ORIGINAL ARTICLE

Assessment of Knowledge Regarding Coronary Artery Atherosclerosis and the Role of Interventional Radiology in Diagnosis and Treatment

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Abstract

Introduction: Coronary artery disease (CAD) remains a leading cause of death and disability globally and within Saudi Arabia, largely due to atherosclerosis, a progressive condition that narrows the coronary arteries and reduces blood flow. Despite its growing prevalence, public awareness in Saudi Arabia remains low, particularly concerning the role of interventional radiology in early diagnosis and minimally invasive treatment. **Objectives:** This study evaluates the knowledge levels among patients in Saudi Arabia regarding coronary artery atherosclerosis and the role of interventional radiology in diagnosis and treatment. **Methodology:** A cross-sectional study was conducted between July 2025 and December 2025 using a structured online questionnaire. The target population included Saudi citizens aged 18 years and above, excluding healthcare professionals, students, and individuals living outside Saudi Arabia. Participants were recruited through social media platforms. A minimum sample size of 384 participants was calculated using the infinite population formula at a 95% confidence interval and 5% margin of error. The survey consisted of three sections: informed consent, demographic data, and questions assessing awareness, knowledge, and perceptions of CAD and interventional radiology. **Results:** Findings revealed that 83.0% of participants had high knowledge scores regarding coronary artery atherosclerosis, while 81.4% demonstrated high overall awareness. Recognition of key modifiable risk factors was exceptional: 94.7% identified smoking, 93.3% acknowledged high cholesterol, 94.8% recognized obesity, and 90.8% cited fast food consumption as important contributors. Awareness of the benefits and procedural details of interventional radiology was also high, with over 90% able to identify angiography, stenting, and minimally invasive interventions correctly. Statistically significant associations were found between knowledge level and age, marital status, employment, and education, while awareness levels differed significantly by gender, body mass index, region, and marital status. **Conclusion:** Results highlight encouraging public health literacy but underscore persistent gaps regarding hereditary risk factors, health behaviors in younger adults, and misconceptions about IR. Targeted

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interventions and health campaigns remain necessary to optimize population understanding and preventive practices for CAD in Saudi Arabia.

Key words: Atherosclerosis, diagnostic, knowledge, treatment

INTRODUCTION

Coronary artery disease (CAD) was the leading cause of death and disability globally, accounting for almost 9.1 million deaths and 182 million disability-adjusted life years in Saudi Arabia (KSA).[1] Atherosclerosis is a common CAD illness that is a major cause of mortality in developed nations.[2] CAD is a chronic condition that causes plaque in the arteries to thicken. Stenosis (narrowing of the artery), or more acutely, complete closure of the artery, causes insufficient blood flow to the organs and tissues after thromboses have healed and diminished.[3] Coronary artery angiography is the gold standard procedure for evaluating severe atherosclerotic disease and guiding percutaneous coronary intervention (PCI).[4]

Atherosclerosis, a chronic process of arterial disease, is the pathophysiologic basis of CAD.[5] A large amount of research conducted over several years has shown that coronary atherosclerosis has a complex etiology, with fat accumulation and persistent inflammation in the arterial wall being the most significant characteristics.[6] Atherosclerotic plaque starts as endothelial dysfunction brought on by long-term exposure to a variety of harmful conditions, including stress, diabetes, high blood pressure, and tobacco use.[7]

According to a 2020 study by Albugami *et al.* Cureus, the Saudi Arabian Western population explicitly knew very little about the symptoms, risk factors, diagnosis, and treatment of CAD.[8] In 2025, another study evaluated the knowledge, attitudes, and practices of elective patients regarding PCI and cardiac catheterization. According to their findings, these patients displayed proactive behaviors, good attitudes, and a lack of knowledge about general elements, preparation, self-care, and recognizing warning signs after these procedures.[9]

This study addresses the high burden of coronary artery atherosclerosis in Saudi Arabia and the lack of public knowledge about interventional radiology's role in early diagnosis and treatment. Despite increasing cardiovascular cases, interventional radiology is underused, and local data on patient knowledge are limited.

Objectives

This study evaluates the knowledge levels among patients in Saudi Arabia regarding coronary artery atherosclerosis and the role of interventional radiology in diagnosis and treatment.

MATERIALS AND METHODS

Study design

A cross-sectional study was conducted between July 2025 and December 2025 using a structured questionnaire adapted, with permission, from previously published tools. Social media platforms were used as part of the recruitment strategy to enroll atherosclerosis patients from across Saudi Arabia.

