

# Knowledge of Cardiovascular Disease and Its Risk Factors among the Community in Kuwait



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## Abstract

**Objective:** To determine the current level of knowledge and its risk factors in the general public in Kuwait.

**Methods:** Six hundred and thirty individual were randomly approached from the six governorates, 600 individual agreed to participate in the study. The data in this study was collected by a random survey. All expatriates, Kuwaiti people of an age < 21 years or > 80 years, medical doctors, dentists, pharmacists, nurses, medical students, dental students and pharmacy students were excluded from the study.

**Results:** The study showed a limited knowledge about cardiovascular disease types since about than quarter of the sample did not know most of CVD types. A low knowledge in this study was regarding symptoms of heart attack; the most known symptom was chest pain that was known to half of the sample followed by shortness of breath (47.2%) then pain in the arm and shoulder (40.7%). Symptoms of stroke were not well known, the most known symptom was confusion and problems in speaking and understanding others (35%), followed by numbness and weakness of the face, arm, or leg in one side of the body. However, it showed a moderate to good knowledge about cardiovascular risk factors and the preventative measures. A better knowledge about cardiovascular disease in general was found in people who have a healthy diet or have positive family history of cardiovascular disease. Participants indicated that the pharmacist role is mainly helping patients in managing their medications, and they did not recognize the role of pharmacist in preventing cardiovascular disease by offering advice and some measurements. Public were willing to use some services and get advice from a pharmacist if it was offered in a community pharmacy.

**Conclusion:** This study indicates that the public need awareness about cardiovascular disease types, symptoms of heart attack and stroke to have a better management of the disease. In addition the pharmacist role must expand to offering public awareness about cardiovascular disease and its risk factors.



## Chapter 1 Introduction



## Introduction

### Definition of Cardiovascular Disease

Cardiovascular disease (CVD) are group of disorders that involve the heart or blood vessels or both. They include [i] coronary heart disease, manifested by myocardial infarction (MI), angina pectoris, heart failure, and coronary death; [ii] cerebrovascular disease, manifested by stroke and transient ischemic attack; [iii] peripheral arterial disease, manifested by intermittent claudication; [iv] rheumatic heart disease that is characterized by damage to the heart muscle and heart valves from rheumatic fever that is caused by streptococcal bacteria; [v] congenital heart disease, which is defined as malformations of heart structure existing at birth; and [vi] deep vein thrombosis and pulmonary embolism [1].

### Epidemiology

Cardiovascular diseases are the leading cause of mortality in both developed and developing countries; account approximately to 30% (17.5 million people) of the deaths worldwide. Of these, 6.2 and 7.3 million were due to stroke and coronary heart disease (CHD), respectively. It is expected to increase to 23.3 million by 2030 [2].

The epidemiological data differs according to the ethnicity and age, which is different in every region depending on the level of health, income of the country, and other risk factors such as obesity, physical inactivity, smoking, hypertension, and blood cholesterol levels [3].

In Kuwait, cardiovascular diseases are the most common cause of death. It accounts for 46% of the total deaths in 2008. The factors contributed to this high rate of mortality in Kuwait is due to the high percentage of population with diabetes, hypertension, obesity and lack of physical activity. Moreover, high blood cholesterol levels and smoking are common among the general public [4].

### Symptoms of Heart Attack (Myocardial Infarction)

Myocardial infarction (MI) results from any imbalance between the myocardial oxygen demand and supply. It can be ST elevation MI (STEMI) and non ST elevation MI (NSTEMI) depending on the ECG readings. Both categories result from the rupture of atherosclerotic plaques and the formation of thrombus on the ruptured plaques. Patients with MI suffer from midline anterior anginal chest discomfort and pain, these discomfort and pain may radiate to the shoulder, left arm, back, or the jaw. The patient also suffers from shortness of breath, weakness, lightheadedness or faintness [5].

### Symptoms of Stroke

Stroke can be either ischemic or hemorrhagic. Ischemic stroke is caused by local thrombus formation or by embolic phenomena, resulting in occlusion in the carotid artery. However, in hemorrhagic stroke, the disease occur due to the presence of blood in the brain parenchyma which will cause damage to the surrounding tissue through a mechanical effect that produce neurotoxicity of the blood

components and their degradation products. Patient with stroke might suffer from sudden weakness or numbness on one side of the body, confusion or inability to speak, troubles in vision, or balance disturbance. In addition they may also suffer from a sudden severe headache with unknown cause [6].

### Risk Factors for Cardiovascular Disease

Many risk factors for CVD are modifiable by specific preventive measures. The modifiable risk factors accounted for over 90% of the population-attributable risk of a first MI, and include smoking, dyslipidemia, hypertension, diabetes, abdominal obesity, psychosocial factors (depression, anger, stress), unhealthy diet that lacks fruits, vegetables and fibers and has high in saturated fats, cholesterol and salt, and lack of physical activity. Other modifiable risk factors include decreased glomerular filtration rate (GFR), patients with stage 3 chronic kidney disease (CKD) have a 2- to 4-fold increased risk in comparison with persons free of CKD. The risk increases to 4- to 10-fold in stage 4 CKD and to 10- to 50-fold in stage 5 CKD (end-stage). Microalbuminuria increases cardiovascular risk 2- to 4-fold. Non-modifiable risk factors include family history of cardiovascular disease, gender (men and postmenopausal women), age ( $\geq 55$  years for males, 65 years for females or premature menopause without estrogen replacement therapy) and ethnicity (higher for blacks followed by hispanics and whites) [7,8].

### Prevention of Cardiovascular Disease

Cardiovascular diseases can be prevented especially if awareness was spread among the population about the causes and the disease itself. People should control their blood pressure, blood glucose and cholesterol levels to reduce the chance of cardiovascular disease occurrence. In addition, they need to increase their physical activity, and have a healthy diet that has high fruits, vegetables and fibers, and low salt, sugar, saturated fats and cholesterol. Other preventative measures are to maintain normal body mass index (BMI), stop smoking, and reduce stress [7].

### Role of Pharmacist in Prevention and Management of Cardiovascular Diseases

In 2006, the International Pharmaceutical Federation (FIP) stated that pharmacists are the most accessible health care provider to the public, and in position to provide early detection of chronic diseases and to identify unhealthy life styles. Hence, they can assist patients to reduce risk factors by education and counseling when appropriate, e.g., diet and weight management, regular physical activity and smoking cessation [9]. Evidence is available in the literature for the roles of pharmacists in the prevention and management of CVD in primary care. These roles included provision of educational materials, screening and monitoring of blood pressure, blood glucose and blood lipids, interventions in areas such as smoking cessation, lifestyle modification, medicines management and medicines adherence [10].

A study conducted in Europe on 2,609 randomly selected



individuals showed that involvement of pharmacists in the education of the public about CVD resulted in improved CVD risk factor knowledge. About eighty-seven percent of study participants reported a positive outcome of increase in their knowledge about CVD with the pharmacist involvement. Pharmacists helped 86.9% of smokers to stop smoking. About two-thirds of participants (65%) indicated that pharmacists had a vital role in control of their lipids and education about dyslipidemia. Half of respondents stated that the pharmacist helped them in their medications [11].

## Relevant Primary Published Literature

### Search Strategy

A survey of relevant primary published literature was conducted through searching multiple electronic databases. Studies published in the international literature in English that assessed Knowledge of cardiovascular disease and its risk factors among the community were identified and selected to read.

The electronic databases used for this purpose include the following; MEDLINE, Scopus, PubMed, ISI Web of Knowledge, and Google scholar. Search terms used in these electronic databases are (i) Knowledge of cardiovascular disease and its risk factors among the community/public/general population in Kuwait; (ii) Knowledge of cardiovascular disease and its risk factors among the community/public/general population;

(iii) Knowledge of cardiovascular disease and its risk factors; and (iv) Role of pharmacist in management and prevention of cardiovascular diseases.

