

Population Based Measurements of Systolic and Diastolic Blood Pressure Among Adult Cohort, Extent and Determinants Mapping in Dubai, UAE

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Abstract

Hypertension remain the most common single risk factor that lead to adult morbidities and mortalities Raising of Systolic and diastolic should be recognized as a unique and most common risk factor for both cardiovascular and overall disease burden and mortality worldwide, It has been proven that medical treatment of hypertension mitigates this risk in routine Medical practice. Management of hypertension is also among the most common reasons for ambulatory visits to physicians' clinics among adults cohorts national, regional and worldwide. Nevertheless, optimal medical management of hypertension kept unclear due to many key aspects. To study the distribution of blood pressure values among Dubai population (systolic and diastolic) in three consecutive measurements with 10 minutes interval according to some epidemiological features and determinants. Dubai Household Health Survey was conducted in 2014 as a Cross-sectional, multistage, stratified, Cluster survey. Houses were visited to obtain detailed information on the different health-related issues. Well-trained personnel with short measurement interval measured a sample of 3716 persons aged ≥ 18 years for systolic and Diastolic blood pressure three times. The study showed that almost 49.9% of adult population (about Half of adult population) in Dubai is at risk of systolic hypertension (pre-hypertensive systolic hypertension), 14.9% of adults showed stage one of systolic hypertension, and 3.3% of adult population showed stage 2 systolic hypertension in the first time checking. As for the diastolic blood pressure among adults in Dubai, the study revealed that 42.7% were at risk of hypertension (Prehypertension stage), 16.4% are in stage one hypertension and 4.6% are in stage two hypertension. Regarding second and third measurements after a waiting interval, both systolic and diastolic blood pressure showed almost similar figures with little non-significant differences. Hypertension is still major public health concern among adults in Dubai. Almost half of population are at borderline prehypertension stage, which necessitate wide base population screening program, hypertension correlated with nationality, age, gender in remarkable profile. Wide Population based screening program is going to have significant yield if applied effectively. Population and individual plan approach is extremely public health priority.

Keywords

Systolic and Diastolic Blood Pressure, Hypertension, Population Based, Dubai

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1. Introduction

Hypertension remain the most common single risk factor that lead to adult morbidities and mortalities. Raising of Systolic and diastolic should be recognized as a unique and most common risk factor for both cardiovascular and overall disease burden and mortality worldwide, It has been proven that medical treatment of hypertension mitigates this risk. In routine Medical practice, management of hypertension is also among the most common reasons for ambulatory visits to physicians' clinics among adult's cohorts national, regional and worldwide. Nevertheless, optimal medical management of hypertension kept unclear due to many key aspects. [1-6]

Studies showed that prevalence of hypertension is high in gulf region 19.1% in UAE, 25.1% in Yamen, 28% in Bahrain, 20% in Kuwait, 25% in Qatar, and 25.2% in KSA. It is 24.3% in Iran, and 24.4% in Iraq. [7]

Average blood pressure (BP) level and its age-related increase differs across populations and may explain much of the observed disparities in stroke mortality. To date, the bulk of the available knowledge about hypertension comes from people of Caucasian origin in developed countries. Little information is available for populations in transition, some of which may have a particularly high genetic risk for the development of diseases of affluence, e.g. the "thrifty gene" hypothesis for diabetes. [8-11]

A specific example of a nation in transition is the United Arab Emirates (UAE). As late as the 1960s the population consisted largely of nomadic Bedouin Arabs. However, the discovery of oil in 1970s has changed the lifestyle dramatically and the UAE is now a modern, wealthy society, heavily influenced by Western living patterns, including a sedentary lifestyle with high CVD risk profiles. Indeed, CVDs are known to be the leading causes of morbidity and mortality in the UAE among both the nationals and the expatriates, who constitute the majority (approximately 80%) of the population. Of particular concern is the prevalence of obesity, which reaches 35% among young adolescent Bedouin Arab women; and approximately 24% among medical students. These students also reported high stress levels (65%), unhealthy diets (50%), and low levels of physical activity (77%) - which is perhaps attributable to cultural and climatic restrictions. [12-16]

Reduction of BP is one of the most important challenges facing medicine and public health in the next 20 years, given that the World Health Organization estimates that disability and mortality as a result of CHD and cerebrovascular disease will rank first and fourth, respectively, as causes of the global disease burden. [17] This study aims to describe the

distribution of blood pressure values among Dubai population (systolic and diastolic) in three consecutive measurements with 10 minutes interval according to some epidemiological features and determinants.

