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Rawas, Hawazen O., Yates, Patsy, Windsor, Carol A., & Clark, Robyn (2012) Cultural Challenges to Secondary Prevention: Implications for Saudi Women. *Collegian : Journal of the Royal College of Nursing Australia*, 19(1), pp. 51-57.

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<http://dx.doi.org/10.1016/j.colegn.2011.12.002>

Journal Collegian

Title: Cultural challenges to secondary prevention: implications for Saudi women.

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Acknowledgements

Mrs. Hawazen O. Rawas is supported by a scholarship from King Saud bin AbdulAziz University for Health Sciences.

A/P Robyn A. Clark is a Post-Doctoral Research Fellow Supported by the NHMRC (NHMRC Grant ID 570 141).

Abstract

Like other highly developed countries, cardiovascular disease (CVD) and coronary heart disease (CHD) are major health problems in Saudi Arabia. The aetiology of cardiovascular disease (CVD) burden within the Saudi population is similar to Western countries with atherosclerosis, hypertension, ischemic heart disease and diabetes highly prevalent with the main risk factors being smoking, obesity and inactivity. There are differences between Saudi men and women in epidemiology, risk factors and health service provision for CHD. These sex and gender based factors are important in considering the health and well-being of Saudi women. Currently, there is limited focus on the cardiovascular health of Saudi women. The aim of this paper is to examine culturally specific issues for Saudi women and the implications for secondary prevention.

Keywords: cardiovascular disease cardiac secondary prevention Saudi women

INTRODUCTION

Saudi Arabian Socio-Political Context:

The Kingdom of Saudi Arabia is located in the Middle East between the Persian Gulf and the Red Sea; it stretches across 200 million square kilometres and has a population of 24,807,000 people, which makes this country one of the largest in the Middle East (World Health Organization (WHO), 2009). Saudi Arabia has the largest reserves of petroleum in the world. This wealth of oil has led to rapid socio-economic transformation, and thus has helped to improve the status of health and health-care in Saudi Arabia. Health-care in Saudi Arabia developed rapidly from the 1950s onwards when the first hospitals were established based on three models: private, public, and military (Aboul Enein, 2002; Tumulty, 2001a, 2001b). In 1954, the Saudi government created the Ministry of Health, the government agency principally responsible for Saudi Arabia's health-care system. The Saudi government has played a major role in effecting improvement of the health-care system in Saudi Arabia, being responsible for ensuring health care services are available to every Saudi citizen and every non-Saudi who is working in the public sector (Aldossary, While, & Barriball, 2008). Health-care services in Saudi Arabia are universal and health-care is accessible for every Saudi citizen.

Islamic Teachings

As Saudi Arabia is an Islamic kingdom, most Saudis practice the Islamic religion and this doctrine's religious beliefs are reflected in all aspects of Saudi public life, including social and economic development (Aldossary, et al., 2008; Littlewood & Yousuf, 2000).

The influence of Islam also extends to every aspect of the lives of Saudi citizens, including food, behaviour, language, and health-care. Moreover, Islam proffers beliefs about the maintenance of good health (El-Gilany & Al-Wehady, 2008). For example, Islam decrees that people should eat moderately, exercise regularly, practice good personal hygiene, and abstain from the use of alcohol and tobacco. However, the degree to which these Islamic guidelines are followed (for example smoking) can be influenced by a range of other socio-cultural factors. For example, increasing liberal notions have resulted in more young females taking up smoking in cafes and restaurants with their friends.

Overview of Women's Health in Saudi Arabia

Prior to Islam becoming the dominant religion in Saudi Arabia, women's status was linked primary to their family roles as mothers, daughter, sisters, or wives (Crocco, Pervez, & Katz, 2009). Men had responsibility for their families and had the power and authority to make decisions, while women had limited power and no entitlements. For example, women could not legally inherit property or hold wealth in their own names, even after marriage. Moreover, the birth of a male child was considered to be an asset to a family's position in society, while a female child as considered a deficit (Crocco, et al., 2009).

When Islam was introduced to the Arab peninsula in the seventh century it was accompanied by an attempt to improve women's lives as well as their rights. Both the Holy Book (Quran) and a hadith (a saying of the Prophet Mohammed, Peace Be Upon Him) assert that women have rights equal to men: the right to learn, to have property, to accept or refuse marriage, to get divorced and to inherit property (Pharaon, 2004).

However, applying the law of any religion is influenced by those individuals in power (both within the culture and within the family). To illustrate this, although the Quran bestows upon women economic, social, and political rights, women in Saudi Arabia are unable to travel, become educated, or work without the agreement of a male relative. The implications of such traditions for women's health are an important area for investigation.

