Original Article

Awareness of Modifiable Cardiovascular Disease Risk Factors and Primary Preventive Practices Among the General Population in Makkah City: A Cross-Sectional Study

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ABSTRACT

Background: Cardiovascular diseases (CVDs) are the leading cause of mortality worldwide and account for about 42% of deaths in Saudi Arabia. CVDs are strongly influenced by modifiable risk factors, including smoking, physical inactivity, and unhealthy diets. However, awareness of these risk factors among the Saudi population remains suboptimal.

Objectives: This study aims to assess knowledge, awareness, prevalence of modifiable CVD risk factors, and primary prevention practices among the general population in Makkah.

Methods: A cross-sectional survey was conducted between April and May 2025 among the general population of Makkah city. Data was collected using an online validated questionnaire targeted residents >18 years via social media.

Results: The study included 623 participants, predominantly males (54.7%) aged 40–59 years (52.5%). Most participants (87.3%) demonstrated good knowledge of modifiable CVD risk factors, with high recognition of hypertension (95.7%) and hypercholesterolemia (94.1%), but lower awareness of diabetes (67.3%). While many reported healthy practices such as daily physical activity (62.1%) and adequate sleep (77.7%), over half did not regularly monitor blood glucose or blood pressure. Good knowledge was significantly associated with gender and income and correlated with healthier lifestyle behaviors.

Conclusion: Although participants showed overall good knowledge of modifiable CVD risk factors, important gaps remained, particularly regarding diabetes, inadequate sleep, and high salt intake. Most correctly identified major risk factors such as hypertension, hypercholesterolemia, obesity, smoking, and unhealthy diet. These findings underscore the need for targeted educational interventions to address knowledge gaps and strengthen CVD prevention and risk reduction.

Keyword: Cardiovascular Disease , Primary Prevention , Health Knowledge , General Population , Makkah City.

Introduction

Cardiovascular diseases (CVDs) comprise a broad spectrum of disorders involving the heart and the vascular system [1]. According to the NHS, these Conditions are classified into four main types: coronary artery disease, which includes angina pectoris, myocardial infarction, and heart failure,

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stroke and transient ischemic attacks (TIAs), peripheral arterial disease, and aortic diseases [2]. CVDs are a major global health concern and remain the leading cause of death worldwide. CVDs are responsible for nearly 42% of all deaths in Saudi Arabia, making them a significant public health issue. The rising prevalence of modifiable risk factors, coupled with the lack of a definitive cure, further exacerbates the burden of CVD [3]. Effective prevention and management of CVD largely depend on addressing well-established modifiable risk factors, such as smoking, high cholesterol levels, diabetes, physical inactivity, obesity, high-fat diets, and excessive alcohol consumption [4,5]. In Saudi Arabia, the most prevalent modifiable risk factors include diabetes, obesity, and hypertension [5]. Despite these known risks, awareness among the Saudi population remains suboptimal, highlighting the need for more educational initiatives to promote preventive measures. A 2023 study conducted among 364 Saudis found that 81.8% recognized hypertension as a CVD risk factor, while 68.8% identified diabetes. Additionally, 79.8% and 78.7% acknowledged lack of physical activity and tobacco use as contributing risk factors, respectively. Most participants (89.5% reported that engaging in regular physical activity) helps prevent CVD, while 74.9% agreed that quitting smoking is beneficial [2]. Similarly, another study from Ethiopia, conducted in 2022 with 318 participants, revealed that 62.3% demonstrated adequate knowledge of modifiable cardiovascular risk factors. Among them, 62.3% identified high-fat diets, and 61.6% recognized physical inactivity as contributing to CVD. Regarding preventive practices, 55% of participants engaged in good health behaviors, with 84% actively avoiding unhealthy foods and 78.6% refraining from smoking [4]. Building upon these findings yet noting the limited scope of such research specifically in Saudi Arabia, the present study seeks to evaluate the level of awareness and understanding of preventive practices related to modifiable CVD risk factors within the general population of Makkah.