Sample size

The sample size was calculated using the infinite population formula with a 95% confidence level (z = 1.96), an estimated proportion ($\hat{p}$) of 0.50, and a maximum acceptable margin of error (ε) of 0.05. The minimum required sample size was estimated as follows:

$n = (1.96)^2 \times 0.50 \times (1 - 0.50)/(0.05)^2 = 384$

$$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2}$$

Inclusion and exclusion criteria

The participants for this study were both males and females, aged 18 years and above. Individuals younger than 18, and any healthcare-related professionals and students, were excluded.

Method for data collection, instrument

The questionnaire was adapted with permission from previously published tools.[10]

Information was gathered through participants' responses to a structured survey.

The questionnaire was divided into three main sections. The first section began with a concise explanation of the study's purpose, followed by a consent question.

The second section covered demographic data, including age, gender, weight, nationality, marital status, employment, and education level. The third section assessed participants' knowledge of CAD, including their sources of information, perceived causes, and risk factors. It also explored how lifestyle habits and chronic conditions may influence the development of CAD.

Scoring system

The questionnaire consists of 26 statements designed to assess participants' levels of awareness and knowledge about coronary artery atherosclerosis and interventional radiology, along with demographic questions. Each correct answer is awarded 1 point, while incorrect answers or responses of "I don't know" receive 0 points.

The first section includes 7 demographic questions, which are used solely for classification purposes and do not contribute to the total score.

The second section, the Awareness Section, contains 9 statements, with each correct response earning 1 point for a total possible score of 9. Participants' awareness levels are classified as low (0–4 points, ≤59%), moderate (5–7 points, 60–79%), or high (8–9 points, ≥80%).

The third section focuses on knowledge and includes 10 statements, where each correct answer (indicated by agreement) is awarded 1 point, for a total possible score of 10. Knowledge levels are similarly classified as low (0–4 points, ≤59%), moderate (5–7 points, 60–79%), or high (8–10 points, ≥80%).

Pilot test

Twenty people were given the questionnaire and asked to complete it. This was done to assess the study's viability and the questionnaire's ease of use. The pilot study's data were not included in the study's final data.

Analysis and entry method

Data entry was initially performed using Microsoft Excel (2025 version) to organize the collected responses. The dataset was then imported into the IBM (SPSS) program, Version 25, for statistical analysis. Descriptive statistics were used to summarize the numerical variables for baseline characteristics. For categorical variables, frequencies and percentages were calculated. The Chi-square test was used to identify associations between categorical variables.

RESULTS

Table 1 presents sociodemographic and health-related characteristics of the study population (n = 601). The study enrolled a total of 601 participants who were aged 18 years and above. The participants included 581 Saudi nationals (96.7%) and 20 non-Saudi participants (3.3%). The sociodemographic characteristics revealed a predominantly female sample, with 418 females (69.6%) and 183 males (30.4%). The age distribution showed that the largest proportion of participants was young adults aged 18–30 years (250/601, 41.6%),

Table 1: Sociodemographic characteristics and health-related factors of participants (n=601)

Parameter	No.	Percent
Gender		
Female	418	69.6
Male	183	30.4
Age group		
18–30 years	250	41.6
31–40 years	126	21.0
41–50 years	141	23.5
51+ years	84	14.0
BMI		
Underweight	45	7.5
Normal weight	270	44.9
Overweight	169	28.1
Obese	117	19.5
Nationality		
Saudi	581	96.7
Non-Saudi	20	3.3
Region of residence		
Southern Region	227	37.8
Western Region	155	25.8
Central Region	133	22.1
Eastern Region	69	11.5
Others	17	2.8
Marital status		
Single	220	36.6
Married	350	58.2
Divorced/Widow	31	5.2
Employment status		
Employed	219	36.4
Unemployed	178	29.6
Student	136	22.6
Retired	43	7.2
Self-employed	25	4.2
Educational qualifications		
Primary school	1	0.2
Middle school	12	2.0
Secondary school	120	20.0
Diploma	73	12.1
Bachelor	355	59.1
Master	31	5.2
Doctorate	8	1.3
No qualification	1	0.2
Do you have any chronic diseases?*		
Diabetes	58	9.7

(*Contd...*)

Table 1: (*Continued*)

Parameter	No.	Percent
High blood pressure	41	6.8
Immune diseases	7	1.2
Liver diseases	1	0.2
Kidney diseases	3	0.5
Heart diseases	13	2.2
Other	41	6.8
I do not suffer from any chronic diseases	474	78.9

