Original Research Article

Awareness level of general population regarding acute chest pain in Aseer region, Southern of Saudi Arabia

Shehata F. Shehata[1,2]*, Muhammed A. Alkhairi[3], Mohammed A. Alzahrani[3], Mohammed A. Alqarni[3], Yahya F. Aseri[3], Mohammed I. Alwadai[3]

[1]Department of Family and Community medicine, King Khalid University, Abha, Saudi Arabia
[2]High Institute of Public Health, Alexandria University, Egypt
[3]Medical intern, Faculty of Medicine, King Khalid University, Abha, Saudi Arabia

*Correspondence:
Dr. Shehata F. Shehata,
E-mail: shehatafarag@yahoo.com

ABSTRACT

Background: Myocardial infarction is caused by sudden closure of a coronary artery due to plaque rupture. Symptoms include chest pain, which travels from left arm to neck, dyspnea, sweating, nausea, vomiting, arrhythmia, anxiety, fatigue and weakness. Complications of acute myocardial infarction include papillary muscle rupture and mitral regurgitation, ventricular septal rupture, free-wall rupture, and right ventricular infarction. Adequate awareness of acute chest diseases improves medical consultation for suspected cases by general population.

Methods: A descriptive cross-sectional approach was used targeting all population in Aseer region. The study was conducted during the period from December 2019 to March 2020. Data were collected using structured questionnaire included person's socio-demographic data, Participants' family history regarding heart attack, participants' awareness regarding acute chest pain.

Results: A total sample of 1287 respondents was included in the study. About 54% of the respondents aged 30 years or more and 65.3% were females. Only 9.2% of the participants correctly defined heart attack. Regarding symptoms, 59.9% of the participants reported left arm pain, 57.1% reported difficulty breathing and 29% told about burning sensation in middle of the chest. Totally, nearly one quarter of the participants had good awareness level regarding heart attack.

Conclusions: In conclusion, the population awareness regarding heart attack and stroke is poor. Also, population with high risk were more knowledgeable. More effort should be paid to improve the public knowledge of stroke, more effective community-based education programs should be organized constantly with screening for population at high risk.

Keywords: Acute chest pain, Awareness, Heart attack, Knowledge, Population, Risk factors, Stroke

INTRODUCTION

Acute chest pain is the initial symptom of many diseases, pain may arise from any structure located in the thoracic cavity, cardiac and non-cardiac origin.[1] Cardiac causes like; acute coronary syndrome, aortic dissection, pericarditis, myocarditis. Non-cardiac origin like; pulmonary embolism, pneumonia, gastrointestinal reflux disease, musculoskeletal causes.[2] Myocardial infarctions is a major cause of death worldwide, which is may be the first manifestation of coronary artery disease.[3] Myocardial infarctions are caused by sudden closure of a

coronary artery due to plaque rupture.[4] Symptoms of myocardial infarction include chest pain, which travels from left arm to neck, dyspnea, sweating, nausea, vomiting, arrhythmia, anxiety, fatigue and weakness.[5] Complications of acute myocardial infarction include papillary muscle rupture and mitral regurgitation, ventricular septal rupture, free-wall rupture, and right ventricular infarction.[6] The significant importance of early thrombolytic therapy followed by angioplasty in treatment of myocardial infarction to ensure adequate reperfusion of the infarcted segment. Any delay in patient seeking medical advice will lead to increase in the infracted segment and therefore decrease the perfusion which will lead to higher morbidity and mortality.[7] This study focused on assessing population awareness regarding acute chest pain, to know the extent of population awareness regarding acute chest pain and how deep medical interest in population, also to know the source of their medical knowledge and their trust on it. Adequate awareness of acute chest diseases improves medical consultation for suspected cases by general population. Also, help in identifying different risk factors including modifiable risk factors which reduce disease incidence if avoided. Early identification of acute chest pain cases help in proper management with less complication which significantly save life with better quality of life.[8,9]

METHODS

A descriptive cross sectional approach was used targeting all population in Aseer region. The study was conducted during the period from December 2019 to March 2020. Persons with smartphone and can access internet were included. All those below the age of 18 years and those who were not permanently living in Aseer region (or for at least 1 year) were excluded. Data were collected using structured questionnaire which developed by the researchers after intensive literature review and expert's consultation. The questionnaire data included person's socio-demographic data such as age, gender, education, and family history. Participants' family history regarding heart attack was included besides medical history of chronic health problems. Participants' awareness regarding acute chest pain was assessed covering 3 main domains including general definition (1 item), signs and symptoms (13 items), and risk factors (6 items). The participants practice regarding faced case of heart attack was also covered in the questionnaire. A panel of 3 experts reviewed the questionnaire independently for content validity and all suggested modifications were applied till the final tool achieved. The questionnaire was uploaded online using social media platforms by the researchers and their relatives and friends to be filled with all population in Aseer region. A consecutive convenience sampling method was used due to the current lockdown and lack of physical contact due to COVID-19 pandemic. All those who received the electronic questionnaire during the study period and fulfilling the inclusion criteria were invited to participate

through filling the questionnaire. A pilot study was conducted to assess tool applicability and reliability. The tool reliability coefficient (Alpha Cronbach's) was assessed and equaled 0.84.[10]

