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# Population awareness of CVD risk factors and lifestyle modifications according to their knowledge

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**ABSTRACT**

**Background:** In the world, cardio-vascular disease accounts for the majority of mortality. It accounts for 50% of all reported deaths worldwide and is expected to increase significantly. Cardiovascular disease is also a major cause of death in Saudi Arabia. The objective of this paper was to assess population awareness on cardiovascular diseases risk factors and to determine the lifestyle modifications according to their knowledge among a random representative sample of Jeddah population, Saudi Arabia. **Methods:** This is a cross-sectional study that used self-administered questionnaires conducted in population (age of 18 years to 60 years) who lives in Jeddah city excluding the medical staff. Data was analyzed via the Statistical Package of Social Science Software (SPSS). **Results:** There were 825 respondents in this study, and women made up the majority (74.1%). Age and knowledge score were significantly correlated, with younger groups having better knowledge than other groups. Additionally, marital status was related to CVD knowledge, with singles outperforming other individuals. Saudis scored better on knowledge than non-Saudis. Finally, people who were not employed performed considerably worse than participants who were students. **Conclusion:** Our conclusion in this study, we found sub-optimal levels of knowledge about cardiovascular disease and warning signs of CVD occurrences in a population in Jeddah, Saudi Arabia. Being Saudi, younger, unmarried, and a student all contributed to having moderate-to-good comprehension. Community education on CVDs, concentrating on those with low socioeconomic status, may be useful in the combined efforts to achieve CVD reductions.

**Keywords:** CVD, Risk Factors, Saudi Population, Knowledge, Awareness.

**1. INTRODUCTION**

The term "cardiovascular disease" refers to diseases that primarily affect the heart and blood vessels, such as coronary (ischemic) heart disease (CHD),

congenital heart disease, peripheral arterial disease (PAD), rheumatoid heart disease (RHD), cerebrovascular disease, deep vein thrombosis, and pulmonary embolism (Olvera Lopez et al., 2022; Walden & Tomlinson, 2011). CVD is considered as the most common cause of death worldwide, resulting in more than 50% of deaths globally (Alhabib et al., 2020). Previous research demonstrated that the key to changing one's lifestyle is having awareness about behavioral hazards, and those who believe they have a higher chance of developing CVDs are more likely to live a healthy lifestyle (Hassen et al., 2022; Alshahrani et al., 2022; Almutairi et al., 2021; Rippe, 2019).

According to global burden of disease reported, there were 422.7 million cases of CVD globally in 2015, resulting in 17.92 million mortalities (Roth et al., 2017). CVD is a significant problem among developing countries despite a limited understanding of those diseases and associated risk factors, a significant portion of CVD cases occur in those with low income, in particular (Negesa et al., 2020). Education appears to be a strong predictor of knowledge about cardiovascular risk factors, with a higher level of knowledge associated with higher education based on the limited available data (Mullie & Clarys, 2011). In Saudi Arabia, where it is estimated that CVD accounts for more than 45% of all deaths (Alhabib et al., 2020).

The health belief model claims that knowledge about healthy behavior is a powerful moderator of healthy living, but that it should be paired with other elements, including favorable views, a positive attitude toward health, and a variety of other situations, including social economic versions (Negesa et al., 2020). Research findings have shown that understanding of particular risk variables is linked to positive lifestyles; however, knowing alone does not inspire behavior change (Abed et al., 2015; Alzaman et al., 2013; Burger et al., 2016; Maruf et al., 2018). The prevalence in Saudi Arabia for modifiable factors like obesity (28.7%), dyslipidemia (1.9%), diabetes (8.95%), hypertension (15.15%), and smoking (12.2%), -According in Ministry Saudi health in 2013- and non-modifiable factors like age, ethnicity, and family history (Ministry of health, 2013).

Regarding to the awareness importance of cardiovascular diseases, high level of patient awareness helps provide early medical care which may lead to better patient outcomes (Mukattash et al., 2012). There is no reliable estimate of the level of CVD risk factors awareness among population in Jeddah city. The aim of this study is to assess population awareness on cardiovascular diseases risk factors and to determine the lifestyle modifications according to their knowledge .

## 2. METHODS

### **Study design**

This is a cross-sectional study design that was conducted in Jeddah city from Jun 2021-May 2022

### **Participants, recruitment and sampling procedure**

The study's population consisted who live in Jeddah city.

