

Awareness of cardiovascular risk factors in Al Al-Ahsa community

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KEYWORDS	ABSTRACT
Awareness, cardiovascular disease, risk factors, Al-Ahsa, Saudis	Background: Cardiovascular diseases rank among the top causes of mortality and morbidity globally. One method to reduce the risks tied to cardiovascular diseases is by recognizing traditional risk factors associated with atherosclerotic heart disease. Aim: Our aim is to Measure the awareness of Al-Ahsa community about Risk factors and symptoms of CVDs among different age groups and between males and females. Methods: a cross-sectional study done in Al-Ahsa Saudi Arabia which involves 438 participants, between the period from 01/12/2024 to 29/12/2024. An online survey was used to conduct the study. The study participants were selected via a convenience sampling technique. Results: The findings reveal that while a majority of participants are aware of common risk factors but there is still a significant portion (near half of the participants) of the population with poor awareness. The results indicate that older individuals, females, those with higher education levels, higher monthly incomes, and regular exercisers are more likely to have a good awareness of cardiovascular risk factors. Conclusion: This study shows that public awareness of cardiovascular disease (CVD) risk factors in Al-Ahsa is moderate, with significant differences in awareness based on demographics and lifestyle factors..

Introduction

Cardiovascular diseases (CVDs) are one of the primary causes of morbidity and mortality globally. They are considered as one of the leading causes of prolonged hospital stays and high healthcare costs (1-4). Heart failure, ischemic stroke, peripheral vascular disease, atherosclerosis of the aorta and its branches, and diseases of the coronary arteries are all considered cardiovascular diseases (CVDs). [5]. CVDs are the leading cause of death. Every year More people die from CVDs than from any other cause. it was estimated in 2016 that 17.9 million people died from CVDs, representing 31% of all global deaths, 85% Of these deaths were due to MI and strokes [6]. The proportional CVD mortality rate in Saudi Arabia, a middle-income country, is 37% [5]. On average, developing countries remain comparatively unprepared to manage the burden, because of low literacy rates and a lack of knowledge of disease-related symptoms and linked risk factors, which leads to worse disease outcomes [7]. Obesity, high blood pressure, blood glucose, abnormal blood lipids, tobacco use, physical inactivity, and poor diet were the most prevalent modifiable risk factors [8]. To alter people's behaviors, health attitudes, and lifestyle choices, it is crucial to raise their understanding about CVD and its modifiable risk factors [5]. A paper done among the Saudi Arabia population shows that the public are unaware of Risk factors for cardiovascular diseases [9]. Another Paper shows that, 5372 (2.7%) Out of 197,681 participants of eastern Saudi Arabia population were aware of CVD history. The prevalence was higher in women, widows, and those with lower levels of education, and it showed a strong correlation with age [10]. However, this study demonstrates that 47.1% of respondents in the Riyadh community had a strong understanding of CVD and its risk factors. Ages 35 to 44 were independent predictors of high CVD awareness [11]. Considered a quickly expanding nation, Saudi Arabia is experiencing rapid urbanization and the rapid adoption of a western lifestyle, both of which are contributing factors to the rising prevalence of cardiovascular disease [12]. Therefore, as a result, risk stratification is essential to the treatment of heart disease, and we carried out a cross-sectional study to assess the Al-Ahsa community's knowledge of CVD risk factors.

Study Methodology

This study will be a cross-sectional study because the study deals about the perception. It was conducted among 438 in Al-Ahsa, Saudi Arabia by using an online questionnaire. Data were collected from December 1st to 30 December 2024. The sample size is calculated by using the Cochran's Formula (13) with 95% confidence, a margin of error of 5%, assuming a population proportion of 0.74(14). This study is specific for patients in Al-Hasa, Saudi Arabia to assess the patients' awareness of the risk factors of CVDs, and to evaluate whether patients are working to modify them., all People who do not live in Al- Hasa or younger than 18 were excluded. they will be asked to fill the questionnaire. In the first part of the questionnaire Participants were asked to complete the first section of the questionnaire which asked about their demographic background, including their educational background, height, weight, BMI, and physical activity level (either regular—at least three times a week for 30 minutes or not at all), as well as whether they had any risk factors for CVD and whether they had been diagnosed with atherosclerotic disease based on their medical history. The patients are then asked to list every known risk factor for cardiovascular disease. In this study, knowledge of CVD risk factors was measured as a continuous variable with a range of 0 to 9, with one point awarded for each identified risk factor.