Methods

An observational cross-sectional study was conducted among the general population of Makkah City from April to May 2025. Ethical approval of the study was obtained before its initiation from the Biomedical Ethics Committee of the Faculty of Medicine at Umm Al-Qura University, Makkah, Saudi Arabia (Approval No.: HAPO-02-K-012-2025-04-2638).

Inclusion criteria: The study included Saudi and non-Saudi adults aged 18 and above residing in Makkah region. Individuals with CVD, mental illness, or incomplete questionnaires were excluded. The required sample size was determined using OpenEpi version 3.0, keeping the confidence interval (CI) level at 95%, and considering 50% of the anticipated frequency. The sample size was calculated to be 385 participants. In case of any possible data loss, the total sample size required is 471 participants. Data were collected using an electronic self-administered questionnaire in the Arabic language, distributed via online social media platforms using Google Forms. The questionnaire was adapted from a previous study on comparable objectives [6]. The questionnaire was consisted of four sections involved Consent form, Informed consent was obtained electronically, Sociodemographic data, Assessment of knowledge of CVDs Risk Factors, and Assessment of knowledge of CVDs Primary Prevention Practices. For each knowledge item related to modifiable CVD risk factors, responses were scored by assigning one point for each correct answer. A cutoff point of 60% was used to categorize participants into two levels: "poor knowledge" for those scoring below 60% and "good knowledge" for those scoring 60% or higher.

Data Analysis

Data analysis was performed using IBM SPSS Statistics version 28. Descriptive statistics were used to summarize the socio-demographic characteristics, knowledge responses, and preventive health practices of the participants. Associations between overall knowledge level and various categorical variables including socio-demographic factors and preventive health practices were examined using Pearson’s Chi-square test. Where applicable, exact probability tests were used for variables with small cell counts. A p-value of less than 0.05 was considered statistically significant.

Results

(Table 1) shows the socio-demographic characteristics of the 623 study participants in Makkah, Saudi Arabia. Most participants were aged 40–59 years (n = 327, 52.5%), followed by 18–39 years (n = 273, 43.8%), with only (n = 23, 3.7%) aged more than 60 years. As for gender, males constituted a slightly higher proportion (n = 341, 54.7%) compared to females (n = 282, 45.3%). Most participants were of Saudi nationality (n = 548, 88.0%), with a minority being non-Saudi (n = 75, 12.0%.(Regarding marital status, nearly half were married (n = 296, 47.5%), while 41.3% were single (n = 257), and 11.2% were either

