Prevalence of Cardiovascular Diseases (CVDs) in OIC Countries: Implications on Healthcare System

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Abstract

Today, cardiovascular diseases (CVDs) are one of the main causes of death around the world, including countries under the banner of the Organization of Islamic Cooperation (OIC). The surge in the prevalence of CVDs is predominantly contributed by demographic changes and adoption of sedentary lifestyles together with deficient in physical activity. The objective of this paper is to examine the patterns of CVDs in OIC countries and how this has significantly affected the healthcare system. Relevant data from 56 OIC countries were obtained from the report by World Health Organization (WHO) in 2016. Descriptive content analysis was conducted to see variations in CVDs across income groups, genders and health conditions. The analysis suggests that CVDs are the main cause of mortality, particularly in high income and upper-middle income countries. Tobacco smoking, alcohol intake, high blood pressure and obesity are the common risk factors which contribute to CVDs. Men are known to have high risk factors compared to women. Indeed, the burden of NCDs has impacted not only on the quality of life of affected individuals and their families, but also on the country's socio-economic system.

Keywords: Cardiovascular diseases; Health; Mortality; OIC countries; Risk factors

Introduction

In the early 1900s, there was a decline in mortality from infectious diseases due to improvements made in sanitation and attention given to personal hygiene. Later, the world experienced a further step in medicinal technology through the discovery and application of vaccines and antibiotics. However, due to changes in lifestyle, degenerative diseases, including heart disease gradually increase. Until the 1940s and 1950s, the primary cardiovascular concerns of the medical profession were the effects of rheumatic fever and syphilis and the influence of high blood pressure on stroke (Kaplan & Keil, 1993).

Cardiovascular diseases (CVDs) are very prevalent in general population affecting the majority of people after the age of 60 years. It is a group of disorders that affect the heart and blood vessels and may manifest in various form such as coronary heart disease, cerebrovascular disease leading to stroke, rheumatic heart disease that damages the heart muscles and valve as well as peripheral arterial disease that affects the blood vessels supplying the arms and legs (WHO 2017).

It is the number one cause of death globally where more people die annually from CVDs than from any other causes. By numbers, 17.7 million people were estimated to have died because of CVDs in 2015; this statistic represents 31% of the total global deaths. From all CVDs mortality, 7.4 million had been estimated to have died due to coronary heart disease while 6.7 million due to stroke. More than one-third of CVDs mortality is suffered by populations in the low and middle-income countries. In 2015 alone, 82% out of the 17 million premature or early deaths (under the age of 70) in low and middle-income countries were due to non-communicable diseases (NCDs) and 37% of the deaths was caused by CVDs (WHO, 2017).

Most CVDs can be considered as terminal illness. However, CVDs can actually be prevented by giving emphasis on the behavioral risk factors such as tobacco habit, obesity, alcohol intake, physical inactivity and dietary habit using population-wide strategies. Good health does not necessarily mean lack of illness. People can be attributed to high risk of CVDs due to the presence of one or more risk factors such as family history, gender, diabetes, cholesterol level and other health issues (Ghazali et al., 2015). More risk factors will contribute to the greater chance of suffering from CVDs unless precautionary action is taken to modify the risk factors and work to prevent them from compromising the health of the heart.

People with CVDs or at high risk of getting CVDs need early detection because by doing so they can manage the diseases through prevention, early medication as well as counselling. Therefore, CVDs screening should be emphasized and implemented at all levels of care, more importantly at the primary care level. In addition, the screening for CVDs must be made highly accessible especially for people who are living in the rural or very remote areas. It is the responsibility of the health authority in that region to ensure successful delivery of the health care system to the population.

Statistics from the World Health Organisation (WHO) reported that death from CVDs is the number one cause of mortality. It constitutes 31% of the global deaths. Countries in the Southeast and South Asia, Eastern Mediterranean and Western Pacific have the largest number of deaths caused by CVDs (Rashid, 2011). However, little is known about the pervasiveness of CVDs in OIC countries. Therefore, the study aims to describe patterns of CVDs as well as the risk factors that caused CVDs in OIC countries.

