Prevalence of Cardiovascular Disease Risk Factors in Shaqra, Saudi Arabia

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ABSTRACT

Background: According to the report of World Health Organization (WHO), cardiovascular diseases (CVDs) accounted for most noncommunicable disease (NCD) deaths (17.5 million NCD deaths) during 2012 worldwide. Surveillance of CVD risk factors is a key strategy for effective CVD prevention.

Aim: To identify the extent of CVD risk factors of developing cardiovascular disease events among Shaqra population of Saudi Arabia.

Method: This community-based cross-sectional study was conducted on a total of 369 participants including 267 (72.3%) males and 102 (27.6%) females aged 18-45 years from Shaqra City of Saudi Arabia. Blood Pressure, BMI, blood glucose, smoking status and family history of CVD risk factors were estimated.

Results: Prevalence of hypertension was 10.3% and diabetes 1.6%. Tobacco consumption was 24.8%. Obesity was 23.30%. Family history of HTN and DM was 50.09%.

Conclusion: High prevalence of hypertension, obesity and tobacco consumption was seen in Shaqra population which will predispose to CVD risk. Campaigns to raise the awareness of CVD risk factors will boost the quality of life of the peoples and will add years to live.

Key Words: Cardiovascular disease, hypertension, diabetes mellitus, smoking, obesity.

INTRODUCTION

Cardiovascular diseases (CVDs) are the first leading cause of death worldwide [1]. According to the World Health Organization (WHO) in 2011, CVDs accounted for 17.3 million deaths per year [2], and the ratio of deaths caused by CVDs among all deaths increased from 1:5 in 1990 to 1:4 in 2010 [3]. CVDs risk factors such as smoking, obesity, BMI and lifestyle are most common causes for life-threatening diseases [4]. These risk factors can be controllable like hypertension, diabetes mellitus, obesity, and hyperlipidemia by lifestyle modifications [5]. Therefore, caring for this risk factor is one of the important goals in preventing CVD [6]. Various worldwide studies assessed the prevalence of CVD risk factors. Almost 50% of the deaths of those aged below 70 were found to be attributed to CVD deaths, while in western countries, it is about 25%, a substantial difference [7]. Lifestyle development in childhood and adolescence reduces mortality from CVD and may prevent long-term disability. CVD are asymptomatic; therefore, preventive measures are very important factor [8]. One systemic review indicates high prevalence of CVD risks in gulf countries [9]. One study indicates the prevalence of CVD mortality rate in the Kingdom of Saudi Arabia is 46% [10]. This significantly high percentage might be related to the lack of awareness of cardiovascular risk factors. Sedentary life, smoking and high consumption of fast food have increased in community, despite the fact that they can be prevented [11, 12]. In Jeddah, research had studied the prevalence of undiagnosed CVD risk factors in adults aged 20-40 and indicated that CVD risk factors are common in young adults [13].

In this study, we determined the common prevalence factors for the CVDs including blood pressure, blood glucose, obesity, and smoking during the "Public Awareness Programme" organized by the medical students of the College of Medicine at Shaqra at Al-Basateen Mall in February 2019.

METHODS

A cross-sectional study was conducted in February 2019 where data was collected from a "Public Awareness Programme" campaign conducted at Al-Basateen Mall, Shaqra city, Saudi Arabia. We briefed male and female visitors of Al-Basateen mall about cardiovascular risk factors.

Ethical consideration:

The Institutional Ethical Committee approved the research protocol with approval number: SUCOM/LIRB/2019-04).

A brief questionnaire was answered by each male and female participant about medical history, smoking status, medications, and family history. Blood pressure (BP) measurement was taken as per the American Heart Association recommendations [14]. BP readings were obtained for each male and female participant. The analysis was based on JNC-8 recommendations to define HBP. We considered HBP if the systolic blood pressure (SBP) exceeded 140 mm Hg and/or the diastolic blood pressure (DBP) exceeded 90 mm Hg [15].

Body mass index (BMI) of the participants was calculated as weight (kg) divided by the square of height (m²). Participants were categorized according

to World Health Organization (WHO) categorization as follows: underweight (BMI < 18.5 kg/ m^2), normal (BMI = 18.5 - 24.9 kg/ m^2), overweight (BMI = 25 - 29.9 kg/ m^2), obese class I (BMI = 30 - 34.9 kg/ m^2), obese class II (BMI = 35 - 39.9 kg/ m^2), and obese class III (BMI ≥ 40 kg/ m^2) [16].

Blood glucose level of the participants was measured using a manual glucometer. All participants were asked about their last meal, to categorize readings as fasting or random, we depended on the 8-h limit. All participants were labeled according to the cutoff points established by the WHO, which are defined as follows: 126 mg/dL for fasting and 200 mg/dL for random [17].