2. Methodology

Dubai Household Health Survey was conducted in 2014 as a Cross-sectional, multistage, stratified, Cluster survey. The sample covered all areas of Dubai. Houses were visited to obtain detailed information on the different health-related issues.. According to Dubai Statistical center, the total population of Dubai at the end of 2014 was 2327350 (males 1613175, females 714175) (UAE 212000, Expatriates 2115350). A structured questionnaire was prepared for the survey purposes. One important part of the survey questionnaire was about different measurements including blood pressure. Blood pressure was measured using calibrated sphygmomanometers. Well-trained personnel performed measurements with short measurement interval. They measured a sample of 3716 persons aged ≥ 18 years for systolic and Diastolic blood pressure three times. Data was entered to the computer using Excel sheet, and analyzed using SPSS 21.

3. Results

The study showed that almost 49.9% of adult population (about Half of adult population) in Dubai is at risk of systolic hypertension (prehypertensive systolic hypertension), 14.9% of adults showed stage one of systolic hypertension, and 3.3% of adult population showed stage 2 systolic hypertension in the first time checking. As for the diastolic blood pressure among adults in Dubai, the study revealed that 42.7% were at risk of hypertension (Prehypertension stage), 16.4% are in stage one hypertension and 4.6% are in stage two hypertension. Regarding second and third measurements after a waiting interval, both systolic and diastolic blood pressure showed almost similar figures with little non-significant differences (table 1).

Table 1. Distribution of blood pressure among Dubai population (systolic and diastolic) in three consecutive measurements with 10 minutes interval.

	Sys-1	Dias-1	Sys-2	Dias-2	Sys-3	Dias-3
Normal BP	32.0	36.3	34.9	41.0	34.2	39.5
Prehypertension	49.9	42.7	50.1	40.7	49.7	42.1
Stage 1 Hypertension	14.9	16.4	12.2	14.7	13.3	14.9
Stage 2 Hypertension	3.3	4.6	2.8	3.6	2.8	3.5

The study revealed that about 42.1% of expatriate showed prehypertension stage of diastolic blood pressure in comparison with 41.8% of UAE nationals, 15.3% of expatriate have stage one diastolic hypertension comparing to 8.8%

UAE nationals, 3.7% stage 2 diastolic among expatriate comparing to 0.8% of UAE Nationals.

As for systolic blood pressure 46.6% prehypertension stage of UAE comparing to 49.9% of expatriate, 3.7% stage 1

among UAE nationals comparing to 13.7% among Expatriate. For stage 2 systolic hypertension about 1.2% of UAE nationals comparing to 2.9% among expatriate as shown in table 2.

Table 2. Distribution of blood pressure among Dubai population (systolic and diastolic) in the third measurement according to nationality.

BP category	Systolic 3			Diastolic 3		
	UAE	Ex	Total	UAE	Ex	Total
Normal BP	44.9%	33.5%	34.2%	48.6%	38.9%	39.5%
Prehypertension	46.6%	49.9%	49.7%	41.8%	42.1%	42.1%
Stage 1 Hypertension	7.3%	13.7%	13.3%	8.8%	15.3%	14.9%
Stage 2 Hypertension	1.2%	2.9%	2.8%	0.8%	3.7%	3.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Concerning Gender, the study showed that for systolic blood pressure 52.8% of Male showed systolic prehypertension stage comparing to 37.6% female, stage 1 systolic hypertension 15.4% male and 5.0 %female, for stage 2 systolic hypertension about 3.5% male comparing to 0.4% females. as for diastolic

in prehypertension about 46.% male comparing to 26.9% females. stage 1 diastolic hypertension 16.9% males and6.8% females, stage 2 diastolic hypertension4.3%males, 0.6 % Females as reflected by Table 3.