Cardiovascular diseases: An overview

Muslim population is one of the largest populations in the world. In 2016, WHO and World Bank record showed that none of the OIC countries had made it to the top 30 countries with long life expectancy. The best record was held by Maldives at the 34th rank worldwide with a life expectancy of 78.5 years. This was followed by Qatar at the 35th rank with a life expectancy of 78.2 years and Albania in the 38th place with a life expectancy of 77.8 years. Overall, the worldwide chart for life expectancy reveals that only eight OIC countries made it to the top 50. Malaysia was at the 67th place with a life expectancy of 75 years. Subsequently, the Organisation of Islamic Conference (OIC) had put much effort to tackle various problems of the Muslim population, including health issues. This is vital because being healthy is part of an obligation of oneself and without tackling this successfully; further issues are more difficult to control.

Globally, CVDs are the primary cause of death that contributes to most young age and premature deaths, especially in the developing world (Rashid, 2011). In developing nations such as the United States (US), the number of CVD deaths has noticeably declined over the past 40 years. As reported, the annual mortality rate related to CVDs between 1998 and 2008 declined by 31% in that country. A similar trend also takes place in the European Union (EU) countries (Steptoe & Kivimäki, 2013). However, until the last decade, there has been no

systematic attempt to quantify health problems in populations in the developing world (Elder, 2001). Recent years have revealed that non-communicable diseases (NCDs) have shown an increase in global interest on the impact of health status in populations, especially in developing countries. NCDs are the primary cause of global deaths and this is a serious public health hazard to developing countries (Islam et al., 2014).

According to WHO, there are two risk factors which contribute to CVDs: the non-modifiable and the modifiable factors. The non-modifiable factors include age, gender inclination towards disease and family history which are all highly related to the occurrence of CVDs. The modifiable factors can be regulated and controlled (including biological and physical inclinations for instance, hypertension, hyperglycemia and hypercholesterolemia conditions) as can physical factors such as physical inactivity, smoking habit, excessive alcohol intake, excessive stress and unhealthy dietary behavior. These contributing factors will establish the risk factors for CVDs. Increase in the prevalence of these risk factors is closely related to the rising prevalence of CVDs. The five leading modifiable risk factors which are hypercholesterolemia, diabetes, hypertension, obesity and smoking are estimated to be accountable for majority of cardiovascular mortality (Patel et al., 2015).

Interestingly, CVDs are the chief cause of both mortality and also morbidity among diabetic patients. The microvascular and macrovascular complications that develop in poorly controlled diabetic patients all contribute to CVDs. The mortality risk due to CVDs is three times higher among diabetic patients compared to non-diabetic patients. This is one of the reasons why diabetes mellitus is also considered as coronary heart disease equivalent for many decades. In the Framingham study, it was demonstrated that the presence of diabetes increased the risk of clinical atherosclerotic disease from twofold to threefold, with coronary artery disease (CAD) as

its chief sequelae. This coronary artery disease is also one form of CVDs (Kannel & McGee, 1979). Besides, CVDs are also contributing to the major occurrence of macrovascular complications among diabetics that can result in significant health burden as well as increased healthcare expenses in the society. Moreover, the quality of life will be further compromised because of the complications. For that reason, early identification and prediction of CVDs among diabetic patients are crucial to establish more cost-efficient and effective preventive plans (Al-Khateeb et al., 2016).

To date, there are numerous CVDs risk calculator or scoring method that are being used to predict patient's risk of future CVDs. By implementing CVDs risk assessment, it can be used as a first entry point for a patient to engage in further CVDs prevention program in order to reduce or retard progression of the disease. Among the most commonly used CVDs risk assessment tool is Framingham risk score for assessment of CVD risk. This model incorporates the clinical parameters such as age, blood pressure measurement, cholesterol level, presence of diabetes and smoking status. This model can be used to predict the probability of an individual's chance of developing CVDs events in the next 10 years (D'Agostino et al., 2008). Malaysia, Saudi Arabia and Iran are among the OIC countries which have been using this model to risk stratifying CVDs in their countries (MOH Malaysia 2017; Sepanlou et al., 2015; Soofi & Youssef, 2015). On top of this, WHO has also come out with WHO/ISH risk prediction charts that have been developed mainly for the usage of low-middle income countries (LMIC) where local risk prediction charts are not available. As using the WHO/ISH charts is very simple, it should be enforced at the primary health care level even in a low resource setting center. This will enhance the effectiveness of cardiovascular management and early detection and prevention are thus can be accelerated (WHO, 2011). To improve the current status of CVDs especially in the low-middle income of OIC countries, it requires a collaborative effort and integrated

approach of multidiscipline area. Policy makers in all regions should decide the best strategies for individuals as well as at population levels to combat the upsurge trend of CVDs mortality and morbidity. Most countries have their own health policy. However, whether the existing policies are thoroughly implemented or proven effective are difficult to predict due to scarce of data.