The search process yielded a total of 21 potential articles, which were identified and their abstracts were read. Of these, 11 were found to be more relevant to the objectives of the current research and reported knowledge of cardiovascular disease and its risk factors among the community / public / general population. All of these were reviewed as full texts either online or from the original journal.

### Published Studies about Knowledge of CVD and its risk factors among the Community

A study was conducted in the Gulf Cooperation Council (GCC) countries to assess the level of stroke awareness among the general population on 2007, The results showed the 29% of respondents were familiar with the term 'stroke' and 29.3% indicated that the age group 30-50 have the highest risk to develop risk. Hypertension, smoking, hypercholesterolemia and diabetes were identified by 23.1, 27.1% , 13.4% and 10.9% of participants as risk factor of stroke, respectively. Stroke symptoms identified by respondents were weakness (23%), followed by speech problems (21.7%), decreased sensation (18.6%) and loss of vision (7.1%). younger age and higher level of education were found to be significantly associated with better knowledge about risk factors of stroke ( $p < 0.05$ ). Physicians and nurses were considered as the best source to provide information about stroke (70%) [12].

In Jordan, a study was performed to examine the public knowledge and awareness of cardiovascular disease and its risk factors among the general population. Eighty-two percent of respondents indicated that chest pain is the commonest symptom of CVD, followed by shortness of breath (57%), pain in the left arm or shoulder (42%). The responses regarding the risk factors of CVD were as follows: smoking (75.7%), obesity (71.2%), high-fat diet (62.0%), Stress (56.4%), positive family history (46%) and lack of exercise (22%). Less than one-tenth of the study population identified hypertension, diabetes and hyperlipidemia as CVD risk factors. Better CVD knowledge was found to be significantly common among non-smokers , those who always or often paid attention to their diet, those with normal BMI, those who occupied a very high socioeconomic level, those who had a high education, and those who had positive family history of CVD ( $p < 0.05$ ). The study population reported that the only role that the community pharmacists had in CVD prevention and management was to benefit patients manage their medications. They stated that community pharmacists had a minimal role in offering lifestyle advice, monitoring and managing blood pressure, blood cholesterol and glucose levels. The findings of this study concluded the knowledge and awareness of CVD among the community in Jordan is limited [13].

A study was conducted in Iran among 200 women to identify their knowledge about CVD risk factors and symptoms. The common symptoms indicated by participants were palpitation (86.5%), followed by chest pain (84.5%) and shortness of breath (67%). In relation to the CVD risk, participants reported smoking (67%) and obesity (65%) as the commonest risk factors, followed by hypertension (54%), stress and anxiety (51.1%), hyperlipidemia (47%), low physical activity (42%), and diabetes (20%) [14].

In South Africa, a study was performed to assess knowledge and awareness of CVD risk factors among the community. A sample of 302 males and 249 female were included in the study. Both males and females indicated stress as the commonest risk factor (53.5% and 50.3%, respectively). The second risk factor being identified by 40 % of respondents was smoking. However, more females were aware of an unhealthy diet as a risk factor for CVD than males (36.3% and 30.1%, respectively). Obesity as a risk factor was indicated by 21.7% of females and 13.3% of males. About twenty-five percent of the females and 18.5% of males identified hypertension as a risk factor. The least known risk factors were diabetes mellitus, alcohol consumption, and a positive family history of CVD, which were reported by less than 15% of the study population [15].

A study was conducted in Nepal to determine the cardiovascular health knowledge among general public. Participates showed poor knowledge of the heart disease risk factors, smoking was identified by 29.9%, followed by excessive alcohol (26.1%), hypercholesterolemia (15.6%), stress (14.3%), hypertension (13.3%), overweight (5.4%), physical inactivity (4.9%), and high blood glucose (1.0%). About 60% of participants did not know any heart attack

symptoms compared with 20% who knew 2–4 symptoms. The most commonly identified symptom was loss of consciousness (33.2%), followed by chest pain (20.5%), dizziness or light-headedness (15.1%), shortness of breath (13.6%), and excessive sweating (10.6%). Pain radiating to teeth or jaw or arm was indicated by less than 1% of respondents. Approximately 44% of the study population had insufficient knowledge about CVD and less than 20% had highly satisfactory knowledge [16].

In Northern Ireland, a study was done among the general public to assess their knowledge and understanding of coronary heart disease (CHD). First the participants were asked about the definition of CHD, 40.5% indicated that it was a narrowing of the blood vessels, while 24.7% reported that it is a heart attack, and almost 16.9% could not define CHD. Their responses regarding the symptoms of CHD were as follows: chest pain (77.3%) followed by shortness of breath (49.2%) lack of energy (26.1%) and pain in the left arm (21.5%). When they were asked about the risk factors of CHD, 73.1% reported that high fat diet is a cause of CHD, followed by smoking (69.5%) lack of exercise (54.9%), obesity (21.6%), stress (17.7%), and positive family history of CVD (17.2%). While dyslipidemia, hypertension, and diabetes were known by 9.8%, 4.5%, and 2.1% of the study participants, respectively. It was found that higher CHD knowledge scores were significantly common among those reported: exercising for 30 min  $\geq$  3 time/ week, often or always paying attention to their diet, being overweight, having a positive family history of CHD, those with high educational level, and those living in a very high socioeconomic level ( $P < 0.05$ ). When the study population was asked if they prefer a nurse or a pharmacist to help in the prevention and management of CHD, most of them declared that it is the nurses' job. More than half (56.7%) of respondents stated that they would prefer a nurse for advice about healthy diet, while 26.8% indicated that it is the pharmacist role. Seventy-three percent of respondents indicated that the role in offering advice about exercise is for the nurse should, while 14.7% answered that it is the pharmacist's role. About 90% of participants stated that the measurement of blood pressure, blood cholesterol and glucose levels are the nurse's role, while less than one-tenth stated that these measurement should be done by a pharmacist. Eight-in-ten (81.1%) responders indicated that it is the pharmacist's role to help patients to manage their prescribed medicine, while 13.2% reported that it is the nurse's role [17].

A study was conducted in Canada to assess knowledge of heart disease and stroke among cardiac patients. Smoking was the most identified risk factor (55%), followed by unhealthy diet (46%), stress (46%), lack of exercise (38%), family history of CVD (36%), overweight/obesity (34%), hypercholesterolemia (31%), hypertension (20%), and diabetes (14%). When the participants were asked about the symptoms of heart attack, only 16% were able to list at least four and 8% were unable to indicate any. The most common symptom known by respondents was

chest pain (82%), followed by arm pain (53%), trouble in breathing (39%), sweating (22%), nausea (21%) and loss of consciousness (8%). The high income and history of heart disease were found to be significantly associated with good knowledge of heart attack symptoms. In relation to stroke symptoms, less than 25% were able to identify one symptom, 31 % identified two symptoms, and 48% were unable to indicate any stroke symptoms. The most common reported symptom was speech difficulty (24%), visual disturbance (18%), weakness and numbness of half of the body (16%), headache (15%) and loss of consciousness (11%). High education, high income and a history of stroke were found to be significant predictors of good stroke symptom knowledge [18].

In Beijing, a study was done to assess the public knowledge about the symptoms of heart attack among the public. Fewer than one-quarter (20.4%) of respondents had correctly reported four or more out of the eight heart attack symptoms included in the survey, 75.4% reported at least one, while only 7.4% knew all the correct symptoms. Chest pain or discomfort as a common symptom of heart attack was identified by 64.2% of respondents. Adequate knowledge about symptoms of heart attack was found to be significantly common among the elderly, those with health insurance coverage, higher education level, higher income, and previous experience with heart disease [19].

A study was Pakistan to examine knowledge about coronary heart disease and its risk factors among the community. Only 14% of respondents were able to describe CHD as a condition involving limitation in blood flow to the heart. The most common identified risk factor was stress (43.4%), followed by dietary fat (39.1%) smoking (31.9%), lack of exercise (17.4%), obesity (14.1%), high cholesterol (7.4%), high blood pressure (7.1%), family history of CVD (4.9%), and diabetes (1.9%). The most common symptom of heart attack identified by respondents was chest pain (36.2%), followed by dyspnea (24.4%), anxiety (22.3%), and headache (2.1%). In relation to reduction of CHD risk, to reduce dietary fat intake was reported by 33.5% of respondents, followed by regular exercise (23.4%), smoking (11.2%), stress reduction (7.3%), and weight control (4.9%) [20].