*Results may overlap. BMI: Body mass index

followed by those aged 41–50 years (141/601, 23.5%). Regarding body mass index (BMI), approximately 45% of participants had normal weight (270/601, 44.9%). The participants were predominantly from the Southern Region (227/601, 37.8%), followed by the Western Region (155/601, 25.8%). Marital status distribution revealed that the majority were married (350/601, 58.2%), while 220/601 (36.6%) were single. Employment status showed that 219/601 (36.4%) were employed, 178/601 (29.6%) were unemployed, and 136/601 (22.6%) were students. Educational qualifications demonstrated a highly educated sample, with 355/601 (59.1%) holding a bachelor's degree, 120/601 (20.0%) completing secondary education, and 73/601 (12.1%) having a diploma. Regarding chronic diseases, the majority (474/601, 78.9%) reported having no chronic conditions.

Table 2 displays the frequency distribution of knowledge-related questions regarding coronary artery atherosclerosis and interventional radiology. The findings revealed that 440/601 (73.2%) of participants had previously heard about coronary artery atherosclerosis. An overwhelming majority (559/601, 93.0%) correctly recognized that untreated coronary artery atherosclerosis can lead to heart attacks. Similarly, 550/601 (91.5%) acknowledged that interventional radiology uses imaging techniques for diagnosis, and 581/601 (96.7%) correctly identified common symptoms.

Table 3 illustrates the frequency distribution of awareness-related questions concerning risk factors for CAD. The results showed exceptionally high awareness levels across multiple risk factors. Specifically, 569/601 (94.7%) of participants believed that smoking increases the risk of CAD, and 561/601 (93.3%) recognized high cholesterol as a risk factor.

Table 4 presents the distribution of knowledge and awareness levels. For knowledge levels, the majority of participants demonstrated high knowledge (499/601, 83.0%), while 76/601 (12.6%) had moderate knowledge, and 26/601 (4.3%) exhibited low knowledge levels. Similarly, awareness levels were predominantly high, with 489/601 (81.4%) of participants classified as having high awareness, 81/601 (13.5%) moderate awareness, and 31/601 (5.2%) low awareness.

Table 2: Consolidated frequency distribution for knowledge question responses (*n*=601)

Parameter	Response	No.	Percent
Have you heard of coronary artery atherosclerosis before?	Yes	440	73.2
	No	161	26.8
Coronary artery atherosclerosis can lead to heart attacks if untreated.	Yes	559	93.0
	No	34	5.7
	I don't know	8	1.3
Interventional radiology uses imaging techniques to diagnose coronary artery disease.	Yes	550	91.5
	No	46	7.7
	I don't know	5	0.8
Symptoms of coronary artery atherosclerosis may include chest pain, shortness of breath, and fatigue.	Yes	581	96.7
	No	19	3.2
	I don't know	1	0.2
Coronary angiography is a procedure performed by interventional radiologists to visualize blocked arteries.	Yes	554	92.2
	No	42	7.0
	I don't know	5	0.8
Minimally invasive treatments, such as angioplasty and stenting, are performed through interventional radiology.	Yes	524	87.2
	No	69	11.5
	I don't know	8	1.3
Interventional radiology can help avoid open-heart surgery in some cases of coronary artery disease.	Yes	538	89.5
	No	54	9.0
	I don't know	9	1.5
Early diagnosis of coronary artery atherosclerosis through interventional radiology improves treatment outcomes.	Yes	581	96.7
	No	20	3.3

Figure 1 illustrates the knowledge levels about coronary artery atherosclerosis and the role of interventional radiology in diagnosis and treatment among the participants. The majority of participants demonstrated high knowledge (499/601, 83.0%), while 76/601 (12.6%) had moderate knowledge, and 26/601 (4.3%) exhibited low knowledge levels.

Figure 2 shows coronary artery atherosclerosis and the role of interventional radiology in diagnosis and treatment among the respondents. Awareness levels were predominantly high, with 489/601 (81.4%) of participants classified as having high awareness, 81/601 (13.5%) moderate awareness, and 31/601 (5.2%) low awareness.