Data analysis

The data analysis for this study was conducted using SPSS version 26 (Armonk, NY: IBM Corp, 2019). To assess public awareness of cardiovascular risk factors, an overall awareness score was calculated based on correct responses to various awareness items, where each correct answer was awarded 1 point. A cutoff point of 60% was applied to categorize participants into two groups: "poor awareness" and "good awareness." Participants scoring below 60% were classified as having poor awareness, while those scoring 60% or higher were classified as having good awareness. Descriptive statistics, including frequencies and percentages, were used to summarize the demographic characteristics of the study participants. To assess factors associated with cardiovascular awareness, bivariate analyses were conducted using chi-square tests for categorical variables. Subsequently, a multiple logistic regression analysis was performed to identify significant predictors of public awareness, adjusting for potential confounders. The predictors included variables such as age, gender, education level, income, exercise habits, smoking, and family history of heart disease. The odds ratios (ORA) with 95% confidence intervals (CI) and p-values were reported, with statistical significance set at $p < 0.05$. All statistical analyses were carried out at a significance level of 0.05.

Results

The table presents the bio-demographic characteristics of 438 study participants from Al-Ahsa, Saudi Arabia. The age distribution shows that the majority of participants are between 45 to 54 years old (26.5%), followed by those older than 65 years (22.1%). There is a slightly higher percentage of females (55.7%) compared to males (44.3%). About educational level, most participants have completed secondary school (43.6%), with 32.4% having a university degree, and 18.0% had a postgraduate degree. Regarding income, 39.3% of participants reported between 5000 and 15000 SR per month, while 36.8% reported less than 5000 SR, and 24.0% had an income greater than 15000 SR. When asked about exercise, just over half (53.2%) of participants reported doing some form of physical activity. Of those who exercise, 46.8% reported doing 3 to 7 hours of exercise per week. Chronic health issues are common among the participants, with 41.8% having diabetes mellitus, 36.8% suffering from obesity, 34.5% complained of hyperlipidemia, and 18.5% diagnosed with hypertension. The atherosclerotic disease affects 26.9% of the participants. Additionally, 43.6% of participants are smokers, and 68.9% have a family history of heart disease.

Table 1. Bio-demographic characteristics of the study participants, Al-Ahsa, Saudi Arabia (n=438)

Bio-demographics	No	%
Age in years		
18 to 24	50	11.4%
25 to 34	49	11.2%
35 to 44	75	17.1%
45 to 54	116	26.5%
55 to 64	51	11.6%
Older than 65	97	22.1%
Gender		
Male	194	44.3%
Female	244	55.7%
Educational level		
Intermediate school	26	5.9%
Secondary school	191	43.6%
University graduate	142	32.4%
Postgraduate degree	79	18.0%
Monthly income		
< 5000 SR	161	36.8%
5000-15000 SR	172	39.3%
> 15000 SR	105	24.0%
Do you practice any type of exercise?		

Yes	233	53.2%
No	205	46.8%
If yes, how many hours weekly		
< 1 hour/week	46	19.7%
1-3 hours/week	56	24.0%
3-7 hours/week	109	46.8%
> 7 hours/week	22	9.4%
Chronic health problems		
None	139	31.7%
Hypertension	81	18.5%
Obesity	161	36.8%
Hyperlipidemia	151	34.5%
Diabetes mellitus	183	41.8%
Atherosclerotic disease	118	26.9%
Are you a smoker (cigars, e-cigarettes, others)		
Yes	191	43.6%
No	247	56.4%
Do you have any family history of heart diseases		
Yes	302	68.9%
No	136	31.1%