Another study was conducted in Pakistan to assess knowledge about modifiable CVD risk factors among subjects who were hospitalized with their first acute myocardial infarction (AMI). Only 42% of respondents had a good level of knowledge of CVD risk factors. Ninety-six percent of participants identified at least one risk factor. One-fifth (20%) of the study population correctly identified the four modifiable CVD risk factors: with heart disease. fatty food consumption, smoking (83%), obesity (42%) and lack of exercise (25%). A good level of knowledge of modifiable CVD risk factor was found to be significantly common among those with high level of education, those involved in regular exercise and non-smokers ( $p < 0.05$ ) [21].

A pilot study was conducted to determine cardiovascular disease prevention knowledge in 35 Latina women. The results showed that only 28% of respondents had some knowledge about CVD. In relation to their knowledge about CVD risk factors, Saturated fat diet was indicated by 90% of respondents as the common risk factor, followed by smoking (70%), hypertension (48%), obesity (25%), and diabetes (20%) [22].

### Rationale for the Present Study

It has been evident that enhanced knowledge of CVD will help individuals to change their health attitudes, behavior's and lifestyle practices. Improved knowledge to the recognition of heart attack and stroke symptoms will lead to earlier presentation to medical care that may result in better patient outcomes. The public needs to have good knowledge about CVD risk factors, and this will aid them to be proactive in decreasing their risk since the majority of the risk factors are modifiable [8,23].

It has been well recognized that knowledge is a vital prerequisite for the implementation of effective primary and secondary preventive interventions for CVD. Poor public knowledge of CVD risk factors and its symptoms limits effective strategies for CVD prevention [23]. In Kuwait,

CHD is the major cause of morbidity and mortality and CVDs are estimated to cause 46.0% of all mortalities [24,25]. To design effective CVD treatment and prevention strategies, an assessment of the public knowledge about CVD is needed. Knowledge of CVD, its symptoms and risk factors have been studied in various populations. However, there are no published studies to date that comprehensively examine the preexisting knowledge about CVD among the general public in Kuwait,. Hence, this study was designed to assess the level of current knowledge about CVD, its symptoms and risk factors among Kuwaiti individuals, and their behavior towards CVD.

### Objectives of Present Study

1. To conduct a survey of relevant primary published literature.
2. To assess the level of current knowledge of cardiovascular disease (CVD), its symptoms and risk factors in the general public of Kuwait.
3. To determine the public's behavior towards CVD.
4. To investigate the public's views of the role of the pharmacist in the management and prevention o CVD.



## Chapter 2 Methods



## Methods

### Study Area and Population

A descriptive, cross-sectional survey was conducted in Kuwait. Kuwait is in the Middle East with an area of 17,820 km<sup>2</sup> and estimated population of 3,065,850 million people (2011 estimate). The total population of Kuwaiti is 1,089,969 [26]. Kuwait is divided into six governorates, which are Capital, Hawalli, Al-Ahmadi, Al-Farwaniyah, Al-Jahra and Mubarak Al-Kabeer, The study population is the general public of Kuwait. The survey was conducted during the period from January to March 2014. The ethical clearance for this study was obtained from the "Human Ethical Joint Committee for Students' Research, Ministry of Health and Health Sciences Center, Kuwait University".

### Inclusion and Exclusion Criteria

The inclusion criteria were Kuwaiti people of an age between 21 and 80 years old. The exclusion criteria were expatriates, Kuwaiti people of an age < 21 years or > 80 years, medical doctors, dentists, pharmacists, nurses, medical students, dental students and pharmacy students.

### Sampling Strategy

The sample size was based on the assumption that the percentage of respondents who have high knowledge of CVD, symptoms of heart attack, and symptoms of stroke, CVD risk factors and CVD prevention is 50% (95% confidence and 5% accuracy). Using the equation  $[n = (1.96)^2 p (1-p)]/d^2$  where the degree of confidence (i.e., 95% which yields the coefficient 1.96), "p" stands for proportion and "d" for accuracy [27]. The sample size was determined to be 384, assuming a response rate of 60%, a sample size of 640 will be randomly selected.

A total of 630 Kuwaiti people were approached to be included in the survey, 600 (95.2 %) were agreed to participate in the study. Random sampling was used for selection of Kuwaiti people from houses, diwanis, government and private enterprises, and colleges of Kuwait University, and from these, individuals were contacted and given an explanation with regard to the purpose of the study. They were free to refuse participation in the study.

### Questionnaire Design

The questionnaire was adapted from previously used and validated surveys to investigate public knowledge and awareness of cardiovascular disease and its risk factors in Jordan and South Africa [13,15]. The questionnaire contained both open-ended and closed-ended questions. It was translated by a professional translator into Arabic. The accuracy and meaning of the translated version was checked by two researchers who are native speakers of Arabic language and fluent in English language, and recommended changes where necessary were discussed before being finalized. It was pretested for readability and comprehension on 16 Kuwaiti subjects, and modifications

were made as necessary so that the questionnaire was simple to understand and answer, yet gave accurate data.

The final version of the pre-tested questionnaire composed of the following four parts (Appendices 2 and 3):

**Part A** (seventeen questions): to provide information about the demographic and other clinical characteristics of the participants (age, gender, marital status, educational level, employment, residence, monthly income, personal health, height, weight, smoking, exercise, healthy food, lifestyle, and family history of CVD).

**Part B** (four questions): to provide information about the participants' medical status including presence of chronic diseases, chronic use of medications, recent measures of blood pressure (BP), blood cholesterol and glucose levels, and last time for checking BP, body weight, and blood cholesterol and glucose levels.

**Part C** (five questions): to determine knowledge about types of cardiovascular disease, symptoms of heart attack and stroke, CVD risk factors and CVD prevention.

**Part D** (two questions): to explore views about the role of pharmacists in prevention and management of CVD, and participants intention to use CVD prevention services if being offered in the community pharmacy.

### Data Collection

Data were collected via self-administered questionnaire. Those who agreed to take part in the study were given the questionnaires, which were completed anonymously and collected after completion. They were assured for confidentiality and gave written consent to participate in the study.

### Data Analysis

Data were entered into the Statistical Package for Social Sciences (SPSS, version 21), and descriptive and comparative analysis were conducted. Responses were presented as numbers (percentages) and median (Interquartile range). Statistical correlational analysis (Spearman's rank correlation) was used to measure the association between respondents' characteristics and knowledge about types of CVD, symptoms of heart attack and stroke, CVD risk factors and CVD prevention. When a significant association was found, Mann-Whitney and Kruskal-Wallis tests were used to evaluate the differences in medians between the groups of the predictor variables and knowledge score.  $P < 0.05$  was considered statistically significant. Non-parametric tests were used for correlation and comparison because the data were not normally distributed.