Women in Saudi Arabia

A review by Mobaraki and Söderfeldt (2007) has identified a number of significant examples of ways in which women's roles and rights in Saudi Arabia are likely to have negative impacts on their health (Mobaraki & Söderfeldt, 2007). A woman in Saudi Arabia cannot be admitted to a governmental hospital without her male guardian nor can a Saudi woman sign a consent form for an invasive medical procedure and men in rural areas in Saudi Arabia do not allow a male gynaecologist or obstetrician to examine his wife or sister. Mobaraki and Söderfeldt (2007) identified that females in Saudi Arabia can be forced to marry at any age. As there is no minimum age for marriage, the high infant mortality rate in Saudi Arabia may in part be related to teenage pregnancies being more common. In addition, there is no national screening for high risk pregnancies,

breast or cervical cancer or inherited blood diseases. The absence of such screening, may mean that couples are not offered counseling to prevent higher risk pregnancies (Mobaraki & Söderfeldt, 2007). Mobaraki and Söderfeldt's (2007) review highlights the many challenges faced by Saudi women, as their limited roles and rights within Saudi culture may have a negative impact on their health.

In addition, there are no sports, education or physical activities, for Saudi girls, potentially contributing to a high prevalence of obesity. Around 44% of Saudi females are obese when compared with a 26.4% obesity rate for Saudi males (WHO, 2010).

Cardiovascular Disease in Saudi Arabia

Like other highly developed countries, CVD is a major health problem in Saudi Arabia. The most recent WHO statistics for Saudi Arabia have reported a total death rate of 424.54 deaths per 100,000 people, including a 26.24 per 100,000 (6%) death from infectious diseases compared to a 156.87 per 100,000 persons (36%) death from CVD, with diabetes being responsible for a further 5% of deaths. The aetiology and risk factors for CVD within the Saudi population is similar to that in Western countries, with atherosclerosis, hypertension, ischemic heart disease and diabetes highly prevalent (WHO, 2004) (See Figure 1).

Cardiovascular Risk Factors

Previous international research has attempted to develop effective strategies to prevent CVD by determining the risk factors for these diseases and implementing public health programs (Flynn, McFarlin, & Markofski, 2007; National Heart Foundation of Australia, 2008; National Vascular Disease Prevention Alliance, 2009). Cardiovascular risk factors have been classified into two categories: “modifiable risk factors” and “non-modifiable risk factors” (National Vascular Disease Prevention Alliance, 2009) (See Figure 2). Modifiable risk factors refer to those factors that can be changed, which include: an unhealthy diet, physical inactivity, tobacco use, hypertension, hypercholesterolemia, and obesity (Khatib, 2004; National Vascular Disease Prevention Alliance, 2009). Non-modifiable risk factors mean those that were inherited and include the social history, socioeconomic status, mental health, age, sex, and family history of premature CVD (National Vascular Disease Prevention Alliance, 2009). Previous research considered that modifiable risk factors were responsible for about 80% of coronary heart disease and cerebrovascular disease cases (Lloyd-Jones, et al., 2009; WHO, 2010). In addition, it is suggested that those risk factors are modifiable by using lifestyle education and self-management techniques (Khatib, 2004; Lloyd-Jones, et al., 2009; WHO, 2010). The National Heart Foundation of Australia (2008) described self-management techniques as including different aspects that patients can follow for self-management, such as taking appropriate medication; monitoring symptoms; managing lifestyle risk factors (obesity and smoking); and managing chest pain. Women in Saudi Arabia have similar risk factors but there are some unique considerations worthy of consideration.

Cardiovascular Risk Factors for Saudi Women: Smoking

It is increasingly common for women to smoke in Saudi Arabia, both daily cigarette consumption, and hubbly-bubbly “shisha” smoking (Siddiqui, Ogbeide, & Khalifa, 2001). A total of 7.4% of Saudi women over 30 smoke tobacco (WHO, 2000). Hubbly-bubbly has a different terminology depended on the region which uses it (Maziak, Ward, Afifi Soweid, & Eissenberg, 2004; Shafagoj & Mohammed, 2002). For example, Egypt and Saudi Arabia use “shisha”, “boory”, “goza” or “water pipe”, whereas Israel, Jordan, Syria, and Lebanon call it “narghil”, “nargile”, or “arghile”. The shisha consists of a head which holds tobacco during the smoking session, a hose that allows smoke to be drawn, a body, and a water bowel which is placed in the bottom of the shisha and contains the water that the tobacco smoke passes through before going to the hose which makes the smoke moist. There are different types of tobacco used in shisha but the most common one is sweet and flavoured, such as apple, and cappuccino and it is called Maassel (Maziak, et al., 2004).

