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Prevalence of cardiovascular risk factors among elderly

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ABSTRACT

Background: Cardiovascular diseases (CVDs) are a group of disorders considered to be the leading cause of death worldwide. This study aimed to assess the prevalence of CVD risk factors in residential care centers (RCCs) among adults and the elderly in Jeddah, Saudi Arabia. *Methodology:* A descriptive cross-sectional study was performed in RCCs in 2018 in Jeddah, Saudi Arabia. A total of 265 participants were interviewed, and males and females who were at least 18 years old were included in the study. Information about

diabetes mellitus (DM), hypertension (HTN), dyslipidemia, physical inactivity, smoking and stress was collected. *Results:* We analyzed data from 259 participants, and DM, HTN and dyslipidemia were highly prevalent in the sample (27%, 30.1% and 23.6%, respectively). A total of 32.8% of the participants were illiterate, and 37.8% reported experiencing stress. Additionally, there was a significant relationship between CVD risk factors (HTN, DM, dyslipidemia, smoking, income, obesity and physical inactivity) and age group. *Conclusion:* Low education levels and low income contributed to the finding that the risk factors for CVDs in RCCs were higher than those in the normal population in Saudi Arabia. Health authorities should develop effective public health policies for RCCs.

Keywords: Residential care center, diabetes mellitus, hypertension, dyslipidemia, smoking.

1. INTRODUCTION

Cardiovascular diseases (CVDs) are the leading cause of death worldwide in developed and developing countries. CVDs are a broad group of disorders involving the heart and vascular system. These disorders include coronary heart disease, peripheral arterial disease, cerebrovascular disease, congenital anomalies of the heart, rheumatic heart disease, pulmonary embolism and deep vein thrombosis (WHO, 2017). Fortunately, most CVDs are highly related to controllable risk factors, such as diabetes mellitus (DM), hypertension (HTN), and dyslipidemia, or preventable risk factors, such as smoking, alcohol, physical inactivity, stress, and obesity (AHA, 2018), (MOH, 2013).

The World Health Organization (WHO) showed that (31%) of the global population (17.7 million people) died from CVDs in 2015 (WHO, 2017). CVDs account for 42% of noncommunicable disease deaths in Saudi Arabia, representing 17.3 million deaths per year, and this number can increase over time. By 2030, nearly 23 million people will die from CVDs, mainly from heart disease and stroke (MOH, 2013).

In Jeddah, Saudi Arabia, the mortality rate of CVDs was estimated to be 46% in 2016, which was highest rate in the adult population (Alharthi et al., 2017). In China in 2016, Jie Wu et al. showed that CVD risk factors increased with age (Wu et al., 2016). Amjad M. Ahmed et al. conducted another study in 2017 in Saudi Arabia and showed that CVD risk factors were highly prevalent among Saudis (Ahmed et al., 2017).

There are a limited number of studies regarding the prevalence of CVDs and their risk factors among the elderly in Saudi Arabia. Thus, this study aimed to assess the prevalence of CVD risk factors among the adult and elderly population in residential care centers (RCCs) in Jeddah, Saudi Arabia.

2. METHODOLOGY

This study was approved by the Institutional Review Board (IRB) of King Abdulaziz University Hospital (KAUH) on 13-May-2018, reference number: 325-18. A descriptive cross-sectional study was performed in RCCs in Jeddah, Saudi Arabia, in June-July 2018.
Males and females who were at least 18 years old were included in the study. Those who were younger than 18 years old, had a speaking disability, or had any cognitive problem were excluded. Verbal consent was obtained from all participants. A cluster sample of 265 individuals was interviewed in the RCCs.

All data collectors were well trained to interview the participants. The questionnaire was a well-structured electronic assessment that was translated into Arabic by an intended interpreter. After providing a thorough explanation of the study, the interviewers collected the following data: sociodemographic data (sex, marital status, age, educational level and income) and all related cardiovascular risk factors (HTN, DM, dyslipidemia, smoking, physical inactivity, family history of CVDs, weight and height to calculate body mass index (BMI) and stress). Age was categorized as follows: young adult (18 – 35 years), middle-aged adult (36 – 55 years) and elderly adult (over 55 years) (Petry, 2002).

