

# ASSESS THE RISK FACTORS AND KNOWLEDGE ON MODIFICATION OF LIFESTYLE AMONG PATIENTS WHO HAVE EXPERIENCED ACUTE MYOCARDIAL INFARCTION IN TAIF

Emad Ahmed<sup>1</sup>, Moussa Youssif<sup>1</sup>, Ibrahim Ayasreh<sup>2</sup>, Nabeel Al-Mawajdeh<sup>2</sup>

<sup>1</sup>Department of Physical therapy, Faculty of Applied Medical Science, Taif University, Taif, KSA

<sup>2</sup>Department of Nursing, Faculty of Applied Medical Science, Taif University, Taif, KSA

Correspondence to: Emad Ahmed (emadtawfik72@yahoo.com)

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## ABSTRACT

**Background:** Patient education programme for cardiac patients is an essential part of quality medical care today. For the diagnosis and therapeutic regimen to be beneficial, patients must be informed about their own health and motivated to share the responsibility.

**Aims & Objective:** This study was conducted to evaluate the risk factors for myocardial infarction in Taif region, Saudi Arabia kingdom and establish a modification in the life style to decrease the incidence of cardiac diseases.

**Material and Methods:** A hospital based cross-sectional study was conducted at governmental hospital at Taif. Thirty nine subjects admitted to Emergency department during the study period with their first episode of Acute Myocardial Infarction participated in this study.

**Results:** A structured questionnaire was used to collect data. They were 31 (79.5%) males and 8 (20.5%) females, the majority of patients (46.2%) under the scope of this study was above the age of 50 years, 87.2% of them was married and 12.8% was divorced. the main risk factors that affect the patients in Taif region, KSA were the presence of hypertension (59%), diabetes (35.9%), consuming a highly deep fried food (76.9%), lack of regular exercise (89.7%) and nervous mode (79.5%). the mean knowledge score of patients recruited in this study was either low (51%) or medium score (29%), and little percentage was either high (14%) or very high (6%) knowledge score.

**Conclusion:** It is recommended to encourage health care providers especially nurses and physicians to teach their patients about disease process, risk factors, and preventive measures during providing either medical or nursing care.

**KEY-WORDS:** Acute Myocardial Infarction; Life Style; Risk Factors; Taif

## Introduction

Evidence of increased risk of coronary heart disease (CHD) with the presence of specific risk factors has been documented in previous epidemiological studies, such as the Framingham Heart Study<sup>[1]</sup>, the Multiple Risk Factor Intervention Trial<sup>[2]</sup> and others<sup>[3]</sup>. In Saudi Arabia, improved socioeconomic conditions in the past two decades have been followed by rapid changes in the lifestyle of the people brought about by urbanization and availability of housing, food and high purchasing power. Consequently, conditions commonly affecting affluent societies, such as CHD, diabetes mellitus (DM), obesity, cancer and road traffic accidents have started to emerge.<sup>[4]</sup> Published literature has not shown the magnitude of the problem of CHD and risk factors in Saudi Arabia. Hospital-based studies have shown that smoking, hypertension and DM are the common

risk factors among patients with acute myocardial infarction.<sup>[5,6]</sup> A recent study on CHD mortality in the Eastern Province of Saudi Arabia, using proportionate mortality ratio, has shown that 26% of total deaths were recorded as CHD death comprising 27.0% of total male and 23.5% of total female deaths respectively.<sup>[7]</sup> Several studies among Saudi populations have shown an increasing prevalence of DM<sup>[8,9]</sup>, smoking<sup>[10]</sup> and obesity<sup>[9]</sup>. A recent national survey showed an increasing prevalence of DM, obesity and hypercholesterolemia.<sup>[11]</sup>

Knowledge of the predisposing risk factors is an important step in the modification of lifestyle behaviours conducive to optimal cardiovascular health in developing countries.<sup>[12,13]</sup> One method of targeting preventive educational strategies involves measuring and appropriately disseminating knowledge of the modifiable risk

factors. However, the level of awareness of cardiovascular health modifiers among the Saudian population has not been clearly quantified.

