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ORIGINAL RESEARCH

Knowledge of Cardiovascular Disease Risk Factors and Its Primary Prevention Practices Among the Saudi Public – A Questionnaire-Based Cross-Sectional Study

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Background and Objectives: In response to the aging population and rapid rise of chronic diseases, it is important to understand the knowledge about primary prevention. We aim to explore Saudi adults' knowledge of cardiovascular disease (CVD) risk factors and its primary prevention practices among the Saudi public.

Methods: This is a cross-sectional community-based study, conducted among people living in Saudi Arabia to assess the knowledge of CVD risk factors using a total of 24-item questionnaires divided into two sections using the Likert scale, true /False/I do not know. The data were analyzed using the statistical software SPSS v. 26.0 (SPSS Inc., Chicago, IL, USA).

Results: In this study, the 81.8% of participants (n=296) agreed that high blood pressure was a risk factor for CVD, while more than two-thirds (68.8%; n=249) believed that diabetes was a risk factor for CVD. Furthermore, about the same proportion of respondents ((79.8%; n=289) and (78.7%; n=285)) agreed that physical inactivity and smoking were risk factors for CVD. In addition, the vast majority of them (n=324; 89.5%) believed that regular exercise aids in the prevention of CVD. In contrast, 74.9% (n=271) of individuals agreed that quitting smoking helps prevent CVD. This study indicated that 55.8% (n=202) of respondents had strong knowledge of CVD, while 44.2% (n=160) had inadequate awareness of CVD risk factors and prevention methods. In terms of the association between socio-demographic factors and overall participants' knowledge of CVD risk factors and preventative measures, we discovered that age (p=0.000), gender (p=0.011), educational status (p=0.000), and the presence of chronic disease (p=0.000) were all significantly associated with CVD knowledge score levels.

Conclusion: Saudi adults have adequate knowledge of CVD risk factors and prevention interventions, but more effort is needed to raise continuous awareness to reduce the prevalence of CVD.

Keywords: cardiovascular diseases, hypertension, stroke, risk factors, diabetes, obesity, primary prevention practice, Saudi public

Introduction

Cardiovascular diseases (CVD) also known as diseases related to the heart, are the most prevalent conditions leading to increased morbidity and mortality worldwide.[1] The World Health Organization (WHO) has estimated that CVD contributed to 32% of deaths globally, and interestingly 85% of the deaths were due to heart attacks and stroke.[1] Furthermore, most of the deaths due to CVD were reported in middle- and low-income countries.[2] It is projected that by 2030 more than 22.2 million individuals will die annually.[3,4] Usually, there were no established symptoms of blood vessel diseases, a heart attack and stroke are the first common sign of CVD.[1] Although CVD is a group of diseases characterized by chest pain, shortness of breath, fatigue, loss of consciousness, and discomfort in the arms, the left shoulder, elbows, jaw, or back.[1]

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The CVDs were associated with the disposition of fatty acids in the arteries, more commonly known as atherosclerosis, and increased risk of blood clots, thereby the destruction of the arteries in the brain, heart, kidneys, and eyes among the patients. There were four main types of CVD according to NHS, which include coronary heart disease (for example, angina, heart attacks, and heart failure) stroke and transient ischemic attacks (TIAs), peripheral arterial disease, and aortic diseases.[5] According to the British Heart Foundation, around 620 million people are living with heart and circulatory diseases across the world.[6] Furthermore, globally 1 in 13 individuals are living with heart disease. The prevalence of heart disease was more common in women (53% in 2019) than men (260 million).[6] The most common cardiovascular conditions are coronary (ischemic) heart disease (global prevalence estimated at 200 million in 2019), peripheral arterial (vascular) disease (110 million), stroke (100 million), and atrial fibrillation (60 million).[6] On the other hand, other literature revealed that heart attacks, followed by stroke, heart failure, arrhythmia, and heart valve complications were the most prevalent CVDs.[7] It was estimated that in 2021 globally there were 20.5 12 million individuals who died due to CVDs. Among those highest death rates were found in Asia and Australia (12 million individuals), followed by Europe (3.6 million individuals), Africa, and the Middle East (3.1 million individuals) north and Latin America reported 1.1 million deaths.[6]

