

Knowledge of Coronary Heart Disease Risk Factors among Patients in Sudan Heart Center, December 2019 – February 2020

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Abstract

Coronary artery disease is a serious heart disorder that affects middle-aged individuals, and is a leading cause of death among adults over the age of 35 years old. The Ministry of Health reports indicate that the main cause of death in Sudan is coronary artery disease. Understanding the risk factors will lessen the problem and decrease the complications and the burden on the health service as well as decrease the morbidity and mortality caused by coronary heart disease.

The aim of this study was to assess the knowledge of patients in Sudan Heart Center about the risk factors of coronary heart disease.

This descriptive cross-sectional study was carried out among a convenience sample of 91 patients with coronary heart disease at the Sudan Heart Center, in February 2020. The data was collected using interview questionnaire designed for the purpose of the study. The data analyzed by statistical package for social sciences (SPSS) version 25.

The study found that overall knowledge of patients was inadequate, with more than one third of participants (36.3%) were poor knowledge and the same percentage (36.3%) moderate knowledge, and the least (27.5%) good knowledge. Knowledge of coronary heart disease risk factors was significantly associated marital status and education level. Patients' were more knowledgeable for the risk factors than for protective measures.

The study concluded that the patients had poor knowledge about the risk factors regarding coronary heart disease. The study recommended health education programs for the risk factors of coronary heart disease for patients by more professional medical staff and designing a teaching class in the hospital for this purpose.

Keywords: Knowledge, Coronary Heart Disease, Risk Factors, Patients

INTRODUCTION:

Cardiovascular disease (CVD) is a leading cause of death around the world. Ischemic heart disease (IHD) is the single largest cause of death in the developed countries and is one of the main contributors to the disease burden in developing countries (Mohammad *et al.*, 2018).

Coronary artery disease (CAD), also called coronary heart disease (CHD), ischemic heart disease (IHD), (Bhatia, 2010; Mayo Clinic 2022). myocardial ischemia or

simply heart disease, involves the reduction of blood flow to the heart muscle due to build-up of atherosclerotic plaque in the arteries of the heart (Mendis et al., 2011; NHLBI, 2019). It is the most common of the cardiovascular diseases. Types include stable angina, unstable angina, myocardial infarction, and sudden cardiac death (Christopher, 2015).

Coronary Artery Disease (CAD) is the leading cause of mortality and disability worldwide. An estimated 17.5 million people died globally due to Coronary Artery Disease (CAD) in 2020, representing 31% of all global deaths (Hassan et al., 2022).

Problem Statement:

In Sudan, Coronary Heart Disease (CHD) account for 20.07% of total deaths according to the latest World Health Organization (WHO) data published in 2018. The age adjusted Death Rate is 279.01 per 100,000 of population ranks Sudan #13 in the world (World Life Expectancy, 2018). Interventions to reduce Lifestyle Related Risk Factors (LRFs) such as overweight, smoking, alcohol consumption and physical inactivity are recommended for the first-line management for Coronary Artery Disease (CAD) (Iepoli et al., 2019).

Justification: Coronary heart disease becoming now one of the emerging causes of morbidity and mortality in Sudan according to The World Health Organization (WHO) and the Statistics of the Ministry of Health in Sudan. The disease was increased due to risk factors and lack of the community knowledge to the disease. Prevention of risk factors of (CHD) is very important. On other hand Sudanese population undergone marked changes in the last decades, there is marked transition from simple to complex life style therefore coronary heart disease increasing due to an increase of the risk factors.

This research is an attempt to assess the risk factors of coronary heart disease among patients, because knowledge makes difference in the occurrence of disease, and the management greatly depends on risk factors modification.

Research question: What is the Knowledge of Patients about Coronary Heart Disease risk factors?

Objectives

General objective

To assess the knowledge of patients about coronary heart disease (CHD) risk factors in 2019-2020.

Specific objectives

To identify the sociodemographic characteristics of the patients

To estimate the knowledge of patients about risk factors.

To evaluate the attitude of patients toward the prevention.

Materials and methods

Study Design: This study was a descriptive cross-sectional hospital-based study.