Table 5 displays the chi-square test results examining the relationship between sociodemographic characteristics and knowledge levels. Statistically significant associations were identified between knowledge level and age group ($P = 0.009$), marital status ($P < 0.001$), employment status ($P < 0.001$),

Table 3: Consolidated frequency distribution for awareness question responses (*n*=601)

Parameter	Response	No.	Percent
Do you believe that having a history of coronary artery disease in a family member raises the chance of coronary artery disease?	Yes	467	77.7
	No	131	21.8
	I don't know	3	0.5
Do you believe that smoking may raise the chance of developing coronary artery disease?	Yes	569	94.7
	No	31	5.2
	I don't know	1	0.2
Do you think the lack of regular exercise increases the risk of coronary artery disease?	Yes	530	88.2
	No	67	11.1
	I don't know	4	0.7
Do you believe that eating fast food may raise the incidence of coronary artery disease?	Yes	546	90.8
	No	51	8.5
	I don't know	4	0.7
Do you believe that age is correlated with coronary artery disease?	Yes	460	76.5
	No	139	23.1
	I don't know	2	0.3
Do you believe that increased cholesterol in the blood may increase the risk of coronary artery disease?	Yes	561	93.3
	No	39	6.5
	I don't know	1	0.2
Do you believe that increased blood sugar (DM) raises the risk of coronary artery disease?	Yes	478	79.5
	No	119	19.8
	I don't know	4	0.7
Do you believe that increased body weight (obesity) raises the risk of developing coronary artery disease?	Yes	570	94.8
	No	30	5.0
	I don't know	1	0.2
Do you believe that increased blood pressure may raise the risk of developing coronary artery disease?	Yes	522	86.9
	No	74	12.3
	I don't know	5	0.8
Do you think that improving lifestyle can help prevent coronary artery disease?	Yes	588	97.8
	No	13	2.2

Table 4: Distribution of knowledge and awareness levels (*n*=601)

Category	Level	Frequency	Percent
Knowledge level	High level	499	83.0
	Moderate level	76	12.6
	Low level	26	4.3
Awareness level	High level	489	81.4
	Moderate level	81	13.5
	Low level	31	5.2

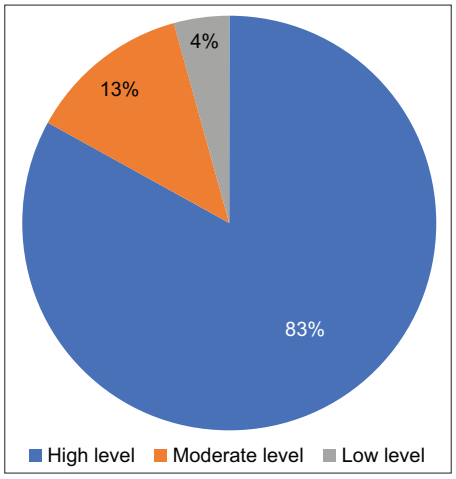

Figure 1: The knowledge levels among the participants

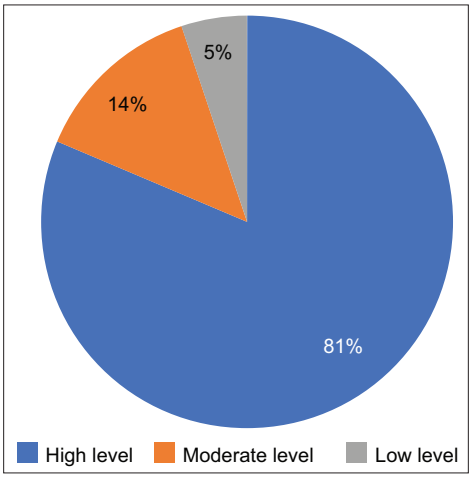

Figure 2: The awareness levels among the participants

and educational qualifications (P = 0.017). No significant associations were found with gender (P = 0.413), nationality (P = 0.406), BMI (P = 0.999), or region of residence (P = 0.458).

Table 6 presents the chi-square test results for the association between sociodemographic characteristics and awareness levels. Significant relationships were identified between awareness level and gender (P = 0.030), BMI (P = 0.014), region of residence (P = 0.010), and marital status (P = 0.002). No significant associations were observed with nationality (P = 0.567), age group (P = 0.060), employment status (P = 0.095), or educational qualifications (P = 0.125).

DISCUSSION

Coronary artery atherosclerosis remains a leading cause of morbidity and mortality globally, particularly in Saudi Arabia

Table 5: Relation between knowledge level and sociodemographic characteristics (*n*=601)