divorced or widowed (n = 70). Concerning work status, the largest group was employees (n = 248, 39.8%), followed by students (n = 189, 30.3%). Others were engaged in private work (n = 81, 13.0%), unemployed (n = 58, 9.3%), or retired (n = 47, 7.5%). About educational level, most participants had a diploma or university degree (n = 430, 69.0%), while 21.2% had a pre-university education (n = 132), and 9.8% had obtained a postgraduate degree (n = 61). Regarding monthly income, (n = 273, 43.8%) earning < 5,000 SR, while 234 participants (37.6%) earned 5,000–10,000 SR, and 116 participants (18.6%) reported earning more than 10,000 SR. The assessment of public knowledge on modifiable CVD risk factors among adults in Makkah (Table 2) showed generally high awareness. Most participants recognized high blood pressure (95.7%, n = 596), high cholesterol (94.1%, n = 586) as CVD risk factors. Similarly, a large proportion correctly identified being overweight (94.9%, n = 591), cigarette smoking (93.9%, n = 585), and unhealthy diets, including high-fat foods (92.5%, n = 576) and sugary/processed foods (90.0%, n = 561), as contributing to CVD. Awareness was also high for stress (90.9%, n = 566) and physical inactivity (86.8%, n = 541). Knowledge was lower for diabetes (67.3%, n = 419) and insufficient sleep (66.3%, n = 413), while awareness of excessive salt intake was moderate (68.1%, n = 424), with 71 (11.4%) answering "no" and 128 (20.5%) responding "I don't know". Notably, "I don't know" responses were more frequent for less-discussed factors such as insufficient sleep (20.2%, n = 126) and diabetes (21.5%, n = 134). (Figure 1) illustrates the overall public knowledge of modifiable CVD risk factors among participants in Makkah, Saudi Arabia (N = 623). The majority of respondents had a good level of knowledge, with 544 participants (87.3%) correctly identifying key modifiable risk factors. In contrast, only 79 participants (12.7%) showed a poor knowledge level. (Table 3) presents self-reported CVD-related lifestyle practices among 623 participants in Makkah. In diet, 60.0% of participants (n = 374) avoided processed foods, and 65.8% (n = 410) avoided soft drinks. However, fewer participants (n = 300, 48.2%) consumed vegetables and fruits daily. Regarding smoking, 36.0% (n = 224) avoided it, while 13.3% (n = 83) were smokers. Notably, over half of the participants (n = 316, 50.7%) were non-smokers. For medical management, 53.3% (n = 332) did not regularly monitor blood sugar or blood pressure (n = 325, 52.2%). Among those with chronic conditions, adherence to medication was 23.8% (n = 148) for diabetes, 25.4% (n = 158) for hypertension, and 27.3% (n = 170) for cholesterol-lowering medications. Most participants did not have diabetes (72.7%), hypertension (68.9%), or hypercholesterolemia (64.0%). In physical activity, 62.1% (n = 387) were active daily. When asked about the type of activity, walking was the most common (n = 203, 32.6%), followed by playing games (18.3%) and household chores (17.5%). while 19.4% (n = 121) were inactive. For stress management, 66.1% (n = 412) used techniques such as meditation or hobbies. Adequate sleep (6–8 hours daily) was reported by 77.7% (n = 484). For weight control, 54.4% (n = 339) maintained a proper weight, while 45.6% (n = 284) did not. (Table 4) shows the relationship between socio-demographic factors and overall knowledge of modifiable CVD risk factors. Gender and monthly income were significantly associated with knowledge (p = 0.003 and p = 0.049, respectively). Regarding gender, males had higher good knowledge (90.9%, n = 310) than females (83.0%, n = 234), with poor knowledge in 9.1% of males versus 17.0% of females (p = 0.003). Similarly, participants earning >10,000 SR had the highest good knowledge (92.2%, n = 107) and lowest poor knowledge (7.8%, n = 9), while those earning <5,000 SR had 84.2% good knowledge (n = 230) and 15.8% poor knowledge (n = 43). Postgraduate participants had the highest good knowledge (91.8%, n = 56), and pre-university educated participants had the highest poor knowledge (17.4%, n = 23). Those >60 years had the lowest good knowledge (78.3%, n = 18), though age was not significant (p = 0.174). Married individuals showed higher good knowledge (90.2%, n = 267) than singles (85.6%, n = 220) and divorced/widowed (81.4%, n = 57), approaching significance (p = 0.078). (Table 5) highlights associations between preventive health practices and overall knowledge of modifiable CVD risk factors. For example, participants avoiding processed/high-fat foods had significantly better knowledge (62.7%, n = 341) than those who did not (37.3%, n = 203) with a p-value of (p = 0.001). Similarly, avoiding sugary drinks was also linked to higher knowledge (67.3%, n = 366 vs. 32.7%, n = 178) with a p-value of (p = 0.043). Moreover, regular monitoring of blood sugar was strongly associated with better knowledge levels, as 49.1% (n = 267) of those who checked regularly had good knowledge, compared to 50.9% (n = 277) who did not (p = 0.002). Similarly, blood pressure monitoring showed the same pattern, with 49.8% (n = 271) of regular checkers having good knowledge versus 50.2% (n = 273) who

did not ($p = 0.009$). In addition, adherence to cholesterol-lowering medications was significantly linked to better knowledge ($p = 0.019$), with 28.3% ($n = 154$) of adherent participants having good knowledge compared to 7.5% ($n = 41$) among non-adherent individuals. Finally, following a balanced diet including fruits and vegetables was similarly associated with higher knowledge ($p = 0.049$), as 49.6% ($n = 270$) of those who adhered to a balanced diet had good knowledge compared to 50.4% ($n = 274$) who did not.