Prevention of CVD is the most effective way of combating the CVD epidemic in the resource poor nations. Knowledge of modifiable risk factors (smoking, lack of exercise, obesity and consumption of fatty foods) for heart diseases has been identified as a prerequisite for change in behavior and is often targeted by prevention programs.<sup>[14,15]</sup> Although knowledge alone is insufficient, it is assumed to be a key component of behavioral change decision making<sup>[16]</sup>, and provides cues for action<sup>[17]</sup>. Estimating the level of knowledge of the population at large as well as those suffering from CVD can help to guide public health programs especially those directed towards reducing modifiable risk factors for CVD. Earlier studies have revealed that education programs for the elderly were effective in improving health promotion knowledge and behaviours.<sup>[18,19]</sup>

The level of knowledge of risk factors for CVD varies among different populations. In the US whites have higher level of knowledge about risk factors of CVD than others, often disadvantaged groups, such as African Americans.<sup>[16]</sup> Similarly, in the UK, South Asian families were less likely to take regular exercise, and had a lower awareness of cholesterol or dietary content (fiber, sugar, salt) compared to the native white population.<sup>[20,21]</sup> The level of education is one of the predictors of knowledge of healthy life styles. In South Asia the family is often the source of knowledge and awareness of a healthy life style. The traditional extended family household may not be as updated in current knowledge as a nuclear family household because of a more orthodox attitude to health beliefs.

A study on the risk factors for heart disease has shown that tobacco use, ghee (clarified butter) intake, raised fasting glucose, high cholesterol, paternal history of CVD, low income, and low levels of education are associated with premature myocardial infarction in Pakistan.<sup>[22]</sup> A more recent study reported very poor knowledge amongst a general population surrogate in

Karachi.<sup>[23]</sup> There are no estimates of the level of knowledge in patients with CVD.

This warrants attention in assessing the knowledge of CASHD among those living in large cities, as Taif. Yet, there are no measures of knowledge of modifiable risk factors of CASHD among the general Saudian population in an urban center. Our study evaluated the knowledge levels of the modifiable risk factors among people who were present at a major tertiary hospital in Taif. The risk factors included smoking, hypertension, elevated cholesterol levels, DM, and obesity. We also identified gaps in the knowledge of specific risk factors as well as key demographic segments, with significantly poor levels of knowledge pertaining to modifiable risk factors of CASHD.

The main objective of our study was to assess the main predisposing risk factors which affect myocardial infarction patients and determine the level of knowledge of the modifiable risk factors such as hypertension, diabetes, diet, smoking, and lack of exercise.

## Materials and Methods

### Study Setting

A hospital based cross-sectional study was conducted at governmental hospital at Taif. Although this is a tertiary care government hospital, it is the initial point-of-care for the majority of patients (across the socioeconomic spectrum). This study involving human subjects is in accordance with Helsinki declaration of 1975 as revised in 2000 and that it has been approved by the relevant ethical committee.

### Sample Size

Thirty nine subjects admitted to Emergency department during the study period from 1/3/1432 H to 1/9/1433 with their first episode of AMI and who fulfilled the AMI criteria participated in the study. The admission records of the Emergency Room of the governmental hospital were reviewed daily to identify patients admitted to the hospital with a first AMI. Those who survived for first 24 hours post admission will be eligible for screening.

## Inclusion Criteria

All subjects who participated in this study fulfilled the following criteria:

1. Fulfilled the AMI criteria: AMI was defined using the European Society of Cardiology and American College of Cardiology's criteria.<sup>[19,20]</sup> The presence of at least two of the following three factors is considered as diagnostic for AMI: (i) Typical chest pain lasting for at least 20 minutes; (ii) ECG showing ST elevation of at least 2 mm in two or more contiguous leads with subsequent evolution of the ECG
2. Patients will sign informed consent.
3. A trained research medical officer approached each of these patients to collect data.

## Exclusion Criteria

Patients were excluded if they have:

1. Unstable mental conditions
2. Life threatening conditions
3. Patients who were already in the hospital at the time of onset of symptoms of AMI.

## Procedures

A structured questionnaire was used to collect data. Components of the questionnaire were taken from published studies.<sup>[21,22]</sup> The questionnaire was initially developed in English and then translated into Arabic, the national language of KSA. To ensure accuracy of the English to Arabic translation, the questionnaire was back translated from Arabic into English. The majority of the questions were close ended.