Parameter	Category	Low level	Moderate level	High level	*P* value*
Gender	Female	19	48	351	0.413
		4.5%	*11.5%*	*84.0%*	
	Male	7	28	148	
		3.8%	*15.3%*	*80.9%*	
Nationality	Saudi	26	72	483	0.406
		4.5%	*12.4%*	*83.1%*	
	Non-Saudi	0	4	16	
		0.0%	*20.0%*	*80.0%*	
Age group	18–30 years	11	46	193	**0.009**
		4.4%	*18.4%*	*77.2%*	
	31–40 years	5	13	108	
		4.0%	*10.3%*	*85.7%*	
	41–50 years	8	7	126	
		5.7%	*5.0%*	*89.4%*	
	51+ years	2	10	72	
		2.4%	*11.9%*	*85.7%*	
BMI	Underweight	2	6	37	0.999
		4.4%	*13.3%*	*82.2%*	
	Normal weight	12	34	224	
		4.4%	*12.6%*	*83.0%*	
	Overweight	8	21	140	
		4.7%	*12.4%*	*82.8%*	
	Obese	4	15	98	
		3.4%	*12.8%*	*83.8%*	
Region of residence	Southern Region	7	29	191	0.458
		3.1%	*12.8%*	*84.1%*	
	Western Region	9	25	121	
		5.8%	*16.1%*	*78.1%*	
	Central Region	7	10	116	
		5.3%	*7.5%*	*87.2%*	
	Eastern Region	2	9	58	
		2.9%	*13.0%*	*84.1%*	
	Others	1	3	13	
		5.9%	*17.6%*	*76.5%*	
Marital status	Single	9	44	167	**<0.001**
		4.1%	*20.0%*	*75.9%*	
	Married	14	29	307	
		4.0%	*8.3%*	*87.7%*	
	Divorced/ Widow	3	3	25	
		9.7%	*9.7%*	*80.6%*	

(*Contd...*)

Table 5: (*Continued*)

Parameter	Category	Low level	Moderate level	High level	*P* value*
Employment Status	Employed	10	23	186	**<0.001**
		4.6%	*10.5%*	*84.9%*	
	Unemployed	5	10	163	
		2.8%	*5.6%*	*91.6%*	
	Student	6	33	97	
		4.4%	*24.3%*	*71.3%*	
	Retired	3	7	33	
		7.0%	*16.3%*	*76.7%*	
	Self-employed	2	3	20	
		8.0%	*12.0%*	*80.0%*	
Educational Qualifications	Primary school	0	0	1	**0.017**
		0.0%	*0.0%*	*100.0%*	
	Middle school	0	0	12	
		0.0%	*0.0%*	*100.0%*	
	Secondary school	7	18	95	
		5.8%	*15.0%*	*79.2%*	
	Diploma	7	5	61	
		9.6%	*6.8%*	*83.6%*	
	Bachelor	12	48	295	
		3.4%	*13.5%*	*83.1%*	
	Master	0	1	30	
		0.0%	*3.2%*	*96.8%*	
	Doctorate	0	3	5	
		0.0%	*37.5%*	*62.5%*	
	No qualification	0	1	0	
		0.0%	*100.0%*	*0.0%*	

**P* value was considered significant if ≤0.05, Bold and Italic value means "consideredstatistically significant"

where cardiovascular disease contributes significantly to the disease burden and healthcare costs. The present study aimed to evaluate knowledge levels and awareness among the general population in Saudi Arabia regarding coronary artery atherosclerosis and the role of interventional radiology in its diagnosis and treatment. The findings revealed that the majority of participants demonstrated high levels of knowledge (83.0%) and awareness (81.4%) regarding coronary artery atherosclerosis and interventional radiology, with significant associations between knowledge levels and specific sociodemographic characteristics including age, marital status, employment status, educational qualifications, and gender.

The high level of knowledge observed in the current study (83.0%) represents an encouraging finding in the context of cardiovascular disease awareness in Saudi Arabia. Previous research has documented variable levels of cardiovascular disease knowledge across different populations. Elsheikh *et al*. (2024) conducted a comprehensive cross-sectional study among the Saudi Arabian population and reported that while participants demonstrated good overall knowledge of cardiovascular disease risk factors, significant knowledge gaps existed regarding specific aspects of CAD management and prevention strategies.[10] Similarly, another recent study by researchers in the same geographic region found that participants possessed moderate levels of cardiovascular disease knowledge, with substantial variations based on sociodemographic characteristics.[11] The improved knowledge levels in the present study may reflect the cumulative impact of increasing health literacy, enhanced access to health information through digital platforms and social media channels, ongoing national health awareness

Table 6: Relation between awareness level and sociodemographic characteristics (*n*=601)

