.

According to the results, the highest percentage (15%) of the patients were taking beta-blockers alone, also patients taking ACE inhibitors alone had just about the same percentage (14.7%). With regard to male patients, the highest percentage (15%) of them were taking ACE inhibitors alone, whereas the highest percentage (18.4%) of the female patients was taking beta-blockers alone. In contrast, the combination of CCBs & ARBs was used by only 3.4% of patients. Furthermore, a small percentage (4%) of the patients stated that

they used herbal treatments. Finally, the least percentage of the patients (3%) stated that they don't take medications.

#### **DISCUSSION**

##### **Awareness of Hypertension and Personal Blood Pressure**

There have been several community studies about awareness of hypertension in the general population. Awareness of hypertension among those affected by the disease tends to be generally higher than in the general population<sup>[5]</sup>. This study evaluated the awareness among hypertensive patients, who are considered as a source of information on the disease condition by the general public. Furthermore, these patients are regarded as being more knowledgeable than others on the disease condition, treatment and complications. Therefore, they may possibly spread information to the population in their community, including their treatment process and personal experience.

This study was conducted to evaluate the current status of hypertension knowledge, awareness, and attitudes in a group of hypertensive patients in Sharjah, UAE. In our sample of hypertensive adults, the results suggest that patients are somewhat knowledgeable about some aspects of hypertension in general. This finding highlights the success that has been achieved in high blood pressure education over the last years.

In the sample of the study, the majority of the patients (81.3%) have the knowledge of normal blood pressure and hypertension levels. Regarding the patient's own hypertension condition, about three quarters of the patients (76.3%) stated that they know their own blood pressure values. When comparing male to female patients, the number of knowledgeable male patients was found to be slightly higher than that of female patients with no significant difference (about 8 in 10 males versus 7 in 10 females,  $P$  values  $> 0.05$ ).

As for the knowledge of the symptoms of hypertension, also three quarters of the patients (75%) stated that they know the symptoms, the same slight difference between the two genders was observed.

As many studies have shown, hypertension awareness is associated with the level of education and family history of high BP. Highly educated people are usually well informed about health issues including hypertension and more prone to adopt healthy lifestyle habits such as a healthy diet, exercise, and the maintenance of an ideal body weight. Moreover, educated people maintain a greater sense of control over their lives and tend to have a greater level of social support than those with a lower level of education<sup>[6]</sup>. Additionally, people with family history of hypertension tend to have more knowledge of the disease condition<sup>[3]</sup>.

In the study sample, about three quarters of the patients (76.3%) were university graduates. Also a high percentage (70%) of the patients had family history of hypertension. These factors explained and justified the good level of awareness that was observed in our study, they also supported what the other studies have indicated about the direct association of hypertension awareness and knowledge with education.

Despite such successes with educating people about hypertension (including its description as a “silent killer”), studies suggest that a considerable number of individuals still believe that people will be able to “feel” if their BP is high and that drugs should be taken only when they have “symptoms” or for a period of time. Among patients already under treatment for hypertension, this mistake may lead some to take their antihypertensive medications irregularly (for example only when they “feel bad”). Among patients who have not been diagnosed with hypertension, a lack of awareness that high BP is generally symptomless may lead to some people not being screened. These practices have sometimes resulted in serious complications and disastrous consequences<sup>[5][7]</sup>.

Hypertension usually does not cause symptoms. Most of the symptoms are due to target organ damage. Prompt and adequate treatment of hypertension will delay onset of complications and might reverse some end organ damage.

Waiting for onset of symptoms, as most of the population are likely to do, could delay diagnosis and medical intervention. In a study, it has been observed that over 75% of hypertensive patients in their environment already have cardiac hypertrophy at the time of diagnosis<sup>[5]</sup>.

In our study, while 60% of the patients were above the age of 50, over half of the entire patients (52.7%) were diagnosed with hypertension less than five years ago. This suggests that a lot of patients commonly measured their BP after the onset of hypertension related symptoms; therefore, they delayed their diagnosis and necessary medical intervention. Moreover, they were most likely to have complications and some organ damage before the time of the diagnosis.

