

## Do Greek Citizens have Minimum Knowledge about Heart Attack? A Survey

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### Abstract

**Introduction:** In Greece, there are no studies that examine the knowledge level of the Greek population regarding heart attack symptomology. This study is the first effort which examines the knowledge of the Greek rural and urban populations regarding heart attack.

**Methods:** It is a face-to-face survey of citizens conducted at five urban areas and ten counties in Greece. Measures included sociodemographics data, and 2 questions with 4 and 7 subjects, respectively, exploring the most common symptoms and the risk factors of heart attack.

**Results:** No single citizen answered all the questions correctly. The mean number of corrected answers was 4.3. Multivariable analysis showed that participants aged  $\leq 55$  years (4.9 vs 3.4,  $p < 0.05$ ), residents in urban areas (4.7 vs 3.4,  $p < 0.05$ ), who have advanced education (4.7 vs 2.5,  $p < 0.05$ ), with high income (4.8 vs 3.3,  $p < 0.05$ ) and family experience to heart attack (4.7 vs 4,  $p < 0.05$ ) answered correctly more questions than the others. Sex ( $p = 0.25$ ), family status ( $p = 0.809$ ), personal history of heart attack ( $p = 0.801$ ), work in clinic ( $p = 0.918$ ) and sources of information ( $p = 0.568$ ) had no effect on the level of knowledge.

**Conclusions:** We found that there is a dramatic lack of knowledge in the general public about the risk factors and typical signs of heart attack. Education seminars to the Greek population are needed to increase the recognition of symptoms and risk factors of heart attack.

**Key words:** Heart attack; Symptoms; Risk Factors; Knowledge

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### Introduction

Cardiovascular diseases (CVD) are the main cause of death in Europe. More than 4 million people die each year. Half of all deaths (47%) are from CVD. Approximately 1,1 million people in Europe die from Stroke. For this reason, stroke by itself is the second most common cause of death in Europe, accounting over one in seven women (15%) and one in ten men (10%) [1]. The annual incidence of acute coronary syndromes in Greece was calculated at 22 per 10,000 people [2]. There are no studies conducted in Greece that show the death rates from CVD. Heart attack is a major cause of death and disability worldwide and strikes both men and women.

Heart attack is a time-dependent disease. Early treatment is critical for poor outcomes [3]. The efficacy of thrombolysis and angioplasty depends on the time between onset of symptoms and treatment [4]. It has been shown that the longest period

of delay is the patient delay from the onset of symptoms to the hospital visit [5]. It is critically not only for their life, but for the quality of life of people to understand and recognize the signs and symptoms of heart attack [6].

There have been found differences in the rates of CVD across race/ethnic and socioeconomic status [7,8]. One study reported that 60% of Canadians were not informed properly about the risk factors and warning symptoms of heart disease and stroke [9]. Other study showed that 27% of people who were treated for lipid disorders did not know their risk [10]. Rural populations have more risk factors and are at higher risk for heart attack for cardiovascular diseases than urban populations [11].

It is essential for the success care of patients with heart attack to recognize as soon as possible the symptoms of the disease and call 911 [6]. It is important for public health organizations to obtain studies that investigate the knowledge of different

populations to heart attack symptomatology, so as to aim public health campaigns to enhance their knowledge [12].

In Greece, there are no studies that examine the knowledge level of Greek population regarding heart attack symptomatology. This study is the first effort which documents the knowledge of Greek rural and urban population regarding heart attack symptomatology.

## Aim

The aim of this study was to document knowledge about heart attack symptoms in Greek residents and to identify the characteristics associated with increased knowledge of heart attack.

## Methods

### Questionnaire development

The questionnaire included demographics (age, sex, residence, family status, level of education, economic status, history of heart attack, family experience of heart attack, place of work and sources of information), 1 question with 4 subjects for the most common symptoms of heart attack and 1 question with 7 subjects which explore the risk factors which are responsible for developing heart attack. The citizens could answer two options: yes or no. The correct answer for all questions was "yes". The questions were given by three experts, and we told them to be very careful and not to include rare symptoms or factors. Also, we informed them that the questions will be given to citizens, no health care professionals. So, we developed a questionnaire that could be completed within 5 minutes maximum.

