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ISCHEMIC HEART DISEASE RISK AMONG POSTMENOPAUSAL WOMEN IN SAUDI ARABIA: KNOWLEDGE AND AWARENESS LEVEL STUDY

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ABSTRACT

The term "ischemia" refers to a localized loss of blood flow (circulation) caused by a blockage of the blood vessels supplying the area. Only 44% of women are aware that CVD is the biggest cause of mortality for women, down from 65% in 2009, according to the results of a 2019 survey. This study aims to assess the awareness and knowledge of Saudi population about the risk of ischemic heart disease (IHD) in post-menopausal women. The study was a community-based cross-sectional study among the Saudi post-menopausal-women population who can read Arabic or English, and have the will to participate in the study were included. The data was collected via a valid and reliable questionnaire that was distributed to participants. Quantitative data were analyzed using the t-test, and the Chi-square test and was used to assess qualitative variables. A P value of ≤ 0.05 is considered significant. Statistical analysis was performed with IBM SPSS version 29.0 Statistical software package. The study included 449 participants, 51.4% of whom were males. 39.2% of the respondents have a high degree of knowledge and awareness of ischemic heart disease risk among post-menopausal women, while 32.3% have a moderate level, and 28.5% have poor knowledge and awareness. Overall, the Saudi general population had inadequate knowledge of ischemic heart disease risk among post-menopausal women. Age, educational level, monthly income, and occupation were significantly associated with participants' knowledge.

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Introduction

Ischemia is described as a localized lack of blood flow (circulation) brought on by a blockage of the blood arteries feeding the region. An organ (such as the heart) is said to be ischemic if it is not receiving enough blood and oxygen. The term "ischemic heart disease," also known as "coronary heart disease" or "coronary artery disease," refers to cardiac conditions caused by occluded coronary arteries, which feed blood to the heart muscle [1].

Recent statistics from the World Health Organization (WHO) demonstrate that coronary heart disease (CHD) continues to be the top cause of mortality globally, with an increase in prevalence in the nations of Africa and the Middle East [2].

According to several studies, premenopausal women had a significantly reduced risk of cardiovascular disease (CVD) than men of the same age. This sex-related protection, nevertheless, declines with aging, and older women show a similar

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vulnerability to CVD and its risk factors as older men do. Potential causes for enhanced CVD risk in elderly women are unknown, however physiologic changes associated with menopause have been suggested [3].

Cardiovascular disease awareness is an extremely important factor when it comes to making lifestyle changes, taking preventive measures, and following health recommendations and treatment guidelines [4].

Although CVD is the leading cause of death among women, results from a 2019 survey revealed only 44% of women are aware of this, which is a decline from 65% in 2009 [5].

Every year, CVD claims the lives of females more than males. More than 450,000 women succumb to heart disease annually, and 250,000 die of coronary artery disease [6].

CVD risk increases after menopause, which may be related to metabolic and hormonal changes Menopause is a risk factor for CVD because estrogen withdrawal has a detrimental effect on cardiovascular function and metabolism [7].

In a span covering January through March 2020, a cross-sectional inquiry was undertaken, employing an online survey accompanied by a self-administered questionnaire. The study encompassed 311 participants, with an average age of 22.5 years. The male contingent constituted the majority at 51.4%. Impressively, around 82% of participants displayed no prior acquaintance with CAD (coronary artery disease), while 26.4% lacked familiarity with any CAD-associated risk factors. The prevalence of CAD risk factors proved noteworthy, inclusive of a familial CAD history (9.3%), excessive weight/obesity (58.6%), physical inactivity (79.1%), and smoking (24.1%) [8].

Conversely, in a separate cross-sectional investigation spanning January to December 2017 in Jeddah, the focus was on discerning participant awareness of CAD risk factors. Executed via an online survey questionnaire, this study scrutinized participants' recognition of 14 specific risk elements, spanning smoking, sedentary habits, dietary choices, and medical histories. The cohort consisted of 468 respondents, averaging 31.9±12.4 years in age, with 41% being male. Predominantly Saudis (~86%) and with around 60% having pursued university education, the participants demonstrated an average overall awareness score of 4.31±1.36 out of 8.0. The risk factors most prominently identified were excessive fast-food consumption, soft drink intake, and family histories of diabetes, acknowledged by 74.8%, 64.3%, and 47.2% of participants, respectively. Interestingly, a robust correlation surfaced between the collective awareness score and the cognizance of specific risk factors ($P<0.003$) [9].

