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Knowledge of Patients with Acute Myocardial Infarction toward Cardiovascular Risk Factors in Public Hospitals at Sana'a-Yemen

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Abstract:

Background: Globally, cardiovascular disease (CVD) poses a significant public health challenge. Evidence indicates that individuals with CVD have considerable knowledge gaps about cardiovascular risk factors. The aim of the study was to assess the knowledge of patients with acute myocardial infarction toward cardiovascular risk factors. **Method:** A descriptive cross-sectional study. Convenience sampling technique from January to March 30, 2023. The data was collected by using a closed-ended questionnaire with demographic data, medical history, and patients' knowledge regarding different risk factors at a public hospital in Sana'a, Yemen. **Results:** A total of 178 patients were enrolled in the study. The mean age was 60.98 years, and 77.5% of patients were male. 53.9% of them live in rural areas, while 28.65% of patients are illiterate. Most patients had hypertension, and 51.1% of patients had a family history of diseases. The main risk factors for the occurrence of myocardial infarction are smoking (90.4%), hyperlipidemia (72.5%), and high blood pressure (61.2%). Overall knowledge of cardiovascular risk factors among patients was fair (52.2%), and 32.0% of them had poor knowledge, while 15.7% of patients had good knowledge. Age and educational level were significantly associated with knowledge of cardiovascular risk factors. **Conclusions:** Patients with myocardial infarction have a fair knowledge of the cardiovascular risk factors. We recommended that medical and nursing staff play a crucial role in this teaching process, and they should be encouraged to educate patients when providing health services regarding the development and progression of disease, predisposing factors, and prevention methods.

Keywords: Patients, Knowledge, Cardiovascular, Risk Factors.

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Introduction

The most common cause of death in the world is cardiovascular disease (CVD). Risk assessment is essential for identifying at-risk patients who need immediate assistance as well as for determining the level of medical therapy needed to lower future CVD risk. To assess the risk of getting CVD, numerous risk prediction models have been put forth over the last ten years. However, the current models that are based on conventional risk variables have low predictive ability in individuals with a history of CVD [1].

One of the most prevalent cardiovascular disorders, myocardial infarction (MI), is a significant contributor to the burden of cardiovascular diseases. A heart attack, also known as a MI or acute myocardial infarction (AMI), happens when blood flow to a part of the heart is cut off, harming the heart muscle [2] [3].

Both modifiable and non-modifiable risk factors can contribute to the development of CVD [4]. Modifiable risk factors can reduce clinical events and fatalities in patients with known CVD as well as in those who are at high risk due to one or more risk factors. The traditional CVD risk factors are hypertension, hyperlipidemia, smoking, being overweight, leading a sedentary lifestyle, and eating poorly [5].

Patients and their families have received health education from nurses, but there are no health education guidelines or modules to use as a basis for the instruction. Health education offered at higher levels of care is not a continuation of earlier health education because no records of health education have been supplied [2].

The World Health Organization (WHO) estimates that 17.9 million people worldwide died from CVD in 2019, accounting for 32% of all fatalities. 85 percent of this fatality was caused by a heart attack or stroke. More than three-quarters of CVD deaths occur in low- and middle-income nations. In 2019, CVDs were

responsible for 38% of the 17 million premature deaths (under the age of 70) from non-communicable diseases. CVD must be identified as early as possible in order to begin treatment with counseling and medication. Notably, over 75% of CVD deaths occur in low- and middle-income nations, and 85% of these deaths are caused by heart attack and stroke [6]. The highest morbidity and mortality rates in the world are caused by coronary artery disease (CAD), which also has a significant financial impact. According to estimates, 17.7 million people worldwide die from CAD each year, making about 31% of all fatalities [7].

Smoking was extremely prevalent (81%) among AMI patients, while the prevalence of diabetes (25%) mellitus (18%), hypertension (18%), and hyperlipoproteinemia (29%) was comparable to those of the Middle East and Western nations [8]. According to study [9] the PURE-Saudi study showed that the adult Saudi population had a high prevalence of unhealthy lifestyle variables and CVD risk factors, with greater rates in rural compared to urban areas.