This analysis focused on identifying the level of knowledge about the modifiable risk factors for CVD. Four aspects of knowledge of the modifiable risk factors for heart disease were assessed: (a) fatty food consumption; (b) smoking; (c) obesity and (d) lack of exercise. Subjects will be asked about the association of each risk factor, as well as direction of association, with heart disease for each risk factor, if the subject correctly identified the association and the direction of the association of the risk factor with heart disease she/he will get a score of one otherwise zero for that component. Subjects scoring a total greater than or equal to three, out of a possible total of four

were regarded as having a good level of knowledge of CVD risk factors .

The independent variables of this study were age, gender, ethnicity (defined according to mother tongue), marital status, level of education (years formal education was defined as person who had ever attended school), type of family system (nuclear family system was defined as a household consisting of two parents and their legal children; extended family system was defined as a household where multiple generations of family were living together), income, occupation, history of hypertension (self-reported and subjects who were taking antihypertensive medication were defined as hypertensive), history of diabetes (self-reported and subjects who were taking anti diabetic medication were defined as diabetic) and general health behavior including tobacco use, physical activity, number of visits to any health care facility in the previous year and knowledge of symptoms of a myocardial infarction (self-reported).

## Data Analysis

Descriptive statistics were used to analyze the data of this study, using the SPSS statistical programme.

## Results

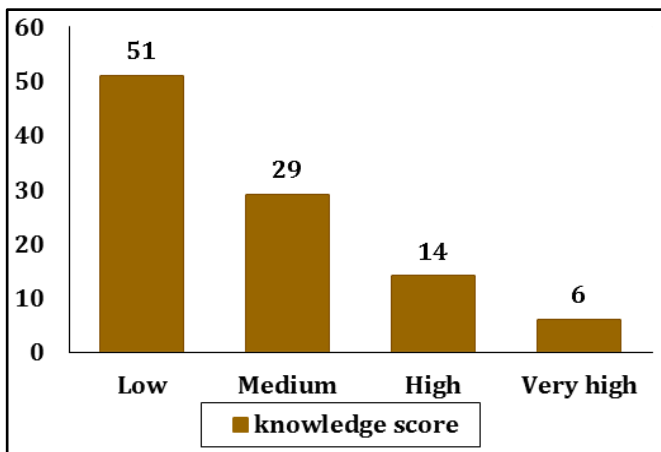
Thirty nine patients responded to myocardial infarction questioner as instructed were recruited from governmental hospital in Taif region, KSA. They were 31 (79.5%) males and 8 (20.5%) females, the majority of patients (46.2%) under the scope of this study were above the age of 50 years, 87.2% of them were married and 12.8 % was divorced. The majority of patients was Muslim (79.5%) except 10.3% was either Hindu. 71.8% of them were located in rural areas on the other hand, 28.2% were located in urban area. or Christian. The majority of patients (61.5%) were higher school graduate and the rest of patients were either secondary school graduate (17.9%) or colligate (20.5%). The majority of patients (71.8%) were working in skilled occupation. Lastly, most of patients (66.7%) have an income greater than 3000 riyals as shown in table 1.

**Table-1: Patient Demographic Data**

Characteristics		N (%)
Gender	Male	31 (79.5)
	Female	8 (20.5)
Age	Below 30 years	1 (2.6)
	30 – 40 years	10 (25.6)
	40 – 50 years	10 (25.6)
	Above 50 years	18 (46.2)
Marital Status	Married	34 (87.2)
	Divorced	5 (12.8)
Religion	Hindu	4 (10.3)
	Muslim	31 (79.5)
	Christian	4 (10.3)
Residence	Rural area	28 (71.8)
	Urban area	11 (28.2)
Education	Secondary education	7 (17.9)
	Higher school education	24 (61.5)
	Collegiate education	8 (20.5)
Occupation	Semiskilled	11 (28.2)
	Skilled	28 (71.8)
Income	Less than 1000 riyals	5 (12.8)
	1001 – 2000 riyals	2 (5.1)
	2001 – 3000 riyals	6 (15.4)
	More than 3000 riyals	26 (66.7)