Discussion

The present study measured the population understanding of preventable risk factors of cardiovascular disease (CVD) and the associated prevention behaviors in Makkah among adults. On the whole, the results show that the majority of key CVD risk factors are greatly aware, and 87.3% of respondents had a rating of good knowledge. Such awareness is widely consistent with studies done in Saudi Arabia and other people in the region. An example is a large Riyadh-based study which found high awareness of hypertension, smoking, and obesity as key risk factors of the CVD, although the overall levels of their knowledge were slightly lower than those in our sample, perhaps because of some differences in sample size and demographics [1-3]. Just like tendencies outlined in the literature on other areas in Saudi, the respondents in the current study were very conscious of the classical modifiable risk factors including hypertension, hyperlipidemia, smoking, and unhealthy dieting. These are in line with the recent cross-sectional study by Jazan that also indicated high levels of awareness of these traditional risk factors by the general population [4]. Nonetheless, we found significantly reduced awareness of diabetes and poor sleep as the risk factors that are still under-discussed in the literature, which is also a symptom of the gap that is present in both national and international studies, indicating that the risk factors that are not actively discussed or even introduced to the population remain under-recognized [2, 5]. The awareness of the common risk factors within our population when compared to international research works is found to be high in comparison with the findings of the research in South Asia and the Middle East where the awareness of lifestyle related risk factors is relatively high. However, lack of understanding of the importance of sleep, stress and diabetes has also been reported in the rest of the world including a recent study done among the population of Europe on the knowledge of nontraditional CVDs determinants. This implies that there are still gaps in perceptions across the regions other than the key risk factors still common [7, 8]. Sociodemographic correlations in the current research revealed that there were strong associations between knowledge and gender as well as monthly income. Males and those with higher income also showed better general knowledge, which aligns with other recent studies conducted in Saudi that have found a relationship between socioeconomic and CVD literacy [4]. The increased knowledge of the people with higher levels of education, though does not significantly affect our study, is an observed trend in various Saudi and international studies, which supports the significance of education as a strong determinant of preventive health knowledge [5, 9]. There existed a significant correlation between knowledge and preventive lifestyle behaviors. Those that did not consume processed foods or were not taking sweetened drinks or taking readings of blood pressure and blood sugar every now and then had a very high chance of having good knowledge [10]. Such associations have been already reported in a literature that has correlated health literacy with healthier behavior with one such study being done on adults in the East Province of Saudi Arabia which has indicated that those highly aware of it were more likely to follow more healthier dietary and screening habits. These observations are similar to ours and we highlight the role of knowledge as the facilitator of healthier lifestyle choices [7]. Even though the majority of the participants said that they participated in daily physical exercises, had sufficient sleep time, and employed stress-relieving measures, the connection between these variables and the level of knowledge was not statistically significant. The same has been noted in the Gulf region where there is no consistency of additional knowledge into health behaviors despite high knowledge [2]. This is an indication that although awareness is necessary, it might not be enough to prompt behavior change and other potential obstacles like environmental factors, cultural practices, and perceived vulnerability could be playing significant roles [9, 10]. Altogether, the findings of the present research can be added to the developing body of evidence suggesting that there is a positive shift in the public awareness of key CVD risk factors in Saudi Arabia, but there still are significant gaps in the research, including minor determinants like the quality of sleep and diabetes. The results are similar to those in the region and worldwide studies and support the necessity to select specific measures in the field of public health, which would focus on

Table 1: Socio-Demographic Characteristics of the Study Participants, Makkah, Saudi Arabia (N=623).