Parameter	Category	Low level	Moderate level	High level	*P* value*
Gender	Female	15	56	347	**0.030**
		3.6%	*13.4%*	*83.0%*	
	Male	16	25	142	
		8.7%	*13.7%*	*77.6%*	
Nationality	Saudi	31	78	472	0.567
		5.3%	*13.4%*	*81.2%*	
	Non-Saudi	0	3	17	
		0.0%	*15.0%*	*85.0%*	
Age group	18–30 years	14	43	193	0.060
		5.6%	*17.2%*	*77.2%*	
	31–40 years	4	20	102	
		3.2%	*15.9%*	*81.0%*	
	41–50 years	7	14	120	
		5.0%	*9.9%*	*85.1%*	
	51+ years	6	4	74	
		7.1%	*4.8%*	*88.1%*	
BMI	Underweight	0	5	40	**0.014**
		0.0%	*11.1%*	*88.9%*	
	Normal weight	7	40	223	
		2.6%	*14.8%*	*82.6%*	
	Overweight	15	26	128	
		8.9%	*15.4%*	*75.7%*	
	Obese	9	10	98	
		7.7%	*8.5%*	*83.8%*	
Region of residence	Southern Region	9	34	184	**0.010**
		4.0%	*15.0%*	*81.1%*	
	Western Region	4	21	130	
		2.6%	*13.5%*	*83.9%*	
	Central Region	7	17	109	
		5.3%	*12.8%*	*82.0%*	
	Eastern Region	7	6	56	
		10.1%	*8.7%*	*81.2%*	
	Others	4	3	10	
		23.5%	*17.6%*	*58.8%*	
Marital status	Single	14	39	167	**0.002**
		6.4%	*17.7%*	*75.9%*	
	Married	13	35	302	
		3.7%	*10.0%*	*86.3%*	
	Divorced/Widow	4	7	20	
		12.9%	*22.6%*	*64.5%*	

(*Contd...*)

Table 6: (*Continued*)

Parameter	Category	Low level	Moderate level	High level	*P* value*
Employment Status	Employed	9	23	187	0.095
		4.1%	*10.5%*	*85.4%*	
	Unemployed	5	27	146	
		2.8%	*15.2%*	*82.0%*	
	Student	9	23	104	
		6.6%	*16.9%*	*76.5%*	
	Retired	5	4	34	
		11.6%	*9.3%*	*79.1%*	
	Self-employed	3	4	18	
		12.0%	*16.0%*	*72.0%*	
Educational Qualifications	Primary school	0	0	1	0.125
		0.0%	*0.0%*	*100.0%*	
	Middle school	0	0	12	
		0.0%	*0.0%*	*100.0%*	
	Secondary school	10	23	87	
		8.3%	*19.2%*	*72.5%*	
	Diploma	6	9	58	
		8.2%	*12.3%*	*79.5%*	
	Bachelor	13	43	299	
		3.7%	*12.1%*	*84.2%*	
	Master	2	4	25	
		6.5%	*12.9%*	*80.6%*	
	Doctorate	0	1	7	
		0.0%	*12.5%*	*87.5%*	
	No qualification	0	1	0	
		0.0%	*100.0%*	*0.0%*	

**P* value was considered significant if ≤0.05, Bold and Italic value means "Consideredstatistically significant"

campaigns, and greater exposure to cardiovascular disease prevention initiatives in recent years.

Regarding awareness of CAD risk factors, the present study found exceptionally high recognition rates for modifiable risk factors. Specifically, 94.7% of participants recognized smoking as a risk factor, 93.3% identified high cholesterol levels, 94.8% acknowledged obesity, and 90.8% recognized fast food consumption as a significant contributing factor to CAD development. These findings are consistent with those reported by Almahmoud *et al*. (2018) in their population-based study in Jeddah, which demonstrated similarly high awareness of traditional cardiovascular risk factors among the general adult population.[12] Furthermore, Aldakhil *et al*. (2024) reported comparable awareness levels for major risk factors in their cross-sectional study examining gender disparities in cardiovascular disease knowledge in Jeddah.[13] However, awareness of family history as a risk factor was relatively lower at 77.7% in the present study, suggesting an important gap in understanding genetic and hereditary components of CAD.

The present study identified significant associations between sociodemographic characteristics and knowledge levels. Age demonstrated a statistically significant relationship with knowledge ($P = 0.009$), with participants aged 41–50 years showing the highest proportion of high knowledge (89.4%), followed by those aged 51–60 years. This finding is consistent with research examining cardiovascular disease knowledge across age groups, which has consistently demonstrated that middle-aged adults possess greater cardiovascular disease awareness compared to younger age groups. The enhanced knowledge in middle-aged participants may be attributed to multiple factors including increased personal health consciousness, greater cumulative exposure to health information and health education campaigns, personal or familial experiences with cardiovascular conditions, and increased medical encounters that facilitate health information acquisition. In contrast, younger adults (18–30 years) demonstrated lower knowledge levels (78.5%), highlighting a vulnerable population requiring targeted health education interventions. Conversely, older adults (above 60 years)

also showed relatively lower knowledge levels (81.5%), suggesting that knowledge retention may be influenced by factors such as educational background and prior exposure to health information.