Statistical analysis

IBM SPSS version 20 was utilized for data entry, management, and analysis. Descriptive statistics were used in the form of frequencies and percentages for categorical data, mean and standard deviation for quantitative data. To compare qualitative variables, we utilized the Chi-square test and we used a P < 0.05 to determine statistical significance.

RESULTS

The study sample was 369 participants. The demographic characteristics and risk factors frequency calculations for the participants are presented in Table 1. 197 (53.38%) participants had an abnormal BMI of ≥25 kg/ m^2 and 86 (23.30%) participants had classified as obese (figure 1).

There was a statistically significant (p= 0.026) relationship between gender and abnormal body weight as seen in table 2 as females represent a higher proportion of obesity and overweight categories when compared to males.

81 (24.8%) participants were smokers. The first-degree relative family history of DM and HTN combined was present in 188 (50.09%) participants (figure 2). 62 (16.8%) participants were reported having a history of high cholesterol and/or triglyceride levels. 6 (1.6%) participants were diagnosed with diabetes mellitus and 38 (10.3%) were diagnosed with hypertension.

Table 1: Parameters values of participants

Parameters	n (%)
Age range	18-45
Male	267 (72.4%)
Female	102 (27.6%)
Blood Pressure Measurements: SBP and/or DBP <140/90 mmHg SBP and/or DBP ≥140/90 mmHg	331 (89.7%) 38 (10.3%)
Blood Glucose Measurements: RBG < 200 mg/dl RBG ≥ 200 mg/dl	363 (98.4%) 6 (1.6%)
Smoking status: Non-smokers Smokers	246 (75.2%) 81 (24.8%)
Family history of CVD risk factors: DM only HTN only Both HTN and DM only Abnormal lipids	59 (15.9%) 32 (8.6%) 188 (50.09%) 62 (16.8%)
Body Mass Index: Underweight (< 18.5 kg/m^2) Normal (18.5-24.9 kg/m^2) Overweight (25-29.9 kg/m^2) Obese class I (30-34.9 kg/m^2) Obese class II (35-39.9 kg/m^2) Obese Class III (≥ 40 kg/m^2)	11 (3.0%) 161 (43.6%) 111 (30.1%) 59 (16.0%) 15 (4.1%) 12 (3.3%)

Table 2: Variables associated with the gender on Univariate analysis

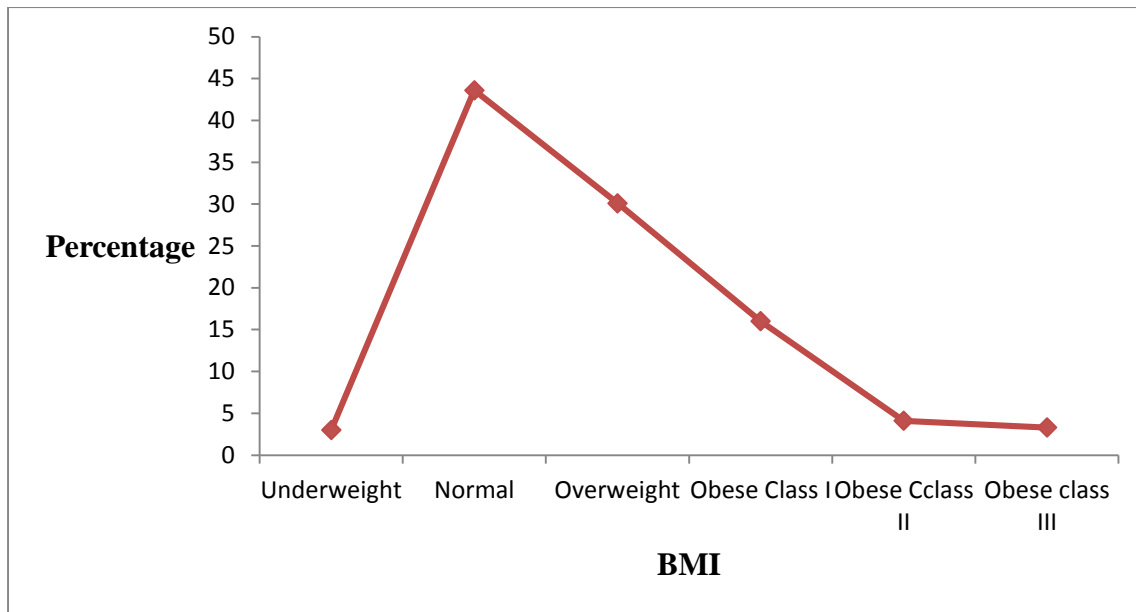| Variables	Male n=267 (% within gender)	Female n=102 (% within gender)
Body Mass Index		
BMI $\geq$ 25 kg/m^2	133 (49.8%)	64 (62.7%)
BMI < 25 kg/m^2	134 (50.2%)	38 (37.3%)
Smoking status		
Current smoker	79 (29.7%)	2 (2.0%)
Non-smoker	187 (70.3%)	100 (98.0%)
Blood Pressure		
SBP $\geq$ 140 and/or DBP $\geq$ 90	29 (10.9%)	9 (8.8%)
SBP/DBP < 140/90	238 (89.1%)	93 (91.2%)