In Saudi Arabia, the data suggested that the most common CVDs were coronary artery disease (18%), hypertension (16%), stroke (14%), peripheral artery disease (11%), and congenital heart disease (10%).[8] However, the majority of the CVDs were preventable by controlling the various risk factors associated with the incidence of CVDs.[6,9] The literature states that there are both modifiable and non-modifiable risk factors for CVDs.[6,9–11] For instance, modifiable risk factors are those that can be controlled or reduced by altering the behavior of an individual also known as a behavioral factor such as factors related to diet (excess consumption of fatty foods, sugars, carbohydrates), smoking, alcohol consumption, physical activity, and sleeping behavior. However, it was found that 53% of deaths were related to hypertension, and 32% were related to dietary factors.[6,12] In contrast, non-modifiable risk factors of CVDs were those that cannot be controlled or modified, for example, age, gender, genetics and ethnicity, and family history.[13]

According to the literature, it was noted that both nationally and internationally many studies reported an increased prevalence of CVD-related mortality which resulted in increased healthcare costs.[8,9,14,15] In addition, the prevalence of CVD differed according to the risk factors, for instance, it was higher among Scottish people with Type 2 diabetes,[9] while in Saudi Arabia the prevalence was reported to be higher among physically inactive people, followed by obese and overweight patients and hypertensive patients.[15] Furthermore, the prevalence was higher among Saudi women.[15] On the contrary, another study from the southern region of Saudi Arabia reported a high prevalence of CVD risk factors, in addition, previous findings also reported inadequate knowledge among the Saudi population about CVDs.[16]

There were limited studies assessed the knowledge about CVDs, more particularly among the Saudi population.[16] There were studies among healthcare professionals and patients' perspectives internationally.[4,17,18] For instance, the knowledge of CVDs among healthcare professionals were good,[17] while among CVD patients it was suboptimal,[17] among diabetes patients it was satisfactory,[4,19] while the knowledge among public perspective was low both nationally and internationally.[16,20] Therefore, it is essentially important to assess the CVD knowledge among the public to create more awareness about the disease, thereby preventing the possible adverse outcomes associated with the Risk of CVD. Furthermore, studies on knowledge of CVD risk factors and its primary prevention practices among the Saudi public are rare in Saudi Arabia and other international countries. The comprehension of many elements of CVD disease among Saudi adults in Saudi Arabia has not been the subject of any research. Therefore, the purpose of this study was to assess the knowledge of CVD risk factors and its primary prevention practices among the Saudi public.

Methods

Study Design

This cross-sectional study was conducted between March 21st to June 21st in 2023 and utilized online-based questionnaires distributed using social media platforms and prepared by Google Forms™ in the community of Saudi Arabia. We developed a questionnaire to investigate the knowledge of CVD risk factors and its primary prevention practices of the Saudi public using similar studies published elsewhere.[3,4] This study included adults aged >18 years or more, Saudi nationals currently residing in

the capital region of Saudi Arabia, and able to provide informed consent were included in the study. However, individuals who did not match the inclusion criteria, and who incompletely answered the survey were excluded from the study.

Sample Size

Similar to previous studies,[21–30] the required sample size was calculated using the Raosoft online calculator at 95% Confidence intervals (CI) and 5% margin of error (ME), by assuming the unknown population of 20,000 individuals, the required sample size was estimated to be 377. To ensure reliability and to avoid sample bias, we decided to survey at least 400 individuals, therefore the required sample size was estimated to be n=400.