### **Sample size**

The minimum participants were 384 ,Confidence level 95%, margin of error 5% but the final sample size was 825 participants.

### **Inclusion criteria**

Saudi Population aged between 18 years and 60 years in Jeddah city.

### **Exclusion criteria**

Population who works in the health sector

### **Method for data collection and instrument**

A structured questionnaire was used as a study tool. This tool was developed after reviewing relevant studies conducted in Saudi Arabia and elsewhere. The final version of the questionnaire is classified into two sections. Section one contained socioeconomic background characteristics questions. The second section contained questions about CVD risk factors and their lifestyle modifications. Medical students collected the information using a Google form questionnaire and sent it to the population who live in Jeddah city.

### **Data analysis**

Data was entered and managed using the Statistical Package for Social-Sciences (SPSS) version 26. We used Kruskal-Wallis and Mann-Whitney tests for inferential statistics. A p-value that is lower than 0.05 was regarded statistically significant.

### 3. RESULTS

This study included 825 participants, the majority of whom (74.1%) were females. More than half (64.7%) of participants were aged 18 to 29 years, single (61.1%), Saudi (85.9%), students (50.2%), had a university degree (65%), and had a family monthly income less than 10,000 SAR (76.8%) (Table 1).

**Table 1** Sociodemographic characters of participants (n=825).

Parameter		Frequency (%)
Age, y	18 to 29	534 (64.7%)
	30 to 49	217 (26.3%)
	50 to 72	74 (9%)
Sex	Female	611 (74.1%)
	Male	214 (25.9%)
Marital status	Single	504 (61.1%)
	Married	291 (35.3%)
	Divorced	24 (2.9%)
	Widowed	6 (0.7%)
Nationality	Non-Saudi	116 (14.1%)
	Saudi	709 (85.9%)
Employment status	Unemployed	160 (19.4%)
	Employed	213 (25.8%)
	Business	38 (4.6%)
	Student	414 (50.2%)
Educational level	Illiterate	1 (0.1%)
	Primary education	2 (0.2%)
	Intermediate education	22 (2.7%)
	Secondary education	211 (25.6%)
	University education	536 (65%)
Average family monthly income, SAR	Postgraduate education	53 (6.4%)
	Less than 10,000	634 (76.8%)
	10,000 to 20,000	141 (17.1%)
	More than 20,000	50 (6.1%)

#### The responses towards CVD knowledge among respondents

Respondents considered that not exercising causes CVDs (78.9%), unhealthy food causes CVDs (91.2%), dizziness and fatigue are signs of a heart attack (35.4%) (Figure 1), edema can be cause by HF (35%), walking reduces risk of CVD (95%), eating healthy food reduces risk of CVD (95%), maintaining normal BP reduces risk of CVD (90.5%), and maintaining normal blood glucose level reduces risk of CVD (76.4%). Smoking was the most reported risk factor for CVD (43.8%) (Table 2 and 3).

**Table 2** Knowledge of participants towards CVDs causes and protective factors (n=825).

Knowledge item	No	I don't know	Yes
Not exercising causes CVDs	101 (12.2%)	73 (8.8%)	651 (78.9%)
Unhealthy food causes CVDs	41 (5%)	32 (3.9%)	752 (91.2%)

Dizziness and fatigue are signs of a heart attack	204 (24.7%)	329 (39.9%)	292 (35.4%)
Edema can be cause by HF	134 (16.2%)	402 (48.7%)	289 (35%)
Walking reduces risk of CVD	13 (1.6%)	28 (3.4%)	784 (95%)
Eating healthy food reduces risk of CVD	9 (1.1%)	32 (3.9%)	784 (95%)
Maintaining normal BP reduces risk of CVD	15 (1.8%)	63 (7.6%)	747 (90.5%)
Maintaining normal blood glucose level reduces risk of CVD	52 (6.3%)	143 (17.3%)	630 (76.4%)
Previous diagnosis of CVD	731 (88.6%)	33 (4%)	61 (7.4%)