Similarly, during the timeframe of January to March 2020, an analogous cross-sectional examination was executed. The study harnessed an online survey and self-administered questionnaire to glean insights from 311 participants, with a distribution of 48.6% men and 51.4% women, predominantly aged 18 to 25. The research centered on discerning the Saudi adult population's grasp of CAD risk factors, and the findings exposed discernible knowledge gaps. A notable 82% exhibited no prior familiarity with CAD, and significant proportions showcased a lack of awareness concerning linked risk factors (26.4%), symptoms (25.1%), and complications (72.7%). Paradoxically, despite the prevailing unawareness, the study spotlighted a considerable prevalence of specific CAD risk factors, including familial CAD history (9.3%), elevated body weight/obesity (58.6%), physical inactivity (79.1%), and smoking (24.1%). The results shed light on the critical necessity for comprehensive public awareness initiatives, aimed at elucidating CAD risk factors and ultimately curbing its impact within the Saudi adult demographic [8].

A cross-sectional study published in Dawadmi, Riyadh in 2020 shows the present study indicates that Saudi citizens are not well-informed on the causes, signs, and complications of CAD. Fast food consumption, obesity, smoking, and physical inactivity are all preventable risk factors that have a major impact on knowledge levels. More than one-fourth of all participants were unable to name even one CAD risk factor. The findings also indicated that around one-third of Saudi adults had more than two CAD risk factors [8].

A systematic review study was conducted in 2016 aimed to provide a comprehensive overview of the latest research on the prevention and treatment of ischemic heart disease (IHD) in women. The study reviewed the literature on the epidemiology, risk factors, diagnosis, treatment, and outcomes of IHD in women. The study found that IHD is the leading cause of death for women in the United States and that it is on the rise among postmenopausal women. The study also found that women with IHD are more likely to have a heart attack than men and that they are more likely to die from a heart attack. The study concluded that IHD is a serious health threat for women, but that it is a preventable disease. The study also found that there are effective treatments available for IHD and that women with IHD can live long and productive lives [10].

A study conducted in Jordan showed that having a family history of heart disease increases your risk of developing the condition by a percentage that reaches (74.4%). The current study's findings are consistent with those of a 2014 study about women's attitudes, practices, and knowledge regarding menopause and hormone replacement therapy that was conducted in Al-Ain, United Arab Emirates. That study found that 67% of women had inadequate knowledge of menopause and that knowledge varied significantly depending on nationality and educational background [11].

This study concluded that our participants' general understanding of CVDs was adequate. Participants displayed strong knowledge of risk factors but poor knowledge of the kinds and warning symptoms of CVDs. The knowledge score was correlated with gender, educational attainment, place of residence, net monthly income, BMI, perception of lifestyle, and history of diabetes or hypertension or family history of CVDs [12].

Despite the high prevalence of IHD among postmenopausal women, most of the population is unaware of this type of disease, and they attribute their symptoms to non-cardiac reasons, women may put off receiving treatment for CHD, So The understanding and assessment of their own risk are the primary factors in prevention. There is a need to inform the population, especially those who are postmenopausal, about the hormonal changes that take place in their bodies after menopause and how

they can be helped in preventing the disease in order to lessen the growing burden of CAD on society. The population also needs to be made aware of the importance of removing the risk factors for coronary artery disease. there are an insignificant number of studies and there are variations in the results within the previous studies, especially in Saudi Arabia this shows the importance of conducting a study that will provide an assessment of the current knowledge and awareness level among post-menopausal women.

Objectives

The purpose of this study is to identify whether the Saudi population is aware of the risk factors of IHD, through the assessment of the awareness and knowledge of the Saudi population about the risk of IHD in post-menopausal women.

Materials and Methods

Study Design and Setting

A community-based, observational, and analytical cross-sectional study conducted in Saudi Arabia that is quick, feasible, and helpful for knowledge assessment.