Marital status showed a highly significant association with knowledge levels ($P < 0.001$), with married participants demonstrating substantially higher knowledge (87.7%) compared to single participants (75.9%). This notable difference may reflect multiple mechanisms including shared health information between spouses, collective engagement with healthcare systems, greater household responsibility that encourages health consciousness, and increased likelihood of household discussions regarding health-related topics.

Employment status demonstrated a significant association with cardiovascular disease knowledge ($P = 0.012$), with employed participants showing higher knowledge levels (86.1%) compared to unemployed participants (76.3%). This association may reflect greater access to workplace health programs, occupational health education, and health insurance benefits that encourage health-seeking behaviors. Unemployed individuals, particularly those without adequate healthcare access, may face barriers to health information acquisition and may represent a population requiring additional targeted health promotion efforts.

Educational qualifications demonstrated a highly significant relationship with knowledge levels ($P = 0.017$), with participants holding master's degrees showing the highest knowledge proportion (96.8%), followed by those with bachelor's degrees (87.3%), and those with high school education showing lower knowledge levels (74.2%). This clear gradient relationship demonstrates the profound influence of educational attainment on health literacy and cardiovascular disease knowledge. These findings corroborate previous research extensively documenting the critical role of education in health literacy, disease understanding, and adoption of preventive health behaviors.

Gender differences in awareness levels revealed a statistically significant association ($P = 0.030$), with females demonstrating higher awareness (83.0%) compared to males (77.6%). This finding represents an interesting divergence from some historical data suggesting gender differences in cardiovascular disease awareness. The observed pattern in the present study may reflect increased health-seeking behaviors and greater engagement with preventive health services among females in contemporary Saudi Arabian society. In addition, females may have greater exposure to health information through maternal and child health programs, family planning clinics, and other women's health services, which frequently incorporate cardiovascular disease prevention messages and health promotion activities.

Regarding knowledge of interventional radiology procedures and their applications in CAD management, the present study found that 92.2% of participants correctly identified coronary angiography as a diagnostic procedure performed by interventional radiologists to visualize coronary artery blockages, while 87.2% recognized that minimally invasive therapeutic interventions such as percutaneous transluminal coronary angioplasty and stent placement are performed through interventional radiology techniques. These high levels of awareness regarding interventional radiology's diagnostic and therapeutic role are encouraging and suggest adequate public understanding of modern cardiovascular interventions. Recent evidence from systematic reviews and meta-analyses demonstrates that advanced intravascular imaging guidance during PCI, including intravascular ultrasound and optical coherence tomography, results in significantly improved clinical outcomes and reduced major adverse cardiac events compared to conventional angiography-guided procedures.[14]

Notably, 96.7% of participants recognized that early diagnosis of coronary artery atherosclerosis through interventional radiology procedures improves treatment outcomes and prognosis, and 89.5% acknowledged that interventional radiology can help avoid open-heart surgery in select cases. This high level of awareness regarding the benefits of early intervention and minimally invasive treatment modalities is particularly encouraging and may facilitate patient acceptance of interventional radiology procedures when clinically indicated.

Regional variations in awareness were also observed, with participants from the Southern Region showing slightly higher knowledge levels compared to those from other regions. This regional variation may reflect differences in healthcare infrastructure development, accessibility of healthcare services, and regional variations in health education initiatives. Such regional differences have been documented in previous Saudi Arabian studies examining cardiovascular disease awareness and suggest the importance of considering geographic context when implementing national health promotion programs.[15]

The present study has important limitations that should be acknowledged when interpreting the findings. First, the cross-sectional study design precludes causal inferences regarding the temporal relationships between sociodemographic factors and knowledge levels. Longitudinal prospective studies would provide more robust evidence regarding the temporal dynamics of knowledge acquisition, retention over time, and persistence of awareness. Second, the study utilized an online self-administered questionnaire, which may have introduced significant selection bias toward individuals with internet access, digital literacy, and comfort with online platforms.

CONCLUSION

This study demonstrates a high level of public knowledge and awareness regarding coronary artery atherosclerosis

and the role of interventional radiology among adults in Saudi Arabia. Key modifiable risk factors such as smoking, cholesterol, and obesity are generally well recognized, while the understanding of IR procedures is adequate. However, knowledge gaps persist related to genetic risks and certain demographic groups, indicating the need for ongoing public health education. Addressing these gaps can enhance preventive strategies, early detection, and acceptance of minimally invasive treatments in Saudi Arabia's evolving cardiovascular care landscape.