**Table-2: Risk Factors of Cardio Vascular Diseases**

Risk Factors	N (%)	
Any illness before the attack of this disease?	Hypertension	23 (59.0)
	Diabetes	14 (35.9)
	Lipid diet	2 (5.1)
Do you smoke?	Yes	28 (71.8)
	No	11 (28.2)
Do you drink alcohol?	Yes	0 (0)
	No	39 (100)
Do you have habit of consuming highly deep-fried fat foods?	Yes	30 (76.9)
	No	9 (23.1)
Do you hold more than one job?	Yes	12 (30.8)
	No	27 (69.2)
Does the patient job require that he do without sleeping?	Yes	9 (23.1)
	No	30 (76.9)
Do you have habit of doing regular exercise?	Yes	4 (10.3)
	No	35 (89.7)
Do you feel more stress in your job?	Yes	20 (51.3)
	No	19 (48.7)
Do you feel anxious or nervous always?	Yes	31 (79.5)
	No	8 (20.5)



**Figure-1: Knowledge Score of Patient**

As shown in table 2, the main risk factors affecting the patients in Taif region, KSA were the presence of hypertension (59%), diabetes (35.9%), consuming a highly deep fried food (76.9%), lack of regular exercise (89.7%) and nervous mode (79.5%).

As shown in figure 1, the mean knowledge score of patients recruited in this study was either low (51%) or medium score (29%), and little percentage was either high (14%) or very high (6%) knowledge score.

## Discussion

As shown in table 2, the majority of the participants of this study were male patients with a ratio of (4:1). Many studies showed that men are at higher risk for myocardial infarction than women.<sup>[24-26]</sup> This sex differences might be related to the differences in body fat distribution.<sup>[27]</sup> Even after menopause, the mortality rate of women from heart disease increases, but it is not as great as men mortality rate.<sup>[28]</sup>

Age is one of the most important risk factors of MI. in the present study, most of participants were elderly (over 50 years old), and this result supports the finding of most previous studies which shown that as age increases, the incidence of coronary heart disorders increases.<sup>[24,25]</sup> American heart Association statistics (2006) showed that 83 percent of people who die of coronary heart disease are 65 or older.<sup>[28]</sup>

The findings of this study revealed that hypertension, diabetes mellitus are considered as major modifiable risk factors of MI. This result supported the findings of the most of previous studies.<sup>[29,30]</sup>

People with high blood pressure are more likely to develop coronary artery disease because high blood pressure puts added force against the artery walls. Over time, this extra pressure can damage the arteries. These injured arteries are more likely to become narrowed and hardened by fatty deposits.

Diabetes Mellitus increases the risk for MI attack incidence, mortality, and recurrence of MIs in

middle-aged people.<sup>[31]</sup> 71.8 % of participants of present study were smokers, and this was consistent with many previous studies. Smoking causes tachycardia which increases workload over the heart.<sup>[32]</sup> Furthermore, adrenaline secretion is stimulated by nicotine – one of the toxic substances present in the smoke – leading to increase in heart rate and blood pressure and these effects boost the workload over the heart, and then increasing the incidence of coronary heart diseases.<sup>[33]</sup>

The present study revealed that fried food was considered as important risk factor for developing myocardial infarction, and this result is consistent with Leitzmann & Kurth (2012).<sup>[34]</sup> Some previous studies showed that frying process changes the quality of food, and may increase fat content and the amount of trans fatty acids in foods<sup>[35,36]</sup>, and this might explain why fried food make people at high risk of myocardial infarction.

Sedentary lifestyle characterized most of participants of this study (89.7%). Fransson et al (2004), found that that repetitive and heavy lifting or carrying at work, and strenuous physical workload, increased the risk of acute MI. and they found that lower risk of MI for those who were active compared with the passive individuals.<sup>[37]</sup>

It is obvious in our present study that the majority of participants experienced anxiety, and this support the findings of most prior studies, which revealed that anxiety and other psychological stresses were considered as main risk factors of coronary artery diseases.<sup>[38]</sup>

Patients' Knowledge of risk factors was analyzed and revealed that more than half of participants had low level of knowledge about risk factors, and less than 10% of participants had very high level of knowledge. These results support the findings of Khan et al (2006) study in which only 42% of participants had good level of knowledge.<sup>[39]</sup> Knowledge deficit of risk factors of myocardial infarction in Taif city may be related to lack of health information resources in general, and mis-activation of health awareness lectures, seminars, and meetings. Additionally, health care providers especially physicians and nurses do not do their teaching responsibilities toward their patients,

and this lead to patients' knowledge deficit of risk factors of myocardial infarction.