Participants, Recruitment, and Sampling Procedure

The study population consisted of Saudi adults who are living in Saudi Arabia, participants were recruited when the questionnaire was administered in 2023.

Inclusion and Exclusion Criteria

Saudi population who are 18 to 65 years old, live in Saudi Arabia, can read and write in Arabic or English, and are willing to participate in the study were included. We shall exclude anyone who refuses to participate, is younger than 18 or older than 65, or doesn't live in Saudi Arabia.

Sample Size

With a 95% Confidence interval and a margin of error (=0.05). The minimum sample size required is 384 according to the Raosoft calculator estimation. This sample size is large enough to achieve the desired statistical power of the study.

Method for Data Collection and Instrument (Data Collection Technique and Tools)

The data for this study was collected by using a self-administered questionnaire and it is a reliable and valid method for collecting data on knowledge and awareness levels. The final version of the questionnaire was then administered to the study participants. The participant was asked if they would be willing to participate in the study and to complete the questionnaire.

Section one contains socio-demographic data including questions regarding Age; Sex; Social status; education level; profession; Weight; Height; Monthly income; How you rate your health; your place of residence; Smoking; The number of times you do sporting activity for more than 30 minutes a week; Eat healthy food; How would you describe your weight from your point of view; How would you describe your lifestyle from your point of view; Does any of the first or second degree family members suffer from cardiovascular disease; Do you suffer from chronic disease; Chronic disease from which you previously suffered.

Section two contains knowledge and awareness about cardiovascular disease including questions regarding diseases of the cardiovascular system such as Coronary heart disease, Congenital heart disease, Deep vein thrombosis and pulmonary embolism, Rheumatic heart disease, Peripheral arterial disease, and Cerebrovascular disease.

Section three contains questions regarding symptoms of heart attack as Pain or discomfort in the chest area, Difficulty or shortness of breath, Pain or discomfort in the arms or shoulder, Feeling weak, dizzy, or fainting, Pain or discomfort in the shoulder, neck, or back.

Section four contains questions regarding symptoms of stroke as Sudden confusion or trouble speaking or understanding others, Sudden numbness in the face, arm, or leg, sudden dizziness, difficulty walking, loss of balance or coordination, Severe headache with no known cause, Severe difficulty seeing in one or both eyes.

Section five contains questions regarding possible causes of cardiovascular diseases such as smoking, Obesity, Unhealthy diet, Physical inactivity and lack of exercise, High levels of harmful cholesterol, Hypertension, Having a family history of cardiovascular disease, Stress, and tension, and diabetes.

Scoring System

43 questions in total are in the survey, 25 of them concerned with the knowledge and awareness level.

Any correct answer will receive a score of 1 and an incorrect one will receive a score of 0, the maximum score is 25 where the minimum is 0.

A score of 14 or less concorded to have poor knowledge and awareness.

From 16 to 19 score is considered to have moderate knowledge and awareness.

From 20 to 25 score is considered to have high knowledge and awareness.

Analyzes and Entry Method

Differences between quantitative data were analyzed using the t-test, and the Chi-square tests was used to assess qualitative variables. A P value ≤ 0.05 is considered significant. Statistical analysis was performed with IBM SPSS version 29.0 Statistical software package.

Results and Discussion

Table 1 shows that age distribution reveals that the largest proportion falls within the 20-30 age range, accounting for 36.1% of the sample, followed by the 41-50 age group at 20.9%. Notably, individuals aged over 60 make up the smallest percentage at 3.1%. Gender distribution indicates a relatively balanced representation, with 51.2% male and 48.8% female respondents. Geographically, the majority of respondents reside in the South, comprising 59.2% of the sample, followed by the Middle region at 14.9%. When considering education level, the data reflects a higher prevalence of Bachelor's degree holders, constituting 63.0% of the sample, while uneducated individuals and those with primary education make up the smallest percentages at 0.4% and 0.7% respectively. In terms of occupation, the highest percentage of respondents are students at 27.8%, followed by government employees at 33.0%. Monthly income distribution shows that the majority of respondents earn less than 5,000 Saudi Riyals, accounting for 40.8% of the sample, while those earning over 15,000 Riyals represent 24.3%. Marital status distribution reveals that the largest proportion of respondents are married at 57.7%, followed by single individuals at 39.2%. Body Mass Index (BMI) distribution indicates that the highest percentage falls within the 'normal' category at 35.9%, while 'underweight' individuals represent the smallest percentage at 5.8%. Place of residence shows that the majority of respondents reside in city centers at 78.6%, with the smallest proportion residing in villages at 7.3%. Finally, smoking habits reveal that the majority of respondents are non-smokers at 81.5%, while current smokers and ex-smokers represent 10.7% and 7.8% respectively.