The following risk factors for CVD were more common in Yemen: smoking (81%), khat chewing (88%), total serum cholesterol (29%), diabetes mellitus (25%), and hypertension (18 %). When AMI was categorized by site, recurrence, and severity, anterior infarction made up 57% of cases, inferior infarction made up 35.2% of cases [8]. Acute coronary syndrome (ACS) patients typically present at a young age [10].

Justification of the Study

Many people are admitted due to CVD. The majority of fatalities are caused by ischemic heart disease or heart failure. The best way to prevent coronary artery disease is to have proper knowledge of the risk factors and make changes to high-risk habits and lifestyles. Lack of information of CVD risk factors raises the prevalence and mortality of this condition, particularly among young people. There are varied levels of

information about this illness among different populations. In this situation, the patient's role is crucial, and it is the nurse's duty to educate the patient's family members about their health. According to research, providing care is linked to biomarkers of chronic stress. The researcher there saw the value of providing an organized training program for patients to obtain necessary knowledge. The aim of our study to assess knowledge of patients with acute myocardial infarction toward cardiovascular risk factors.

Research Methodology

Study Design, Sitting and Sampling

A descriptive cross-sectional study was conducted on public hospitals in Sana'a, Yemen, including the Republican Teaching Hospital Authority, Al-Thawra General Hospital Authority, and Al-Kuwait University Hospital. Convenience sampling was used to choose the final sample size of 178 patients over the three months from January to March 2023 with regard to inclusion and exclusion criteria. Patients must be more than 18 years old, have a myocardial infarction diagnosis that has been confirmed, and agree to participate in the study in order to meet the inclusion criteria. Life-threatening conditions, patients with mental illness, those with a disability (hearing and talking impairment), those with congenital heart disorders, rheumatic heart disease, infectious heart disease, inflammatory heart disease, hypertension, and heart failure, as well as all patients who refused to take part in this study, were the exclusion criteria.

Data Tool and Method

A structured questionnaire has two sections: (i) the first: the sociodemographic data of patients adopted from the WHO STEPs instrument, which employs a stepwise method to chronic disease risk factor surveillance [11] (ii) The second: patient knowledge about cardiovascular risk factors adopted from the

"Heart Disease Fact Questionnaire" [12] which included 17 questions. Each answer of "yes" gives one score, and zero is given for answers of "no" or "don't know." The total score level for the questionnaire sheet was 15 scores. It was categorized as follows: good knowledge level was assigned to nurses who got 76%-100% (12 to 15 scores), fair knowledge level was 50%-75% (8 to 11 scores), and poor knowledge level was 0%-49% (0 to 7 scores). The reliability test analysis using Cronbach's coefficient Alpha ($r = 0.665$) is acceptable. Observe the patient file to confirm patients with a diagnosis of myocardial infarction. Face-to-face interviews with patients were used by the researchers to gather data. The interviews were conducted next to the patient's bed in a quiet room and in Arabic.

Data Processing and Statistical Analysis

The statistical analysis of these data was conducted using the statistical package for social science (SPSS 25.0), a pre-packaged computer analytic application. The frequency, the percentage for categorical variables, and the mean and standard deviation for numerical variables are all descriptive metrics. One ANOVA test was conducted to determine the relationship between knowledge and sociodemographic data, and a P-value of 0.05 was deemed significant.

Ethics approval and consent to participate.

The Al-Razi University Ethics Committee for Research granted ethical approval for this study (016/FMHS/2023). We certify that all procedures used in this study adhere to all applicable rules and regulations. Each patient who had signed up for the trial was then asked for their written informed consent.

Results

Table 1 noted that more than one third (44.4%) of patients were in the age group between 56 to 70 years

old, and 53.9% of them lived in rural areas. while more than one quarter (28.7%) of them were illiterate and 76.4% of them were non-employed. More than two-thirds (68.5%) of patients did not have enough income. Most (35.4%) of patients had hypertension, and 51.1% of them had family history of diseases. Finally, 45.5% of them were previous smokers, but 68 percent of patients were still chowing Khat.