## Conclusion

This study highlighted one of the most important health related issues in Taif community which is the lack of knowledge about risk factors of myocardial infarction, and this will boost the incidence probability of these coronary artery disorders in Taif community. So it is recommended to develop new modern educational programs by health experts and health care providers through introducing seminars and lectures about myocardial infarction, risk factors, treatment, and preventive measures. Additionally, it is recommended to encourage health care providers especially nurses and physicians to teach their patients about disease process, risk factors, and preventive measures during providing either medical or nursing care.

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## References

1. Dawber TR. The Framingham Study: The Epidemiology of Atherosclerotic Disease. Cambridge, Mass: Harvard University Press; 1990.
2. Multiple Risk Factor Intervention Trial Research Group. Multiple risk factor intervention trial: risk factor changes and mortality results. *JAMA*. 1982;248:1465-77.
3. Semenciw RM, Morrison HI, Mao Y, Johansen H, Davies JW, Wigle DT. Major risk factors for cardiovascular disease mortality in adults: results from the Nutrition Canada Survey cohort. *Int J Epidemiol*. 1988;17:317-24.
4. Sebail ZA. Health in Saudi Arabia, Vol. 2. Riyadh, Directorate of Scientific Research, King Abdul Aziz City for Science and Technology 1987:81-126.
5. Al-Gindan YM, Al-Quorain A, Ibrahim E. Acute myocardial infarction in the Eastern Province of Saudi Arabia: retrospective analysis of 264 patients. *Annals of Saudi medicine* 1990;10:129-36.
6. Ahmed AF, Abdelsalam SA, Mahmoud ME, Gadri MA. A case-control study of coronary heart disease risk factors in Saudis at Al-Madina Al-Mounawarah. *Saudi medical journal* 1993;14:146-51.