In addition, limitations of resources with poor accessibilities to healthcare services in certain developing countries further impose a great challenge to the situations. Although many strategies have been done to impede the burden of CVDs at the national or international level, problems of implementation still persist. For instance, the most common obstacle is enforcement of 'no smoking' in areas which have been gazetted as 'NO Smoking Allowed'. This concern has to be overcome by the involvement of many organizations such as ministry of education, enforcement officers and others rather than to rely solely on the health personnel. In Malaysia, the Ministry of Health has introduced a recent health policy with regards to CVDs prevention in which all Malaysians age >30 years should have CVDs screening and repeat the profile based on their CVDs risk scoring (Ministry of Health Malaysia, 2017).

Methodology

This research employed a qualitative approach. It attempts to identify the patterns of CVDs in OIC countries. The researchers utilised examination of report on non-communicable diseases (NCDs) published in 2016 by World Health Organization (WHO) for data collection, using purposive sampling procedure. 56 OIC countries were selected and re-organized based on WHO classification of income groups. All data were analyzed using the thematic analysis technique. According to Braun and Clarke (2006:79), "thematic analysis is a method for identifying, analysing and reporting patterns (themes) within data". The analysis focused

on several components such as income groups, risk factors and types of CVDs.

Results and Discussion

Based on the analysis, there are variations of CVDs based on income groups. Three risk factors were identified that have contributed to CVDs in OIC countries: tobacco smoking, high blood pressure and obesity.

Variations of CVDs according to income groups

Figure 1 shows the distribution of CVDs in OIC countries. Among the high-income countries, the highest incidence of CVDs is in Saudi Arabia (46%), followed by Kuwait (41%). According to NCD deaths in these countries, CVDs was the main cause of mortality compared to cancer, chronic respiratory disease and diabetes. In fact, the rate was higher compared to deaths caused by injuries, maternal, perinatal and nutritional conditions. Indeed, CVDs are serious public health threats to developing countries compared to developed countries (Islam et al., 2014).

Interestingly, data on CVDs for middle-income group show higher percentage. The highest CVD mortality in OIC countries was recorded by Albania with 59%, then Kazakhstan and Azerbaijan, both with 54%. Rapid urbanization in the upper-middle income countries caused rapid changes to lifestyle and therefore increased the risk factor of CVD occurrence. In 2001, most studies on CVD occurrence were conducted in developed nations such as the United States and countries in the Western Europe. Surprisingly, it was recorded that 13 million out of 16 million CVD deaths happened in low income and middle-income countries (Celermajer et al., 2012).

