

Cardiovascular Diseases' Awareness Among Women in Northern Jordan

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Abstract

Background: Women's awareness of chronic diseases, including cardiovascular diseases, is the cornerstone in promoting women's health. Objectives: To examine the relationship of awareness levels about cardiovascular diseases and their related risk factors with demographic information of Jordanian women.

Methods: A cross-sectional study of 18 years and older women. Scores of awareness were computed for each individual and were divided into 4 quartiles. Logistic regression analysis was used to examine the association of demographic information of participants with mean scores of quartiles. ANOVA analysis was used to compare the mean scores of quartiles.

Results: A total of 514 women completed the questionnaire, with a mean age of 35.46 (± 12.53). Current smokers were 6.2%, and 34.6% had a family history of heart disease. The proportion of diabetes, hypertension, hypercholesterolemia, and overweight/obesity were 15.6%, 19.3%, 14.4%, & 21.6% respectively. The mean score for awareness was 12.87 (± 3.26). Women who had lower income and who were at younger age were more likely to score low in awareness.

Conclusion: Women illustrated a fair level of awareness of CVD and its related risk factors. Increasing women awareness of CVD through educational programs, targeted toward women at risk, assists in disease prevention and help to improve treatment plans.

Keywords: women's health, cardiovascular diseases, awareness, Jordan

1. Introduction

Cardiovascular diseases (CVD) include diseases of the heart and blood vessels, and vascular diseases of the brain (Aminde et al., 2017; Mozaffarian, 2017). They are responsible for over 19.9 million deaths per year and are the leading causes of death worldwide (Aminde et al., 2017; Mozaffarian, 2017). CVD commonly occurs as the result of a combination of modifiable and non-modifiable risk factor. Modifiable CVD risk factors include hypertension, tobacco use, physical inactivity, alcohol consumption, poor diet, high serum triglycerides, low High – Density Lipoprotein (HDL) cholesterol, abdominal obesity, high serum blood glucose, and insulin resistance/diabetes and non-modifiable risk factors are age, gender, and ethnicity (Aminde et al., 2017; Cobiac et al., 2012; Fahs, Khalife, Malaeb, Iskandarani, & Salameh, 2017). CVDs continue to rise mainly because preventive measures are inadequate, and rates of modifiable risk factors are increasing at unprecedented levels (Aminde et al., 2017; Fahs et al., 2017). It is widely accepted that a substantial proportion of CVD burden is preventable through reduction of modifiable risk factors. Between 36% and 63% of myocardial infarctions and 20% and 31% of strokes could be prevented (Fahs et al., 2017).

Lack of awareness of CVD and its risk factors among women was reported in many previous studies (Aminde et al., 2017; Awad & Al-Nafisi, 2014; Bunker et al., 2003; Fahs et al., 2017; Kaddumukasa et al., 2015; Mukattash et al., 2012; Obembe, Olaogun, Bamikole, Komolafe, & Odetunde, 2014). The evidence indicates that in women with better awareness of CVD and risk factors, modification of risk factors through change in lifestyle habits and behaviors such as smoking, physical inactivity and obesity has been achieved in higher pace and magnitude, in

addition to improving attendance to health care services (Cobiac et al., 2012; Ebrahim et al., 2011; Eriksson, Franks, & Eliasson, 2009; Mozaffarian, 2017). Other studies have reported improved CVD outcomes with better awareness (Alam, Chowdhury, Siddiquee, Ahmed, & Niessen, 2014; Aminde et al., 2017; Boateng et al., 2017; Choi et al., 2010; Ebrahim et al., 2011; Eriksson et al., 2009).

There is little information reported in the literature on Jordanian women's awareness of CVD and risk factors, while a few studies reported a lack of CVD awareness among Jordanian population in general (Kannel, 2002; Mosca et al., 2006; Oliver-Mcneil & Artinian, 2002). In 2010, cardiovascular disease was the leading cause of death in Jordan, accounting for 40% of all deaths in that year [10]. Ammouri et al 2016, reported lack of knowledge regarding the risk of coronary heart disease, particularly among women and young adults (Ammouri et al., 2016). Similarly, Eshah et al 2013, assessed healthy lifestyle behaviors among Jordanian adults, and found that 50% of the participants had excess weight; 30% were current smokers; and 33% reported having a family history of coronary heart disease (Eshah, 2013). It is therefore important that Jordanian women be aware of CVD and its risk factors, which will improve their utilization of health care services, and decrease disease burden (Chen, Lin, & Lin, 2013; Snider, 1980; Yarger, Decker, Campa, & Brindis, 2017). The purpose of this study was to assess level of CVD awareness among women in Jordan, and to examine the relationship of awareness levels about cardiovascular diseases and their related risk factors with demographic information of participants.