Study area: This study was conducted at Sudan Heart center (SHC) which located in Africa Street/ in Khartoum city this hospital receives the patient from the whole state

of Sudan. The center consisted of units of the center are: coronary care unit, Intensive Care Unit, Emergency Room cardiac catheterization units (cath lab), and operation rooms for open heart surgery, x-ray unit and Echo Cardiograph unit laboratory, blood bank, clinical unit and statistical unit, nutritional unit, engineering unit, sterilization unit.

Study population: The population of the present study includes patients diagnosed as coronary heart disease who came to the outpatient clinics in Sudan Heart center during the study period having the following criteria.

Inclusion criteria and Exclusion criteria:

Inclusion criteria:

Patients with CHD not in acute onset and not unstable.
Patients agree to participate.

Exclusion criteria:

Patients who are critically ill
Patients not agree to participate.

Sample size: The sample was totally 91 patients available in the allowed period (1-8 February 2020). ample size

Sampling methodology: Non-probability Convenience sampling

Data collection tools and methods:

Data was collected by using interview-administered Questionnaire. The questionnaire consisted of two sections: one to collect sociodemographic characteristics and another for assessment of knowledge about CHD risk factors and methods of reducing these risk factors. The questionnaire used to measure patients' knowledge was obtained from previous studies with some modification. The socioeconomic variables included in the questionnaire were participants' age, gender, marital status, education, occupation, and weight. The modified questionnaire contains 22 items measuring knowledge of CHD risk factors and methods of decreasing CHD risk. Each item had two available responses: True or False. Scores were calculated by summing the correct answers (range: 0–22). Statements with scores of <33%, 33-66%, >66% were deemed to indicate poor, moderate and good knowledge, respectively. The original questionnaire was English. The Arabic version was independently translated from the English instrument by the researchers then discussed it with the supervisor who's agreed on the translated version (Schlesselman,1982).

Data management:

Data was processed and analyzed using Statistical Package for Social Sciences (SPSS) software version 25.0, and presented in forms of tables and figures.

Ethical considerations:

- Official letter from collage of medicine in Karary University to the head manager of Sudan Heart Center to approval to collect the data.
- Ethical clearance from the Sudan Heart Center
- Written consent from the head manager to collect the data within one week only.

- Explanation to all patients about the questionnaire and verbal consent was obtained from them.
- Each patient was asked to complete the questionnaire with the guidance of the researcher.

Study variables

- Age
- Gender
- Marital status
- Educational level
- Occupational status
- Weight
- Level of knowledge of patients

RESULTS

The study was conducted to study Knowledge of Coronary Heart Disease Risk Factors among Patients in Sudan Heart Center 2019-2020

Age, gender, Marital Status and occupation of participants: Referring to table 1, the results revealed that the majority of respondents (31.9%) were between the ages of 30 and 39, while 26.4% were under the age of 30, and 15.4% were beyond the age of 50. According to the results, women made up almost two-thirds of the participants (62.6%). Table 4.1's marital status data shows that more over half (57.1%) of people are married, 19.8% are not married, and roughly 23.1% are unmarried (divorced and Widower).

More than a third of them (39.6%) were employed, 30.8% were unemployed, and only 5.5% were retired, according to the occupations (table 4.1).

Weight of participants: Figure (1): showed about third of the participants (31.9%) possessed a baccalaureate degree, also (30.8%) were having high school qualification, whereas (23.1%) uneducated and only (7.7%) possessed postgraduate qualification. The majority of the participants (61.5%) were over 80kg and (29.7%) were between 60-80 kg, there were only (8.8%) have weight less than 60kg (Figure 2).

Table (1): Age, gender, Marital Status and occupation of participants in Sudan Heart Center, 2019-2020 (n =91).