Table 1. Sociodemographic characteristics of participants (n=449)

Parameter		No.	Percent
Age	less than 20	28	6.2
	20- 30	162	36.1
	31 -40	69	15.4
	41 -50	94	20.9
	51- 60	82	18.3
	more than 60	14	3.1
Gender	Male	230	51.2
	Female	219	48.8
Location	East	41	9.1
	Middle	67	14.9
	North	12	2.7
	South	266	59.2
	West	63	14.0
Education Level	uneducated	2	.4
	primary	3	.7
	middle	2	.4
	secondary	74	16.5
	diploma	37	8.2
	Bachelor's	283	63.0
	Postgraduate	48	10.7
Occupation	free business	11	2.4
	Government employee	148	33.0
	Private employee	39	8.7
	student	125	27.8
	Retired	55	12.2
	Other than that	71	15.8
Monthly Income (in Saudi Riyals)	Less than 5,000	183	40.8
	5,000 - 10,000	75	16.7

	11,000 - 15,000	82	18.3
	Over 15,000	109	24.3
Marital Status	Married	259	57.7
	Single	176	39.2
	Divorced	9	2.0
	Widowed	5	1.1
BMI	underweight	26	5.8
	normal	161	35.9
	overweight	145	32.3
	obese	117	26.1
Place of residence	village	33	7.3
	City center	353	78.6
	governorate	63	14.0
Smoking	Current smoker	48	10.7
	Ex-smoker	35	7.8
	Non-smoker	366	81.5

Firstly as shows in **Table 2**, the statistics show that a significant portion of the population engages in sports activity for more than 30 minutes per week. It is encouraging to note that 40.8% participate once or twice, 18.5% three or four times, and 9.4% five times or more, indicating a substantial commitment to physical activity. However, it is concerning that 31.4% report engaging in no sports activity. When it comes to dietary habits, the data reveals a mixed picture. While 23.4% eat healthy food once a week and 33.4% do so one to three times a week, a notable 17.1% do not consume healthy food at all. Encouragingly, 26.1% report eating healthy food more than three times a week. The statistics related to weight perceptions are particularly noteworthy. A significant 44.1% perceive themselves as overweight, with 6.7% suffering from obesity. The data also sheds light on the perception of lifestyle exhaustion. While 18.9% strongly agree and 30.1% agree that their lifestyle is exhausting, a substantial 27.2% remain neutral. Understanding the prevalence of cardiovascular disease within families is crucial for assessing potential risk factors. The data indicates that 30.5% have a first- or second-degree family member suffering from cardiovascular disease. Furthermore, the statistics on chronic diseases provide valuable insights. While 14.9% report suffering from chronic diseases, the majority (85.1%) do not.

Table 2. Knowledge of participants about IHD in postmenopausal women (n=449)

Parameter		**No.**	**Percent**
The number of times you engage in sports activity for more than 30 minutes per week:	Once or twice	183	40.8
	Three or four times	83	18.5
	Five times or more	42	9.4
	nothing	141	31.4
Eat healthy food:	Once a week	105	23.4
	One to three times a week	150	33.4
	More than three times a week	117	26.1
	Not once	77	17.1
How would you describe your weight from your perspective:	I'm overweight	198	44.1
	I suffer from obesity	30	6.7
	Less than normal	40	8.9
	natural	181	40.3
From your point of view and your lifestyle, do you agree with this sentence: My lifestyle is exhausting	Strongly agree	85	18.9
	I agree	135	30.1
	neutral	122	27.2
	I do not agree	94	20.9
	I strongly disagree	13	2.9
Does a first- or second-degree family member suffer from cardiovascular disease?	Yes	137	30.5
	no	312	69.5