Table 2 shows that the majority of patients with CVD have significant knowledge about smoking (90.4%), hyperlipidemia (72.5%), and high blood pressure (61.2%) as cardiovascular (CV) risk factors. Patients also have deficient knowledge about being overweight (54.5%) and having diabetes (64.4%) as CV risk factors. Almost one quarter (26.4%) were unaware that controlling blood pressure lowers the risk of developing CVD; 86.5% couldn't explain how eating fatty foods affects blood cholesterol levels; and 57.9% believed only exercising at a gym or in an exercise class lowers the chance of developing CVD, while 51.1% were unaware that feeling anxious and nervous always increases the risk factor for CVD. Finally, 51.1% of patients are aware that stress in the workplace is a CV risk factor.

Figure 1 More than half (62.9%) of patients had fair knowledge, followed by 29.4% who had poor knowledge, and 10.7% had good knowledge about CV risk factors.

Table 3. There was a statistically significant association between knowledge score and age group and educational level of patients (p -values = 0.014 and 0.002, respectively). There is no statistically significant association between the total knowledge score and other demographic data about the patient (p -value > 0.05).

Discussion

The present study was carried out to assess the knowledge of patients with myocardial infarction

Table 1. Distribution of patients according to sociodemographic data (n=178).

Demographic Data		F	%
Age group	Less than 41yrs.	18	10.1
	41-55yrs.	37	20.8
	56-70yrs.	79	44.4
	More than 71yrs.	44	24.7
	Mean±SD	60.98±14.02	
Sex	Male	138	77.5
	Female	40	22.5
Marital status	Single	11	6.2
	Married	136	76.4
	Divorced	28	15.7
	Widow	3	1.7
Residence	Rural Area	96	53.9
	Urban Area	82	46.1
Educational level	Illiterate	51	28.7
	Primary	46	25.8
	Secondary	49	27.5
	University	25	14.0
	Above	7	3.9
Employment status	Employed	42	23.6
	Non-Employed	136	76.4
Income	Enough	56	31.5
	Not-Enough	122	68.5
Medical history	Hypertension	63	35.4
	Diabetic mellitus	52	29.2
	Myocardial infarction	32	18.0
	Dyslipidemia	24	13.5
	Stroke	7	3.9
Family history	Yes	90	51.1
	No	88	48.9
Smoking	Smoker	55	30.9
	Non-smoker	42	23.6
	Ex-smoke	81	45.5
Chowing Khat	Yes	121	68.0
	No	57	32.0

Discussion

The present study was carried out to assess the knowledge of patients with myocardial infarction toward cardiovascular risk factors. In the present study, more than one third (44.4%) of patients were in the age group between 56 and 70 years old, and the majority of them were married. 76.4% of patients were non-employed, and most of them were illiterate. More than

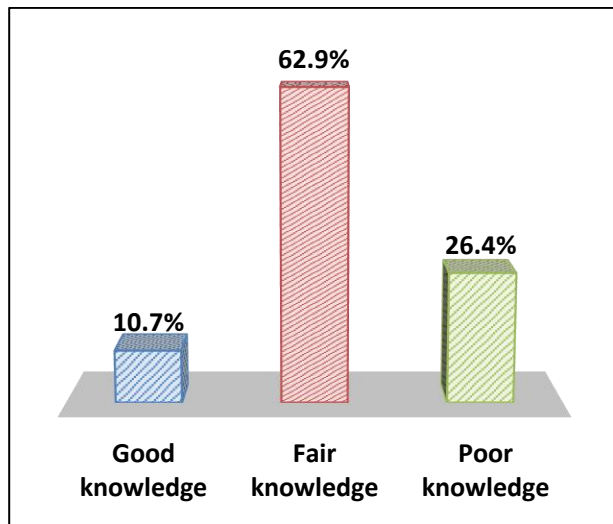


Figure 1. Level of knowledge of patients about cardiovascular risk factor (n=178).