Age	Frequency	Percentage
<30 years	24	26.4
30 – 39 years	29	31.9
40– 49 years	24	26.4
≥50 years	14	15.4
Total	91	100.0
Gender	Frequency	Percentage
Male	34	37.4
Female	57	62.6
Total	91	100.0
Marital Status	Frequency	Percentage
Married	52	57.1
Unmarried	18	19.8
Other	21	23.1

Alhakami, W.M.H.; Al-tam, A.A.S.; Abd Egabar, A.O.A.; Yahia, M.E.A.; Ali, T.I.–
Knowledge of Coronary Heart Disease Risk Factors among Patients in Sudan Heart Center, December 2019 – February 2020

Occupation	Frequency	Percentage
Total	91	100.0
Employed	36	39.6
Free business	22	24.2
Unemployed	28	30.8
Retired	5	5.5
Total	91	100.0

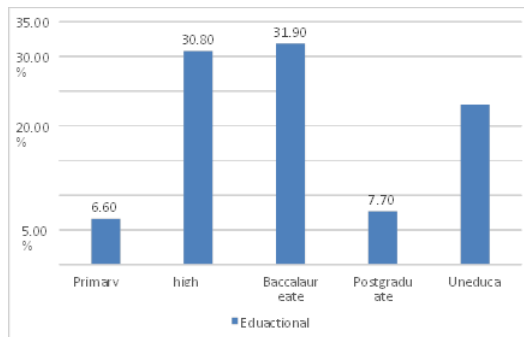


Figure (1): Educational level of participants in Sudan Heart Center, 2019-2020 (n =91)

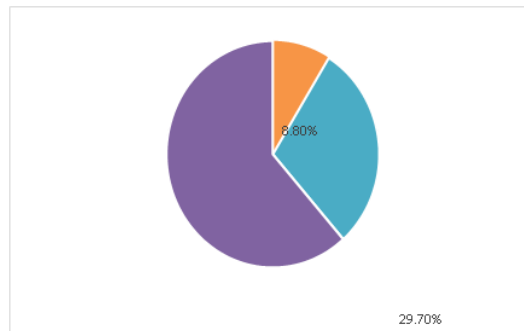


Figure (2): Weight of participants in Sudan Heart Center, 2019-2020 (n =91)

Knowledge assessment about cardiovascular risk factors among participants:

Table (2): showed adequate knowledge of certain CHD risk factors, such as Being overweight (n = 91; 65.9%), high cholesterol level (n = 91; 62.6%), Smoking (n = 91; 63.7%), age (n = 91; 61.5%), stress (n = 91; 60.4%) and family history of CHD (n = 91; 60.4%) but inadequate knowledge of certain CHD risk factors as high blood pressure (n = 91; 44.0%) and diabetes (n = 91; 39.6%).

The majority also demonstrated adequate knowledge regarding several CHD prevention measures, such as regular physical activity (n = 91; 67.0%).

However, fewer participants demonstrated correct knowledge of other CHD risk factors, including control of diabetes (n = 91, 53.8%), blood pressure control (n = 91; 45.1%) and smoking cessation (n = 91; 48.4%), and abdominal obesity (n = 91; 48.4%).

Knowledge of coronary heart disease risk factors among Patients: Table (3) showed fewer subjects were aware of high-density lipoproteins (HDL) and low-density

lipoproteins (LDL) as risk factors (n = 91; 37.4%% and n = 91; 36.3%, respectively). After giving each question value and used SPSS to analysis, finding more than one third of participants (36.3%) were poor knowledge and the same percentage (36.3%) moderate knowledge, and the least good knowledge (27.5%)

Gender among participants: figure (3) Three-fourths of poor knowledge were females (75.80%), the percentage of moderate knowledge the males and females are near to each other (51.5%, 48.5%) respectively but the males have good knowledge more than females (64%, 36%) respectively (P. value = 0.07).

Education level among participants

About one third of the total participants (31.9%) possessed a baccalaureate degree: two-thirds of them have moderate and good knowledge respectively. One-fifths of total participants (23.1%) were uneducated: two-thirds of them have poor knowledge (table 4). There were only (7.7%) from the total participants' possessed postgraduate qualification: all of them have moderate and good knowledge respectively. Participants with a postgraduate and higher education level had knowledge scores higher than those with less education (P .value = 0.017).