Operationalization and Measurements

The questionnaire was titled "Knowledge of CVD risk factors and its primary Prevention practices" and was developed in light of the stated objectives and purposes of the study. The King Saud University Ethics Committee authorized the experimental protocol, and informed consent was acquired before any data were collected. Furthermore, this study complied with the Declaration of Helsinki guidelines for human research. No pertinent data was gathered from the self-administered questionnaire. The ability to withdraw at any moment was given to the participants.

The study tool was designed by two authors and included 22 questions. Additional File 1 is the questionnaire used in this study. The survey inquired about the following: a) background information of the respondents which includes age, gender, marital status, occupation, education, monthly income, presence of chronic disease, physical activity status, and, type of physical activity b) The knowledge about CVD risk factors (7-items) (which includes questionnaires about the risk factors such as high blood pressure, overweight, excessive alcohol and tobacco intake, presence of Diabetes, physical inactivity, and unhealthy eating habits such as taking high-fat meals) and the preventative measures (6-items) (which includes questionnaires about the type of food should be avoided, physical activity helps in the prevention of CVD, adherence to treatment protocols, reduced alcohol consumption, screening for high blood pressure) were assessed using three-point scale namely True/False/I do not know.

After the initial preparation of the study tool, it was subjected to evaluation of its content, and accuracy. The two authors or researchers (one researcher from the College of Pharmacy and another researcher or associate professor from the College of Nursing) conducted a pilot study before beginning the original study. The pilot study was conducted among randomly selected participants (n=30), the results of this study as not concluded in the main findings. The Cronbach's alpha coefficients for the knowledge of risk factors and preventative measures were found 0.76 indicating that questionnaires are reliable and valid to carry out the study.

Data Collection and Distribution

The questionnaire was distributed among individuals in Riyadh, aged above ≥18 years using social media. For this purpose there was a researcher appointed, who looked out for the responses and distribution of the study tool. The survey was distributed primarily using snowball sampling to reach out to a significant number of individuals who were interested in answering the survey. To prevent some single individuals from entering the survey more than once, the survey was restricted to one response.

Statistical Data Analysis

All data were analyzed in SPSS (version 26) using basic statistics. A descriptive analysis was conducted to assess the prevalence and sociodemographic factors of the study population. The chi-square test was used for categorical variables analysis whenever applied. The data were analyzed using Statistical Package for Social Sciences version 26.0 (SPSS Inc., Chicago, IL, USA), and the p-value of <0.05 was considered statistically significant.

Results

Three hundred and sixty-four participated in the survey, giving a response rate of 91%. Table 1 shows the socio-demographic characteristics of the studied participants. Among the participants 208 (57.5%) of them female, 154 (42.5%) of them were male and two-third of the participants were married, and 23.8% the individuals in the age range of >40

Table 1 Participants' Sociodemographic and Professional Characteristics (n=364)

Variables	Frequency (n)	Percentage (%)
Gender		
Male	154	42.5%
Female	208	57.5%
Age		
20–25	68	18.8%
26–30	85	23.5%
31–35	72	19.9%
36–40	51	14.1%
>40	86	23.8%
Marital status		
Single	115	31.8%
Married	222	61.3%
Divorced	25	6.9%
Occupation		
Students	61	16.9%
Housewives	82	22.7%
Employed	189	52.5%
Unemployed	30	8.3%
Educational status		
High school/preparatory	101	27.9%
Elementary	44	12.2%
College (Graduates or post graduate)	217	59.9%
Monthly income*		
170,000 SR (Excellent)	108	29.8%
Between 6–16,000 SR (Good)	140	38.7%
>5000 SR (Poor)	49	13.5%
I do not have any income	65	18%
Presence of chronic disease		
Yes	171	47.2%
No	191	52.8%
Do you physically active		
Yes	278	76.8%
No	84	23.2%

Abbreviation: *SR, Saudi Riyals.

years. Regarding socioeconomic status (SES), more than half of the 189 (52.5%) participants were employed, slightly less than two-thirds (59%) were university graduates (graduates and postgraduates), 27.9% had preparatory or high-school education and 12.2% had elementary education. In terms of financial status, more than one-third of the participants (38.7%) had a good income (between 6 and 17,000 Saudi riyals). More than half of the participants (52.8%) were free from any chronic disease. Detailed demographic characteristics are presented in Table 1.