BMI was calculated by the following equation: BMI = weight (in kilograms) over height squared (in meters). BMI was categorized into the following four groups according to WHO guidelines: underweight (less than 18.5 kg/m2), normal (18.5 - 24.9 kg/m2), overweight (25 - 29.9 kg/m2) and obese (more than 30 kg/m2). For physical activities, we divided the participants into three groups: physically active (those who walked for at least 30 minutes three times per week), physically inactive (those who did not walk at least for 30 minutes three times per week) and physically disabled as shown in fig. 1. We obtained information about dyslipidemia by asking participants about their cholesterol levels. Stress and income were self-reported.

Age groups		
Young adult	**Middle-aged adult**	**Elderly adult**
18-35 years	36 to 55 years	Over 55 years

Body Mass Index categories			
Underweight	**Normal**	**Overweight**	**Obese**
Less than 18.5 kg/m2	18.5 - 24.9 kg/m2	25 - 29.9 kg/m2	More than 30 kg/m2

Physical activity levels		
Physically active	**Physically inactive**	
Those who walked for at least 30 minutes three times per week	Those who did not walk at least for 30 minutes three times per week	**Physically disabled**

Figure 1 Categorization of the study patients into the different groups

Data entry was performed with Microsoft Excel 2014, and statistical analysis was performed by the Statistical Package for the Social Sciences (SPSS V21), with statistical frequencies and percentages being used to summarize categorical data (demographic information) and all risk factors. Measures of central tendency (MCT) were used for continuous data and were reported as the mean ± standard deviation. Bivariate qualitative variables comparing CVD risk factors with age group were evaluated with chi-square tests.

3. RESULTS

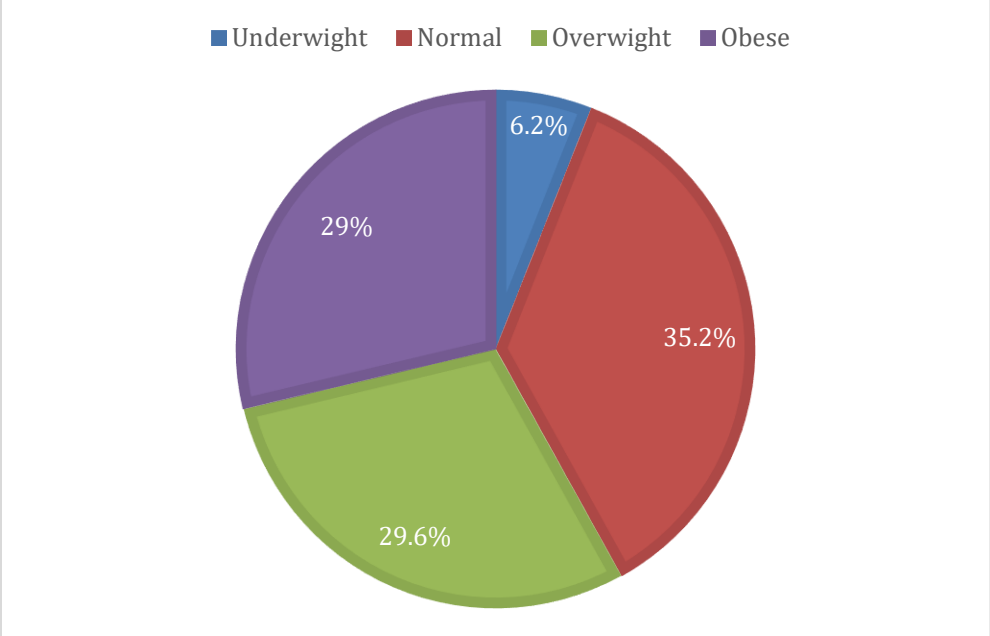
In this study, we aimed to define the prevalence of CVD risk factors among the adult and elderly population. This was a descriptive cross-sectional study conducted in RCCs in Jeddah, Saudi Arabia, in June-July 2018. Out of the 265 participants, six participants were excluded. The majority of the participants were female (80.3%, n=208), and males comprised (19.7%, n=51) of the sample. Participants' ages ranged from 18-100 years old, with a mean age of 48.5 ± 17.4 years (Table 1).