Table 2 shows the public awareness of cardiovascular risk factors among the residents of Al-Ahsa, Saudi Arabia. The majority of participants (55.7%) know that aging can increase the risk of heart disease, while 44.3% do not. Similarly, more than half (51.1%) understand that male gender may raise the risk, while 48.9% disagree. When it comes to lifestyle factors, 53.0% of participants reported that lack of exercise can contribute to heart disease, and 61.2% believe stress is a risk factor. A large portion of participants (81.3%) correctly identify high blood pressure as a risk factor for heart disease, and 72.6% are aware that high blood sugar levels can increase the risk. Over 64% recognize high cholesterol levels as a contributing factor, while 67.1% are aware of the connection between obesity and heart disease. About 50.9% of respondents know that a family history of heart disease is a risk factor. Regarding general knowledge of heart diseases, 57.3% of participants consider themselves somewhat aware, while 32.0% feel fully aware, and 10.7% report being unaware of heart diseases.

Table 2. Public Awareness of cardiovascular risk factors in Al Al-Ahsa Community, Saudi Arabia (n=438)

Awareness items	Yes		No	
	No	%	No	%
Do you think aging can increase the risk of heart diseases	244	55.7%	194	44.3%

Do you think male gender can increase the risk of heart diseases	224	51.1 %	214	48.9 %
Do you think lack of exercise can increase the risk of heart diseases	232	53.0 %	206	47.0 %
Do you think stress can increase the risk of heart disease?	268	61.2 %	170	38.8 %
Do you think High blood pressure can increase the risk of heart disease?	356	81.3 %	82	18.7 %
Do you think High blood sugar levels can increase the risk of heart disease?	318	72.6 %	120	27.4 %
Do you think High cholesterol levels can increase the risk of heart disease?	281	64.2 %	157	35.8 %
Do you think obesity can increase the risk of heart disease?	294	67.1 %	144	32.9 %
Do you think a family history of heart disease increases the risk of heart disease?	223	50.9 %	215	49.1 %
How would you rate your knowledge of heart diseases	No		%	
Aware	140		32.0%	
Somewhat aware	251		57.3%	
Unaware	47		10.7%	

Figure 1 summarizes the overall awareness level of cardiovascular health in the Al-Ahsa community. It shows that 52.3% of participants have a good awareness of heart disease and its risk factors, while 47.7% have a poor level of awareness. As for the most effective methods for raising awareness about heart diseases among the population as reported (Figure 2), the majority (41.3%) believe that social media platforms are an effective tool for spreading awareness. Creating videos or websites and publishing them on the internet and television is the second most favored method, with 31.3% of participants supporting it. Additionally, 21.5% suggest increasing the availability of pamphlets and brochures in waiting areas as a good strategy. Fewer respondents (4.8%) think that including this topic in school and university curricula would be an effective method, while just 1.1% support including the topic in school and other curricula.