one third (35.4%) of patients had hypertension, and 29.2% of them had diabetes mellitus as a medical history. This result is in agreement with studies in King Saudi Arabia (KSA) [13], [14], which reported that the majority of patients were males and their mean age was 60 years. The majority of them were married and lived in rural areas. A study in India [15] found that 64% of the participants were males, and 68% of them were employed. Also, a study in Pakistan [16] showed that 68.7% of patients were male, 93.3% were married, 66.7% were illiterate, and 21.6% were diabetic, while 46.7% were hypertensive. In a study in Peshawar, Pakistan [17], the majority of male patients and (17 out of 25) of them with both diabetes and hypertension were in the age group (>60 years). A study in Karachi, Pakistan [18] found that most patients with hypertension (43.3) and diabetes (27.4) had a similar clinical history. In a study in Ethiopia [19], it was found that 70.7% of the patients had hypertension diagnoses, and more than half of them had a low level of education. In a study in Nepal [20], the majority of participants were literate, and 52.5% were male. A study in Lebanon [21] the majority of participants were literate, and 52.5% were male.

Patients' Knowledge about Cardiovascular Risk Factor.

The likelihood of CVD is influenced by a variety of factors. Some of them have a minor impact, while others have a major one. The patients hold the same opinion. The major factors that affect the occurrence of CVD are smoking (90.4%), hyperlipidemia (72.5%), hypertension (61.2%), (60.7%) nervous mood, old age (53.4%), stress (51.1%), activity and exercise (48.9%), being overweight (45.5%), and diabetes (37.6%). Smoking increases tachycardia, which puts more strain on the heart. Additionally, nicotine, one of the harmful compounds found in tobacco, stimulates the release of adrenaline, which increases heart rate and blood pressure. As a result, the burden on the heart is increased, which increases the risk of coronary heart disease [13].

An increased force is exerted against the arterial walls by high blood pressure. This added pressure over time can harm the arteries. These damaged arteries are more likely to develop fatty deposits that restrict and stiffen them. These results are supported by the study conducted in Lebanon [21], which found that 67.3% of patients knowledge for cardiovascular risk factors for smoking. A studies in KSA [13], demonstrated that the patients had the presence of hypertension (59%), lack of regular exercise (89.7%), diabetes (35.9%), and nervous mode (79.5%) as the most common risk factors of CVD. A study by [22], reported that obesity (52.8%) and smoking (41.5%) of the participants were associated with a heart attack, and 39% of the sample was aware that there is an association between a heart attack and physical exercise. A study in Nepal [20], reported that 95% of participants knew that HTN is a risk factor for developing MI. In another study in Ethiopia [19], it was reported that the smoking (97.6%), overweight (91.3%), and hypertension (81.9%) of patients answered questions about their knowledge of

Table 2: Distribution of patients' knowledge about modifiable cardiovascular risk factors (n=178).

Items	Yes	No
	F(%)	F(%)
High cholesterol is a risk factor for developing heart attack	129(72.5)	49(27.5)
Smoking is a risk factor for heart attack	161(90.4)	17(9.6)
Walking and gardening are considered exercise that will help lower a person's chance of developing heart attack	122(68.5)	56(31.5)
High blood pressure is a risk factor for heart attack	109(61.2)	69(38.8)
Always anxious, and nervous are a risk factor for heart attack.	87(48.9)	91(51.1)
Diabetes is a risk factor for developing heart attack	67(37.6)	111(62.4)
Being overweight increases a person's risk for heart attack	81(45.5)	97(54.5)
Regular physical activity will lower a person's chance of getting heart attack	108(60.7)	70(39.3)
Only exercising at a gym or in an exercise class will lower a person's chance of developing heart attack	103(57.9)	75(42.1)
A person who stops smoking will lower their risk of developing heart attack	57(32.0)	121(68.0)
Diet rich in fruit is a risk factor for heart attack.	69(38.8)	109(61.2)
More stress in job is a risk factor for heart attack.	91(51.1)	87(48.9)
Diet rich in vegetables is a risk factor for heart attack.	116(65.2)	62(34.8)
Keeping blood pressure under control will reduce a person's risk for developing heart attack	131(73.6)	47(26.4)
Eating fatty foods does not affect blood cholesterol levels.	154(86.5)	24(13.5)