The low-income countries however, experienced lower occurrence of CVDs in the population. Gabon recorded only 16% of CVDs. Injuries, maternal, perinatal and nutritional conditions, in fact, were the prime reasons for mortality.
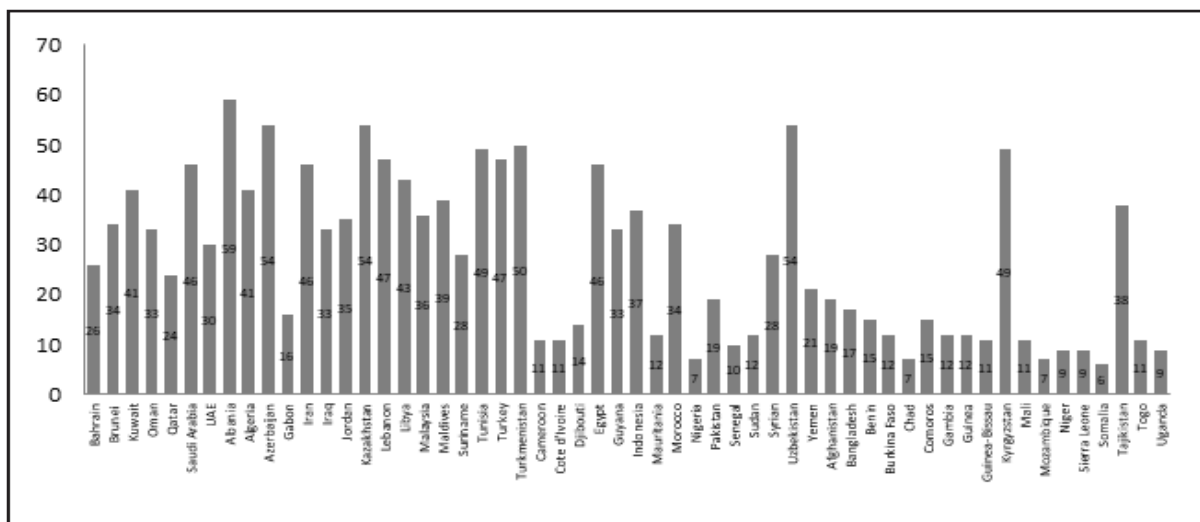
Figure 1: Distribution of CVD mortality in OIC countries (Source: WHO, 2016)

Interestingly, CVDs in lower-middle income countries were still high in Uzbekistan (54%), Egypt (46%) and Indonesia (37%). The CVD trend in lower income countries shows lower percentage compared to other income groups, except for Kyrgyzstan (49%) and Tajikistan (38%). Lower income countries were mostly struggling to combat deaths caused by maternal, perinatal and nutritional conditions. Thus, CVDs might not become the major issue in their countries.

Risk factors contributing to CVDs

Most CVDs can be prevented only if individuals make some behavioral modifications. People who are diagnosed with CVDs or who are at high cardiovascular risk need early detection and by doing so, they can have early counselling and medication (WHO, 2017). A major factor in the increasing occurrence of CVDs in developing countries is because of the ongoing changes in dietary preferences and nutrition patterns. Modernization comes with the progressive shift towards the Westernized diet which is high in sugar, cholesterol and fat. More or less, this eating habit comes with sedentary lifestyle where people are mostly prone to consuming fast and processed food (Celermajer et al., 2012)"

Smoking

Figure 2 shows that tobacco smoking is one of the popular risk factors that contribute to CVDs. Males dominate the prevalence of smoking tobacco with 87% compared to females with only 13%. Tobacco smoking is one of the major causes for many illnesses and diseases including CVDs, respiratory disease and cancers of the lung (Zheng et al., 2014). In 2009, nearly one-third of the world's adult population smoked and produced more than 10,000 deaths per day (Elder, 2001). Today, the tobacco epidemic will obviously continue to increase as people remain, for most of the time, living an inactive life.
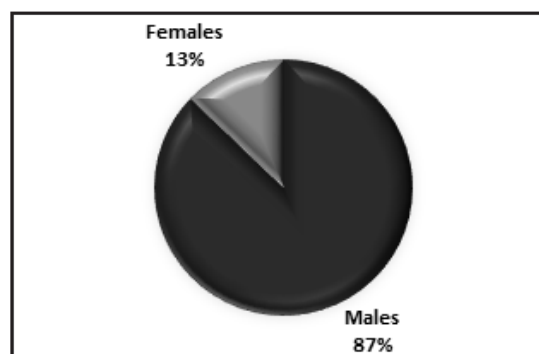

Figure 2: Percentage of tobacco smokers based on gender (Source: WHO, 2016)

Tobacco smoking has always been connected with an elevated risk of mortality. Nearly three million people die of tobacco-related causes per year in economically developed countries alone with half of them being premature deaths. Taking wisdom from history, over the past 50 years, the landscape of tobacco smoking has slightly changed worldwide. In developed and high-income countries, smoking tobacco has shown a declining trend resulting in a decrease in smoking-related deaths, particularly among men.

Conversely, the trends in the Western and non-Muslim developed nations are not reflected in high-income OIC countries. Smoking is still prescribed in Muslim populations even though smoking violation is clearly mentioned in the religion. The prevalence of tobacco smoking still remains high in middle and low income OIC countries. As the tobacco epidemic is still growing, the number of deaths due to tobacco will keep increasing in Asian countries too (Zheng et al., 2014).