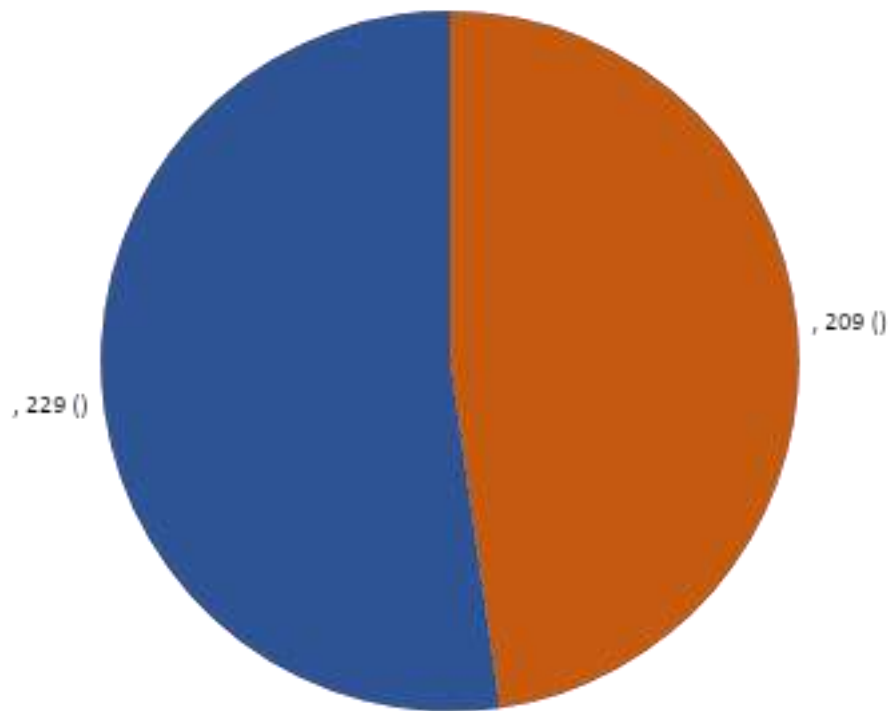


Figure 1. The overall public Awareness of cardiovascular risk factors in Al Al-Ahsa Community, Saudi Arabia (n=438)

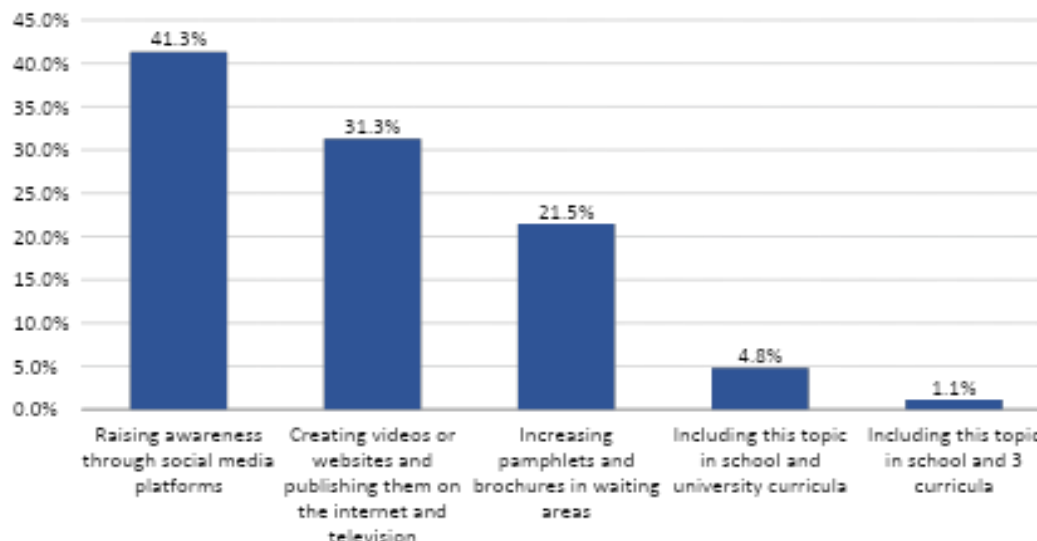


Figure 2. The effective methods in raising awareness about heart diseases among the population

Table 3 presents factors associated with public awareness of cardiovascular risk factors in Al-Ahsa, Saudi Arabia. Younger age groups show higher awareness, with 66.0% of those aged 18 to 24 having good awareness compared to only 10.2% in the 25 to 34 age group. Overall, awareness is better among older individuals, with 86.2% of those aged 45 to 54 having good awareness ($p = 0.001$). Also, females demonstrate higher awareness, with 66.0% of women reporting good awareness compared to 35.1% of men ($p = 0.001$). Awareness increases with higher education. Among those with postgraduate degrees, 74.7% have good awareness, whereas all participants with only intermediate school education (100.0%) have poor awareness ($p = 0.001$). Similarly, higher income correlates with better awareness, as 69.5% of those earning more than 15,000 SR have good awareness, compared to only 32.3% of those earning less than 5,000 SR ($p = 0.001$). Individuals who exercise are more likely to have better awareness, with 73.4% of those who exercise having good awareness compared to only 28.3% of non-exercisers ($p = 0.001$). Additionally, among those who exercise, those doing 3-7 hours per week have better awareness, with 60.6% having good awareness ($p = 0.001$). Participants with chronic health conditions show poorer awareness (40.9% with good awareness) compared to those without such conditions, where 76.1% have good awareness ($p = 0.001$). On the other hand, there is no significant difference between smokers and non-smokers in terms of awareness ($p = 0.348$) and also there is no significant difference in awareness between those with a family history of heart disease (49.7% with good awareness) and those without (58.1%) ($p = 0.103$).