Table 1 Demographic data of the participants (N = 259)

Sociodemographic profile		No.	%
Age group	Young adult	68	26.3
	Middle-aged adult	101	39.0
	Elderly adult	90	34.7
Marital Status	Single	44	17
	Married	82	31.7
	Divorced	73	28.2
	Widowed	60	23.2
Nationality	Saudi	63	24.3
	Non-Saudi	196	75.7
Educational level	Illiterate	85	32.8
	Primary school	50	19.3
	Secondary school	36	13.9
	High school	66	25.5
	College	21	8.1
	Completion of college	1	0.4

	degree		
Income	Good	17	6.6
	Medium	78	30.1
	Low	108	41.7
	None	56	21.6
Smoking	Smoker	40	15.4
	Previous smoker	27	10.4
	Nonsmoker	192	74.1

Stress was the most prevalent risk factor (37.8%) of our sample (Table 2). BMI categories were as follows: underweight (6.2%), normal (35.2%), overweight (29.6%) and obese (29%) (Fig. 2).



* BMI: body mass index. * Obese includes obese class I, II, and III.

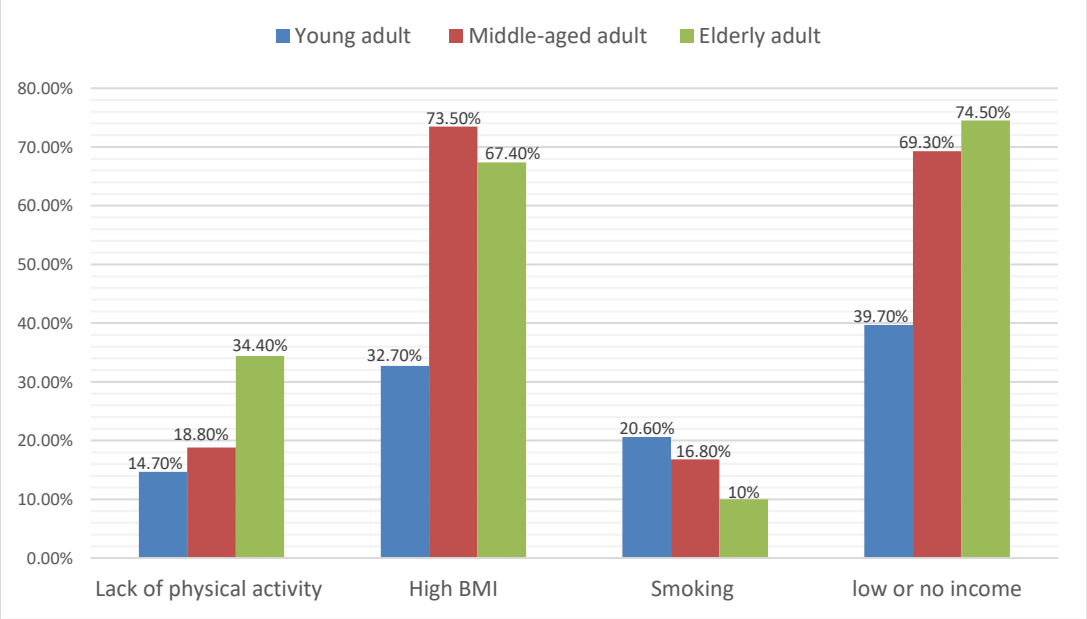
Figure 2 Distribution of patients among the different age categories

Table 2 Cardiovascular risk factors

CVD risk factors		No.	%
DM	Yes	70	27.0
	No	189	73.0
HTN	Yes	78	30.1
	No	181	69.9
Regular PHC follow-up	Yes	90	34.7
	No	169	65.3
History of CVDs	Yes	30	11.6
	No	229	88.4
Stress	Yes	98	37.8
	No	81	31.3
	Sometimes	80	30.9

Physical activity	Active	192	74.1
	Inactive	60	23.2
	Disabled	7	2.7
Family history of CVDs	Yes	82	31.7
	No	158	61.0
	Do not know	19	7.3
Cholesterol	Yes	61	23.6
	No	131	50.6
	Do not know	67	25.9
Alcohol	Yes	0	0
	No	253	97.7
	Refuse to answer	6	2.3
* DM: diabetes mellitus, HTN: hypertension, PHC: primary health care, CVDs: cardiovascular diseases.			