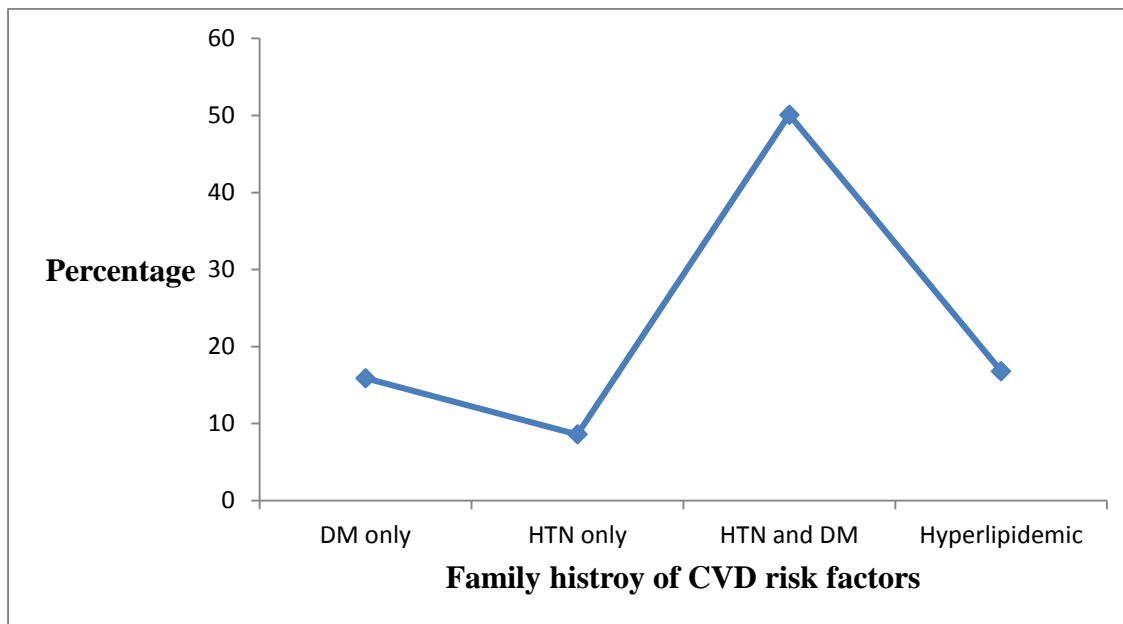Figure 1: Body Mass Index of the participants

Figure 2: Family history of CVD risk factors

DISCUSSION

Cardiovascular risk factors burden in the population of Saudi Arabia is quite high, with a previous national study showing almost half of the study cohort (49.8%) having more than three cardiovascular risk factors with dyslipidemia being the highest factor followed by obesity, diabetes mellitus, and hypertension [18]. Researchers from worldwide indicated high prevalence of CVD among the respective population which is nationwide growing problem [19]. In this study, we attempted to quantify the prevalence of cardiovascular risk factors in the community of Shaqra a rural city in the middle region of Saudi Arabia through personal medical history and actual measurements of BMI blood glucose and blood pressure to assess the existence of undiagnosed diseases in these participants. Participants with undiagnosed diabetes prevalence of RBG $\geq$ 200 mg/dL [17] was 6 (1.6%). One study done in the western region of Saudi Arabia indicated a 1.3% prevalence of undiagnosed DM [20]. An international study done in China in 2016 measuring the prevalence of undiagnosed HTN was (21.3%) [21] and a national survey was done in Saudi Arabia covering HTN awareness, treatment, and control which showed 14.1% of undiagnosed cases [22]. One of the most important risk factors which are obesity, shown to be a very common problem in our population and a red flag reaching up to (53.38%) of the sample having an abnormal BMI $\geq$25 kg/m^2. While obesity classes combined add up to (23.30%) which are both really high when compared to the 36% prevalence of abnormal bodyweight representing the global burden [23].

One study was done in the Saudi population in 2013 showing 57% prevalence of abnormal BMI [24]. One survey conducted nationally in Saudi Arabia covering males and females from the age of 15 and older that recruited 10,000 participants and found out that smoking prevalence was (12.2%) [25] and in another study done in 2010 in the eastern province indicated (16.9%) were smokers [26, 27]. Our study shows a higher prevalence of smoking in Shaqra population of 24.8%.

CONCLUSION

It is obvious from the results of this study that cardiovascular disease risk factors are very common among the population of Shaqra, thus campaigns to raise the awareness of CVD risk factors and provide ways to combat it while encouraging annual medical check-ups to promote health to lead a wholesome life unburdened by illness.

Conflict of Interest:None

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