Table 3. Distribution of blood pressure among Dubai population (systolic and diastolic) in the third measurement according to gender.

BP category	Systolic 3			Diastolic 3		
	Males	Females	Total	Males	Females	Total
Normal BP	28.3%	57.1%	34.2%	32.8%	65.6%	39.5%
Prehypertension	52.8%	37.6%	49.7%	46.0%	26.9%	42.1%
Stage 1 Hypertension	15.4%	5.0%	13.3%	16.9%	6.8%	14.9%
Stage 2 Hypertension	3.5%	0.4%	2.8%	4.3%	0.6%	3.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

In relation to the age, the study showed that systolic blood pressure increase with age as systolic blood pressure stage 1 was 20.9% among more than 60 years age and 13.2% among less than 60 years age while stage 3 systolic hypertension showed 16.4% among above 60 years old and only 2.6% among less than 60 years age old. as for diastolic

hypertension showed in prehypertens 19.4% among more than 60 years age and 14.8% among younger age groups stage 50.7% among more than 60 years old age and 41.9% among less than 60 years old age, for stage 1 diastolic hypertension 19.4% among older and 14.8% among younger as shown by table 4.

Table 4. Distribution of blood pressure among Dubai population (systolic and diastolic) in the third measurement according to age.

BP category	Systolic 3			Diastolic 3		
	18-59	60+	Total	18-59	60+	Total
Normal BP	34.5%	13.4%	34.2%	39.8%	As 23.9%	39.5%
Prehypertension	49.7%	49.3%	49.7%	41.9%	50.7%	42.1%
Stage 1 Hypertension	13.2%	20.9%	13.3%	14.8%	19.4%	14.8%
Stage 2 Hypertension	2.6%	16.4%	2.8%	3.5%	6.0%	3.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

4. Discussion

The study showed that about 16.1% of total adult population have systolic hypertension and 18.4% of total adult population have diastolic blood pressure, these result showed much higher than other study carried out in China which revealed that Overall, 7.6% of the Chinese adult population had ISH, 7.4% had SDH, and 4.4% had IDH. The prevalence of ISH increased with age and was more common in older

women than in older men. Stage 1 hypertension was much more prevalent than stage 2 hypertension among all hypertension subtypes. [18]

The current study is showing much more prevalence that the study conducted in Saudi Arabia which showed only a total 4562 subjects, 180 (3.95%) suffered from IDH (Isolated Diastolic hypertension), which was significantly related to age, gender, while this study showed the same profile as in relation of hypertension to age and gender. [19]

The IDH prevalence was 4.5–6.7% in India, about 6% in

Ethiopia and Nigeria, about 7.2% in Oman, 8.6% in young adults in the USA and 4.4% in China. In this study, IDH was significantly more common among males, which is in agreement with many other studies. The group aged 35–44 years was the most affected age group in this study. Studies in other communities reported that IDH is more common in younger adults. The significant association of IDH with obesity agrees with the findings of other studies. The association of smoking with IDH in this study is not in agreement with other studies, which revealed no significant association of smoking with IDH. [20-30]

As for nationality, Ethnicity and racial factors, this study that expatriate groups of different nationalities ethnicities and races have much more high prevalence of hypertension comparing to UAE nationals which comes similar to what other studies concluded that Ethnicity is an important consideration in the management of BP, given the ethnic differences in the prevalence, treatment, and control of hypertension, differing responses to anti-hypertensive medication, and substantial ethnic differences in CVD mortality attributable to hypertension. [31]

5. Conclusion

Hypertension is still major public health concern among adults in Dubai. Almost half of population are at borderline prehypertension stage, which necessitate wide base population screening program, hypertension correlated with nationality, age, gender in remarkable profile. Wide Population-based screening program is going to have significant yield if applied effectively. Population and individual plan approach is extremely public health priority.

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