We found statistically significant results when we examined the relationships between age group and the following variables: physical inactivity (p-value = 0.000398), high BMI (p-value = 0.000056), smoking (p-value = 0.030) and low to no income (p-value = 0.000432) (Fig. 3).

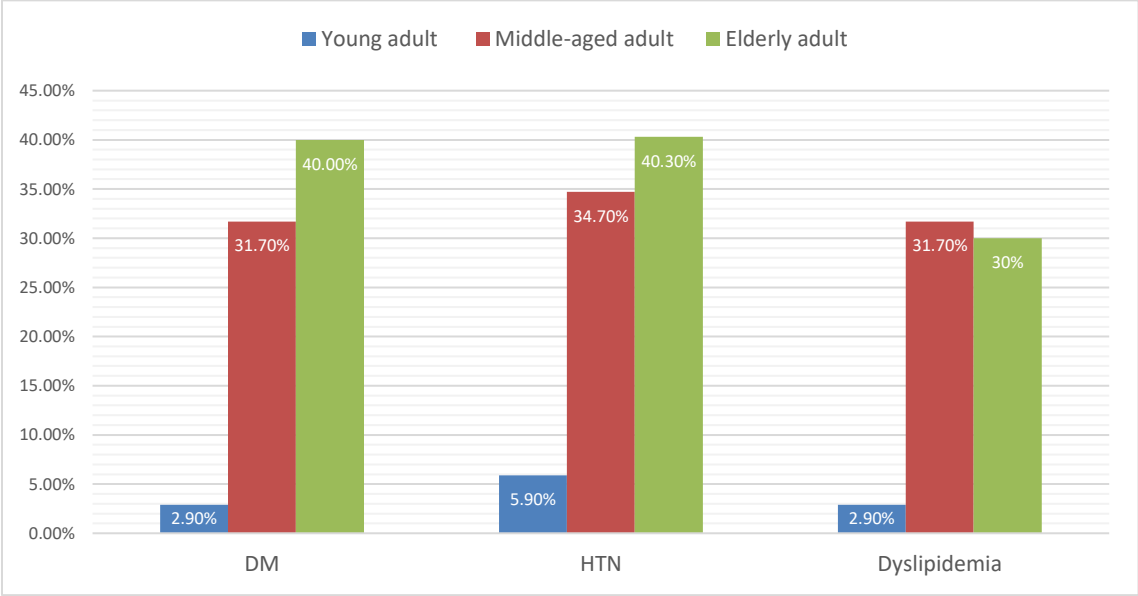


* In this figure, we used the chi-square test to determine the relationships between the most common CVD risk factors and different age groups. * BMI: body mass index.

Figure 3 Distribution of cardiovascular risk factors among the different age groups

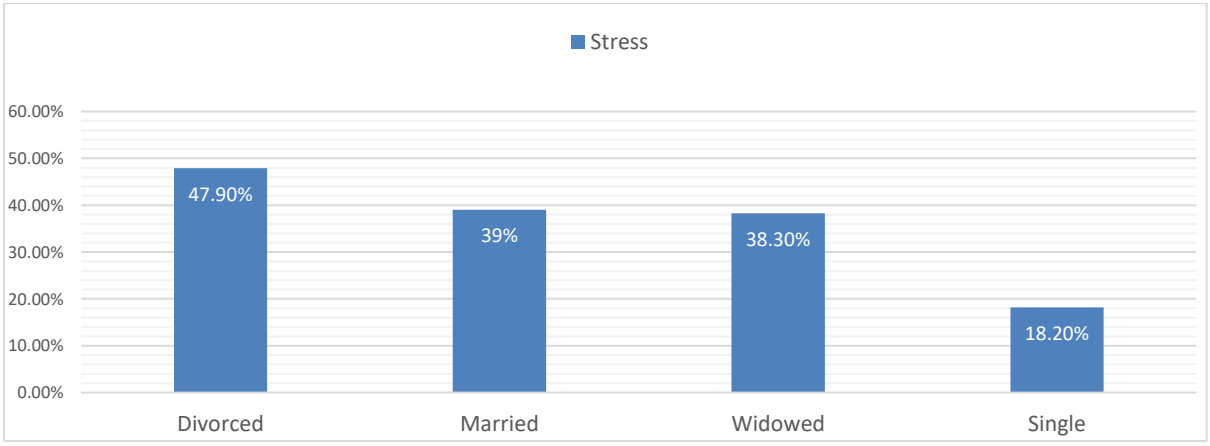
We also found a highly significant relationship between age group and DM (p-value = 0.000001), HTN (p-value = 0.000001) and dyslipidemia (p-value = 0.000078), as shown in Figure 4.