In this study, 66.6% of the respondents performed walking, while 33.7% were household work followed by 23.2% were cycling and 22.9% were running. The detailed frequency of the respondent's physical activity is given in Figure 1.

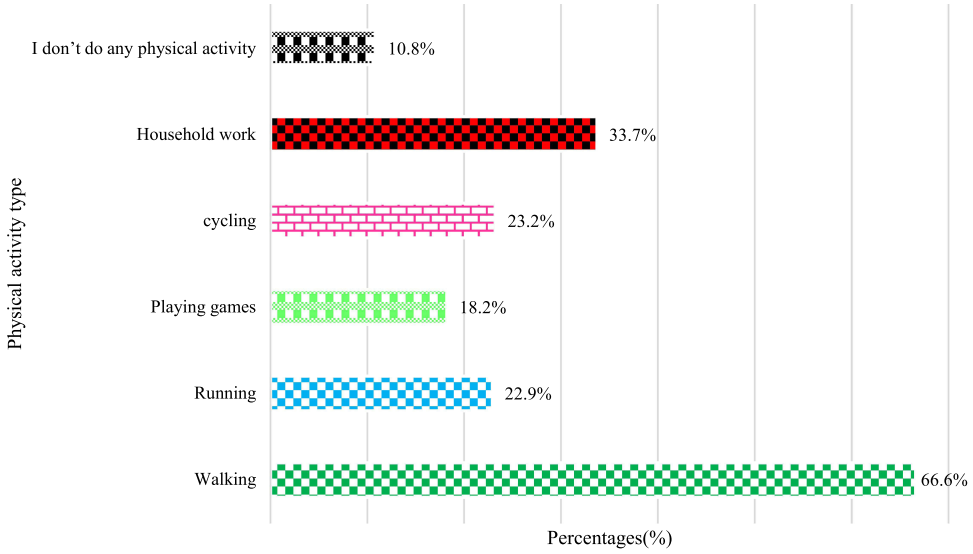

Figure 1 Type of Physical Activities.

Table 2 displays the findings of the participant knowledge assessment about risk factors. In this study, the majority of participants (n=296) believed that high blood pressure is a risk factor for CVD, while more than two-thirds (n=249) believed that diabetes is a risk factor for CVD. On the other hand, a similar percentage (78.5%; n=284) expressed concern about the likelihood that excessive alcohol use is a risk factor for CVD, and roughly 79.6% (n=288) of the participants reported being overweight. Additionally, almost the same number of survey respondents agreed with the statement that physical inactivity and smoking were risk factors for CVD (79.8%; n=289); (78.7%; n=285). Even though the majority of participants (83.7%; n=303) thought eating foods high in fat was a risk factor for CVD.

When asked about the best way to prevent CVD, 82.6% of respondents (n=299) said that cutting back on foods high in fat, sugar, and salt is a good idea. Meanwhile, the majority of participants (n=324; 89.5%) agreed that regular exercise helped avoid cardiovascular illnesses (Figure 2). In contrast, 74.9% (n=271) of the participants believed that quitting smoking aids in the prevention of CVDs. While the majority (81.8%; n=296) also believe that following treatment guidelines helps in preventing CVDs. The full questionnaires about the preventative measures and their codes were presented in Appendix 1.

As indicated in Figure 3, 55.8% (n=202) of the respondents in this study reported having good knowledge of CVD, while 44.2% (n=160) were found to have poor knowledge of CVD risk factors and preventative measures.