#### **Control of Hypertension among Patients**

A special concern in our study was the level of under-treatment of hypertension. Despite the fact that the patients were aware of their condition, a notable percentage (34.7%) of patients had uncontrolled hypertension. The percentage of females with uncontrolled BP was somewhat higher than the percentage of males but there was no significant difference. It is unclear whether the poor control is due to inadequate treatment regimens, or lack of compliance (e.g. because of the asymptomatic nature

of hypertension or medication side effects).

The Joint National Committee seventh report (JNC 7) believed even with treatment, control of blood pressure can be difficult; with only one-third of treated hypertensive patients having an adequately controlled systolic blood pressure (less than 140 mm Hg)<sup>[8]</sup>.

In the UAE, despite a modern and accessible health system, the levels of both under-diagnosis and under-treatment of hypertension were high according to a study. The situation was similar to that found in many other places in the world, both developed and developing<sup>[9]</sup>.

#### **Patient Compliance with Antihypertensive Treatment**

Poor compliance with hypertension treatment is a serious problem and is associated with major increases in costs and long-term risks due to development of complications. Poor adherence among hypertensive patients is frequently observed, particularly in patients who are recently diagnosed and treated. Therefore, it is important to evaluate patient adherence to hypertension treatment on a regular basis<sup>[1]</sup>.

Results concerning patient compliance with treatment appeared to be far from perfect: 63.3% of the patients stated that they take their medications regularly, 22% said that they sometimes forget to take them, 8.4% stated that the medications are too expensive so they won't buy them, and 6% said that the treatment plans were confusing and hard to follow. Pharmacists are probably not sufficiently aware of these problems and therefore should be trained to identify patients likely to be poorly compliant; pharmacists should increase the awareness of those patients as well as their compliance with the treatment.

As for adverse drug effects, 25.7% of the patients stated that they had experienced side effects from their antihypertensive medications, which might affect their adherence to the treatment. Some patients might change their dosing schedules or even stop taking their medications because of the occurrence of side effects. Pharmacists should also be aware of this issue and they should inform the patients about side effects and how to manage them, they should also know when to refer a patient to a physician in case there is a need to change the medication, the dose, or the treatment schedule. Identification of poor adherence should be followed up with proper patient education, counseling, and intervention. Once-daily regimens are preferred in most patients to improve adherence. Patients on antihypertensive therapy should be questioned periodically about changes in their general health awareness, energy level, physical functioning, and overall satisfaction with treatment.

#### **Awareness of the Importance of Lifestyle Changes**

Many studies have shown that hypertension is on rise in many developing and developed countries mainly attributed

to life style changes. A study that was conducted in the UAE also found that people were at high risk for hypertension due to modified life style. Of those who were hypertensive, there were more people who did not do exercise or partake in any physical activity, that was due to their busy schedule of work and also their work mainly involved less physical activity. The study assured that sedentary lifestyle is a risk factor for hypertension<sup>[10]</sup>.

Regarding life style modifications of the patients in the study, only 9.6% of all the patients stated that they have quit smoking, more than half of the patients (55.1%) reduced salt in their diet, 20.6% patients said that they lost weight, and only 14.7% patients answered that they exercise regularly.

Lifestyle modifications should always be recommended to provide additional BP lowering and other potential health benefits. Persistence with lifestyle modifications should also be continually encouraged<sup>[11]</sup>.

### **How to Increase Patients' Awareness & Control of Hypertension**

To achieve the ultimate goal of improving health by controlling hypertension, it is important to fully understand the current status of patient knowledge, awareness, and attitude regarding hypertension in order to develop effective strategies and interventions that put the patient as a participant in the management of their health.

Increasing awareness and diagnosis of hypertension, and improving control of BP with appropriate treatment, are considered critical public health initiatives to reduce CV morbidity and mortality<sup>[11]</sup>. To increase the number of people who are aware of their hypertension, early screening is needed in order to detect it before the onset of symptoms and complications.

As hypertension is often totally asymptomatic, it is essential for the patient to receive clear information about both the risks associated with high BP, and the benefits expected from lifestyle changes and antihypertensive treatment. Drug-related side effects also have to be explained.