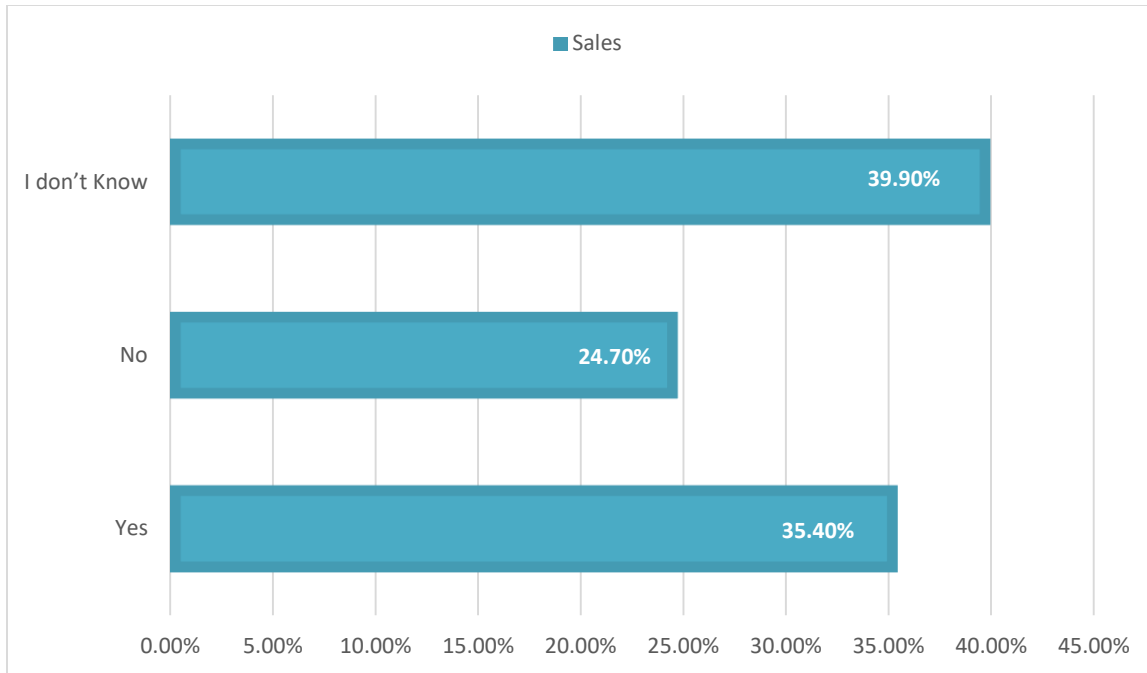


Figure 1 Knowledge of participants towards Dizziness and fatigue are signs of a heart attack (n=825).

Table 3 Knowledge of participants towards CVDs risk factors and manifestations (n=825).

Knowledge item	Frequency (%)	
CVD Risk factors	Family history	136 (16.5%)
	Hypertension	318 (38.5%)
	Hypercholesterolemia	324 (39.3%)
	Smoking	361 (43.8%)
	Obesity	335 (40.6%)
	Diabetes	144 (17.5%)
	All of the above	415 (50.3%)
	I don't know	26 (3.2%)
Manifestations of CVD include	Pain in the chest, shoulder, jaw, neck, or back	250 (30.3%)
	Epigastric pain	18 (2.2%)
	All of the above	429 (52%)
	Dyspnea	128 (15.5%)
Recommended frequency for measuring blood lipids	Three times a year	151 (18.3%)
	I don't know	290 (35.2%)
	Not needed	9 (1.1%)
	Once a year	324 (39.3%)
	Twice a year	51 (6.2%)

Table 4 shows that there was a significant association between knowledge score and age ( $p=0.010$ ) as there was higher knowledge in younger group ( $76\pm16.7$ ) more than other groups. Marital status was also associated with CVD knowledge where singles scored higher among other participants ( $p=0.050$ ). Higher knowledge score was evident among Saudis ( $75.6\pm16$ ) than non-Saudis ( $70.3\pm16.6$ ) ( $p=0.006$ ). Finally, students scored highest ( $77.2\pm16.6$ ) among participants, whereas unemployed participants scored significantly lower ( $71.6\pm16$ ) ( $p=0.004$ ).