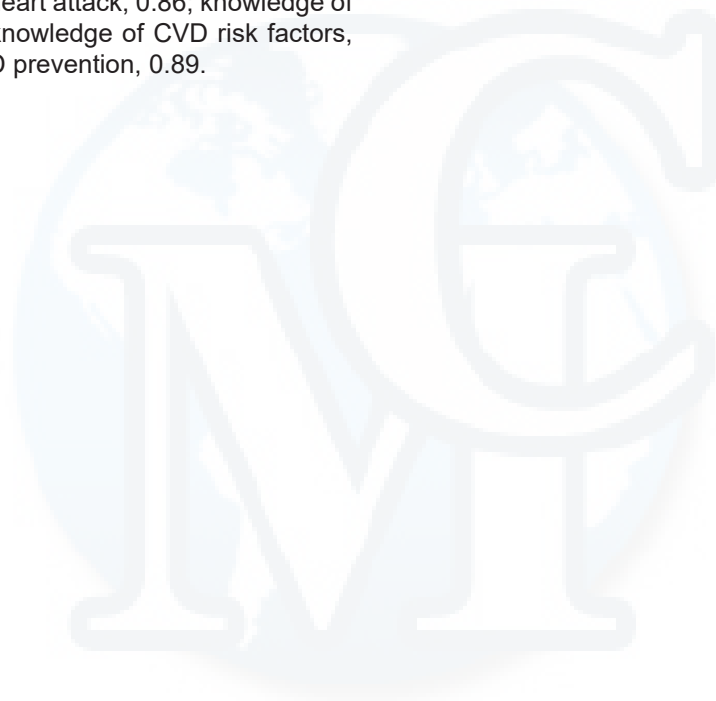
The predictor variables were categorized as follows: (1) gender: males and females; (2) age: [20–39 years] and [40–60 years]; (3) level of education: low-intermediate [0–12 years] for those who completed secondary school or less, and high [>12 years] for those who had diploma,

or bachelor degree or postgraduate degree; (4) monthly income: low [ $< 500$  Kuwaiti Dinars (KD)], middle [500-1000 KD] and high [ $> 1000$  KD]; (5) personal health: excellent, very good, good/Fair; (6) smoking status [yes, no]; (7) BMI (normal, overweight and obese); (8) 30 minutes exercise/week: 0-2 times, 3-5 times and  $> 5$  times/week); (9) eating healthy food ( everyday and not everyday); (10) everyday life (very stressful/stressful, somewhat stressful, and free from stress (relaxing); (11) Family history of CVD: (yes, no); (12) chronic disease: (yes, no).

A scoring system was applied to measure the overall participants knowledge of each of the following: types of CVD, symptoms of heart attack and stroke, CVD risk factors and CVD prevention. Internal consistency for each of the 5 sections to determine knowledge was assessed using Cronbach's test. The test results were as follows: participants' knowledge about types of CVD, 0.91; knowledge of symptoms of heart attack, 0.86; knowledge of symptoms of stroke, 0.88; knowledge of CVD risk factors, 0.88; and knowledge of CVD prevention, 0.89.

Knowledge scores were categorized for each section as follows:

- a. Knowledge about types of CVD: low knowledge ( $\leq 3$ ), moderate knowledge (4-5) and high knowledge (6).
- b. Knowledge about symptoms of heart attack: low knowledge ( $\leq 2$ ), moderate knowledge (3-4) and high knowledge (5).
- c. Knowledge about symptoms of stroke: low knowledge ( $\leq 2$ ), moderate knowledge (3-4) and high knowledge (5).
- d. Knowledge about CVD risk factors: low knowledge ( $\leq 5$ ), moderate knowledge (6-8) and high knowledge (9).
- e. Knowledge about CVD prevention: low knowledge ( $\leq 5$ ), moderate knowledge (6-8) and high knowledge (9).





## Chapter 3 Results



## Results

### Study Population

A total of 630 Kuwaiti individuals were approached to be included in the study, 600 agreed to participate in the study giving a response rate of 95.2%. Their median (IQR) age was 32 (25,40) years. Of the 600 respondents, 376 (62.7%) were females, 92.2% had high education, and 50.3% with a high monthly income of > 1000 KD. Table 1 shows the demographic characteristics of respondents.

**Table 1:** Demographic Characteristics of Respondents (n =600).

Characteristic	Frequency (%)	
<b>Age</b>		
21-39	444	(74.0)
40-60	156	(26.0)
<b>Gender</b>		
Male	224	(37.3)
Female	376	(62.7)
<b>Marital status</b>		
Single	207	(34.5)
Married	357	(59.5)
Divorced	27	(4.5)
Widowed	9	(1.5)
<b>Educational level</b>		
Low-intermediate education	47	(7.8)
High Education	553	(92.2)
<b>Employment</b>		
Unemployed	4	(0.7)
Retired	26	(4.3)
Housewife	6	(1.0)
Student	37	(6.2)
Professional	199	(33.2)
Manage own Business	11	(1.8)
Clerical	317	(52.8)
<b>Residence</b>		
Al-Asimah	266	(44.3)
Hawalli	146	(24.3)
Al-Farwanhiya	58	(9.7)
Al-Ahmadi	46	(7.7)
Al-Jahra	16	(2.7)
Mubarak Al-Kabeer	68	(11.3)
<b>Monthly income</b>		
< 500 KD	68	(11.3)
500-1000 KD	230	(38.3)
> 1000 KD	302	(50.3)

The median (IQR) BMI of the study population was 26.4 (23.6, 29.9). Two hundred and forty six participants (41.0%) reported that they had normal body weight; however, 31.0% of them were found to have for either overweight or obese according to their calculated BMI. Of the study population, 96 (16.0%) reported that they were smokers, 5.5% indicated

exercising for 30 minutes, more than five times/week, and 25.7% reported eating healthy food everyday. Over half (54.7%) of participants indicated to be somewhat stressful. Table 2 shows the clinical characteristics of respondents.

**Table 2:** Clinical Characteristics of Respondents (n =600).

Characteristic	Frequency (%)	
<b>General personal health</b>		
Excellent	274	(45.7)
Very good	254	(42.3)
Good	68	(11.3)
Fair	4	(0.7)
<b>BMI</b>		
< 25 Kg/m <sup>2</sup>	230	(38.3)
25-29.99 Kg/m <sup>2</sup>	222	(37.0)
≥ 30 kg/m <sup>2</sup>	148	(24.7)
<b>Smoking status</b>		
Yes	96	(16.0)
No	504	(84.0)
<b>30 Minutes exercise /week</b>		
0-2 times	458	(76.3)
3-5 times	109	(18.2)
More than 5 times/week	33	(5.5)

### Information about the Medical Status of Respondents

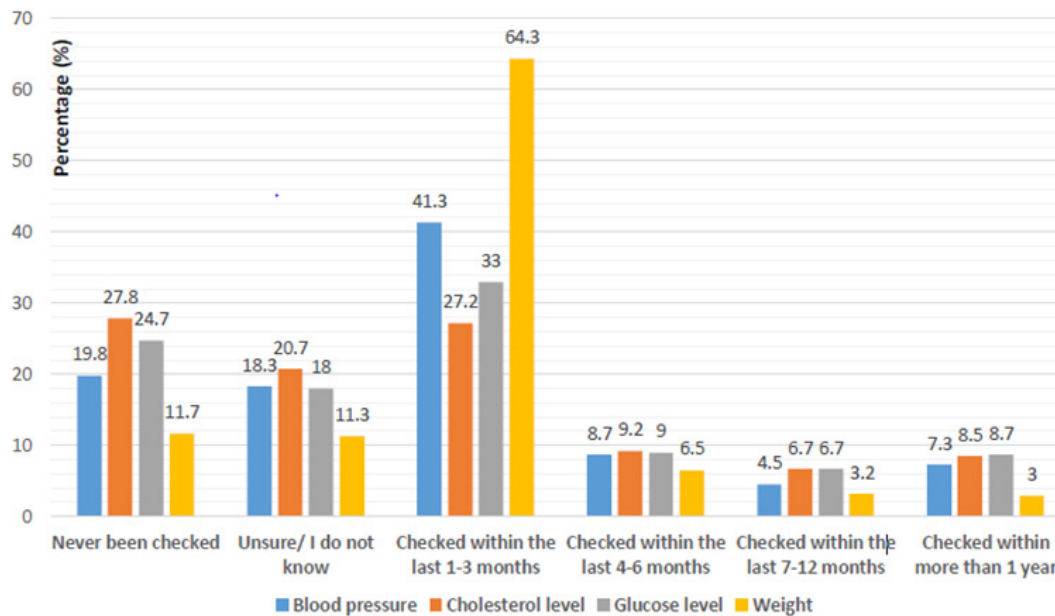
About two-in-ten (n = 136; 22.7%) responders indicated to have chronic diseases. Of those, 92 (67.6%) had dyslipidemia, 60 (44.1%) hypertension, 35 (25.7%) diabetes, and 11 (8.1%) coronary heart disease (CHD). All respondents who had diabetes and CHD indicated that they use medications for these diseases. Fourteen (23.3%) of the hypertensive patients and 60 (65.2%) of those with dyslipidemia reported that they were not using medications for both diseases. Of the study population, 207 (34.4%), 284 (47.3%) and 254 (42.3%) reported that they did not know their recent measures for blood pressure, blood cholesterol and blood glucose, respectively. The participants were also asked about the last time they checked their blood pressure, blood cholesterol levels, blood glucose levels, and weight, their responses are presented in Figure 1. About one-fifth of respondents has never checked their blood pressure, and about one-quarter had never checked their blood cholesterol and glucose levels.