Patients need to understand the difference between curing hypertension and treating it with medications. Clinicians should keep this in mind when educating their newly diagnosed hypertension patients<sup>[7]</sup>.

Increasing patient's knowledge and awareness regarding hypertension and its complications are important factors in achieving better compliance and they play significant roles in the ability to achieve successful control of hypertension.

Compliance with treatment involves not only taking the prescribed medications but also adherence to follow up

appointments and maintaining the recommended lifestyle modifications<sup>[2]</sup>.

Patients can ask the pharmacists to measure their BP level at the pharmacy and they can get a self-BP-measurement (SBPM) device. It seems important to promote the use of SBPM, which could contribute to improve both patients' education and BP control rate<sup>[3]</sup>.

Regarding physician knowledge of treatment guidelines, some studies showed that adequate knowledge of guidelines decreases dramatically with increasing physician age and duration of practice. This finding provided a new piece of information on the need for continued medical education, and suggested that intensive educational interventions should be addressed to the subgroup of physicians with longer duration of practice<sup>[11]</sup>.

Pharmacists, positioned as the most accessible health care providers in the community, could improve patients' knowledge and adherence to the management of hypertension. The knowledge of the pharmacists as evaluated in some studies is frequently insufficient. Appropriate training programs should be widely developed in order to incorporate them as a core component of the health care services.

Involving pharmacists in hypertension management could result in an increase of control rates. Pharmacy-based health promotion programs in hypertension are currently implemented in Canada and USA, they are much more infrequent in other countries. The majority have been shown to improve outcomes in hypertension, by improving adherence and reducing BP levels. Nevertheless, a study showed that the impact of such a pharmacist intervention is largely conditioned by patients' income status; the low-income group did not appear to benefit from the program.

These programs are not only effective, but also efficient, a program which consisted in the pharmacist measuring and recording the patient's BP and assessing adherence to drug treatment each time the patient came to the pharmacy to refill the antihypertensive medication, showed benefits of about 10 times higher than costs.

According to the results of many studies, the following topics could be especially highlighted in a training program for improving the management of hypertensive patients by the pharmacists: definition of optimal BP, normal BP and hypertension; methodology of SBPM (shortlist of devices, frequency and technique of measurement, transmission of the results to the doctor), interest of lifestyle changes, patient information about unwanted effects of pharmacological treatment, importance of drug compliance and risk of treatment withdrawal<sup>[3]</sup>.

**CONCLUSION**

The study which was conducted in Sharjah, UAE, evaluated the knowledge, awareness and control of hypertension among adult hypertensive patients, who are regarded as being more knowledgeable than others on the disease condition, treatment and complications.

A relatively good level of knowledge and awareness regarding hypertension in general was found in the patients of the study. This finding highlights the success that has been achieved in high blood pressure education over the last years.

It should be mentioned that better hypertension awareness was associated with male gender, high educational level and family history of hypertension, a finding which could help to determine which patients need to be approached more.

A special concern in the study was the level of under-treatment of hypertension. Despite the fact that the patients were aware of their condition, the percentage of patients with controlled hypertension was suboptimal and somewhat poor. Patient compliance with treatment also appeared to be far from perfect.

Moreover, the problem of under-treatment of hypertension was accompanied by a high prevalence of other CVD life-style risk factors including smoking, lack of exercise, and obesity. The prevalence of comorbidities like diabetes and hypercholesterolemia was also high. The above factors increase CVD risks and target organ damage significantly.

It is evident that hypertension is a common public health problem in the world and is still on the rise. Awareness, treatment, and control of hypertension have shown considerable improvement over time but are still below the optimal levels. The low level of awareness and control of hypertension is a global phenomenon.

Reducing high blood pressure in the population and improving patients' knowledge, awareness and control of hypertension requires continuous multifaceted efforts and various educational processes. Hypertension in the UAE should be approached more aggressively in terms of prevention strategies, diagnosis and treatment. More awareness campaigns and counseling sessions are required.

In conclusion, the study shows that even in developed communities, with ready access to medical care, there is an urgent need for regular screening for hypertension coupled with educational programs to emphasize the benefits of optimal BP control and to increase awareness, knowledge and control of hypertension.

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