Table 2 Knowledge About CVD Risk Factors Among the Participants (n=362)

Variables	True n(%)	False n(%)	I Do Not know n(%)
Is high blood pressure a risk factor for CVD	296(81.8%)	20(5.5%)	46(12.7%)
Is overweight a risk factor for CVD	288(79.6%)	40(11%)	34(9.4%)
Is excessive alcohol intake a risk factor for CVD	284(78.5%)	33(9.1%)	445(12.4%)
Do you think Diabetes is a risk factor for CVD	249(68.8%)	44(12.2%)	69(19.1%)
Is physical inactivity a risk factor for CVD	289(79.8%)	28(7.7%)	45(12.4%)
Is cigarette smoking a risk factor for CVD	285(78.7%)	36(9.9%)	41(11.3%)
Is consuming foods rich in fats instead of vegetables and fruit a risk factor for CVD	303(83.7%)	29(8%)	30(8.3%)

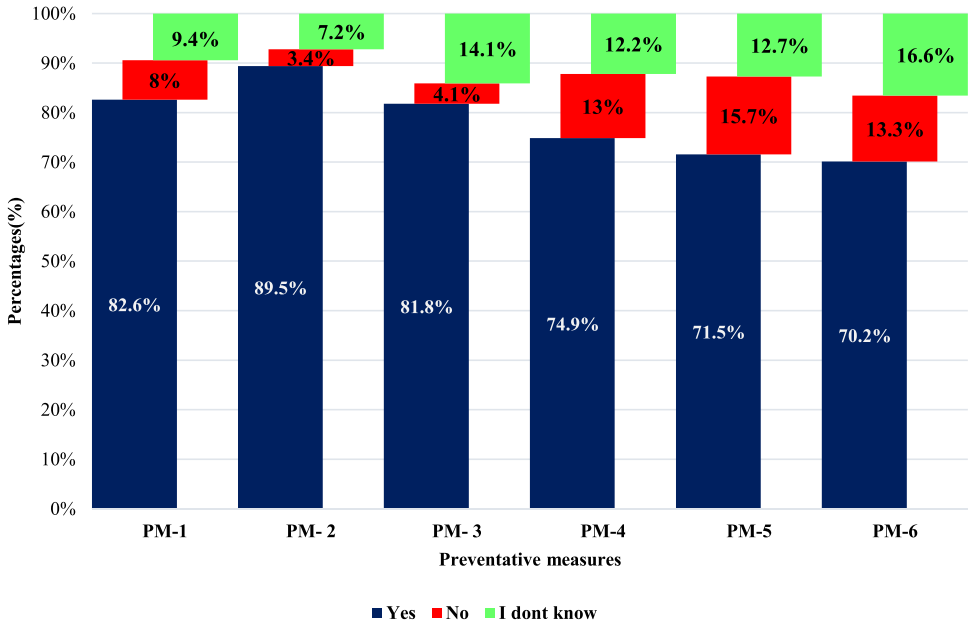

Figure 2 Participants responses towards preventative measures(PM) of CVD.

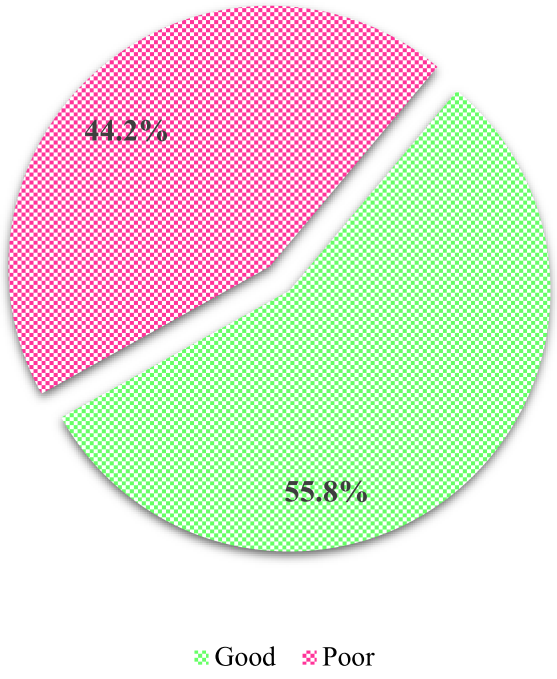

Figure 3 Levels of Knowledge among respondents.