Demographics	**N**	**%**
Age in years		
18-39	273	43.8%
40-59	327	52.5%
60+	23	3.7%
Gender		
Male	341	54.7%
Female	282	45.3%
Nationality		
Saudi	548	88.0%
Non-Saudi	75	12.0%
Marital status		
Single	257	41.3%
Married	296	47.5%
Divorced / widow	70	11.2%
Work status		
Not working	58	9.3%
Student	189	30.3%
Employee	248	39.8%
Private work	81	13.0%
Retired	47	7.5%
Educational level		
Pre-university education	132	21.2%
Diploma / university education	430	69.0%
Post-graduate degree	61	9.8%
Monthly income		
< 5000 SR	273	43.8%
5000-10000 SR	234	37.6%
> 10000 SR	116	18.6%

N: Number of participants.

Table 2: Public Knowledge of Modifiable Cardiovascular Disease (CVD) Risk Factors, Makkah, Saudi Arabia (N=623).

Knowledge items	Yes		No		I don't know	
	N	%	N	%	N	%
High blood cholesterol is a risk factor for cardiovascular disease	586	94.1%	10	1.6%	27	4.3%
High blood pressure is a risk factor for cardiovascular disease	596	95.7%	11	1.8%	16	2.6%
Diabetes mellitus (DM) is a risk factor for cardiovascular diseases	419	67.3%	70	11.2%	134	21.5%
Cigarette smoking is a risk factor for cardiovascular disease	585	93.9%	20	3.2%	18	2.9%
Not getting enough sleep is a risk factor for cardiovascular disease	413	66.3%	84	13.5%	126	20.2%
Being overweight is a risk factor for cardiovascular diseases	591	94.9%	8	1.3%	24	3.9%
Physical inactivity is a risk factor for cardiovascular diseases	541	86.8%	22	3.5%	60	9.6%
Consuming large amounts of salt in food is a risk factor for cardiovascular disease	424	68.1%	71	11.4%	128	20.5%
Consuming soft drinks and processed, sugary foods is a risk factor for cardiovascular disease	561	90.0%	16	2.6%	46	7.4%
Eating high-fat foods instead of vegetables and fruits is a risk factor for cardiovascular disease	576	92.5%	15	2.4%	32	5.1%
Uncontrolled stress and psychological pressure for long periods is a risk factor for cardiovascular disease	566	90.9%	15	2.4%	42	6.7%

N: Number of participants.

Table 3: Self-Reported Lifestyle Practices Related to Cardiovascular Disease Prevention among Participants in Makkah, Saudi Arabia (N = 623).

Domain	Question	Response	Count	Column N %
Dietary Habits	Do you avoid eating processed foods saturated with unhealthy fats?	Yes	374	60.0%
		No	249	40.0%
	Do you avoid consuming soft drinks and sugar-sweetened beverages?	Yes	410	65.8%
		No	213	34.2%
	Do you follow a balanced diet including vegetables and fruits daily?	Yes	300	48.2%
		No	323	51.8%
Smoking	Do you avoid smoking cigarettes?	Yes	224	36.0%
		No	83	13.3%
		Non-smoker	316	50.7%
Medical Management	Do you check your blood sugar regularly?	Yes	291	46.7%
		No	332	53.3%
	Do you check your blood pressure regularly?	Yes	298	47.8%
		No	325	52.2%
	Are you taking your diabetes medications regularly as directed?	Yes	148	23.8%
		No	22	3.5%
		Not diabetic	453	72.7%
	Are you taking your blood pressure medications regularly as directed?	Yes	158	25.4%
		No	36	5.8%
		Not hypertensive	429	68.9%
	Are you taking cholesterol-lowering medications regularly as directed?	Yes	170	27.3%
		No	54	8.7%
		No hypercholesterolemia	399	64.0%
Physical Activity	Do you commit to daily physical activity?	Yes	387	62.1%
		No	236	37.9%
	What type of physical activity do you do regularly?	I do not do any	121	19.4%
		Walking	203	32.6%
		Playing games	114	18.3%
		Household chores	109	17.5%
		Running	58	9.3%
		Riding a bike	18	2.9%
Stress Management	Do you work to reduce stress through techniques like meditation or hobbies?	Yes	412	66.1%
		No	211	33.9%
Sleep	Do you get enough sleep every day (6–8 hours)?	Yes	484	77.7%
		No	139	22.3%
Weight Control	Do you maintain a proper weight for your height?	Yes	339	54.4%
		No	284	45.6%