### Participants

This study conducted at five urban areas and ten counties in Greece. Interviewees were first asked and if they agreed they participated in the study. We chose these people randomly. Totally, 15,278 were asked, and 11,000 (72%) citizens took part to the study. The mean age of the correspondents was  $48.9 \pm 17.4$  years. We interview them face-to-face. The interviewer asked all the questions and marked the answers that citizens gave. The study included all people who spoke Greek, were adults (>18 years old) and were not health care professionals.

### Statistical analysis

Data analysis was carried out using SPSS version 17. The results are reported as means  $\pm$  standard deviations for continuous variables (age, family status, level of education, economic status, and sources of information) and as frequencies and percentages for categorical variables (sex, residence, history of heart attack, family experience of heart attack, and place of work). Differences between participants were assessed using the *t* test for continuous variables and Fisher exact test for categorical variables. All variables were checked for normality with Kolmogorov Smirnov test. Pearson chi-square test was employed to determine the difference in final score and the age, sex, residence, family status, level of education, economic status, history of heart attack, family experience of heart attack, place of work and sources of information. A *p* value of < 0.05 was considered statistically significant.

## Results

It is only 53% women, aged 50-64 years old, married and lived in urban areas. The education level of the sample was mainly mandatory school, advanced technical college and university. Most of them were in median economic status and they had not history (themselves or family) of heart attack. Also, most of the sample did not work to clinic and they were not health care professionals. Those worked in the clinic, were technicians and secretaries. The source of information was TV, health care professionals, internet and books. The demographics of the sample are shown in Table 1.

No one answered correctly all the questions. The mean correct answers were  $4.3 \pm 1.7$ ; the range was 1 to 11. Table 2 shows the number and percentage of positive answers that respondents gave. Multivariable analysis showed that participants aged  $\leq 55$  years ( $4.9$  vs  $3.4$ ,  $p < 0.05$ ), residents in urban areas ( $4.7$  vs  $3.4$ ,  $p < 0.05$ ), who have advanced education ( $4.7$  vs  $2.5$ ,  $p < 0.05$ ), with high income ( $4.8$  vs  $3.3$ ,  $p < 0.05$ ) and family experience to heart attack ( $4.7$  vs  $4$ ,  $p < 0.05$ ) answered correctly more questions than the others. Sex ( $p = 0.25$ ), family status ( $p = 0.809$ ), personal history of heart attack ( $4.4$  vs  $4.3$ ,  $p = 0.801$ ), work in clinic ( $4.2$  vs  $4.3$ ,  $p = 0.918$ ) and sources of information ( $p = 0.568$ ) had no effect on results.

Analysis showed that education ( $r = 0.900$ ), economic status ( $r = 0.839$ ), and family experience to heart attack ( $r = 0.797$ ) have strong correlation with the number of the correct answers given by citizens. Also, age ( $r = -0.512$ ) and the place of stay ( $r = -0.675$ ) have medium correlation (see Table 3).

## Discussion

To our knowledge, this is the first population-based study of the knowledge of risk factors and the symptoms of heart attack among Greeks. This survey shows a high level of ignorance of the risk factors and symptoms of heart attack. The most frequently identified risk factor by participants was stress (57.3%), followed by smoking (52.7%) and obesity (51.8%). Alcohol (10%) was not identified from participants as a risk factor for heart attack. However, participants with experience of heart attack in their family environment tended to answer more questions correct than those without. This gap in knowledge is very important and we believe that if the level of knowledge increases, the mortality of CVD will decrease.

### Symptoms

#### Chest pain

In this study, chest pain was the most identified symptom of heart attack from citizens (71.8%). This finding was in agreement with previous studies that showed chest pain to be the most identified symptom of heart attack from citizens [13-16]. Only one study conducted in Nepal showed that a small percentage of citizens (22.5%) recognized chest pain as a symptom of heart attack [17].