Do you suffer from chronic diseases?	Yes	67	14.9
	no	382	85.1
Chronic diseases that you previously suffered from	Hypertension	22	4.9
	Dyslipidemia	19	4.2
	diabetic	27	6.0
	nothing	381	84.9

Table 3 shows that. coronary heart disease, which is the most common type of cardiovascular disease, was recognized by only 73.5% of the respondents. This is quite alarming, as coronary heart disease is a leading cause of death worldwide. Similarly, congenital and obstetric heart diseases, which affect a significant number of infants and pregnant women, were recognized by only 63.5% of the respondents. The data also reveals that there is a lack of understanding regarding the symptoms and risk factors of these diseases. For instance, only 43% of the respondents recognized cerebrovascular disease, which is a major cause of stroke. It is also interesting to note that there is a significant difference in the level of awareness among the different types of cardiovascular diseases. While some diseases, such as coronary heart disease and peripheral arterial disease, were recognized by more than 50% of the respondents, others, such as rheumatism heart disease, were recognized by less than 60% of the respondents.

Table 3. Knowledge of participants of types of cardiovascular diseases

Parameter	Yes	No	Don't know
Coronary heart disease is a type of cardiovascular disease	330 73.5%	27 6.0%	9 20.5%
Congenital and obstetric heart diseases is a type of cardiovascular disease	285 63.5%	66 14.7%	98 21.8%
Deep vein thrombosis and pulmonary embolism is a type of cardiovascular disease	247 55.0%	107 23.8%	95 21.2%
Rheumatism heart disease is a type of cardiovascular disease	258 57.5%	58 12.9%	133 29.6%
Peripheral arterial disease is a type of cardiovascular disease	228 50.8%	96 21.4%	125 27.8%
Cerebrovascular disease is a type of cardiovascular disease	193 43.0%	130 29.0%	126 28.1%

Pain or discomfort in the chest area is a symptom of IHD, with 80.2% of respondents correctly identifying it as such. Difficulty or shortness of breath is another symptom of IHD, with 78.6% of respondents correctly identifying it. Pain or discomfort in the arms or shoulders is a symptom of IHD, with 62.6% of respondents correctly identifying it. Feeling weak, dizzy, or faint is a symptom of IHD, with 61.2% of respondents correctly identifying it. Pain or discomfort in the shoulder, neck, or back is a symptom of IHD, with 53.9% of respondents correctly identifying it. Moving on to the symptoms of stroke, it is concerning to see that there is a lower level of awareness compared to the symptoms of IHD. Sudden confusion or difficulty speaking or understanding others is a symptom of stroke, with 72.2% of respondents correctly identifying it.

Sudden numbness in the face, arm, or leg is a symptom of stroke, with 65.7% of respondents correctly identifying it. Sudden dizziness, difficulty walking, or loss of balance or coordination is a symptom of stroke, with 67.9% of respondents correctly identifying it. Severe headache with no known cause is a symptom of stroke, with only 45.9% of respondents correctly identifying it. Severe difficulty seeing in one or both eyes is a symptom of stroke, with 57.2% of respondents correctly identifying it **(Table 4)**.

Table 4. Knowledge of participants of symptoms of cardiovascular diseases

Parameter	Yes	No	Don't know
Pain or discomfort in the chest area is a symptom of IHD	360 80.2%	36 8.0%	53 11.8%
Difficulty or shortness of breath is a symptom of IHD	353 78.6%	42 9.4%	54 12.0%
Pain or discomfort in the arms or shoulder is a symptom of IHD	281 62.6%	74 16.5%	94 20.9%
Feeling weak, dizzy, or faint is a symptom of IHD	275 61.2%	77 17.1%	97 21.6%
Pain or discomfort in the shoulder, neck, or back is a symptom of IHD	242 53.9%	96 21.4%	111 24.7%
Sudden confusion or difficulty speaking or understanding others is a symptom of stroke	324 72.2%	38 8.5%	87 19.4%
Sudden numbness in the face, arm, or leg is a symptom of stroke	295	47	107

	65.7%	10.5%	23.8%
Sudden dizziness, difficulty walking, or loss of balance or coordination is a symptom of stroke	305 67.9%	47 10.5%	97 21.6%
Severe headache with no known cause is a symptom of stroke	206 45.9%	97 21.6%	146 32.5%
Severe difficulty seeing in one or both eyes is a symptom of stroke	257 57.2%	64 14.3%	128 28.5%

Regarding risk factors illustrated in **Table 5**, 92.2% of participants identified smoking as a possible cause of cardiovascular disease, 92.9% identified obesity, 80.8% with an unhealthy diet, 80% physical inactivity, 89.5% high levels of harmful cholesterol, 83.7% hypertension, 78.8% family history of CVD, and 63.9% diabetes.