The mean CVD scores and distribution among respondents were then assessed (Table 3). The results showed an average score of 9.38 ± 2.82 (min=1.00, max=13.00). About the distribution of CVD scores per item, the highest score was found for item 12 (37%, n=134), while the lowest was found in items 2 and 3 (1.1%, n=4). Regarding the association between socio-demographic factors and overall participants' knowledge of CVD risk factors and preventative measures score levels, we found that age (p=0.000), gender (p=0.011), educational status (p=0.000) and presence of chronic disease (p=0.000) were significantly associated with CVD knowledge score. The total knowledge of CVD was not significantly associated with marital status, occupation, monthly income, and physical activity. Detailed information Influence of respondents' characteristics on their knowledge levels is given in Table 4.

Table 3 Mean Knowledge of CVD Risk Factors and Preventative Measures Scores and Distribution Among the Studied Population (n=331)

Score	n	Min	Max	Mean (Median)	SD
Knowledge About CVD	**362**	**1.00**	**13.00**	**9.38 (10.00)**	**2.826**
Knowledge About CVD				**Count (n)**	**Percentage (%)**
			1	7	1.9%
			2	4	1.1%
			3	4	1.1%
			4	9	2.5%
			5	11	3.0%
			6	22	6.1%
			7	33	9.1%
			8	35	9.7%
			9	35	9.7%
			10	35	9.7%
			11	32	8.8%
			12	134	37.0%
			13	1	0.3%
			Total	362	100.0%

Table 4 Cross-Tabulation Between Demographic Characteristics and Knowledge of CVD Risk Factors and Preventative Measures Scores Categories

Participants Characters	Number of Respondents	Poor Knowledge	Good Knowledge	*p*-value
Age				
20–25	Respondents	82	66	0.0001
	% within age	55.4%	44.6%	
	% within knowledge categories	51.3%	32.7%	
26–30	Respondents	25	50	
	% within age	33.3%	66.7%	
	% within knowledge categories	15.6%	24.8%	
31–35	Respondents	5	26	
	% within age	16.1%	83.9%	
	% within knowledge categories	3.1%	12.9%	
36–40	Respondents	3	17	
	% within age	15%	85%	
	% within knowledge categories	1.9%	8.4%	
>40	Respondents	45	43	
	% within age	51.1%	48.9%	
	% within knowledge categories	28.1%	21.3%	

(*Continued*)

Table 4 (Continued).

Participants Characters	Number of Respondents	Poor Knowledge	Good Knowledge	*p*-value
Gender				
Male	Respondents	80	74	0.011
	% within age	51.9%	48.1%	
	% within knowledge categories	50%	36.6%	
Female	Respondents	80	128	
	% within age	38.5%	61.5%	
	% within knowledge categories	50%	63.4%	
Marital status				
Single	Respondents	44	71	0.298
	% within age	38.3%	61.7%	
	% within knowledge categories	27.5%	35.1%	
Married	Respondents	104	118	
	% within age	46.8%	53.2%	
	% within knowledge categories	65%	58.4%	
Divorced	Respondents	12	13	
	% within age	48%	52%	
	% within knowledge categories	7.5%	6.4%	
Occupation				
Students	Respondents	21	40	0.220
	% within age	34.4%	65.6%	
	% within knowledge categories	13.1%	19.8%	
Housewives	Respondents	38	44	
	% within age	46.3%	53.7%	
	% within knowledge categories	23.8%	21.8%	
Employed	Respondents	84	105	
	% within age	44.4%	55.6%	
	% within knowledge categories	52.5%	52%	
Unemployed	Respondents	17	13	
	% within age	56.7%	43.3%	
	% within knowledge categories	10.6%	6.4%	
Educational status				
High school/preparatory	Respondents	65	36	0.0001
	% within age	64.4%	35.6%	
	% within knowledge categories	40.6%	17.8%	
Elementary	Respondents	36	8	
	% within age	81.8%	18.2%	
	% within knowledge categories	22.5%	4%	
College (Graduate/Post graduate)	Respondents	59	158	
	% within age	27.2%	72.8%	
	% within knowledge categories	36.9%	78.2%	
Monthly income				
Excellent (>17,000 SR)	Respondents	47	61	0.371
	% within age	43.5%	56.5%	
	% within knowledge categories	29.4%	30.2%	
Good (Between 6–16,000 SR)	Respondents	58	82	
	% within age	41.4%	58.6%	
	% within knowledge categories	36.3%	40.6%	