Marital status among participants

Regarding married participants 34.6% of them having poor knowledge, 44.2 % having moderate knowledge and 21.2% having good knowledge. Regarding unmarried participants 16.7%% of them having poor knowledge, 27.8%% having moderate knowledge and 55.6% having good knowledge. Marital status significantly associated with knowledge of CHD risk factors (P = 0.011), this indicates that married participants had less knowledge than unmarried (table 5)

Table (2): Results of knowledge assessment about cardiovascular risk factors among Patients in Sudan Heart Center, 2019-2020 (n = 91).

Items	Correct response	Correct n (%)	Incorrect n (%)
Coronary Heart Disease is due to narrowing or blockage of the blood vessels of the heart	T *	44 (48.4%)	47 (51.6%)
A person always knows if he/she have Coronary Heart Disease	F*	38(41.8%)	53(58.2%)
If you have a family history of Coronary Heart Disease, you are at risk of developing Coronary Heart Disease	T	55(60.4%)	36(39.6%)
The older a person is, the greater their risk of developing Coronary Heart Disease	T	56 (61.5%)	35 (38.5%)
Smoking is a risk factor for Coronary Heart Disease	T	58(63.7%)	33(36.3%)
A person who stops smoking will lower their risk of developing Coronary Heart Disease	T	44(48.4%)	47(51.6%)
High blood pressure is a risk factor for developing Coronary Heart Disease	T	40 (44.0%)	51 (56.0%)
Keeping blood pressure under control will reduce a person's risk for developing Coronary Heart Disease	T	41(45.1%)	50(54.9%)
Diabetes is a risk factor for developing Coronary Heart Disease	T	36 (39.6%)	55 (60.4%)
High blood sugar makes the heart work harder	T	40(44.0%)	51(56.0%)
A person who has diabetes can reduce their risk of developing Coronary Heart Disease if they keep their blood sugar levels under control	T	49(53.8%)	42(46.2%)
High cholesterol is a risk factor for developing Coronary Heart Disease	T	57(62.6%)	34(37.4%)
If your 'good' cholesterol (HDL) is high, you are at risk for Coronary Heart Disease	F	34(37.4%)	57(62.6%)
If your 'bad' cholesterol (LDL) is high, you are at risk for Coronary Heart Disease	T	33(36.3%)	58(63.7%)
Eating fatty foods does not affect blood cholesterol levels	F	57(62.6%)	34(37.4%)
Being overweight increases a person's risk of Coronary Heart Disease	T	60 (65.9%)	31 (34.1%)
Abdominal obesity is a risk factor for developing Coronary Heart Disease	T	44 (48.4%)	47 (51.6%)
Regular physical activity will lower the risk of developing	T	61 (67.0%)	30 (33.0%)

Alhakami, W.M.H.; Al-tam, A.A.S.; Abd Egabar, A.O.A.; Yahia, M.E.A.; Ali, T.I.–
Knowledge of Coronary Heart Disease Risk Factors among Patients in Sudan Heart Center, December 2019 – February 2020

Coronary Heart Disease			
Only exercising at a gym or in an exercise class lowers the risk of developing Coronary Heart Disease	F	45 (49.5%)	46 (50.5%)
Stress may cause an increase in blood sugar, blood pressure and cholesterol levels	T	53 (58.2%)	38 (41.8%)
Decrease stress can lower the risk of Coronary Heart Disease	T	55(60.4%)	36(39.6%)
A person can reduce the risk of death from Coronary Heart Disease by changing his lifestyle	T	57 (62.6%)	34 (37.4%)
T*= True; F*=False; HDL = high-density lipoproteins; LDL = low-density lipoproteins.			

Table (3): Level of knowledge of coronary heart disease risk factors among Patients in Sudan Heart Center 2019-2020 (n = 91)

Knowledge level	Frequency	Percentage
Poor knowledge	33	36.3
Moderate knowledge	33	36.3
Good knowledge	25	27.5
Total	91	100.0

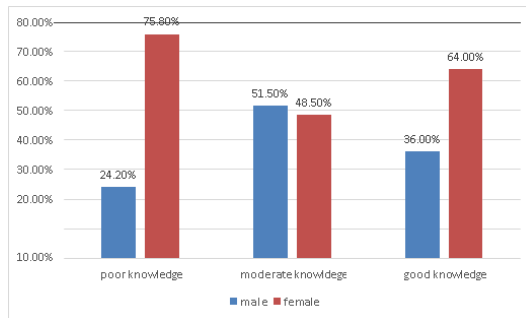


Figure (3): Relationship between knowledge level and Gender among participants in Sudan Heart Center, 2019-2020 (n =91).