In Arab countries, teenage females have been more influenced by changes in lifestyle in the area of smoking than are teenage males (Sharawi, 2009). From a woman’s perspective, shisha is more fashionable and prestigious than a cigarette, but in fact, it is more dangerous (Merdad, Al-Zahrani, & Farsi, 2007). A cross-sectional study was conducted in Jeddah city in Saudi Arabia to determine the prevalence of tobacco smoking among female students in colleges of Medicine, Dentistry, and Art and Science (Merdad, et al., 2007). The study identified that although 90% of students were aware of

the relationship between smoking and heart disease, the prevalence of smoking was 11%. A total of 5% of them were cigarettes smokers, 8.7% used a water pipe (shisha) and other tobacco products, 2.7% smoked both cigarettes and other tobacco products. Importantly, the study also identified significant relationships between the prevalence of smoking and higher family socio-economic status, and having a parent or friend who smokes. Moreover, although the water pipe is more harmful than cigarettes, 8.7% of the study participants were using water pipes and other forms of tobacco. Thus, for Saudi women smoking shisha may be increasingly part of their social and entertainment lives, but such practices may impact on their health status and increase the risk of cardiovascular disease.

CVD Risk Factors for Saudi Women: Obesity

In recent years, lifestyles and social and behavioural patterns in Saudi Arabia have changed dramatically. For example, the eating behaviour of children and adults in Saudi Arabia has changed towards greater consumption of unhealthy food, (high sugar, high fat and Western fast food). This has led to an increased prevalence of obesity and diabetes. The modern diet of Saudi Arabians is now characterised by a high intake of carbohydrates, sugar and red meat, and the daily consumption of fat intake in Saudi Arabia is 143.3% (Shara, 2010). In 2005, 43.8% of Saudi women were obese and 7.6% suffered from morbid obesity (WHO, 2005).

A case-control study was conducted in Saudi Arabia to examine the perception of body weight and eating and exercise behaviour among obese and non-obese Saudi women (Rasheed, 1998). He found that misconceptions about eating and exercise behaviour or weight control programs had a major effect on their weight status. This study showed

that when women in Saudi Arabia experience negative emotional feelings, they eat much more as a response to this stress and anger which may affect their weight status. In addition, Rasheed (1998) reported that Saudi women were now more obese when compared to the average of European women and concluded that this may be related to the recent change in socio-economic status, traditional food style, lack of physical activity, cultural barrier factors and engagement in lifestyle behaviours characterised as sedentary. To illustrate this, women in Saudi Arabia have the responsibility to cook for their family and the meals should be in the traditional way which includes two or more different kinds of food that are rich with fat, sugar, meat, and other things. Such traditions may prevent women in Saudi Arabia from cooking healthy food because they have ensured the agreement about food amongst the whole family.

CVD Risk Factors for Saudi Women: Physical Inactivity

Al-Hazzaa (2004) has reviewed current literature on physical inactivity in Saudi Arabia in the last 25 years. Al-Hazzaa (2004) found that changing lifestyles in Saudi Arabia led to physical inactivity, which increased the risk of chronic heart disease (CHD). He reported that the percentage of Saudi adults who are at risk of CHD due to inactivity is 53.4% of men (Al-Hazzaa, 2004). More recently, Shara (2010) reported similar finding for Saudi women, with rates of physical activity among Saudi women being lower than women in other countries. Shara concluded that this may be because many women have a role in the community which may create barriers for them. Indeed, a study by Al-Nuzha et al. (2007) reported that physical inactivity among Saudi women was as high as 98%.

A cross-sectional study conducted in Saudi Arabia to identify barriers to physical activity and healthy eating among patients who were attending a primary health-care clinic, found that none of the participants meet the level of physical activity recommended by the Center for Disease Control (CDC) (AlQuaiz & Tayel, 2009). The study reported that the number of people classified as being physical inactive overall was 82.4%, with the number of women identified as physically inactive being (87.6%). The study highlighted that a lack of resources, particularly among females, was the major reason for inactivity, followed by the lack of willpower, and lack of energy. For a healthy diet the barriers were as follows: lack of willpower, lack of social support, lack of time, and lack of resource. Al-Quaiz and Tayel (2009) concluded that developing a good physical environment and access to healthy food choices whilst improving understanding and awareness, the benefit of exercise and a healthy diet are important priorities for Saudi Arabia. Such findings are especially relevant for Saudi women, because of the significant role they play in determining food choice for the family.