### Knowledge about Types of Cardiovascular Disease (CVD)

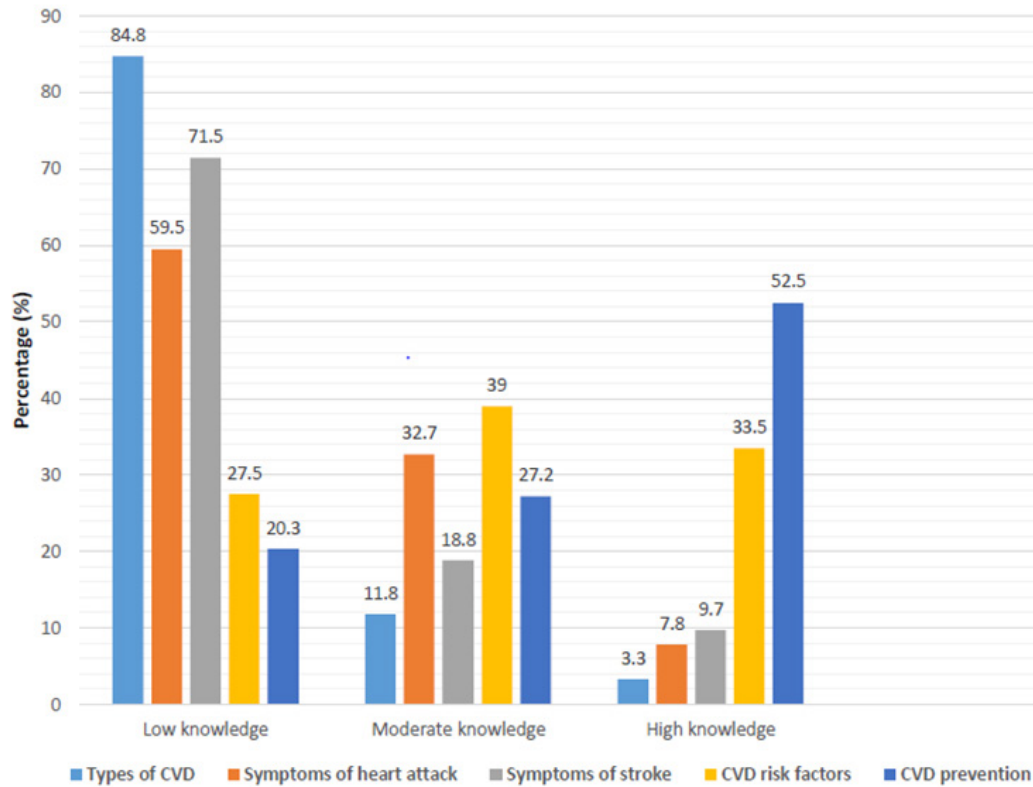
Coronary heart disease was known as CVD by 176 (29.3%) respondents, followed by congenital heart disease (n = 163; 27.2%), deep vein thrombosis and pulmonary embolism (n = 150; 25.0%), rheumatic heart disease (n = 91; 15.2%), peripheral arterial disease (n = 79; 13.2%),

and cerebrovascular disease (n =76; 12.7%). The overall median score for knowledge about the six types of CVD was 1.0 (low knowledge). Only 20 (3.3%) respondents were

found to be knowledgeable about the six types of CVD. Respondents' knowledge scores about types of CVD are presented in Figure 2.



**Figure 1:** Last time check for blood pressure, blood cholesterol, blood glucose, and weight (n =600).



**Figure 2:** Respondents' knowledge scores about types of CVD, Symptoms of Heart Attack and Stroke, CVD Risk factors and CVD Prevention (n = 600).

Respondents' frequency of eating healthy food and family history of CVD were significantly and positively associated with their knowledge level about types of CVD ( $p < 0.05$ ). Those who reported to eat healthy food everyday were significantly more knowledgeable than those who did not ( $p = 0.004$ ). Study participants with a family history of CVD were found to be significantly more knowledgeable compared to those who did not have ( $p = 0.024$ ). There were no significant association between the other respondents' characteristics and their knowledge level about types of CVD ( $p > 0.05$ ).

### Knowledge about Symptoms of Heart Attack

The most commonly known symptoms of heart attack were chest pain or discomfort ( $n = 301$ ; 50.1%) and difficulty in breathing or shortness of breath ( $n=283$ ; 47.2%). Table 3 shows the distribution of responses to the symptoms of heart attack in a descending order. The overall median score for knowledge about the five symptoms of heart attack was 2.0 (low knowledge). Only 47 (7.8%) respondents were found to be knowledgeable about the five symptoms of heart attack correctly. Respondents' knowledge scores about symptoms of heart attack are presented in Figure 2.

**Table 3:** Respondents' Knowledge about Symptoms of Heart Attack ( $n = 600$ ).

Symptom	Frequency (%)
<b>Chest pain or discomfort</b>	
Yes	301 (50.2)
No	108 (18.0)
I do not know	191 (31.8)
<b>Difficulty in breathing or shortness of breath</b>	
Yes	283 (47.2)
No	114 (19.0)
I do not know	203 (33.8)
<b>Pain or discomfort in arms or shoulder</b>	
Yes	244 (40.7)
No	126 (21.0)
I do not know	230 (38.3)
<b>Feeling weak, light-headed, or faint</b>	
Yes	159 (26.5)
No	154 (25.7)
I do not know	287 (47.8)
<b>Pain or discomfort in the jaw, neck, or back</b>	
Yes	105 (17.5)
No	183 (30.5)
I do not know	312 (52.0)

Age, family history of CVD and regular eating of healthy food were significantly and positively associated with the respondents' knowledge level about symptoms of heart attack ( $p < 0.05$ ). Respondents aged 40-60 years, those who had a family history of CVD and those who reported to eat healthy food everyday were found to be significantly more knowledgeable than the younger age group ( $p = 0.018$ ), those with no family history of CVD ( $p = 0.029$ ), and those who did not regularly eat healthy food ( $p = 0.013$ ). There were no significant association between the other respondents' characteristics and their knowledge level about symptoms of heart attack ( $p > 0.05$ ).

### Knowledge about Symptoms of Stroke

The most common symptoms of stroke found to be known by more than one-third of participants were sudden confusion or trouble speaking or understanding others (35.0%), followed by sudden numbness or weakness of the face, arm, or leg (34.5%), and sudden dizziness, trouble walking, or loss of balance or coordination (32.2%). Table 4 shows the distribution of responses to the symptoms of stroke in a descending order. The overall median score for knowledge about the five symptoms of stroke was 1.0 (low knowledge). Only 58 (9.7%) respondents were found to be knowledgeable about the five symptoms of stroke. Respondents' knowledge scores about symptoms of stroke are presented in Figure 2.

Regular eating of healthy food was significantly and positively associated with the respondents' knowledge level about symptoms of stroke ( $p < 0.05$ ). Respondents indicated to eat healthy food everyday were significantly more knowledgeable than those who did not ( $p = 0.026$ ). There were no significant association between the other respondents' characteristics and their knowledge level about symptoms of stroke ( $p > 0.05$ ).