2. Methodology

2.1 Study Design, Setting and Sample

This was a descriptive cross-sectional study carried out on women who were 18 years and above. The initial sample included 565 women randomly selected in a systematic approach by selecting every other woman who attended the Jordan University of Science and Technology (JUST) health care center in Irbid city, Jordan. However, the final sample was 514 (90.9% response rate) women who agreed to participate in the study and had completed the survey. A minimum sample size was determined using PS power and sample size calculator V.3.05 (Dupont & Plummer, 1998), considering confidence level of 95% and a 0.04 margin of error, this gave an estimated minimum sample size of 515. The study was approved by the Institutional Review Board (IRB) of JUST.

2.2 Data Collection

The questionnaires were distributed to women who agreed to participate in the study. Purpose of the study and study details were described to them, as well as they were reassured about the complete confidentiality of the study. They were also guaranteed by the study team that there would not be any interference with their responses.

2.3 Measurements and Analysis

A questionnaire in Arabic language consisting of questions on demographic characteristics and others adapted from the "American Heart Association Women's Heart Disease and Stroke Campaign Task Force Study" (Mosca et al., 2000) to assess the level of knowledge on heart diseases. The questionnaire consisted of two sections; the first section included questions about age, marital status, education level, occupation, monthly family income, presence of chronic diseases, and family history of heart diseases. The second section (see Table 3) included 23 items which measured awareness of heart diseases and related risk factors. These items are close ended questions constructed as true, false, and do not know. Only answers reported as "True" were calculated in the total score for each participant. Thus, the highest possible score was 23; if all answers were correct. Percentages for the number of women who correctly answered questions on heart disease and its risk factors were calculated.

Women's awareness scores were categorized into four levels based on quartiles. The first quartile (Q1) represented the lowest quarter of awareness level; the fourth quartile (Q4) represented the highest quarter of awareness. For each group of awareness, we used two-sample t-test or ANOVA to examine differences among the quartiles' means. This approach was used in previous studies (El Ansari, Oskrochi, & Haghgoo, 2014; Handel & Fritzsche, 2016; Karmacharya et al., 2017). Logistic regression was used to examine the association of demographic characteristics with scores' quartiles.

The original English language questionnaire was translated to Arabic language, and was translated back to English by independent expert, validated and tested. To test the applicability of the questionnaire, a pilot testing was conducted on 20 women, and accordingly, modifications were made. Internal consistency and reliability was measured by calculating Cronbach's alpha coefficient, which was 0.89. P – Value less than 0.05 was considered significant and data was analyzed using Statistical Package for Social Science (SPSS) software version 20. The study was approved by the Institutional Review Board of JUST.

3. Results

The characteristics of 514 women who participated in the study are summarized in Table 1. The age of participants ranged from 18 to 75 years, with a mean age of 35.46 (± 12.53). Most participants were young (under the age of 30), well-educated (diploma degree or more) and had a family income between 300 and 500 JD (\$423-\$706) per month.

Table 1. Demographic information of the sample

Demographic information	Frequency (percentages %)
18-29 years old	211 (41.1%)
30-39 years old	101 (19.6%)
40-49 years old	120 (23.3%)
50-59 years old	64 (12.5%)
≥ 60 years old	18 (3.5%)
Single	190 (37%)
Married	297 (57.8%)
Divorced	12 (2.3%)
Widow	15 (2.9%)
Illiterate or Primary education	36 (7%)
Secondary education	120 (23.3%)
Diploma degree	98 (19.1%)
Bachelor's degree	232 (45.1%)
Graduate degree	28 (5.4%)
Student	121 (23.5%)
Employed	161 (31.3%)
Unemployed	202 (39.3%)
Retired	30 (5.8%)
Less than 300 JD of monthly income	128 (24.9%)
300-500 JD of monthly income	196 (38.1%)
501-700 JD of monthly income	83 (16.1%)
More than 700 JD of monthly income	107 (20.8%)

JD: Jordanian Dinars.

Table 2 demonstrates the prevalence of cardiovascular diseases and risk factors in participants based on what they have reported. All chronic diseases were lower in this sample than the general population, however, smoking was more prevalent.

Table 2. Self-reported prevalence of cardiovascular diseases' risk factors in women

Self-reported risk factors	Frequency (Percentages %)
Diabetes	80 (15.6%)
High Blood Pressure	99 (19.3%)
High Cholesterol	74 (14.4%)
Overweight or obesity	111 (21.6%)
Non-smoker	345 (67.1%)
Smoker	32 (6.2%)

Ex-smoker	7(1.4%)
Passive smoker	130(25.3%)
Family History	178(34.6%)

Table 3 shows women's responses to core questions that measured awareness. Mean for correct scores of awareness was 12.87 (\pm 3.26), which corresponds to 55.9%, and scores ranged from 0 to 23.