Evidence-based practice for secondary CHD prevention

Research has provided evidence of the effectiveness of both pharmacological and non-pharmacological interventions for secondary prevention of CHD (Biondi-Zoccai Giuseppe et al., 2005; Cooper & O'Flynn, 2008; Davies Ed et al., 2010; MacKay-Lyons, Thornton, Ruggles, & Manley, 2010; Monk-Hansen et al., 2002). Various international studies have reported that using aspirin, beta-blockers, angiotensin converting enzyme inhibitors (ACEI), lipid lowering drugs, and anti-hypertensive drugs reduce the incidence of recurrent CVD (Biondi-Zoccai Giuseppe, et al., 2005; Hassan & Amonkar, 2001;

Manyemba & Mayosi Bongani, 2002; Monk-Hansen, et al., 2002; Saxena & Koudstaal Peter, 2004). In addition, non-pharmacological interventions consisting of modifying lifestyles related to patient risk behaviours, such as stopping smoking, engaging in physical exercise, and a healthy diet, can reduce cardiovascular mortality in people with a prior cardiac event (Brunner, Rees, Ward, Burke, & Thorogood, 2007; Cooper & O'Flynn, 2008; Davies Ed, et al., 2010; Eagles & Martin, 1998; Jolliffe et al., 2001; MacKay-Lyons, et al., 2010).

Primary and secondary prevention of cardiovascular disease in women has been a focus of research in a number of western countries (Australian Institute of health and Welfare (AIHW), 2010; Mosca et al., 2007; Mosca et al., 2011). In 2011, the American Heart Association with other organizations updated their effectiveness-based guidelines for the prevention of cardiovascular disease in women (Mosca, et al., 2011). In these guidelines, there is a change in the focus from “Evidence-Based” to “Effectiveness-Based” which will focus more on the implementation of the evidence into the real world. In addition, these guidelines have also focused on health education for patients and their families, and to examine intervention either medication or lifestyle, and to assess the barriers for intervention; especially barriers for women, such as stress, fatigue, family responsibilities, and lack of time (Mosca, et al., 2011).

In similar systematic reviews of CHD interventions, researchers have also focused on cardiac rehabilitation programs as interventions to reduce the risk of a second heart attack (Clark, Hartling, Vandermeer, & McAlister, 2005; Thomas et al., 2007).

These programs include exercise intervention and assessment for modifiable risk factors. Although these guidelines were supported with evidence (Balady et al., 2007; Leon et al.,

2005; Mosca, et al., 2007; Smith Jr et al., 2006), there is a significant gap between what is expected from published authorities, and the reality of clinical practice. This gap may relate to a variety of barriers, such as a lack of awareness, attitudes, and a lack of expected outcomes (Leon et al., 2005; International Centre for Allied Health Evidence, 2009). For example, in 2005, the American Heart Association (AHA) reported that of the more than 2 million patients yearly, who are eligible for cardiac rehabilitation programs, only 10% to 20% participated in these programs (Leon et al., 2005).

Evidence-based practice for secondary prevention in Saudi Arabia

There are few research studies in Saudi Arabia examining interventions that are provided for patients with CHD. For instance, although Hassan and Fawzy (2004) note that exercise training improves the general health and quality of life among older women who had had coronary artery disease, they did not report on the percentage of the improvement for the Saudi women. Instead, they provided evidence which relied on worldwide studies rather than data specifically related to the Saudi context.

Although there are 15 heart centres in Saudi Arabia, there are no structured cardiac rehabilitation programs or centres which practice formalised secondary prevention programs after a cardiac event for men or women. All patients, after they are discharged from hospital, are followed-up with a general physician in outpatient clinic. A cardiologist may give instructions for exercise, nutrition, and medications, but there are very limited community based rehabilitation programs that are supervised by physicians, nurses, and allied health professionals. In addition, although there are practice guidelines for health conditions, such as hypertension and diabetics in Saudi Arabia, there are no culturally

specific guidelines designed for Saudi heart patients or cardiac practice guidelines that address the unique circumstances for Saudi women. Instead, existing international guidelines from the American Heart Association (AHA) and Europe provide a basis for Saudi practice.

Implications for Practice

Culturally and gender specific models for cardiac rehabilitation and secondary prevention could be developed for Saudi Arabia, similar to those recommended by the American Heart Association (AHA) (Mosca, et al., 2011), European Society of Cardiology (ESC) and Heart Foundation, and the Australian (Statewide Cardiology Clinical Network, 2010). Such guidelines would assist the development of cardiac rehabilitation and secondary prevention services so that they are tailored to the key risk factors for Saudis (smoking, obesity and physical inactivity). Further research, funding and patient resources (similar to those available from AHA and the Heart Foundation in Australia) need to be provided for Saudi women and healthcare strategies are needed that consider the Saudi culture and context. Ensuring health interventions are delivered within the context of both gender and culture is important in addressing health disparities and promoting health equity (Davidson, McGrath, Meleis et. al., 2011).