### Knowledge about Risk Factors of Cardiovascular disease (CVD)

The most common risk factors of CVD found to be known by more than three-quarters of respondents were smoking ( $n=538$ ; 89.7%), obesity ( $n=522$ ; 87.0%) and unhealthy diet ( $n=521$ , 86.8%). Table 5 shows the distribution of responses to the risk factors of CVD in a descending order. The overall median score for knowledge about the nine risk factors of CVD was 7.0 (moderate knowledge). Approximately three-in-ten ( $n = 201$ ; 33.5%) participants were found to be knowledgeable about the nine risk factors of CVD. Respondents' knowledge scores about risk factors of CVD are presented in Figure 2.

Age, family history of CVD, regular eating of healthy food and BMI were significantly and positively associated with knowledge level about risk factors of CVD ( $p < 0.05$ ). Respondents aged 40-60 years, those who had a family history of CVD, those who reported to eat healthy food every day, and those with BMI  $\geq 30$  kg/m<sup>2</sup> (obese) were significantly more knowledgeable compared to the younger

age group ( $p = 0.013$ ), those with no family history of CVD ( $p = 0.007$ ), those who did not regularly eat healthy food ( $p = 0.004$ ), and those who were either overweight or normal weight ( $p = 0.007$ ). There were no significant association between the other respondents' characteristics and their knowledge level about risk factors of CVD ( $p > 0.05$ ).

**Table 4:** Respondents' Knowledge about Symptoms of Stroke (n = 600).

Symptom of stroke	Frequency (%)	
<b>Sudden confusion or trouble speaking or understanding others</b>		
Yes	210	(35.0%)
No	138	(23.0%)
I do not know	252	(42.0%)
<b>Sudden numbness or weakness of the face, arm, or leg</b>		
Yes	207	(34.5%)
No	140	(23.3%)
I do not know	253	(42.2%)
<b>Sudden dizziness, trouble walking, or loss of balance or coordination</b>		
Yes	193	(32.2%)
No	133	(22.2%)
I do not know	274	(45.7%)
<b>Severe headache with no known cause</b>		
Yes	155	(25.8%)
No	142	(23.7%)
I do not know	303	(50.5%)
<b>Sudden trouble seeing in one or both eyes</b>		
Yes	135	(22.5%)
No	172	(28.7%)
I do not know	293	(48.8%)

### Knowledge about Cardiovascular Disease (CVD) Prevention

The most commonly known preventative measures of CVD were found to be smoking cessation ( $n=551$ ; 91.8%), regular exercise ( $n=545$ ; 90.8%), eating healthy food ( $n=536$ ; 89.3%) and weight control ( $n = 522$ ; 87.0%). Table 6 shows the distribution of responses to the preventative measures of CVD in a descending order. The overall median score for knowledge about the nine preventative measures of CVD was 9.0 (high knowledge). Over half ( $n = 315$ ; 52.5%) of participants were found to be knowledgeable about the nine preventative measures of CVD. Respondents' knowledge scores about CVD prevention are presented in Figure 2. Age and regular eating of healthy food were significantly and positively associated with knowledge level about CVD prevention ( $p < 0.05$ ). Respondents aged 40-60 years and

those who reported to eat healthy food everyday were found to be significantly more knowledgeable than the younger age group ( $p = 0.001$ ), and those who did not regularly eat healthy food ( $p = 0.018$ ). There were no significant association between the other respondents' characteristics and their knowledge level about CVD prevention ( $p > 0.05$ ).

**Table 5:** Respondents' Knowledge about Risk factors of Cardiovascular Disease (n = 600).

Risk factor	Frequency (%)	
<b>Smoking</b>		
Yes	538	(89.7)
No	29	(4.8)
I do not know	33	(5.5)
<b>Obesity</b>		
Yes	522	(87.0)
No	30	(5.0)
I do not know	48	(8.0)
<b>Unhealthy diet such as diets high in saturated fats, cholesterol and salt</b>		
Yes	521	(86.8)
No	28	(4.7)
I do not know	51	(8.5)
<b>Physical inactivity (lack of exercise)</b>		
Yes	504	(84.0)
No	37	(6.2)
I do not know	59	(9.8)
<b>High LDL Cholesterol levels</b>		
Yes	431	(71.8)
No	56	(9.3)
I do not know	113	(18.8)
<b>Hypertension</b>		
Yes	392	(65.3)
No	68	(11.3)
I do not know	139	(23.3)
<b>Positive family history of heart disease</b>		
Yes	382	(63.7)
No	94	(15.7)
I do not know	124	(20.7)
<b>Stress</b>		
Yes	376	(62.7)
No	93	(15.5)
I do not know	131	(21.8)
<b>Diabetes mellitus</b>		
Yes	317	(52.8)
No	106	(17.7)
I do not know	177	(29.5)

**Table 6:** Respondents Knowledge about Cardiovascular Disease Prevention (n = 600).

Preventative measure	Frequency (%)	
<b>Stopping Smoking</b>		
Yes	551	(91.8)
No	17	(2.8)
I do not know	32	(5.3)
<b>Regular exercise</b>		
Yes	545	(90.8)
No	23	(3.8)
I do not know	32	(5.3)
<b>Eating healthy food</b>		
Yes	536	(89.3)
No	24	(4.0)
I do not know	40	(6.7)
<b>Controlling weight</b>		
Yes	522	(87.0)
No	26	(4.3)
I do not know	51	(8.5)
<b>Controlling high blood cholesterol</b>		
Yes	472	(78.7)
No	32	(5.3)
I do not know	96	(16.0)
<b>Controlling hypertension</b>		
Yes	463	(77.2)
No	40	(6.7)
I do not know	97	(16.2)
<b>Reducing stress</b>		
Yes	451	(75.2)
No	49	(8.2)
I do not know	100	(16.7)
<b>Reducing salt intake</b>		
Yes	433	(72.2)
No	64	(10.7)
I do not know	103	(17.2)

### The role of Pharmacists in Prevention and Management of Cardiovascular Disease

Seven-in-ten responders (n= 425; 70.8%) indicated that the role that a pharmacist had was to help patients manage their medications. Around two-fifths of participants reported that a pharmacist can offer advice on smoking cessation (44.2%) and diet (40.0%). Almost six-in-ten responders preferred that services for measurement of blood pressure (58.5%), blood glucose (59.0%) and blood cholesterol

(58.8%) to be offered by a nurse. Table 7 shows distribution of responses to the provision services by pharmacists or nurses in addition to the medical doctors.

When respondents asked about their intention to use CVD prevention services if become available in the community pharmacy. More than three-quarters of participants reported their intention to use weight measurement (n = 507; 84.5%), blood glucose measurement (n= 491; 81.8%), blood pressure measurement (n = 489; 81.5%), blood cholesterol measurements (n = 487; 81.2%), advice on diet and smoking cessation (n = 464; 77.3%), and advice on physical activity (n = 454; 75.5%).

**Table 7:** Respondents' Preference in relation to the Provision of Services by Pharmacists and Nurses.

Service	Frequency (%)	
<b>Helping the patient to manage their prescribed medicines</b>		
Pharmacist	425	(70.8%)
Nurse	91	(15.2%)
Not sure	84	(14.0%)
<b>Offering smoking cessation advice</b>		
Pharmacist	256	(44.2%)
Nurse	172	(28.7%)
Not sure	163	(27.2%)
<b>Offering advice about diet</b>		
Pharmacist	240	(40.0%)
Nurse	149	(24.8%)
Not sure	211	(35.2%)
<b>Offering advice on physical activity</b>		
Pharmacist	207	(34.5%)
Nurse	201	(33.5%)
Not sure	192	(32.0%)
<b>Measuring blood pressure</b>		
Pharmacist	152	(25.3%)
Nurse	351	(58.5%)
Not sure	97	(16.2%)
<b>Measuring blood glucose levels</b>		
Pharmacist	148	(24.7%)
Nurse	354	(59.0%)
Not sure	98	(16.3%)
<b>Measuring blood cholesterol levels</b>		
Pharmacist	130	(21.7%)
Nurse	353	(58.8%)
Not sure	117	(19.5%)





## Chapter 4 Discussion

## Discussion

This is the first study to determine the public knowledge about CVD and its risk factors in Kuwait and the Gulf region. However, a study was done in the Gulf area [12] about stroke only. In the Middle East, this study was only done in Jordan [13]. The current results would be the first step toward helping individuals to change their health attitudes, behavior's and lifestyle practices. Improving knowledge about heart attack and stroke symptoms will lead to earlier presentation to medical care that may result in better patient outcomes. The public needs to have good knowledge about CVD risk factors, and this will aid them to be proactive in decreasing their risk since the majority of the risk factors are modifiable.