7. Alobaid AA, Gilchrist R, Bointon B. Coronary heart disease mortality in the Eastern Province of Saudi Arabia in 1989 and 1990. *Annals of Saudi medicine* 1994;14:387-91.
8. Bacchus RA, Bell JL, Madkour M, Kilshaw B. The prevalence of diabetes mellitus in male Saudi Arabs. *Diabetologica* 1982;23:330-2.
9. El-Hazmi MAF, Ai-Swailem A, Warsy AS, Al-Sudairy F, Sulaimani R, Al-Swailem A, et al. The prevalence of diabetes mellitus and impaired glucose tolerance in the population of Riyadh. *Annals of Saudi medicine* 1995;15:598-601.
10. Taha A Bener A, Noah MS, Saeed A, Al-Harthy S. Smoking habits of King Saud University students in Riyadh. *Annals of Saudi medicine* 1991;11:141-3.
11. Anokute CC. Epidemiology of diabetes mellitus in Saudi Arabia—retrospective study of 210 cases. *Practical diabetes digest* 1991;3:25-6.
12. Vartiainen E, Puska P, Jousilahti P, Korhonen HJ, Tuomilehto J, Nissinen A. Twenty-year trends in coronary risk factors in north Karelia and in other areas of Finland. *Int J Epidemiol* 1994;23(3):495-504.
13. Dowse GK, Gareeboo H, Alberti KG, Zimmet P, Tuomilehto J, Purran A, et al. Changes in population cholesterol concentrations and other cardiovascular risk factor levels after five years of the non-communicable disease intervention programme in Mauritius. Mauritius Non-communicable Disease Study Group. *BMJ* 1995;311(7015):1255-1259.
14. Potvin L, Richard L, Edwards AC. Knowledge of cardiovascular disease risk factors among the Canadian population: relationships with indicators of socioeconomic status. *CMAJ* 2000;162(9 Suppl):S5-11.
15. Bani IA, Hashim TJ. Knowledge of nutrition and coronary heart disease in Riyadh, Saudi Arabia. *J Community Health* 1999;24(6):467-473.
16. Ford ES, Jones DH. Cardiovascular health knowledge in the United States: findings from the National Health Interview Survey, 1985. *Prev Med* 1991;20(6):725-736.
17. Becker MH, Maiman LA, Kirscht JP, Haefner DP, Drachman RH. The Health Belief Model and prediction of dietary compliance: a field experiment. *J Health Soc Behav* 1977;18(4):348-366.
18. Huang LH, Chen SW, Yu YP, Chen PR, Lin YC. The effectiveness of health promotion education programs for community elderly. *J Nurs Res* 2002;10(4):261-270.
19. Kirk-Gardner R, Steven D. Hearts for Life: a community program on heart health promotion. *Can J Cardiovasc Nurs* 2003;13(1):5-10.
20. Lip GY, Luscombe C, McCarry M, Malik I, Beevers G. Ethnic differences in public health awareness, health perceptions and physical exercise: implications for heart disease prevention. *Ethn Health* 1996;1(1):47-53.
21. Rankin J, Bhopal R. Understanding of heart disease and diabetes in a South Asian community: cross-sectional study testing the 'snowball' sample method. *Public Health* 2001;115(4):253-260.
22. Ismail J, Jafar TH, Jafary FH, White F, Faruqui AM, Chaturvedi N. Risk factors for non-fatal myocardial infarction in young South Asian adults. *Heart* 2004;90(3):259-263.
23. Jafary FH, Aslam F, Mahmud H, Waheed A, Shakir M, Afzal A, et al. Cardiovascular health knowledge and behavior in patient attendants at four tertiary care hospitals in Pakistan – a cause for concern. *BMC Public Health* 2005;5:124.
24. Abduelkarem AR, El-Shareif HJ, Sharif SI. Evaluation of risk factors in acute myocardial infarction patients admitted to the coronary care unit, Tripoli Medical Centre, Libya. *East Mediterr Health J*. 2012;18(4):332-6.
25. Aubeidia M. Assessment of Myocardial Infarction Risk Among Patients in Nablus District. Master thesis. 2006.
26. Anand SS, Islam S, Rosengren A, Franzosi MG, Steyn K, Yusufali AH, et al. Risk factors for myocardial infarction in women and men: insights from the INTERHEART study. *Eur Heart J*. 2008 Apr;29(7):932-40
27. Campbell DJ. Why do men and women differ in their risk of myocardial infarction? *Eur Heart J* 2008;29(7):835-836.
28. American Heart Association. 2006
29. Malinauskiene V. Arterial hypertension as a risk factor of myocardial infarction in different occupational categories of Kaunas men, Lithuania. Institute of Cardiology Kaunas University of medicine. 2004
30. Kondo Y, Toyoshima H, Yatsuya H, Hirose K, Morikawa Y, Ikeda N, et al. Risk factors for first acute myocardial infarction attack assessed by cardiovascular disease registry data in Aichi Prefecture. *Nagoya J Med Sci*. 2007;69(3-4):167-72.
31. Abu Ali M. Type one diabetes mellitus in northern Palestinian community. Master thesis. 2003
32. Jahangir T, Siddiqui AJ, Jehangir W, Sheikh NH. Relationship of Smoking and Myocardial Infarction among Male above 40 Years Checking Into Jinnah Hospital. *A.P.M.C* 2012;6(1):56-58.
33. Action on Smoking and Health. Smoking, the heart and circulation. ASH fact sheet 2011. Available from: URL: [http://ash.org.uk/files/documents/ASH\\_111.pdf](http://ash.org.uk/files/documents/ASH_111.pdf)
34. Leitzmann MF, Kurth T. Fried foods and the risk of coronary heart disease. *BMJ* 2012;344:d8274.
35. Fillion L, Henry CJ. Nutrient losses and gains during frying: a review. *Int J Food Sci Nutr* 1998;49:157-68.
36. Guallar-Castillón P, Rodríguez-Artalejo F, Lopez-García E, León-Muñoz LM, Amiano P, Ardanaz E, et al. Consumption of fried foods and risk of coronary heart disease: Spanish cohort of the European Prospective Investigation into Cancer and Nutrition study. *BMJ* 2012;344:e363.
37. Fransson E, De Faire U, Ahlbom A, Reuterwall C, Hallqvist J, Alfredsson L. The Risk of Acute Myocardial Infarction: Interactions of Types of Physical Activity. *Epidemiology*. 2004;15(5):573-82.
38. Shen BJ, Avivi YE, Todaro JF, Spiro A III, Laurenceau JP, Ward KD, et al. Anxiety characteristics independently and prospectively predict myocardial infarction in men the unique contribution of anxiety among psychologic factors. *J Am Coll Cardiol*. 2008;15;51(2):113-9.
39. Khan MS, Jafary FH, Jafar TH, Faruqui AM, Rasool SI, Hatcher J, et al. Knowledge of modifiable risk factors of heart disease among patients with acute myocardial infarction in Karachi, Pakistan: a cross sectional study. *BMC Cardiovascular Disorders* 2006;6:18

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