High blood pressure

This study found that the persistence increase of blood pressure as a CVD risk factor is high across OIC countries. Based on Figure 3, the trend shows slightly lower in high-income countries and gradually increases among middle income and low-income countries. Niger has the highest record of blood pressure (48%) and the lowest is Brunei (20%). Although men suffer more from high blood pressure compared to women, data from high-income countries show that the number is lower due to lower job strain and job stress thus leading to lower risk of getting CVDs (Siegrist et al., 1990). In contrast, people in middle-income and low-income countries are struggling to get jobs and earn money to support their families despite low resources in their countries, which explains the high percentage in people with high blood pressure.

Obesity

Figure 4 reveals the obesity trend across OIC countries. In general, the data shows that obesity among women is higher compared to men in these countries. However, the prevalence of obesity in high-income countries for both males and females is higher compared to those in lower-income countries. Kuwait has the highest percentage of obesity with 36% males and 50% females. In contrast, Bangladesh has the lowest obesity with 1% males and 1.3% females. Interestingly, women show a higher risk of CVDs because of obesity compared to men. Among Southeast Asian countries, Malaysia has the highest obesity rate among women (18%) compared to Indonesian and Bruneian women, both with 7%. There are several factors that contribute to obesity among
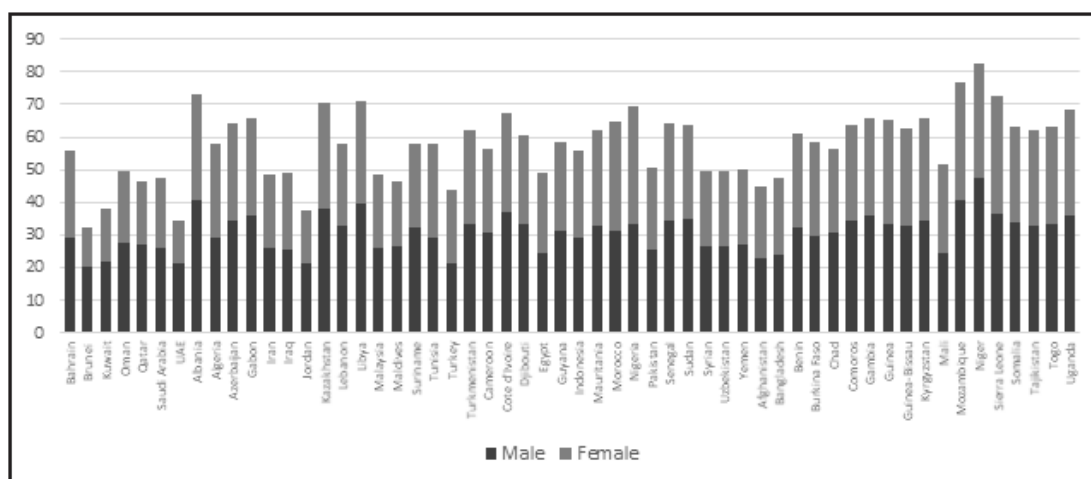

Figure 3: Distribution of high blood pressure between males and females (Source: WHO, 2016)
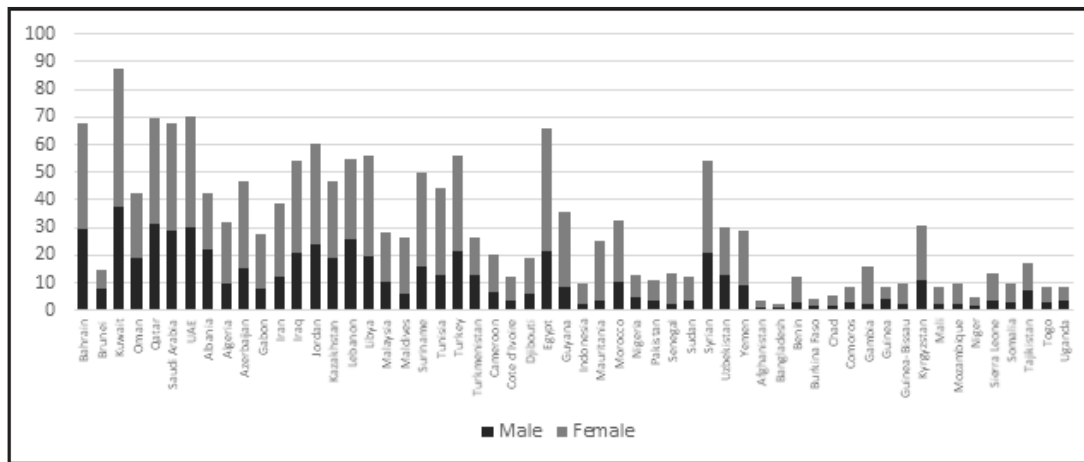
Figure 4: Distribution of obesity between males and females (Source: WHO, 2016)