### Knowledge about Cardiovascular Disease

The general knowledge about CVD and its types is low in Kuwait. The same applies to Jordan [13], South Africa [15], and North Ireland [17] since all of them have poor knowledge about CVD. In the Gulf region there is a similar poor knowledge about stroke in general [12]. In all previous countries, the knowledge is better in higher education levels, higher socioeconomic levels and in people who exercise regularly, with positive family history, and who have a healthy diet. However, in Kuwait a better knowledge is found only in people on healthy diet or a positive family history of CVD. This poor knowledge might be due to lack of media publication about CVD so the increase of awareness is necessary.

### Knowledge about Heart Attack Symptoms

Heart attack symptoms knowledge was generally low in Kuwait; the most known symptom was chest pain that was known to only half of the sample. In contrast, in Jordan [13], Iran [14], North Ireland [17], and Canada [18], chest pain as a symptom has a much higher knowledge than in Kuwait. However, Kuwaitis have a better knowledge about chest pain than Nepal [16], and Pakistan [20], and a similar knowledge to the population of Beijing [19]. The knowledge of shortness of breath in Kuwait was similar to Jordan [13], North Ireland [17], and Canada [18], while it was higher than Nepal [16], and Pakistan [20]. However, Iranian [14] has a higher knowledge than Kuwaitis regarding shortness of breath. As for pain in arms or shoulder, Kuwaitis have similar knowledge as Jordanians [13] and Canadians [18], while it is higher than Nepal [16], and North Ireland [17]. Feeling weak, light-headed, or faint as a symptom of heart attack in Kuwait was similar to Nepal [16], and North Ireland [17], while it is higher than Canada [18]. Older age, positive family history and healthy diet has a positive effect about heart attack knowledge in Kuwait. The knowledge of heart attack symptoms needs to be increased because better knowledge will lead to earlier presentation to medical care that may result in better patient outcomes [8].

### Knowledge about Stroke Symptoms

Kuwaiti population has very low knowledge regarding stroke symptoms only 35% has identified confusion or

trouble speaking and approximately similar percentages identified sudden numbness and weakness of the face, arm or leg as well as dizziness. Similar knowledge about the previous symptoms was found in Gulf area [12], while Kuwaitis have more knowledge about visual problems than other population in the Gulf area in 2007 [13]. Canada [18] has a lower knowledge about all stroke symptoms when compared to Kuwait. The knowledge of stroke symptoms has to be improved by media publication because better knowledge will lead to earlier presentation to medical care that may result in better patient outcomes [8].

### Risk Factors Knowledge

This study showed that smoking is a well-known risk factor of CVD, similarly it is well known in Pakistan [21]. In contrast, it is less known in Gulf area [12], Jordan [13], Iran [14], South Africa [15], Nepal [16], North Ireland [17], Canada [18], and Latin women [22]. Diet is a known risk factor in Kuwait and Latin women [22]. However, this study showed a better knowledge about diet as a risk factor when compared to Jordan [13], South Africa [15], North Ireland [17], and Pakistan [20]. A lesser knowledge about exercise and obesity as risk factors were found in Jordan [13], Iran [14], Nepal [16], North Ireland [17], Canada [18], and Pakistan [20,21] when compared to Kuwait. This study showed a better knowledge stress similar to Jordan [13], Iran [14], and South Africa [15]. In contrast, Kuwait was found to have more knowledge about stress than Nepal [16], North Ireland [17], Canada [18], and Pakistan [20]. Positive family history is more known in Kuwait than Jordan [13], South Africa [15], North Ireland [17], Canada [18], and Pakistan [20]. This study showed a better knowledge regarding hyperlipidemia, hypertension, and diabetes as risk factors when compared to Gulf area [12], Jordan [13], Iran [14], South Africa [15], Nepal [16], North Ireland [17], Canada [18], Pakistan [20], and Latin women [22]. Poor public knowledge of CVD risk factors limits effective strategies for CVD prevention [23]. In Kuwait, CHD is the major cause of morbidity and mortality and CVDs so the risk factors must be well known to avoid high death rate due to CVD [24,25].

### Preventative Measures Knowledge

Kuwaiti population has good knowledge about CVD prevention since all the preventative measures were known to 70% of the population or more. When compared to Pakistan [20] that have a very poor knowledge, smoking cessation was known to approximately nine in ten people in Kuwait, while only one in ten person knew it as a preventative measure in Pakistan [20]. Exercise and healthy food were well known preventative measures in Kuwait; however, in Pakistan only 33.5% and 23.4% stated it as a CVD preventative measure. In Kuwait, stress reduction was known to three quarter of the sample but only 4.9% stated it as way to prevent CVD in Pakistan [20].

Approximately only 5% identified salt intake reduction and weight control as preventative measures in Pakistan [20], while 72.2% and 87% stated that reduction in salt and controlling weight, respectively, identified them in Kuwait.



Preventative measures of CVD must be known to the public because it is the major cause of morbidity and mortality in Kuwait [24,25].

### Role of Pharmacist

The most known role of the pharmacist in this study is helping patients with managing their medication, similar result was found in Jordan [13] and North Ireland [17]. According to the result of this study the pharmacist has a minimal role in offering advice about exercise, smoking cessation, and healthy diet; these results were similar in Jordan [13] and North Ireland [17]. In addition, the pharmacist role in measuring blood pressure, blood glucose levels, and blood cholesterol levels was not recognized by the public in Kuwait, Jordan [13], and North Ireland [17]. This knowledge should increase since a study showed that pharmacists are the most accessible health care provider to the public, and in position to provide early detection of chronic diseases and to identify unhealthy life styles. Hence, they can assist patients to reduce risk factors by education and counseling when appropriate, e.g., diet and weight management, regular physical activity and smoking cessation [9]. Evidence is available in the literature for the roles of pharmacists in the prevention and management of CVD in primary care. These roles included provision of

educational materials, screening and monitoring of blood pressure, blood glucose and blood lipids, interventions in areas such as smoking cessation, lifestyle modification, medicines management and medicines adherence [10].

Moreover, another study showed that involvement of pharmacists in the education of the public about CVD resulted in improved CVD risk factor knowledge. About eighty-seven percent of study participants reported a positive outcome of increase in their knowledge about CVD with the pharmacist involvement. Pharmacists helped 86.9% of smokers to stop smoking. About two-thirds of participants (65%) indicated that pharmacists had a vital a role in control of their lipids and education about dyslipidemia. Half of respondents stated that the pharmacist helped them in their medications [11].

In this study the population was willing to use weight measurement services, blood glucose monitoring services, blood pressure measurement services, and blood cholesterol measurements services if they were offered in community pharmacy. They were also willing to get advice from the pharmacist about life smoking cessation and physical activities if it was offered in community pharmacy. So these services must be offered in every pharmacy to help people to have a better knowledge about CVD.





## Chapter 5 Conclusion

## Conclusion

### Strength and limitations of This Study

The strength of this study was the first to be done in Kuwait and the sample size used in this study represents the population. In addition, this study had a good response rate. However, every study has its limitations, in this study, the sample was not normally distributed according to the governorates of Kuwait and it was a cross sectional study by random services.

### Conclusion

This the first study to be done in Kuwait to assess the knowledge about CVD and its risk factors. The findings showed that the Kuwaiti population needs to increase their awareness regarding CVD types and the symptoms of heart attack and stroke. On the other hand, the knowledge about the risk factors and preventative measures should be maintained and increased.