Table 3. Factors associated with public awareness of cardiovascular risk factors in Al Al-Ahsa Community, Saudi Arabia (n=438)

Factors	Overall awareness level				p-value
	Poor		Good		
	No	%	No	%	
Age in years					
18 to 24	17	34.0%	33	66.0%	.001*
25 to 34	44	89.8%	5	10.2%	
35 to 44	55	73.3%	20	26.7%	
45 to 54	16	13.8%	100	86.2%	
55 to 64	24	47.1%	27	52.9%	
Older than 65	53	54.6%	44	45.4%	
Gender					
Male	126	64.9%	68	35.1%	.001*
Female	83	34.0%	161	66.0%	
Educational level					
Intermediate school	26	100.0%	0	0.0%	.001*^
Secondary school	124	64.9%	67	35.1%	
University graduate	39	27.5%	103	72.5%	
Postgraduate degree	20	25.3%	59	74.7%	
Monthly income					
< 5000 SR	109	67.7%	52	32.3%	.001*
5000-15000 SR	68	39.5%	104	60.5%	
> 15000 SR	32	30.5%	73	69.5%	
Do you practice any type of exercise?					
Yes	62	26.6%	171	73.4%	.001*
No	147	71.7%	58	28.3%	
If yes, how many hours weekly					
< 1 hour/week	2	4.3%	44	95.7%	.001*^
1-3 hours/week	6	10.7%	50	89.3%	
3-7 hours/week	43	39.4%	66	60.6%	
> 7 hours/week	11	50.0%	11	50.0%	
Chronic health problems					
Yes	175	59.1%	121	40.9%	.001*
No	34	23.9%	108	76.1%	
Are you a smoker (cigars, e-cigarettes, others)					
Yes	96	50.3%	95	49.7%	.348
No	113	45.7%	134	54.3%	
Do you have any family history of heart disease?					
Yes	152	50.3%	150	49.7%	.103
No	57	41.9%	79	58.1%	

P: Pearson χ^2 test

^: Exact probability test

* $P < 0.05$ (significant)

The multiple logistic regression model (Table 4) identifies several significant predictors of public awareness of cardiovascular risk factors. Age is a significant predictor ($p = 0.026$), with older individuals being 5.6 times more likely to have a good awareness of cardiovascular risk factors (ORA = 5.6, 95% CI: 1.2–25.6). Female gender is also a strong predictor ($p = 0.001$), with women being 31 times more likely to have good awareness compared to men (ORA = 31.0, 95% CI: 7.9–122.1). High education level is another significant factor ($p = 0.001$), with individuals who have a higher level of education being 18.3 times more likely to be aware of cardiovascular risks (ORA = 18.3, 95% CI: 6.9–49.0). High monthly income also influences awareness ($p = 0.047$), as individuals with higher income levels have a lower likelihood of being unaware (ORA = 0.4, 95% CI: 0.2–1.0). Regular exercise is a significant predictor ($p = 0.003$), with those who exercise being 10 times more likely to have good awareness (ORA = 10, 95% CI: 2.1–16.9). Chronic health problems were not found to significantly impact awareness ($p = 0.254$), and similarly, a family history of heart disease ($p = 0.001$) shows a strong association with awareness, with those having a family history being 15.1 times more likely to be aware (ORA = 15.1, 95% CI: 4.5–44.3). Finally, smoking is also a significant factor ($p = 0.006$), with smokers being 2.8 times more likely to have better awareness compared to non-smokers (ORA = 2.8, 95% CI: 1.3–5.7).