Chest pain as a symptom of heart attack seems to be the first recognizable symptom from people more than a decade ago [18,19]. There are few studies which conducted at 1981 in Texas

**Table 1** Demographics data.

Characteristics	Frequency (%)
<b>Sex</b>	
Women	5,800 (52.7)
Men	5,200 (47.3)
<b>Age</b>	
<20	4 (3.6)
20-34	24 (21.8)
35-49	23 (20.9)
50-64	37 (33.6)
65-87	22 (20.1)
<b>Mean age ± SD (age range)</b>	48.9±17.4 (18-87)
<b>Residence</b>	
Urban	7,900 (71.8)
County	3,100 (28.2)
<b>Family Status</b>	
Single	3,000 (27.3)
Married	6,200 (56.4)
Widowed	800 (7.3)
Divorced	800 (7.3)
Symbiosis	200 (1.8)
<b>Education</b>	
Mandatory School	2,800 (25.5)
Secondary School	2,300 (20.8)
University	2,800 (25.5)
Advanced technical college	2,800 (25.5)
Master degree	200 (1.8)
PhD	100 (0.9)
<b>Economic Status</b>	
Very little (<5.000 euro)	2,000 (18.2)
Little (5.000-10.000 euro)	2,700 (24.5)
Median (10.000-20.000 euro)	4,500 (40.9)
Large (>20.000 euro)	1,800 (16.4)
<b>History of heart attack</b>	
Yes	900 (8.2%)
No	10,100 (91.8)
Family experience to heart attack	3,100 (28.2)
<b>Place of work</b>	
Clinic	800 (7.3%)
No clinic	10,200 (92.7)
<b>Sources of Information</b>	
TV	4,200 (38.2)
Internet	2,500 (22.7)
Books	500 (4.5)
Health care professionals	3,800 (34.5)

[19] and 1992 in Dublin [18] which shows that a large portion of people knew chest pain as a symptom of heart attack. Although, chest pain has been reported as the most important and common symptom of heart attack, [20,21] one to three patients who admit to emergency services of a hospital with heart attack has not chest pain the time of admission [22].

### Dyspnea

Less than half in our study identified dyspnea as a symptom of heart attack (34.5%). This result is similar with other studies

**Table 2** Positive answers to questions.

Questions	Positive Answers, n (%)
<b>What can be symptoms of a heart attack?</b>	
Chest pain	7,900 (71.8)
Dyspnea	3,800 (34.5)
Radiating pain	3,900 (35.5)
Fainting	1,800 (16.4)
<b>What risk factors are mainly responsible for developing heart attack?</b>	
Smoking	5,800 (52.7)
Obesity	5,700 (51.8)
Diabetes	1,700 (15.5)
High Blood Pressure	1,600 (14.5)
Abnormal Blood Fat	1,300 (11.8)
Alcohol	1,100 (10)
Stress	6,300 (57.3)

**Table 3** Variables correlated with the number of correct answers .

Variables		score
Age (≤55 vs. >56 years)	Pearson Correlation	-0,512
	Sig. (2-tailed)	0,001
Residence (urban vs. county)	Pearson Correlation	-0,675
	Sig. (2-tailed)	0,002
Education (School vs. advanced education)	Pearson Correlation	0,900
	Sig. (2-tailed)	0,000
Economic Status (very little vs. little, median and large)	Pearson Correlation	0,839
	Sig. (2-tailed)	0,012
Family experience to heart attack (yes vs. no)	Pearson Correlation	0,797
	Sig. (2-tailed)	0,019

conducted in Korea, [13] USA, [21] UK,[14] and Nepal [17]. There are no a lot of studies that shows high level of knowledge of dyspnea as a symptom of heart attack. Two of them conducted in Beirut and California had high percentages (94% and >95% respectively) [15,16].

### Radiating Pain

One of three citizens in our study identified radiating pain as a symptom of heart attack. This finding is consistent with other studies [13,14,23]. In Portland, USA, two of three people identified arm pain, and 10% classified jaw, neck or back pain as heart attack symptoms [21]. Also, arm pain was known as a symptom of heart attack by 95% of citizens in California [16] and 90% in Dublin [24].