Data analysis

After data were extracted, it was revised, coded and fed to statistical software IBM SPSS version 22(SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. P value less than 0.05 was considered to be statistically significant. For awareness items, each correct answer was scored one point and total summation of the discrete scores of the different items was calculated. A participant with score less than 60% (11 points) of the maximum score was considered to have poor awareness while good awareness was considered if he had score of 60% (12 points or more) of the maximum or more. Descriptive analysis based on frequency and percent distribution was done for all variables including demographic data, awareness items and participants practice and attitude. Cross tabulation was used to assess distribution of awareness according to participants' personal and medical data. Relations were tested using Pearson chi-square test. Multiple logistic regression model was used to assess the most significant adjusted determinants of participants awareness level based on backwards LR model.

RESULTS

A total sample of 1287 respondents were included in the study. About 54% of the respondents aged 30 years or more and 65.3% were females. Married cases were 54.8% of the respondents and 72.5% were university graduated. About 16% studied at the medical field and 49.7% were employee. Hypertension as a chronic health problem was reported by 22.1% of the respondents and 19.1% had high cholesterol level while only 6.5% complained of chronic heart disease. Cigarette smoking was reported by 19.4% of the participants and 17.9% had family history of heart attack (Table 1).

Table 2 illustrates awareness of the participants regarding heart attack. Only 9.2% of the participants correctly defined heart attack as a defect in heart electric transition. Regarding symptoms awareness, 59.9% of the participants reported left arm pain, 57.1% reported difficulty breathing, and 29% told about burning sensation in middle of the chest. With regard to risk factors, 64.8% of the population reported high cholesterol level, 62% of the told about hypertension, while 74.5% agreed on cigarette smoking but 42.1% reported high salt diet. Totally, 26.5% of the participants had good awareness level regarding heart attack.

Figure 1 demonstrates the source of awareness recorded by the participants. Social media was the most recorded source (52.1%) followed by heath care staff (13.9%), family and friends (13.5%) while TV was recorded by

9.2% of the respondents. By asking about actions should be taken in case of facing heart attack patient (Figure 2), 63.8% of the participants reported that we should call the ambulance and 32.4% told that they should take the case to the nearest hospital while 0.4% told about calling the police.

Table 1: Socio-demographic data of the study participants.

Socio-demographic data		N	%
Age in years	<18	46	3.6
	18-24	354	27.5
	25-29	194	15.1
	30-34	167	13.0
	35-40	246	19.1
	> 40	280	21.8
Gender	Male	446	34.7
	Female	841	65.3
Marital status	Single	502	39.0
	Married	705	54.8
	Divorced	56	4.4
	Widow	24	1.9
Education	Basic education	17	1.3
	Middle education	44	3.4
	High school	293	22.8
	University/more	933	72.5
Specialized health study	Yes	207	16.1
	No	1080	83.9
Occupation	Not working	326	25.3
	Student	322	25.0
	Employee	639	49.7
Monthly income	<5000 SR	548	42.6
	5000-	328	25.5
	10000-	246	19.1
	15000-	108	8.4
	20000+	57	4.4
Co-morbidity	HTN	285	22.1
	DM	247	19.2
	High cholesterol	246	19.1
	Obesity	382	29.7
	Heart disease	84	6.5
	Stroke	32	2.5
Cigarette smoking	Yes	250	19.4
	No	1037	80.6
Family history of heart attack	Yes	231	17.9
	No	1056	82.1

On relating population awareness level to their personal data (Table 3), it was clear that 15.6% of the participants who aged above 30 years had good awareness level compared to 10.9% of those below the age of 30 years (p=0.028). Also 19.6% of the female respondents had good awareness compared to 6.9% of males (p=0.001).