Table (4): Relationship between knowledge level and Education level among participants in Sudan Heart Center, 2019-2020 (n =91).

Education level	Percentage	Knowledge level			Total	p-value
		Poor knowledge	Moderate knowledge	Good knowledge		
Primary school	% within education level	50.0%	33.3%	16.7%	100.0%	0.017
	% within knowledge level	9.1%	6.1%	4.0%	6.6%	
High school	% within education level	28.6%	42.9%	28.6%	100.0%	
	% within knowledge level	24.2%	36.4%	32.0%	30.8%	
Baccalaureat degree	% within education level	24.1%	41.4%	34.5%	100.0%	
	% within knowledge level	21.2%	36.4%	40.0%	31.9%	
Postgraduate degree	% within education level	0.0%	57.1%	42.9%	100.0%	
	% within knowledge level	0.0%	12.1%	12.0%	7.7%	
Uneducated	% within education level	71.4%	14.3%	14.3%	100.0%	
	% within knowledge level	45.5%	9.1%	12.0%	23.1%	
Total	% within education level	36.3%	36.3%	27.5%	100.0%	
	% within knowledge level	100.0%	100.0%	100.0%	100.0%	

Table (5): Relationship between knowledge level and Marital status among participants in Sudan Heart Center, 2019-2020 (n =91).

Marital status	Percentage	knowledge level			Total	p.value
		Poor knowledge	Moderate knowledge	Good knowledge		
Married	% within marital status	34.6%	44.2%	21.2%	100.0%	0.011
	% within knowledge level	54.5%	69.7%	44.0%	57.1%	
Unmarried	% within marital status	16.7%	27.8%	55.6%	100.0%	
	% within knowledge level	9.1%	15.2%	40.0% ^b	19.8%	

DISCUSSION & LIMITATIONS

Discussion

The purpose of this study was to assess knowledge of CHD risk factors and identify sociodemographic variables associated with knowledge levels among a sample of patients in Sudan Heart center.

Patient recognition of CHD risk factors is an important first step in preventing cardiac events (Al-Tamimi et al., 2017). In 2004, the INTERHEART study demonstrated that 90% of first myocardial infarctions could be prevented through the modification of 9 factors. Six of these— hyperlipidemia, smoking, diabetes, hypertension, stress, and abdominal obesity— increase risk, and regular physical activity is protective (Steyn et al., 2005).

Our study offers an assessment of these risk factors among a sample of patients in Sudan Heart center. We found that our patients' overall knowledge about these risk factors was inadequate, with more than one third of participants (36.3%) were poor knowledge and the same percentage (36.3%) moderate knowledge, and the least (27.5%) good knowledge (Rosenstock, 1974).

Similar study conducted to determine knowledge, attitude, and practice (KAP) of patients regarding the risk of cardiovascular diseases in patients attending an outpatient clinic in Kuantan, Malaysia 2012 which revealed that only (35%) had a good knowledge (Yusuf et al.,2004).

A study conducted in Kuwait to assess public knowledge of cardiovascular disease (CVD) risk factors and another conducted in Saudi Arabia reported similar findings (inadequate knowledge), while another conducted in Jordan reported higher levels of knowledge among their cohort (Mukattash et al., 2012; Nursyafza *et al.*, 2018; Almalki et al., 2019).