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ETHICAL APPROVAL

The study was fully explained to all participants, and it was emphasized that participation was voluntary. Written informed consent was obtained from each participant before enrollment. All collected information was securely stored and used exclusively for research purposes.

INFORMED CONSENT

Written informed consent was obtained from all study participants.

DATA AND MATERIALS AVAILABILITY

All data generated or analyzed during this study are included in this published article.

REFERENCES

1. Al-Ghamdi SH, Aldosari KH, AlAjmi MM. Patterns and determinants of treatment for coronary artery disease: A cross-sectional study in the Kingdom of Saudi Arabia. Saudi Med J 2021;42:895-902.
2. Kamangar S, Ameer Ahamad N, Nik-Ghazali N, Anqi AE, Algahtani A, Ahamed Saleel C, *et al*. The influence of multi-stenosis in the left coronary artery subjected to the variable blood flow rate. Front Eng Built Environ 2021;1:97-106.
3. Kataria T, Hussain S, Kaur G, Deb A. Emerging nanoparticles in the diagnosis of atherosclerosis. Int J Pharm Sci Rev Res 2021;70:46-57.
4. Ghafari C, Carlier S. Stent visualization methods to guide percutaneous coronary interventions and assess long-term patency. World J Cardiol 2021;13:416-37.
5. Oikonomou E, Theofilis P, Lampsas S, Katsarou O, Lysandrou A, Gounaridi M, *et al*. Current concepts and future applications of non-invasive functional and anatomical evaluation of coronary artery disease. Life (Basel) 2022;12:1803.
6. Meng H, Ruan J, Yan Z, Chen Y, Liu J, Li X, *et al*. New progress in early diagnosis of atherosclerosis. Int J Mol Sci 2022;23:8939.
7. Dawson LP, Lum M, Nerleker N, Nicholls SJ, Layland J. Review JS. Coronary atherosclerotic plaque regression: JACC State-of-the-art review. J Am Coll Cardiol 2022;79:66-82.
8. Albugami S, Al-Husayni F, Bakhsh L, Alhameed F, Alsulami A, Abumelha K, *et al*. The perception of coronary artery disease and cardiac catheterization in Saudi Arabia: "What the public know." Cureus 2020;12:e6570.
9. De Souza PG, De Almeida Lima EF, Sipolatti WG, Filetti FM, Furieri LB, De Silveira PG, *et al*. Knowledge, Attitude, and Practice Regarding Cardiac Catheterization and Percutaneous Coronary Intervention in Patients with Stable Coronary Artery Disease; 2025. Available from: https://www.preprints.org/manuscript/202501.1305/v1 [Last accessed on 2025 Jan 17].
10. Elsheikh EA, Alqahtani OH, Aljedani HM, AlKulayb SM, Bamousa OM, Althobaiti RM, *et al*. Assessment of knowledge and awareness regarding coronary artery disease risk factors among the Saudi Arabian population: A cross-sectional study. Cureus 2024;16:e52299.
11. Alnahdi AA, Alqahtani SS, Alqahtani MS, Almutairi AF, Alqahtani AM. High prevalence of lack of knowledge and unhealthy lifestyle practices regarding premature coronary artery disease and its risk factors among the Saudi population. BMC Public Health 2023;23:975.
12. Almahmoud M, Alhaddad IA, Alkhaldi A, Alsubaie S, Alhabeeb W. Population awareness of coronary artery disease risk factors in Jeddah, Saudi Arabia: A cross-sectional study. East Med Health J 2018;24:1183-9.
13. Ghamri RA. Knowledge of cardiovascular diseases and associated risk factors in the general adult population of Jeddah, Saudi Arabia: A cross-sectional study examining gender disparities. Medicine (Baltimore) 2024;103:e38378.
14. Thygeson AD, Maselli J, Gonzalez DM, Wali B. Intravascular imaging-guided versus angiography-guided percutaneous coronary intervention: A systematic review and bayesian network meta-analysis of randomized controlled trials. J Cardiovasc Med 2024;25:589-601.
15. Alkobati Bicaki M, Al-Ghamdi R, Alqahtani H, Alshehri M. Awareness of myocardial infarction symptoms and risk factors in Saudi Arabia: A cross-sectional study. J Cardiovasc Dis Res 2023;14:445-55.

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