(*Continued*)

Table 4 (Continued).

Participants Characters	Number of Respondents	Poor Knowledge	Good Knowledge	*p*-value
Poor (>5000 SR)	Respondents	20	29	
	% within age	40.8%	59.2%	
	% within knowledge categories	12.5%	14.4%	
I do not have any income	Respondents	35	30	
	% within age	53.8%	46.2%	
	% within knowledge categories	21.9%	14.9%	
Presence of chronic disease				
Yes	Respondents	92	79	0.0001
	% within age	53.8%	46.2%	
	% within knowledge categories	57.5%	39.1%	
No	Respondents	68	123	
	% within age	35.6%	64.4%	
	% within knowledge categories	42.5%	60.9%	
Do you physically active				
Yes	Respondents	122	156	0.827
	% within age	43.9%	56.1%	
	% within knowledge categories	76.3%	77.2%	
No	Respondents	38	46	
	% within age	45.2%	54.8%	
	% within knowledge categories	23.8%	22.8%	

Discussion

An increasing percentage of the world's population is being affected by CVDs, and their prevalence is rising day by day. Cardiovascular diseases are a group of conditions related to the heart and blood vessels. It is a complex medical condition that can show up suddenly or over time in many different ways. Despite the healthcare professional's support and counseling of patients and individuals on self-care, the management of CVDs requires a multidisciplinary approach. Knowledge of the diseases together would provide the best care for patients. The prevention of sudden cardiac incidence is made possible by persons with sufficient disease information, which is vital in this process. Furthermore, having enough knowledge will help people develop good behaviors for preventing diseases and get the right treatment and counseling to effectively manage their condition. As a result, people must have a firm understanding of the risk factors for CVD and the primary means of prevention. Therefore, the goal of this study was to evaluate the knowledge of risk factors for CVD and its primary prevention strategies to find any potential gaps in participants' knowledge of CVD. The findings showed that 56% of adults had a solid understanding of CVD. These results were comparable to previous studies published both nationally and internationally. For instance, Mujamammi et al revealed a knowledge score of 47.1% (Mujamammi et al 2020).[31] The knowledge score is different according to the study and population. For instance, a previous study by Workina et al in 2022[4] among diabetes patients reported 62.3%, of them, had good knowledge of modifiable CVD risk factors. On the other hand, another previous study reported very low knowledge, for example, Muhihi et al among Tanzania young adults reported that 25.4% had good knowledge score of risk factors.[32]

The majority of questions regarding the knowledge about the risk factors of CVD were correctly answered, which revealed good knowledge from the Saudi adults, with an overall mean score of 9.38 ± 2.82 out of the maximum score of 13. The findings of this study indicated that most of the respondents had adequate information about the risk factors of CVD, which occurs due to sedentary behavior, and unhealthy eating habits. In this study, 82% of the respondents agreed that high blood pressure is one of the causes of CVD. These findings were comparable to previous findings[4,33,34] (Workina et al 2022; CDCP; Bays et al, 2021). For example, Workina et al reported that 54.7% of the study participants identified hypertension as a risk factor for CVD.[4]