Table 5. Knowledge of participants of causes of cardiovascular diseases

Parameter	Yes	No	Don't know
Smoking is a possible cause of cardiovascular disease	414 92.2%	14 3.1%	21 4.7%
Obesity is a possible cause of cardiovascular disease	417 92.9%	7 1.6%	25 5.6%
Unhealthy diet is a possible cause of cardiovascular disease	363 80.8%	40 8.9%	46 10.2%
Physical inactivity and lack of exercise is a possible cause of cardiovascular disease	359 80.0%	41 9.1%	49 10.9%
High levels of harmful cholesterol is a possible cause of cardiovascular disease	402 89.5%	12 2.7%	35 7.8%
Hypertension is a possible cause of cardiovascular disease	376 83.7%	25 5.6%	48 10.7%
Having a family history of cardiovascular disease is a possible cause of cardiovascular disease	354 78.8%	33 7.3%	62 13.8%
Stress and tension are possible causes of cardiovascular disease	296 65.9%	69 15.4%	84 18.7%
Diabetes is a possible cause of cardiovascular disease	287 63.9%	77 17.1%	85 18.9%

Figure 1 shows that 39.2% of the respondents have a high degree of knowledge and awareness, while 32.3% have a moderate level, and 28.5% have poor knowledge and awareness.

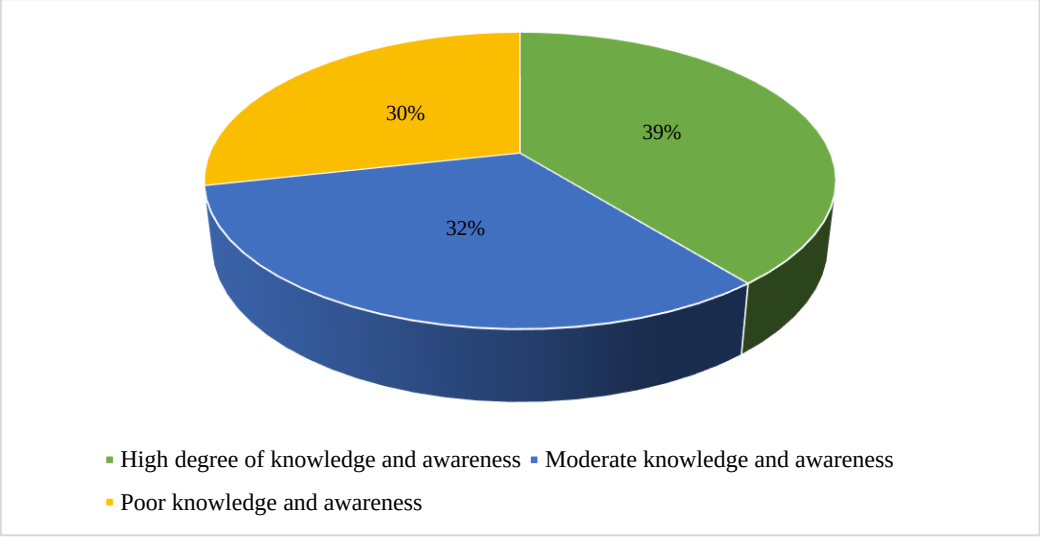

Figure 1. Participants' knowledge scores of IHD in postmenopausal women

As illustrated in **Table 6**, participants aged 20-30 exhibit the highest proportion of individuals with a high degree of knowledge and awareness, accounting for 17.6% of the total respondents. In contrast, those aged 51-60 and over 60 demonstrate comparatively lower levels of knowledge and awareness, at 6.0% and 0.7% respectively. Furthermore, the examination of knowledge and awareness levels across marital status and gender presents intriguing findings. While the differences in knowledge and awareness levels across marital status groups do not reach statistical significance (p=0.162), the gender-based analysis also indicates no significant disparities (p=0.608). The investigation into knowledge and awareness levels based on location and education level provides valuable insights. Notably, participants residing in the South demonstrate the highest

proportion of individuals with a high degree of knowledge and awareness, at 24.5%. In contrast, uneducated individuals, and those with only primary education exhibit markedly lower levels of knowledge and awareness.