Table 3. Knowledge about Cardiovascular diseases and their related risk factors

Item	Correct answers (n=514)	Percentage %
1 Heart disease is the leading cause of death in women Globally.	125	24.3
2 Having family history of heart disease lead to a higher risk of getting heart disease.	352	68.5
3 Being overweight lead to higher risk of getting heart disease.	468	91.1
4 Having diabetes increase the risk of getting heart disease.	305	59.3
5 Having high blood pressure increase the risk of getting heart disease.	425	82.7
6 Having high cholesterol lead to a higher risk of getting heart disease.	428	83.3
7 Not exercising increases the risk of getting heart disease.	423	82.3
8 Smoking can increase the risk of getting heart disease.	480	93.4
9 Low levels of estrogen lead to a higher risk of getting heart disease.	105	20.4
10 Stress lowers the risk of heart disease.	71	13.8
11 High Density Lipoprotein (HDL) is good for the heart.	99	19.3
12 Low Density Lipoprotein (LDL) is bad for the heart.	118	23.0
13 Eating 2-3 portions of fruit and vegetable daily is beneficial to the heart.	440	85.6
14 Reducing animal products such as meat, whole milk, butter and cream in my diet lower the risk of getting heart disease.	405	78.8
15 Increasing sodium or salt in the diet lower my risk of getting heart disease.	93	18.1
16 Vegetable oils are healthier to the heart than butter or margarine for cooking.	433	84.2
17 If I am overweight, losing weight can lower my chance of getting heart disease.	439	85.4
18 Women are more likely to get heart disease after menopause.	249	48.4
19 Young women do not get heart disease.	85	16.5
20 Hypertension medications should be used for a lifetime.	303	58.9
21 Every person with high cholesterol level is given medicine.	300	58.4
22 There is nothing I can do to help prevent myself from getting heart disease.	95	18.5
23 Heart disease develops gradually over many years	374	72.8

ANOVA analysis revealed a highly significant difference between quartile means ($p < 0.0001$). Running LSD post – Hoc analysis, all quartiles were significantly different from each other.

Logistic regression analysis revealed that age and income were statistically significant in all quartiles compared to Q4 (Table 4). Younger ages were more likely to score lower (i.e. Q1 – Q3) than elders (above 50). In addition, women with lower incomes were more likely to be in the first two quartiles than to be in Q4.

Table 4. Relationship of demographic information with scores of awareness

First Quartile^a (scores 0 – 11)			
Predictor	OR	P value^{bc}	CI (95%)
18 – 29 years old	9.6	<0.001	(3 – 30.9)
30 – 39 years old	9.5	<0.001	(3.2 – 28.4)
40 – 49 years old	6.3	0.001	(2.2 – 17.8)
50 years and older	1		
Unemployed	0.255	0.044	(0.68 – 0.96)
Retired	1		
Below 300 JD monthly income	2.58	0.025	(1.13– 5.93)
300 – 500 JD monthly income	2.1	0.05	(0.99– 4.43)
More than 700JD monthly income	1		
Smoker	6.56	0.012	(1.52 – 28.39)
Passive smoker	1		
Second Quartile (scores 11 – 13)			
18 – 29 years old	4.58	0.009	(1.47 – 14.28)
30 – 39 years old	5.02	0.002	(1.77 – 14.22)
40 – 49 years old	5.28	0.001	(2.01 – 14.06)
50 years and older	1		
300 – 500 JD monthly income	2.04	0.05	(0.99– 4.19)
More than 700 JD monthly income	1		
Third Quartile (scores 13 – 15)			
40 – 49 years old	2.64	0.02	(1.17 – 5.96)
50 years and older	1		
501 – 700 JD monthly income	0.32	0.014	(0.13– 0.8)
More than 700 JD monthly income	1		

^a The fourth quartile Q4; “scores 15 and above” was the reference category.

^b logistic regression was used in the analysis.

^c Only significant variables are included.

JD: Jordanian Dinars.