N: Number of participants.

Table 4: Factors Associated with Public Overall Knowledge about Modifiable Cardiovascular Disease (CVD) Risk Factors in Makkah.

Factors	Overall knowledge level				p-value
	Poor		Good		
	N	%	N	%	
Age in years					
18-39	39	14.3%	234	85.7%	0.174^
40-59	35	10.7%	292	89.3%	
60+	5	21.7%	18	78.3%	
Gender					
Male	31	9.1%	310	90.9%	0.003*
Female	48	17.0%	234	83.0%	
Nationality					
Saudi	71	13.0%	477	87.0%	0.576
Non-Saudi	8	10.7%	67	89.3%	
Marital status					
Single	37	14.4%	220	85.6%	0.078
Married	29	9.8%	267	90.2%	
Divorced / widow	13	18.6%	57	81.4%	
Work status					
Not working	9	15.5%	49	84.5%	0.604^
Student	29	15.3%	160	84.7%	
Employee	27	10.9%	221	89.1%	
Private work	9	11.1%	72	88.9%	
Retired	5	10.6%	42	89.4%	
Educational level					
Pre-university education	23	17.4%	109	82.6%	0.132
Diploma / university education	51	11.9%	379	88.1%	
Post-graduate degree	5	8.2%	56	91.8%	
Monthly income					0.049*
< 5000 SR	43	15.8%	230	84.2%	

5000-10000 SR	27	11.5%	207	88.5%
> 10000 SR	9	7.8%	107	92.2%

P: Pearson X^2 test. ^: Exact Probability test. N: Number of participants. * P < 0.05 (significant).

Table 5: Association between Preventive Health Practices and Public Knowledge of Modifiable Cardiovascular Disease (CVD) Risk Factors in Makkah, Saudi Arabia (N = 623).

Practice		**Overall knowledge level**				**p-value**
		Poor		**Good**		
		N	**%**	**N**	**%**	
Do you avoid eating processed foods that are saturated with unhealthy fats, such as fried foods and fast food?	Yes	33	41.8%	341	62.7%	0.001*
	No	46	58.2%	203	37.3%	
Do you avoid consuming soft drinks and sugar-sweetened beverages?	Yes	44	55.7%	366	67.3%	0.043*
	No	35	44.3%	178	32.7%	
Do you avoid smoking cigarettes?	Yes	24	30.4%	200	36.8%	0.460
	No	13	16.5%	70	12.9%	
	Non-smoker	42	53.2%	274	50.4%	
Do you check your blood sugar regularly?	Yes	24	30.4%	267	49.1%	0.002*
	No	55	69.6%	277	50.9%	
Do you check your blood pressure regularly?	Yes	27	34.2%	271	49.8%	0.009*
	No	52	65.8%	273	50.2%	
Are you taking your diabetes medications regularly as directed by your doctor?	Yes	19	24.1%	129	23.7%	0.747
	No	5	6.3%	17	3.1%	
	Not diabetic	55	69.6%	398	73.2%	
Are you taking your blood pressure medications regularly as directed by your doctor?	Yes	20	25.3%	138	25.4%	0.202
	No	8	10.1%	28	5.1%	
	Not hypertensive	51	64.6%	378	69.5%	
Are you committed to taking your cholesterol-lowering medications regularly as directed by your doctor?	Yes	16	20.3%	154	28.3%	0.019*
	No	13	16.5%	41	7.5%	
	No hyper-cholesterolemia	50	63.3%	349	64.2%	
Do you commit to daily physical activity?	Yes	44	55.7%	343	63.1%	0.208
	No	35	44.3%	201	36.9%	