There was a strong association between marital status and stress, such that stress was highly prevalent in divorced participants (47.9%; p-value= 0.004) (Fig. 5).



* In this Figure, we used the chi-square test to determine the relationships between chronic diseases related to CVD risk factors and different age groups. * DM: diabetes mellitus, HTN: hypertension.

Figure 4 Distribution of chronic diseases in the different age groups



* In this Figure, we used the chi-square test to determine the relationship between marital status and stress.

Figure 5 Relationship between marital status and stress level

However, there was no significant relationship between age group and stress and family history of CVDs (p-value > 0.05).

4. DISCUSSION

Our study aimed to assess the prevalence of CVD risk factors among the adult and elderly population in RCCs in Jeddah, Saudi Arabia. A multicenter study conducted in 2016 showed an increased prevalence of HTN (31.5%) among adults in low- and middle-income countries (Mills et al., 2016). On the other hand, two national studies showed that the prevalence estimates of HTN in middle-aged groups in Tabuk and Jeddah were 11.1% and 8.3%, respectively, which were lower than the prevalence of HTN of the same age group in our study (34.7%) (Alharthi et al., 2017, Gutierrez et al., 2018).

With regard to DM, a meta-analysis study performed in China (2000-2014) among adults aged 65–74 years old showed a higher prevalence of approximately 14.1% (Yang, et al., 2016) which is similar to the prevalence found in a study conducted in Saudi Arabia (14.4%) (WHO, 2016). In this study, we found a higher prevalence of diabetic individuals (27%). A study in 2013 among adults in

Saudi Arabia showed that the prevalence of dyslipidemia was 8.5% (Ibrahim et al., 2014). However, the current study showed that the prevalence of dyslipidemia in adults was 23.6%. The high prevalence of HTN can be explained by the fact that the majority of the participants were female, and half of them were either divorced or widowed, which could cause a high level of stress. Other risk factors for DM, HTN and dyslipidemia were prevalent, such as an unhealthy diet, which may be attributable to low levels of education. Approximately one-third of the participants was illiterate and had low incomes, and they could not afford healthy food. Most of our participants with comorbidities did not have long-term access to medication; hence, the compliance level was low.

There was no difference in the prevalence of smoking between the population in RCCs and the general population (15.4% and 12.2%, respectively) (Moradi-Lakeh et al., 2015). The prevalence of overweight and obesity was high (58.6%), which is mostly explained by sedentary lifestyles, multiple comorbidities and little knowledge about healthy diets. Primary health care (PHC) was found to be indicative of overall health and to minimize differences among various subgroups. Hence, a lack of regular checkups with PHC providers influences CVD risk factors.

Limitations

The limitation of our study was the unequal sex distribution of our sample (80.3% females and 19.7% males). In addition, the sample size was relatively small that may affect the reliability of the results.

5. CONCLUSION

The prevalence of CVD risk factors among adults and the elderly aged (18 to 55 years) is high. The findings of our study indicate strong significant relationships between different age groups and DM, HTN, dyslipidemia, BMI, physical inactivity, and smoking. Health authorities should develop effective public health policies for RCCs. PHC should be accessible to the RCC population to facilitate the early detection and management of CVD risk factors to improve overall public health.

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Conflicts of interest

All authors declare that there are no conflicts of interest.

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