4. Discussion

Cardiovascular diseases and their related risk factors are a serious threat to women’s health. It increases mortality rates among women and affects women's quality of life for those who survive it and increase the cost of health care system. Understanding risk factors of diseases has advanced the efforts for prevention. Women’s awareness of high blood pressure, serum lipids, smoking and other risk factors for developing cardiovascular event, in addition to knowing causes of death is the cornerstone in promoting women’s health, and designing preventive strategies and programs for preventing CVD among women (Scuteri et al., 2009). The present study has tackled women's awareness about one of the most challenging diseases in Jordan. Most women considered overweight, high blood pressure, high cholesterol, and smoking as risk factors, while considered losing weight, reducing dietary cholesterol, reducing animal products intake, eating vegetables and fruits daily, and decreasing salt intake as preventive measures against heart disease. However, findings from this study indicated that even educated and employed women lacked awareness of CVD. The level of awareness reported in our study (55.9%) is based on the score from correctly answering the 23 items used for measuring awareness. This level is similar to or higher than those reported in previous studies (Mosca et al., 2006; Mozaffarian et al., 2016; Oliver-Mcneil & Artinian, 2002;

Scuteri et al., 2009), while is lower than others (Giardina et al., 2011; Mosca et al., 2000), specifically for family history, which was recognized by fewer women as a risk factor. It is also fortunate that majority of women had identified some of the major risk factors of CVD (overweight, diabetes, high blood cholesterol, high blood pressure, not exercising, and smoking), which agrees with other studies (Giardina et al., 2011; Munoz et al., 2010). Approximately, 20% of women in this study were able to identify HDL as a good cholesterol, and 23.0% identified LDL as a bad cholesterol. These results were similar to a study by Mosca et al. (2000) (Mosca et al., 2000) on American women but higher than a study by Choi et al. (2010) on Korean women who could correctly recognize HDL and LDL effects by only 8% and 6% respectively (Choi et al., 2010).

Assessment of awareness was based on quartile partition of scores; an informative method used in previous studies (El Ansari et al., 2014; Handel & Fritzsche, 2016; Karmacharya et al., 2017), and served the objectives of this study. Quartile approach helped presenting our data in a manageable way, easy to compare based on ascending score groups that has the same weight. ANOVA comparison between scores revealed a significant difference between quartiles. Every quartile was significantly different than the other one, which indicates a high variability in the level of knowledge among participants. Based on analysis of this study, this variability was partially due to demographic factors such as age and income. Age had high impact on the level of awareness among women, indicating that older respondents were more aware than the younger ones. In addition, family income had a high impact on the level of awareness among women. Women from families of lower incomes were less aware (lower scores) than those with higher incomes. Low family income is strongly associated with an increased prevalence of heart disease risk factors and with greater morbidity and mortality among heart disease patients (Bunker et al., 2003). However, none of other demographic characteristics or known risk factors for CVD, such as smoking history, diabetes, and overweight/obesity were related to heart disease awareness levels.

Findings of the current study revealed a major disappointment in women's awareness of CVD. More than 75% of women were not able to recognize the leading cause of death among women, a worrying result, which may indicate inconsistency in relating pieces of the circulated health education messages, considering the high average (55.9%) of awareness scored in this study. Lack of awareness about causes of death among women is a global concern reported by many studies (Alm-Roijer, Fridlund, Stagmo, & Erhardt, 2006; Choi et al., 2010; Hamner & Wilder, 2008; KS, 2009; Mosca et al., 2006; Scuteri et al., 2009; Valentin Fuster, 2010), and need to be addressed further in future studies.

4.1 Limitations and Weaknesses of the Study

There are some limitations to this study. The health perceptions were totally self-reported, a probable bias may have occurred, especially of reporting status of chronic diseases. Not all responses of women received in similar conditions, resulting in some of 'non-response', which could be attributed to women's time inadequacy and/or inconvenient conditions. In addition, sample size was not as expected, but was diminished due to limited resources of this study. The structure of the sample of women participated, although randomly selected, was dominantly represented by women aged less than 50 years old (84%), educated (70% had diploma or higher education), and relatively had good family monthly income (75% higher than 300 JDs). This could have caused a restriction in representation. However, the setting of the university health care center might have influenced this structure. Women in other settings (community or non-health related facility) were not included for comparison.

5. Conclusion

This is the first study in Jordan that addresses the level of awareness among Jordanian women regarding cardiovascular diseases and their related risk factors in this comprehensive manner. Women illustrated a fair level of awareness of CVD and its related risk factors compared to other studies, however, they lack awareness about the cause of death among women worldwide and in Jordan. Increasing women awareness of CVD through educational programs, targeted toward women at risk, assists in disease prevention and help to improve treatment plans.

The information resulted from this study offer evidence to health policy decision-makers, clinicians, and health care providers to focus on disease prevention, improve treatment plan, and support health educational programs targeted toward women at risk. It is important to place heart disease as a priority in women's health agenda and health care provision.

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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