**Table 4** Knowledge score in association with sociodemographic characters (n=825).

Parameter	Knowledge score	P-value
Total	74.8±16.2	
Age, y	18 to 29	76±16.7
	30 to 49	72.5±14.5
	50 to 72	73.3±16.4
Sex	Female	75.3±16.4
	Male	73.6±15.5
Marital status	Single	76.1±16.6
	Married	72.8±15.2
	Divorced	72.3±16.8
	Widowed	74.1±23
Nationality	Non-Saudi	70.3±16.6
	Saudi	75.6±16
Employment status	Unemployed	71.6±16
	Employed	72.5±15.6
	Business	76.1±12.6
	Student	77.2±16.6
Educational level	Illiterate	77.8
	Primary education	88.9±0
	Intermediate education	71.3±17.1
	Secondary education	71.9±17.7
	University education	75.9±15.8
	Postgraduate education	76.8±11.6
Average family monthly income, SAR	Less than 10,000	74.5±16.2
	10,000to 20,000	76.8±15.9
	More than 20,000	73.8±17.3

\*Kruskal-Wallis test was used.  
 \*\*Mann-Whitney test was used.

#### 4. DISCUSSION

The current study's results may be seen as a first step in obtaining quantitative data on the underlying level of awareness and perception of CAD risk factors among the public in Jeddah. These findings can be used for planning interventional educational campaigns to raise awareness of the public in Jeddah towards CVD. This cross-sectional study included 825 participants of the general population living in Jeddah that are not healthcare providers. Average knowledge score among participants was 74.8%.

There was a significant relationship between knowledge score and age ( $p=0.010$ ), with the younger group (76%) having more knowledge than the other groups. The participants recognized smoking as the most prevalent risk factor.

In a Kuwaiti study (Awad & Al-Nafisi, 2014), similar outcomes were observed. It is worth emphasizing that smoking is a risk factor that can be changed. The high-risk category may be persuaded to stop smoking with tailored health education. In our study, marital status was similarly linked to CVD knowledge, with singles scoring better than the rest of the group ( $p=0.050$ ). Many major CAD risk variables were found to be poorly recognized in the study. Comparable outcomes were observed in both regional and international studies (Awad & Al-Nafisi, 2014; Gill et al., 2010; Jafary et al., 2005; Mukattash et al., 2012). The inability of the participants to recognise the link between diabetes mellitus and coronary artery disease (CAD) reveals the community's lack of attention to the illness's strict management. Saudis (75.616) had a higher knowledge score than non-Saudis (70.316.6) ( $p=0.006$ ).

A higher-level of knowledge is linked to a healthy lifestyle and adequate self-care behaviors, according to studies from Nigeria, Germany, and Luxembourg (González et al., 2014; Ike et al., 2010; Tchicaya et al., 2018). Furthermore, findings out of a study showed that awareness of CV risk factors is correlated with educated grade, which is consistent with the current study's conclusion (Boateng et al., 2017). Outcomes from Pakistani concur with the findings of this study, wherein a lack of formal education is linked to a lower awareness of the risk factors for cardiovascular disease (Khan et al., 2006). As previously shown, enhancing literacy in emerging economies is essential to combating the growing burden of chronic illnesses, in particular CVD and its related lifestyle behaviors. However, nearly 1/3 of the respondents in the current research had no formal education (Negesa et al., 2020). Finally, among participants, students scored the highest (77.216.6), whereas unemployed persons scored substantially lower (71.6±16) ( $p=0.004$ ).

There are a few limitations in our study. Because of its cross-sectional character, it was difficult to explore causality. Some attributes were self-reported, which might lead to recall bias and over or underestimation. While awareness of CVD is not a guarantee of excellent cardiovascular outcomes, it is known that adequate information is required for people to make informed choices about their health and maybe adopt risk-free behaviors. Our results may be applicable to other regions of Saudi Arabia, since the knowledge gap observed in our research is consistent with findings from previous Saudi Arabian studies and also on par with sub-optimal awareness in a number of other studies.

## 5. CONCLUSION

In a community in Jeddah, Saudi Arabia, we discovered sub-optimal levels of knowledge of cardiovascular disease and warning signs of CVD events. Moderate-to-good understanding was connected with being younger, single, Saudi, and a student. In the joint efforts to achieve CVD reductions, community education on CVDs, focusing on groups with low socioeconomic status, may be advantageous.

### Ethics statement

Ethical approval was obtained from the Research Ethical Committee at Faculty of Medicine in Taif University, Taif City, Saudi Arabia (Ethical approval number :43-777). Participants were informed that their participation is voluntary and filling the questionnaire indicates their consent to participate

### Funding

This study has not received any external funding.

### Conflicts of interest

The authors declare that there are no conflicts of interests.

### Data and materials availability

All data associated with this study are present in the paper.

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