Table 2: Awareness regarding heart attack among general population in Aseer region, Saudi Arabia.

| Awareness items		N	%
Definition of heart attack	Blockage in the aortic artery	396	30.8
	Blockage in arties supplying the heart	663	51.5
	Defect in heart electric transition	118	9.2
	Enlargement of heart muscle	110	8.5
Symptoms of heart attack	Don't know	313	24.3
	jaw pain	622	48.3
	pain in left arm	771	59.9
	burning sensation in middle of the chest	373	29.0
	pain in the back	183	14.2
	legs swelling	126	9.8
	cough with sputum	66	5.1
	difficulty breathing	735	57.1
	whistling and bubbles sound with breathing	123	9.6
	increase in body temperature	103	8.0
	palpitation and increase in heart rate	418	32.5
	weakness and dizziness	78	6.1
	sever chest pain	330	25.6
	numbness in hands and face	135	10.5
Risk factors	HTN	798	62.0
	High cholesterol	834	64.8
	Black magic	91	7.1
	Cigarette smoking	959	74.5
	Alcohol intake	739	57.4
	High salt food	542	42.1
Overall awareness	Poor	946	73.5
	Good	341	26.5
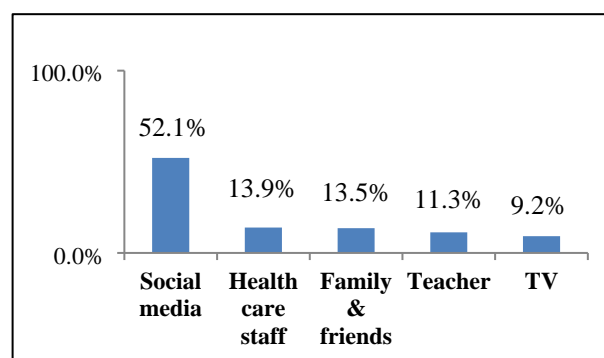
Figure 1: Source of information regarding heart attack.

Table 3: Distribution of awareness level by people socio-demographic data.

Personal data		Awareness level				P value
		Poor		Good		
		No	%	No	%	
Age in years	<30	454	35.3%	140	10.9%	0.028*
	>30	492	38.2%	201	15.6%	
Gender	Male	357	27.7%	89	6.9%	0.001*
	Female	589	45.8%	252	19.6%	
Marital status	Single	370	28.7%	132	10.3%	0.933
	Married	516	40.1%	189	14.7%	
	Divorced	60	4.7%	20	1.6%	
Education	Basic education	11	0.9%	6	.5%	0.048*
	Middle education	37	2.9%	7	.5%	
	High school	227	17.6%	66	5.1%	
	University/ more	671	52.1%	262	20.4%	
Specialized health study	Yes	121	9.4%	86	6.7%	0.001*
	No	825	64.1%	255	19.8%	
Occupation	Not working	244	19.0%	82	6.4%	0.817
	Student	235	18.3%	87	6.8%	
	Employee	467	36.3%	172	13.4%	
Monthly income	< 10000 SR	661	51.4%	215	16.7%	0.021*
	> 10000 SR	285	22.1%	126	9.8%	
How did you know about heart attack	Teacher	90	7.0%	55	4.3%	0.009*
	Health care staff	145	11.3%	34	2.6%	
	Family and friends	129	10.0%	44	3.4%	
	TV	88	6.8%	30	2.3%	
	Social media	493	38.3%	178	13.8%	

P: Pearson X^2 test, * P <0.05 (significant).
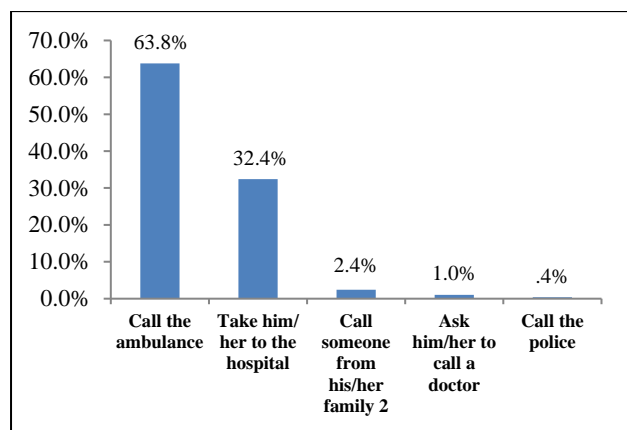
Figure 2: Action should be taken in cases of facing heart attack patient.

Considering education, 20.4% of highly educated parsons had good awareness level in comparison to 0.5% of those with basic level of education. Good awareness regarding heart attack was recorded among 19.8% of those who not studied health related courses compared to 6.7% of those who did (p=0.001). About 14% of those gained their information from social media had good awareness level compared to 2.6% of those who gained from health care staff (p=0.009).