Table 6. Participants' knowledge scores in association with their sociodemographic characters (n=449)

		Knowledge score			Total (N=449)	P value
		High knowledge	Moderate knowledge	Poor knowledge		
Age	less than 20	6	12	10	28	0.032
		1.3%	2.7%	2.2%	6.2%	
	20 30	79	41	42	162	
		17.6%	9.1%	9.4%	36.1%	
	31 40	26	17	26	69	
		5.8%	3.8%	5.8%	15.4%	
	41 50	35	35	24	94	
		7.8%	7.8%	5.3%	20.9%	
	51 60	27	33	22	82	
		6.0%	7.3%	4.9%	18.3%	
	more than 60	3	7	4	14	
		0.7%	1.6%	0.9%	3.1%	
Marital status	Single	81	48	47	176	0.162
		18.0%	10.7%	10.5%	39.2%	
	Married	92	89	78	259	
		20.5%	19.8%	17.4%	57.7%	
	Divorced	2	5	2	9	
		0.4%	1.1%	0.4%	2.0%	
	widow	1	3	1	5	
		0.2%	0.7%	0.2%	1.1%	
Gender	Male	85	77	68	230	0.608
		18.9%	17.1%	15.1%	51.2%	
	Female	91	68	60	219	
		20.3%	15.1%	13.4%	48.8%	
Location	East	19	11	11	41	0.373
		4.2%	2.4%	2.4%	9.1%	
	Middle	18	30	19	67	
		4.0%	6.7%	4.2%	14.9%	
	North	6	3	3	12	
		1.3%	0.7%	0.7%	2.7%	
	South	110	82	74	266	
		24.5%	18.3%	16.5%	59.2%	
	West	23	19	21	63	
		5.1%	4.2%	4.7%	14.0%	
Education Level	uneducated	0	1	1	2	0.047
		0.0%	0.2%	0.2%	0.4%	
	primary	1	0	2	3	
		0.2%	0.0%	0.4%	0.7%	
	middle	0	1	1	2	
		0.0%	0.2%	0.2%	0.4%	
	secondary	21	30	23	74	
		4.7%	6.7%	5.1%	16.5%	
	diploma	9	13	15	37	

		2.0%	2.9%	3.3%	8.2%	
	Bachelor's	131	81	71	283	
		29.2%	18.0%	15.8%	63.0%	
	Postgraduate	14	19	15	48	
		3.1%	4.2%	3.3%	10.7%	
Occupation	free business	2	8	1	11	0.001
		0.4%	1.8%	0.2%	2.4%	
	Government employee	62	53	33	148	
		13.8%	11.8%	7.3%	33.0%	
	Private employee	11	12	16	39	
		2.4%	2.7%	3.6%	8.7%	
	student	63	31	31	125	
		14.0%	6.9%	6.9%	27.8%	
	Retired	18	23	14	55	
		4.0%	5.1%	3.1%	12.2%	
	Other than that	20	18	33	71	
		4.5%	4.0%	7.3%	15.8%	
Monthly Income (in Saudi Riyals)	Less than 5,000	72	51	60	183	0.039
		16.0%	11.4%	13.4%	40.8%	
	5,000 - 10,000	31	19	25	75	
		6.9%	4.2%	5.6%	16.7%	
	11,000 - 15,000	26	32	24	82	
		5.8%	7.1%	5.3%	18.3%	
	Over 15,000	47	43	19	109	
		10.5%	9.6%	4.2%	24.3%	
BMI	under weight	13	7	6	26	0.533
		2.9%	1.6%	1.3%	5.8%	
	normal	63	45	53	161	
		14.0%	10.0%	11.8%	35.9%	
	overweight	57	49	39	145	
		12.7%	10.9%	8.7%	32.3%	
	obese	43	44	30	117	
		9.6%	9.8%	6.7%	26.1%	
Place of residence	village	12	8	13	33	0.425
		2.7%	1.8%	2.9%	7.3%	
	governorate	23	25	15	63	
		5.1%	5.6%	3.3%	14.0%	
	City center	141	112	100	353	
		31.4%	24.9%	22.3%	78.6%	
Smoking	Non-smoker	145	100	121	366	0.487
		32.3%	22.3%	26.9%	81.5%	
	Current smoker	17	19	12	48	
		3.8%	4.2%	2.7%	10.7%	
	Ex-smoker	14	9	12	35	
		3.1%	2.0%	2.7%	7.8%	