cardiovascular risk factors while being unaware of the diabetes (64.1%) risk factors of CVD. A study in India [15], showed that 88% of the samples knew about high blood pressure, 80% knew about smoking, and 62%, 46%, and 46% knew about obesity and diabetes, respectively, as CVD risk factors. On the other hand, this result is inconsistent with a study in India [5], which reported that the major risk factors for heart disease as identified by participants are dyslipidemia (96.8%), obesity (94.1%), high blood pressure (92.8%), smoking (84.4%), diabetes (82.4), and a lack of physical activity (73.9%).

In the current study, more than half (52.2%) of patients had fair knowledge, (32.0% had poor knowledge; and 15.7% had good knowledge about cardiovascular risk factors. The present result, supported by a study conducted in Nepal [20], demonstrated that, 62.4% of participants' level of knowledge was moderate about

risk factors for MI. A study in India [15], showed that the patients had an average level of knowledge about risk factors for ACS. A study in Poland [23], most of the sample had a moderate level of knowledge about MI risk factors. A studies in Pakistan [18], found that most subjects admitted with AMI had a moderate level of knowledge about modifiable risk factors for heart disease, and a study by [16], established that there is an average level of knowledge of modifiable risk factors for cardiovascular diseases among patients with MI in a tertiary care hospital. A study by [24], reported that only a small percentage of patients have a good level of knowledge about the predisposing factors for CVA. On opposite side, this result is not similar to a study conducted in Lebanon [21], which showed inadequate knowledge about myocardial infarction. A study in Ethiopia [25], revealed that 71.4% of cardiovascular disease patients had satisfactory

Table 3: Association between sociodemographic data of patient and knowledge level about cardiovascular risk factor.

Demographic Data		Total knowledge		p-value
		Mean	SD	
Age group	Less than 41yrs	9.11	2.42	0.014
	41-55yrs	9.78	2.11	
	56-70yrs	8.67	1.89	
	More than 71yrs	8.50	1.66	
Sex	Male	9.00	1.90	0.234
	Female	8.58	2.24	
Marital status	Single	7.91	2.39	0.216
	Married	9.06	1.99	
	Divorced	8.61	1.79	
	Widow	8.33	1.15	
Residence place	Rural Area	8.67	2.06	0.084
	Urban Area	9.18	1.87	
Educational	Illiterate	8.33	1.63	0.002
	Primary	8.52	2.09	
	Secondary	9.39	1.84	
	University	9.96	2.26	
	Above	8.43	1.72	
Employment status	Employed	9.40	2.22	0.061
	Non-Employed	8.75	1.89	
Income	Enough	8.73	2.05	0.434
	Not-Enough	8.98	1.96	
Smoking	Smoker	8.91	2.00	0.686
	Non-smoker	9.12	2.34	
	Ex-smoker	8.79	1.78	
Chowing Khat	Yes	8.79	2.02	0.243
	No	9.16	1.90	
Medical history	Hypertension	8.98	1.82	0.699
	Diabetic mellitus	8.65	2.19	
	Myocardial Infarction	9.28	2.07	
	Dyslipidemia	8.79	1.96	
	Stroke	8.71	1.80	
Family history	Yes	8.63	1.95	0.065
	No	9.18	2.00	

*Significant statistics at P-value <0.05.

knowledge regarding CV risk factors. Also, according to studies in KSA [13], [14], [22], the mean knowledge score of patients recruited in this study was either poor or very poor about risk factors for coronary artery disease. In a study in Ethiopia [19], knowledge of CV risk factors among AMI patients was unsatisfactory. A study in Pakistan [17], concluded that the level of awareness regarding smoking, physical exercise, and obesity was very low, as the majority of patients didn't know the difference these risk factors made.