Table 4. Multiple logistic regression model for predictors of public awareness of cardiovascular risk factors

Predictors	p-value	OR _A	95% CI	
			Lower	Upper
Age in years	.026*	5.6	1.2	25.6
Female gender	.001*	31.0	7.9	122.1
High education	.001*	18.3	6.9	49.0
High monthly income	.047*	0.4	0.2	1.0
Exercises	.003*	10	2.1	16.9
Chronic health problem	.254	2.8	0.5	16.0
Smokers	.006*	2.8	1.3	5.7
Family history of heart diseases	.001*	15.1	4.5	44.3

Discussion

The study conducted in Al-Ahsa, Saudi Arabia, aimed to assess the public awareness of cardiovascular risk factors and effective methods for raising awareness about heart diseases. The findings reveal that while a majority of participants are aware of common risk factors such as lack of exercise, high blood pressure, high cholesterol, high blood sugar, obesity, family history of heart disease, aging, male gender, and stress, there is still a significant portion (near half of the participants) of the population with poor awareness. The results indicate that older individuals, females, those with higher education levels, higher monthly incomes, and regular exercisers are more likely to have a good awareness of cardiovascular risk factors. This aligns with previous studies that have shown demographic factors such as gender, age, income, and education to be important indicators of health awareness. A study conducted by Mukattash TL et al. (13) revealed a limited public awareness of cardiovascular disease (CVD). Better knowledge was linked to non-smoking, healthy eating habits, maintaining a healthy weight, high socioeconomic status, university education, and a family history of CVD. Also, our study findings align with the other study conducted by Awad A and Al-Nafisi H (14) which identified similar predictors such as age, education, and lifestyle. However, our study emphasized the role of social media and digital platforms in raising awareness, while the other study focused on the pharmacist's role in medication management. Both studies highlight the need for improved public education on CVD. Also, our study findings are Comparable to that found in Beijing (15) though higher than that in Nepal (16) and Pakistan. (17) In contrast, previous studies from Canada, Jordan, Iran, and North Ireland, shows higher knowledge in disease risk factors which were known by over 75% of respondents. (13, 18-20) As for factors associated with public awareness, a study conducted in Riyadh, Saudi Arabia by Khalifa A. et al. (21) also highlighted the importance of demographic factors in determining public awareness of cardiovascular risk factors. The study found that older age, female gender, higher education levels, and higher income were associated with better awareness of cardiovascular health. The study also identified effective methods for raising awareness about heart diseases, with social media platforms being the most favored method, followed by creating websites or videos and publishing them through the internet and television, and increasing the availability of pamphlets and brochures in waiting areas. These findings are consistent with other research that emphasizes the role of digital media and educational materials in improving public health awareness. (22, 23)

One important finding of this study is the significant association between smoking and awareness, suggesting that smokers may have a heightened awareness of cardiovascular risks, potentially due to health campaigns targeting smoking-related diseases. However, this study also highlights the need for more targeted interventions, especially for individuals with low education levels, lower income, and those who do not engage in regular physical activity. These groups may benefit from enhanced educational campaigns that focus on the prevention of cardiovascular diseases and the importance of healthy lifestyle choices.

Conclusions and recommendations

This study shows that public awareness of cardiovascular disease (CVD) risk factors in Al-Ahsa is moderate, with significant differences in awareness based on demographics and lifestyle factors. Knowledge about common CVD risk factors such as [obesity](#), [stress](#), and high blood pressure was relatively high, but awareness of heart attack and stroke symptoms remains low. Factors that were associated with better awareness include being female, older age, higher education, higher income, regular exercise, and a family history of heart disease. The results indicate that while most people are aware of some CVD risk factors, there is still a need for broader public education. To improve public awareness of CVD risk factors, health campaigns should target younger age groups, males, and individuals with lower educational levels. Social media platforms and digital content, such as videos and websites, are identified as effective tools for raising awareness and should be utilized. Additionally, increasing access to educational materials like pamphlets in public places could help spread important information. Public health initiatives should also encourage regular exercise, healthy eating, and routine health check-ups, particularly for individuals with low awareness or chronic health conditions. Moreover, incorporating CVD-related education into school curricula could have a lasting impact on future generations.

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