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## Informed Consent Form

Kuwait University

Faculty of Pharmacy

Department of Pharmacy Practice

### Informed Consent Form

#### Title of the Project: Knowledge of Cardiovascular disease and its risk factors among the community in Kuwait

The aim of this research is to assess the level of current knowledge and understanding of cardiovascular disease and its risk factors among Kuwaiti's general public, and their behavior towards cardiovascular disease.

The procedures involved in this study include answering 28 questions on this questionnaire, which should only take you about 5-10 minutes to be completed.

There are no risks to you if you participate in this research. Your participation will increase knowledge about this important issue. All information collected will remain confidential. Neither your name nor address will be recorded in any assessment.

There is no obligation or compulsion for you to participate, and you have the freedom to agree or not agree to participate. You may withdraw from the research at any time

Please indicate (✓) below if you wish to participate or decline to do so:

☐  
☐

I wish to participate.

I do not wish to participate.

Thank You for Your Cooperation . . .

Student name: Hala Al-Nafisi

Supervised by: Dr. Abdelmoneim Awad Date:

Exclusion criteria:

1. Is your age less than 21 years? ☐ Yes ☐ No
2. Is your age greater than 80 years? ☐ Yes ☐ No
3. Are you a medical doctor or dentist or pharmacist or nurse? ☐ Yes ☐ No
4. Are you a medical or dental or pharmacy or nursing student? ☐ Yes ☐ No

If the answer to any of these four questions is "YES", please DO NOT complete the questionnaire

#### A. Demographic and other Characteristics

PLEASE FILL IN OR TICK ( ) THE APPROPRIATE ANSWER

1. Age (in years): .....
2. Gender: ☐ Male ☐ Female
3. Marital status: ☐ Single ☐ Married ☐ Divorced ☐ Widowed
4. Educational level: ☐ Less than high school ☐ High school ☐ Diploma  
☐ University ☐ Postgraduate
5. Employment: ☐ Unemployed ☐ Retired ☐ Housewife ☐ Student ☐ Professional  
☐ Manage my Business ☐ Clerical
6. Residence: ☐ Al-Asimah ☐ Hawalli ☐ Al-Farwaniya  
☐ Al-Ahmadi ☐ Al-Jahra ☐ Mubarak Al-Kabeer
7. Monthly income: ☐ Less than 500 KD ☐ 500-1000 KD ☐ Greater than 1000KD

8. Personal health: ☐ Excellent ☐ Very good ☐ Good ☐ Fair ☐ Poor

9. Height (meters) :.....

10. Weight (Kg):.....

11. How do you describe your weight? ☐ Underweight ☐ Normal ☐ Overweight ☐ Obese

12. Do you currently smoke? ☐ Yes ☐ No ☐ previously smoked\*

**\*If you chose “previously smoked” in Q 12 then you need to answer Q 13, but if you chose “yes” or “no” you may skip Q13 and start answering Q14**

13. If you previously smoked, when did you stop smoking?

☐ Less than 6 months ago ☐ 6-12 months ago ☐ More than 12 months

14. How many days per week do you usually have at least 30 minutes of exercise?

(such as walking fast, cycling, jogging) ☐ 0-2 times/week ☐ 3-5 times/week ☐ More than 5 times/week

15. How often do you eat healthy food? (Plenty of fresh fruits and vegetables and foods low in saturated fat, cholesterol, salt and high in fiber)

☐ Everyday ☐ Not everyday

16. How do you describe your everyday life?

☐ Very stressful ☐ Stressful ☐ Somewhat Stressful ☐ Relaxing

17. Have any of your immediate family members been diagnosed with a cardiovascular disease? ( Mother, father, sister, brother, own child)

☐ Yes ☐ No

## B. Information about Your Medical Status

**PLEASE FILL IN OR TICK ( ) THE APPROPRIATE ANSWER**

18. Do you suffer from any of the following chronic diseases? \*

	Yes	No
Hypertension		
Diabetes		
High blood cholesterol level		
Coronary heart disease		

**\* if you answered all of the previous diseases in Q 18 with “NO” then you can skip Q 19 and go to Q 20, But if you answered any of Q 18 diseases with “YES” then please answer Q 19.**

19. Do you take any medications for the following diseases?

	Yes	No
Hypertension		
Diabetes		
High blood cholesterol level		
Coronary heart disease		

20. Information about the recent measures of your blood pressure, blood cholesterol and blood glucose

	Normal	High	I do not know	If you remember, please indicate the actual number?
Your recent blood pressure				
Your recent cholesterol level				
Your recent fasting blood glucose level				

21. Last time you checked your blood pressure, blood cholesterol, blood glucose and weight

	Never being checked	Unsure/ I do not know	Being checked within the last 1-3 months	Being checked within the last 4-6 months	Being checked within the last 7-12 months	Being checked within more than 1 year
Blood pressure						
Blood cholesterol						
Blood glucose						
Body weight						

### C. Knowledge about Cardiovascular Diseases

22. Please insert tick (√) in the box that most appropriately reflects your knowledge about cardiovascular diseases. Cardiovascular diseases include:

	Yes	No	I do not Know
Coronary heart disease			
Cerebrovascular disease			
Peripheral arterial disease			
Rheumatic heart disease			
Congenital heart disease			
Deep vein thrombosis and pulmonary embolism			

23. Please insert tick (√) in the box that most appropriately reflects your Knowledge about symptoms of a heart attack. Symptoms of a heart attack include:

	Yes	No	I do not Know
Pain or discomfort in the jaw, neck, or back			
Feeling weak, light-headed, or faint			
Chest pain or discomfort			
Pain or discomfort in arms or shoulder			
Difficulty in breathing or shortness of breath			

24. Please insert tick (√) in the corresponding box that most appropriately reflects your knowledge about symptoms of stroke. Symptoms of a stroke include:

	Yes	No	I do not Know
Sudden numbness or weakness of the face, arm, or leg, especially on one side of the body			
Sudden confusion or trouble speaking or understanding others.			
Sudden trouble seeing in one or both eyes.			
Sudden dizziness, trouble walking, or loss of balance or coordination			
Sudden severe headache with no known cause			

25. Please insert tick (✓) in the corresponding box that most appropriately reflects your knowledge about risk factors of cardiovascular disease. Risk factors of cardiovascular disease include:

	Yes	No	I do not Know
Smoking			
Unhealthy diet such as diets high in saturated fats, cholesterol and salt			
Physical inactivity (lack of exercise)			
Obesity			
Stress			
Positive family history of heart disease			
High LDL Cholesterol levels			
Hypertension			
Diabetes mellitus			

26. Please insert tick (✓) in the corresponding box that most appropriately reflects your opinion on preventing cardiovascular disease. The following can help to prevent cardiovascular disease

	Yes	No	I do not Know
Doing regular exercise			
Reducing stress			
Stopping Smoking			
Eating healthy food (Plenty of fresh fruits and vegetables and foods low in saturated fat, cholesterol, salt and high in fiber)			
Reducing salt intake			
Controlling hypertension			
Controlling diabetes			
Controlling high blood cholesterol			
Controlling weight			

#### D. Role of Pharmacist

27. In addition to the medical doctors' role in prevention and management of cardiovascular disease, who do you think should offer the following services:

(Please tick ( ) only one option either nurse or pharmacist)

	Pharmacist	Nurse	Unsure
Offer advice on diet			
Offer advice on physical activity			
Offer advice on smoking cessation			
Measure blood pressure			
Measure blood glucose			
Measure cholesterol level			
Help patients to manage their prescribed medicines			



**28.** If the following services are offered in the near future in the community pharmacy, do you intend to use them? (Please tick ( ) only one option)

	Yes	No	Unsure
Blood pressure measurement			
Blood sugar measurement			
Cholesterol level measurement			
Body weight measurement			
Advice on Diet			
Advice on physical activity			
Advice on smoking cessation			