Our patients' knowledge showed adequate knowledge of certain CHD risk factors, such as Being overweight (n = 91; 65.9%), high cholesterol level (n = 91; 62.6%), Smoking (n = 91; 63.7%), age (n = 91; 61.5%), stress (n = 91; 60.4%) and family history of CHD (n = 91; 60.4%) but inadequate knowledge of certain CHD risk factors as high blood pressure (n = 91; 44.0%) and diabetes (n = 91; 39.6%). Similar study conducted among a Community Sample in Oman showed also adequate knowledge of certain CHD risk factors, such as smoking (n = 112; 98.3%), high blood pressure (n = 100; 87.7%), being overweight (n = 100; 87.7%), high cholesterol levels (n = 97; 85.1%) and age (n = 81; 71.1%) (Seef *et al.*, 2013).

Ammouri et al., (2016) found that the majority also demonstrated adequate knowledge regarding several CHD prevention measures, such as regular physical activity (n = 91; 67.0%). Oman study revealed that the majority also demonstrated adequate knowledge regarding several CHD prevention measures, such as regular physical activity (n = 104; 91.2%), blood pressure control (n = 101; 88.6%) and smoking

cessation (n = 100; 87.7%). Our research revealed that fewer individuals correctly identified other CHD risk factors, such as managing diabetes (n = 91, 53.8%), managing blood pressure (n = 91, 45.1%), quitting smoking (n = 91, 48.4%), and managing abdominal obesity (n = 91, 48.4%). Low-density lipoproteins (LDL) and high-density lipoproteins (HDL) were less widely known as risk factors (n = 91; 36.3% and 37.4%, respectively).

Ammouri et al., (2016) stated that fewer participants demonstrated correct knowledge of other CHD risk factors, including diabetes (n = 72, 63.2%), stress (n = 72; 63.2%), a family history of CHD (n = 68; 59.7%) and abdominal obesity (n = 61; 53.5%). Fewer subjects were aware of high-density lipoproteins (HDL) and low-density lipoproteins (LDL) as risk factors (n = 39; 34.2% and n = 59; 51.8%, respectively).

So our patients' were more knowledgeable for the risk factors than for protective measures. This study reported that majority of the participants (31.9%) aged between 30-40 years old while (26.4%) less than 30 years old and 15.4% were above 50 years old that did not reflect the real increase of the risk of CHD with increasing age, this probably because young adults care more about their health. Patient distributions of the selected sample according to the sex, about two-thirds of participants were female (62.6%) while others were male (37.4%). Three-thirds of poor knowledge were females (75.80%), the percentage of moderate knowledge the males and females are near to other (51.5%, 48.5) respectively but the males have good knowledge more than females (64%, 36%) respectively. The majority of the participants (61.5%) were over 80kg and (29.7%) were between 60-80 kg, there were only (8.8%) have weight less than 60kg. Ford et al., (2011) noted an increasing prevalence of abdominal obesity in the USA. This may indicate the existence of intra-personal inhibitory factors preventing individuals from instituting measures to address this CHD risk factor (Ammouri et al., 2016)

According to the occupation about one third of the participants (30.8%) were unemployed and only 5.5% were retired so that unemployment may have impact on health and awareness of these patients. Participants with a postgraduate and higher education level had knowledge scores higher than those with less education similar to the other studies. 34.6% of married participants had inadequate knowledge, 44.2% had moderate knowledge, and 21.2% had strong knowledge, according to the study. 16.7% of individuals who were not married had poor knowledge, 27.8% had moderate knowledge, and 55.6% had strong knowledge. Inferring that married participants had less knowledge than single participants, marital status was substantially linked with awareness of CHD risk variables.

Limitations

We enjoyed working in this study although there were some obstacles that limit it, expenditure and time was very short due to the hard circumstances that the whole country passed through. Studying pressure in addition has consumed much efforts and time.

CONCLUSION

Inadequate knowledge regarding CHD risk factors were reported among the studied group of patients. While knowledge of certain CHD risk factors was adequate, fewer participants were aware of other risk factors, such as diabetes, high blood pressure,

abdominal obesity, HDL and LDL. Marital status and education levels were significantly associated with knowledge levels.

Recommendations

The study recommended to formation of health education programs for patients. also, to usage of mass media for health education of public about the risks of CHD. For the public:

- To quit smoking.
- To have regular exercise.
- To have a healthy diet rich in fruits and vegetables.
- To have and maintain a normal body weight.

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