Association between demographic data of patients with knowledge scores toward cardiovascular risk

factors in this study, there was a statistically significant association between knowledge and the demographic data of patients regarding age and educational level. The current study is similar to in a studies in Ethiopia [19], [25], who reported that there was a statistically significant association between knowledge of CV risk factors and level of education and age. In studies in Pakistan [16], [18], there was a significant relationship between knowledge and educational level. In a study in Nepal [20], a significant association was found among education and knowledge. This study demonstrated that there is no statistically significant

association between total knowledge score and demographic data of patients regarding sex, marital status, residence place, income, family, and medical history. Our study agreement with the study in Lebanon [21], there were no significant associations between knowledge and any of the demographic or clinical variables. In a study in Pakistan [18], there was a significant relationship between knowledge, sex, and medical history. On the other side, the current study disagrees with a study in Ethiopia [25], who mentioned that sex, place of residence, and marital status were significantly associated with participants' knowledge.

Conclusion

It has been concluded that most of the patients had fair knowledge and family history, and 34.4% of them had hypertension medical history, while 32.0% of them had poor knowledge about cardiovascular risk factors. There was a statistically significant association between total knowledge score, age group, and educational level.

Recommendations

We recommended that a rehabilitation program be held for patients with CVD to meet the needs (therapeutic regimen, follow up, exercise, and dietary information after CVD) and follow up of patients. Also, patients are in need of a simplified and comprehensive Arabic booklet, including information about lifestyle modification for patients after CVD.

Limitations of the Study

Al-Kuwait University Hospital Administration was refusing to collect data, and the statistical report for CVD patients didn't have any hospitals.

Conflict of interest

No conflict of interest is associated with this work.

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معارف المرضى المصابين باحتشاء عضلة القلب الحاد تجاه عوامل الخطر القلبية الوعائية في المستشفيات العامة في صنعاء-اليمن

الملخص

الخلفية: على الصعيد العالمي، تشكل الأمراض القلبية الوعائية تحديًا صحيًا عالميًا كبيرًا. تشير الأدلة إلى أن الأفراد المصابين بالأمراض القلبية الوعائية لديهم فجوات معرفية كبيرة فيما يتعلق بعوامل الخطر القلبية الوعائية. هدفت الدراسة إلى تقييم معرفة المرضى المصابين باحتشاء عضلة القلب الحاد تجاه عوامل الخطر القلبية الوعائية. **الطريقة:** دراسة وصفية مقطعية باستخدام تقنية العينات الملائمة من يناير إلى 30 مارس 2023. تم جمع البيانات باستخدام استبيان مغلق يحتوي على البيانات الديموغرافية والتاريخ الطبي ومعرفة المرضى بشأن عوامل الخطر المختلفة في مستشفى عام في صنعاء، اليمن. **النتائج:** شملت الدراسة 178 مريضًا. كان متوسط العمر 60.98 عامًا، وكان 77.5% من المرضى ذكورًا. يعيش 53.9% منهم في المناطق الريفية، في حين أن 28.65% من المرضى أميون. كان معظم المرضى يعانون من ارتفاع ضغط الدم، وكان لدى 51.1% من المرضى تاريخ عائلي من الأمراض. كانت عوامل الخطر الرئيسية لحدوث احتشاء عضلة القلب هي التدخين (90.4%)، فرط شحميات الدم (72.5%)، وارتفاع ضغط الدم (61.2%). كانت المعرفة العامة لعوامل الخطر القلبية الوعائية بين المرضى متوسطة (52.2%)، و32.0% منهم كانت معرفتهم ضعيفة، بينما كانت معرفة 15.7% من المرضى جيدة. كان العمر والمستوى التعليمي مرتبطين بشكل كبير بمعرفة عوامل الخطر القلبية الوعائية. **الاستنتاجات:** يمتلك المرضى المصابون باحتشاء عضلة القلب معرفة متوسطة بعوامل الخطر القلبية الوعائية. نوصي بأن يلعب الطاقم الطبي والتمريضي دورًا حاسمًا في عملية التعليم هذه، ويجب تشجيعهم على تثقيف المرضى عند تقديم الخدمات الصحية بشأن تطور المرض وعوامله المسببة وطرق الوقاية منه.