Practice		Overall knowledge level				p-value
		Poor		Good		
		N	%	N	%	
What type of physical activity do you do regularly?	I do not do any physical activity.	20	25.3%	101	18.6%	0.062
	Walking	19	24.1%	184	33.8%	
	Playing games	8	10.1%	106	19.5%	
	Household chores	19	24.1%	90	16.5%	
	Running	10	12.7%	48	8.8%	
	Riding a bike	3	3.8%	15	2.8%	
Do you work to reduce stress and tension through techniques such as meditation, hobbies, or relaxation?	Yes	48	60.8%	364	66.9%	0.280
	No	31	39.2%	180	33.1%	
Do you follow a balanced diet that includes eating vegetables and fruits daily?	Yes	30	38.0%	270	49.6%	0.049*
	No	49	62.0%	274	50.4%	
Do you get enough sleep every day (between 6-8 hours daily)?	Yes	59	74.7%	425	78.1%	0.492
	No	20	25.3%	119	21.9%	
Do you maintain a proper weight for your height?	Yes	46	58.2%	293	53.9%	0.466
	No	33	41.8%	251	46.1%	

P: Pearson X^2 test ^: Exact Probability test

* P < 0.05 (significant)

N: Number of participants.

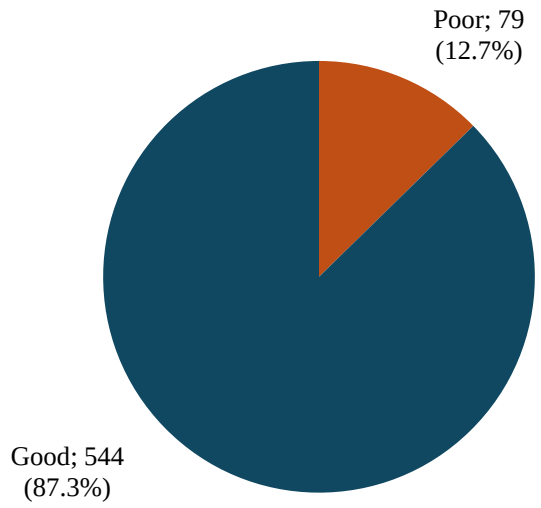

Figure 1: The Overall Public Knowledge of Modifiable Cardiovascular Disease (CVD) Risk Factors, Makkah, Saudi Arabia (N=623).

educating people about the risks as a whole, rather than solely on the traditional ones [3, 11]. In the future, the most vulnerable demographic categories should be considered first, and more behavioral support programs that cater to knowledge-action gap should be included. Limitations: This paper was based on self-reported data, and this can produce bias. The sample was restricted to the Makkah residents thus the results might not be representative of the whole Saudi population. The cross-sectional design does not allow forming causality. Recommendations: Conduct special purposes public health campaigns on risk factors that are poorly understood (sleep and diabetes), implement community interventions that will help change behavior and not merely awareness, incorporate CVD education at schools, at work and primary healthcare, carry out more research in different regions through longitudinal designs.

Conclusion

This study assesses knowledge of modifiable CVD risk factors and early prevention strategies among the general population of Makkah city. The results showed 87.3% of participants had a strong understanding of modifiable CVD risk factors. However, there was limited awareness of diabetes, insufficient sleep, and excessive salt intake. Almost all participants correctly demonstrated knowledge of leading risk factor for CVD, which include hypertension, high cholesterol, obesity, smoking, and unhealthy diet. These steps are essential to reduce risk factors, correct misconceptions, and better prepare future healthcare providers to support individuals' knowledge of CVD and their prevention

Conflict of Interest

None

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None

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