It is crucial to address the general population's awareness of ischemic heart disease (IHD) risk among postmenopausal women. IHD is the leading cause of death in women, and postmenopausal women are at an increased risk due to hormonal changes and other factors. However, there is a concerning lack of awareness about this issue among the general population [4]. Postmenopausal women experience a decline in estrogen levels, which can lead to an increase in LDL cholesterol and a

decrease in HDL cholesterol, putting them at a higher risk for IHD. Additionally, other risk factors such as high blood pressure, diabetes, obesity, and a sedentary lifestyle can further contribute to their risk of developing IHD. Despite these significant risk factors, many postmenopausal women and the general population are not fully aware of the implications and potential consequences [9, 11].

Our study results indicated inadequate knowledge of IHD in postmenopausal women and its associated risk factors. Numerous cardiovascular risk factors are linked to an increase during the menopause transition. Women who have gone through menopause have changes in their BMI, total body fat, and visceral fat in addition to a loss of lean mass that happens regardless of age. If a healthy lifestyle is not maintained, this shift in fat distribution can cause weight gain, obesity, and an increase in metabolic and cardiac risk. Specifically, in women in the early stages of postmenopausal life, visceral fat as determined by computed tomography scans is associated with reduced insulin sensitivity. Even after controlling for BMI, postmenopausal women with abdominal obesity (waist circumference > 80 cm) had higher levels of lipids, systolic blood pressure, incidence of glucose intolerance, and fasting insulin than those with smaller waists. Their risk of developing IHD is further increased by the loss of endogenous estrogen that occurs after menopause, which also causes detrimental alterations in lipoprotein metabolism, such as increased plasma cholesterol, elevated LDL cholesterol, and decreased HDL cholesterol. As a result, there are risk variables that are unique to women, and data indicates that menopause negatively alters the cardiovascular risk profile. Healthcare professionals need to educate both postmenopausal women and the general population about the risk factors and symptoms of IHD. By increasing awareness, individuals can take proactive steps to reduce their risk, such as adopting a healthy diet, engaging in regular physical activity, and seeking regular medical check-ups to monitor their heart health. Furthermore, recognizing the symptoms of IHD, such as chest pain, shortness of breath, and fatigue, can lead to early detection and intervention, ultimately improving outcomes for postmenopausal women.

In addition to individual awareness, it is also important for healthcare providers to advocate for policy changes and public health initiatives aimed at addressing IHD risk among postmenopausal women. This may include promoting access to preventive care, supporting research on gender-specific risk factors, and implementing educational campaigns to raise awareness in the community.

As an objective observer of research studies, it is important to acknowledge the limitations that can arise in any given study. One such limitation that can have a significant impact on the validity and reliability of a study is the lack of previous research that has been conducted with similar objectives. In such cases, the absence of a comparison group or benchmark can make it difficult to draw meaningful conclusions from the results obtained.

Conclusion

Overall, the Saudi general population had inadequate knowledge of ischemic heart disease risk among postmenopausal women. Age, educational level, monthly income, and occupation were significantly associated with participants' knowledge. Increasing awareness of IHD risk among postmenopausal women is critical for improving public health outcomes. By educating both postmenopausal women and the general population, we can empower individuals to take control of their heart health and reduce the burden of IHD in our communities. It is our responsibility as healthcare professionals to prioritize education and advocacy in order to address this significant public health issue.

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