women. Kanter and Caballero (2012) identified that excessive consumption of sugar-laden food and physical inactivity among women lead to obesity. Also, the preference of larger body size among women in some countries is considered a cultural value as it symbolizes fertility, good health and prosperity.

From the socio-economic perspective, higher income countries which possess higher purchasing power and have more food resources eventually suffer from obesity more than low-income countries. Obesity rate is also highly dependent on the eating culture and norms of a particular country. Almost all Middle East countries which are best known for their luxury culinary habits are facing obesity. In the case of Asian countries with more moderate eating habits like Brunei, obesity is still under control, Unfortunately, the problem keeps increasing as more foreign eating cultures and traditions are being imported into their countries. For low-income nations which suffer from malnutrition and lack of resources, obesity is less an alarming issue that needs to be taken care of.

CVDs have been the leading killer worldwide for many decades despite advances in treatment and emergency response system. Undoubtedly, it poses a great impact on the health care system in many ways. The expenditure involved in managing CVDs is another great concern affecting health care economic status. The

economic burden of CVDs appears in two forms which are direct and indirect cost. The direct medical cost related to CVDs mainly involves expenses such as money spent on medical services which include prescriptions of drugs, home care, nursing procedure, surgical procedure as well as costing for continuity of routine follow up visit. In the year of 2013, the medical cost per capita in Qatar was $2001 and this value is expected to rise by 2022 to a $2,778 (Booz & Company, 2013). Before that, it was also reported the total cost of all medical care for ischaemic heart disease (one of CVDs illnesses) in Central Saudi Arabia was SAR8,233,531 which is equal to US$2,195,608 meanwhile the estimated cost for individual patient per month was SAR 40,164 which corresponds to US$4,284.3 (Osman et al., 2011). Another OIC region which is Lebanon also experienced a huge number of medical expenses whereby a total of $103 673 535 were spent in 2012 for managing all medical related fees (Tatari et al., 2015). Thus, undeniably that clinical care of CVDs is very costly and imposes a huge burden to the countries involved.

The above cost is just the tip of the iceberg. What is more apparent and significant is the indirect economic penalty poses to countries involved as a result of high prevalence of CVDs. From the global point of view, CVDs will shorten life expectancy. As it is commonly observed, CVDs tend to affect individuals in their peak

mid-life years. Mostly, these are the group of people who are at the stage of mature adulthood in which they have settled themselves in their work life, raised families and contributes to humanity volunteerism, advisership and other form of beneficence. Hence, this will reduce their labor productivity due to absence from work or any humanitarianism activities with the need for them to come for regular follow up after their hospitalization. Apart from the clinical impact, the consequences of CVDs can also potentially affect the psychological aspect of patients. CVDs, being one form of non-communicable chronic diseases are also prone to the development of depression, social withdrawal, poor self-esteem and may also lead to loss of independence in those with very poor prognosis (Khayyam et al., 2013).

Conclusion

This study has examined the trends of CVDs in OIC countries. The cardiovascular burden is ubiquitous among the Muslim populations and OIC countries. Cardiovascular risk factors and CVDs need to be reduced so that the longevity and quality life of the Muslim population is guaranteed. Recent trends show that OIC countries have seriously emphasized on preventive measures to improve the health profile of the Muslim nations. Research specifically on the health profile of Muslim populations has to be carried out in a more holistic way, discarding all the biases and prejudices. This approach can provide a useful understanding of health phenomenon in OIC countries which is lacking and that understanding can be used to provide a better public health measure for all people, particularly the Muslim populations.

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