In this study, majority of the participants identified diabetes, excessive alcohol consumption, being overweight, and physical inactivity were other risk factors. Similar findings were reported by other authors internationally (Bays et al, 2021; Mujamammi et al, 2020).[31,33] For example, according to Aursulesei Onofrei et al, hypertension increases the risk of serious cardiovascular events.[35] Similarly, another study by Bays et al, 2021 study revealed that unhealthful nutrition, physical inactivity, dyslipidemia, hyperglycemia, high blood pressure, obesity, smoking, kidney dysfunction, and genetics/familial hypercholesterolemia were predominant risk factors for CVD.[33] On the other hand, Mujamammi et al, 2020 conducted a similar study among Saudi adults and revealed that unhealthy eating habits, smoking, dyslipidemia, and physical inactivity were the factors contributing to CVD.[31]

Similarly, the Centers for Disease Control and Prevention reported high blood pressure, high low-density lipoprotein (LDL) cholesterol, diabetes, smoking and secondhand smoke exposure, obesity, unhealthy diet, and physical inactivity (Centers for Disease Control and Prevention).[34] Therefore, following a healthy lifestyle, more particularly adhering to treatment guidelines, regular physical activity, and lifestyle modifications are potential to control the incidence of CVD among individuals, furthermore, raising awareness among individuals and continuous education about diabetes and hypertension management might be supportive efforts to reduce death rates from heart disease and stroke by preventing and controlling risk factors. In this study, the majority of respondents (89.5%) agreed that regular exercise, quitting smoking, and adherence to treatment guidelines are the best approaches to prevent cardiovascular illnesses, while 82.6% of respondents thought that limiting foods rich in fat, sugar, and salt is an effective strategy. These findings were comparable to previous findings by Workina et al in 2022 and revealed that more than three-quarters of the study's participants believed that avoiding foods high in fat, sugar, and salt, together with quitting smoking, would help reduce the risk of developing CVDs.[4]

In this study, knowledge of CVD risk factors and preventive measures was substantially correlated with respondents' ages, with respondents aged 26 to 30 years showing considerably higher levels of good knowledge (66.7%) than respondents in other age groups (p=0.0001). Similar to this, there was a significant relationship between the knowledge score and gender, with female respondents reporting higher levels of good knowledge (61.5%; n=128) (p=0.011). Additionally, as shown in Table 4, respondents with a college education (n=158; 72.8%) scored more favorably on good knowledge than those with other types of education (p=0.0001). The knowledge of CVD risk factors and prevention measures was also found to significantly correlate with the existence of the chronic disease in individuals (p=0.0001). The previous study reported that the educational status, college, and residence of the individuals were associated with knowledge of CVD risk factors. On the other hand, previous results did not find an association between knowledge and prevention practice of modifiable CVD risk factors with sex, marital status, monthly income, and age of the participants.[4]

Few limitations exist in our study. First, it is purely limited to the capital region of Saudi Arabia college and focused on assessing knowledge of CVD risk factors and preventive measures. Second, given the lower sample size, the study lacks the generalizability of the results. Despite these limitations, such a report is very crucial to unveil such issues first, if exist, then further investigate their impact on the research and demonstrate strategies to fix them later. With that being said, our study is the first of its kind that will establish the foundation of research on this issue.

Conclusion

Saudi adults have adequate knowledge of CVD risk factors and prevention interventions, but more effort is needed to raise continuous awareness to reduce the prevalence of CVD. Age, gender, educational status, and the presence of chronic disease were all strongly related to respondents' knowledge of CVD risk factors and preventative actions. It is crucial to encourage young adults to practice proper health care and to understand what it is about the age that causes people to become more health conscious as they get older. People must be informed about risk factors and disease management, while lifestyle changes are also necessary. Reminding patients to follow their treatment plan may also be very helpful in reducing the incidence. There is a need to investigate the variables that contribute to poor health habits and devise solutions to address them.

Data Sharing Statement

The data used to support the findings of this study is available from the corresponding author upon request.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no competing interests in this work.

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