Table 4: Multiple stepwise logistic regression model for determinants of awareness level regarding heart attacks among participants.

Predictor	P-value	OR$_A$	95% C.I for OR	
			Lower	Upper
Age above 30 years	0.004	1.71	1.19	2.46
Female	0.001	1.95	1.42	2.68
Medical related study	0.001	0.39	0.28	0.55
DM	0.001	2.33	1.58	3.44
High cholesterol	0.005	1.63	1.16	2.29
Smokers	0.035	1.47	1.03	2.11
Constant	0.055	0.29		

OR$_A$: adjusted odds ratio, CI: confidence interval.

Multiple stepwise logistic regression model (Table 4) demonstrated that among all included determinants for good awareness level, old age (OR=1.7) was associated with 70% more likelihood for good awareness, female gender (OR=1.95) had doubled likelihood for good awareness level, medical related study was associated with 61% less likelihood for good awareness level, having diabetes mellitus, high cholesterol level and

smoking all were associated with higher awareness level regarding heart attack.

DISCUSSION

Stroke still a major cause of death and leading cause of long-term disability, with about 700,000 people suffering a new or recurrent stroke each year in the United States. 11 Over the past decade, there were many actions taken for the rapid evaluation of patients with chest pain as they still challenging, and most of these patients are admitted to hospital for assessment to minimize the increased mortality risk of these patients who either come late or mistakenly discharged from the ED.[12] As stroke outcomes can be significantly better by timely care, it is vital for the general population to be aware of the major symptoms of stroke in order to initiate prompt action within reversible time.[13,14]

The current study aimed to assess general population awareness regarding heart attack and stroke in Aseer region, Saudi Arabia. The study revealed that nearly 1 out of each 4 of the general population was aware of acute heart attack and stroke. The awareness level was considerably good for definition of the heart attack with chest pain besides risk factors. Regarding awareness of symptoms and alarming signs, the population recorded poor scores for all expected symptoms and about one quarter did not know about any symptoms. Considering determinants of good awareness, old aged female patients who are highly educated were the most important predictors.

The surprising finding was that awareness level was higher among those whose study did not related to health speciality and the authors had no explanation for this finding. But this may be partially explained by that they may read more or use social media in higher rates as the main source of information among those with high awareness was social media not study. Also patients with high cholesterol or diabetic and smokers had higher awareness level as they may be exposed to heart attack and received medical explanation for their health condition.

Considering actions that should be taken if one exposed to patient with heart attack, more than two thirds of the respondent told about calling ambulance or taking the patient to the nearest hospital which is good perception and recommended in United States.

These findings are no so odd of what recorded by Greenlund et al who assessed public awareness of major stroke symptoms.[15] The study revealed that only 17.2% of respondents overall (5.9% to 21.7% by state) correctly classified all stroke symptoms and indicated that they would call emergency number if they faced someone was having stroke. Also, Aminde et al in Cameroon, aimed to assess the population awareness of CVD types and risk factors. The researchers reported that 52.5% had overall poor awareness regarding CVD with nearly 25% correctly identifying types of CVD.[16] Overall, 36, 63 and 45% were unaware of CVD risk factors, warning signs of heart attack and stroke respectively.

Regionally, a study was conducted to assess the level of awareness of stroke risk factors and symptoms in the Gulf Cooperation Council Countries: Gulf Cooperation Council Stroke Awareness Study.[17] The survey was conducted at primary health care centers (PHCs), in urban and semi-urban areas, of the GCC countries (Qatar, Saudi Arabia, Kuwait, Bahrain, the United Arab Emirates, Oman) on the level of stroke awareness in the general public. The study findings were that 29.0% were familiar with the term 'stroke', and 29.3% considered the age group 30-50 at the highest risk for stroke. The commonest risk factors recorded were hypertension (23.1%) and smoking (27.3%). younger age, higher level of education, and female gender were the most significant awareness level determinants.

Proper awareness of cardiovascular diseases and their risk factors have a significant role in minimizing the population's exposure to modifiable risk factors and thereby help to prevention and control measures.

CONCLUSION

In conclusion, the population awareness regarding heart attack and stroke is poor especially for initial symptoms which may be the main barrier against early seeking for medical intervention. Also, population with high risk were more knowledgeable for the disease in total. More effort should be paid to improve the public knowledge of stroke, more effective community-based education programs covering the initial and alarming signs, symptoms, and risk factors of stroke. Life style modifications are also required especially among high risk groups, particularly the younger population with poor educational level. A periodic public health commitment at the region level toward screening, prevention and treatment of stroke is crucially recommended.

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