Conclusion

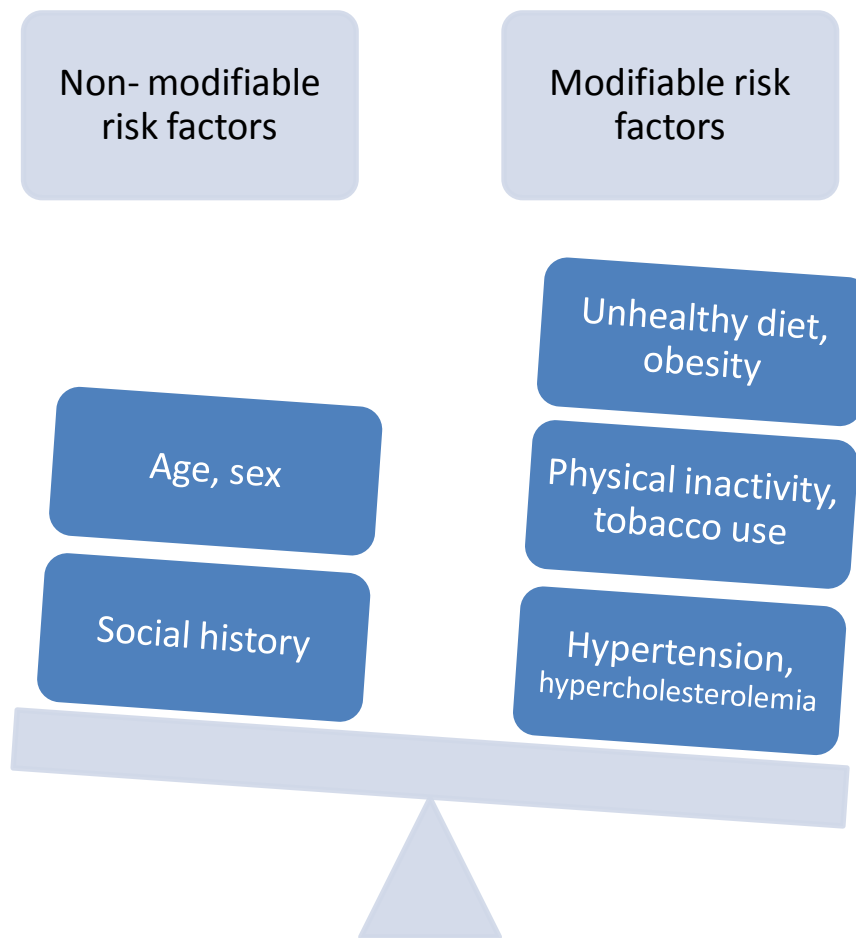
Based on this overview, we would recommend further research to identify the current state of secondary prevention in Saudi Arabia, and to identify solutions for promoting effective secondary prevention for women. Finally, research is also needed to generate

recommendations for improving and developing secondary prevention strategies to overcome the identified barriers to managing the risk factors associated with CHD for women in Saudi Arabia.

Table 1:
WHO Global Burden of Disease Estimated Proportional Mortality (%), Saudi Arabia, 2004

Sex	Cause	Mortality Rate
Male	I. All NCDs	65.5
Male	A. Circulatory	38.1
Male	Rheumatic heart	0.1
Male	Hypertensive	7.8
Male	Ischemic heart	21.3
Male	Cerebrovascular	3.9
Male	Other CVDs	5.1
Male	B. Cancers	10.1
Male	C. Diabetes	4.5
Male	D. Respiratory	2.2
Male	E. Other NCDs	10.5
Male	II. Injuries	21.5
Male	III. Others Causes	13.0
Female	I. All NCDs	70.2
Female	A. Circulatory	34.9
Female	Rheumatic heart	0.2
Female	Hypertensive	11.6
Female	Ischemic heart	12.1
Female	Cerebrovascular	4.6
Female	Other CVDs	6.4
Female	B. Cancers	12.6
Female	C. Diabetes	6.0
Female	D. Respiratory	2.6
Female	E. Other NCDs	14.0
Female	II. Injuries	8.4
Female	III. Others Causes	21.5

Figure 1 : Cardiovascular Risk Factors



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