One possible explanation for this low rate is that people usually realize the pain in different parts of their body as pain of cramb or cold [25]. They translate this kind of pain as non-cardiac cause and they do not visit hospital.

### Fainting

Very few of participants answered that fainting is a heart attack symptom (16.4%). This result is similar with other studies that show that the percentage of people who recognize the fainting as a symptom of heart attack is very low [14,26].

## Risk Factors

### Smoking

It has been shown from other studies that cigarette smoking is the most preventable risk factor of CVD [27,28]. Nonetheless, only 52.7% of participants in our study recognized smoking as risk factor of heart attack. This rate is low in relation to other studies. For instance, in Nigeria, smoking was readily identified by 70.6% of respondents [22].

### Obesity

Obesity is a risk factor of heart attack that only half of the women surveyed correctly identified. This finding is in agreement with previous studies that showed obesity to be one of the most recognizable warning symptoms by citizens. This result is consistent with a study conducted in Nigeria [29]. It make sense the fact that nowadays people who live in a country, Greece, with high rates of obese are not update for the implications that obesity causes.

### Diabetes

Despite there are studies that show that diabetes is a great predictor of CVD, [30] in our study the rate of participants who identified diabetes as a risk factor of heart attack was very low, about 15.5%. The percentage of people in other countries who know diabetes as a risk factor vary from 20% in USA [31] to 47.1% in Korea [13].

### High blood pressure

One of risk factors that participants identified was hypertension (14.5%). This result is not consistent with other studies. The percentage of people who recognize high blood pressure as a risk factor was 78.4% in Korea, [13] and 50% in USA [32].

### Abnormal blood fat

In our study only 11.8% of participants answered that abnormal blood fat is a risk factor for heart attack. In AHA survey, that 40% of women claimed to be very well informed, it was proved that only a minority of them could name cholesterol as a risk factor [33]. Whereas this small rate, one study in Chicago showed that the majority of participants selected correctly hypercholesteremia as a risk factor of heart attack [31].

### Alcohol

It is fact that the consumption of alcohol in Greece has been decreased due to the extra taxes that have increase the price of the liter of alcohol. Because of this, about 10% of the participants

ignored alcohol consumption as a risk factor responsible for developing heart attack. In a study conducted in Nigeria, 52.8% of the respondents recognized alcohol as risk factor of heart attack [29]. In our study this percentage was 10%.

### Stress

One risk factor that participants identified most was the stress (57.3%). This result is consistent with a study conducted in USA (approximately 50%) [34], but comparing it with a study in Korea (73%) this rate is low [13].

Whereas the knowledge of warning symptoms and risk factors of heart attack is very important, it seems that Greeks are not well informed. In our study, younger people answered more questions correctly. This result is supported by other studies [13,20,35]. However, some studies found that younger people were less likely to know the risk factors and the symptoms of heart attack [36,37]. One study showed that there was no effect between age and knowledge [38]. We believe that younger people have more access to information, because of the skills and knowledge they have about the technology.

In our study, level of education and income was strongly associated with knowledge of heart attack symptoms and risk factors. Participants with university or college degree and high income achieved higher knowledge scores. These findings are supported by previous studies [13,20,35,37,38]. They supported that participants with less knowledge was seen in the low-income and low educational attainment. A possible explanation for this is the fact that access to sources of information costs. Also, more information is difficult to be read and understood by citizens. So, income and level of education play important role to the level of knowledge of heart attack symptoms and risk factors.

Also, we found that people with a history of a heart attack in a family member were more likely to have more knowledge. It was expected, because these people already have experience of this disease and possibly they have done a lot of discussions with their relatives.

## Conclusions

We found that there is dramatic lack of knowledge in the general public about the risk factors and typical signs of heart attack. Lower education level, younger age, low income and history of a heart attack in a family member were predicting factors for the level of knowledge of heart attack symptoms and risk factors. Education seminars are needed to increase the recognition of symptoms and risk factors of heart attack to Greek population.

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