

Knowledge of Palestinian University Women Employees About Heart Disease: Across-Sectional Study

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Abstract

Heart disease is the first leading cause of death and disability for women worldwide, yet the condition is largely preventable and few women perceive themselves at risk. Evidence in the literature supports diminished awareness of heart disease among women and limited data as to provider knowledge of the current guidelines for the prevention of heart disease in women. The purpose of this study was to examine the current knowledge levels, personal risk factors related to heart disease among selected university female employees, and to identify variables that best predict health-promoting behaviors among university female employees. A descriptive cross-sectional research design was utilized. A stratified sample of 320 Palestinian university females aged 20-58 years completed a questionnaire developed by the researcher to assess their knowledge of heart disease and to assess the heart disease risk factors. Descriptive and inferential statistics were used for data analysis. Results: The sample had an average knowledge score of 45.9% out of a maximum correct score of 100%. Results from data analysis revealed general knowledge of heart disease was relatively low. The risk factors prevalent among them included: hypertension (14.6%), diabetes (11.8%), dyslipidemia (11.1%), overweight (21.8%), smoking (19.6%), and physically inactive (55.4%). Conclusion: Heart disease is the leading cause of death among Palestinians. In this study, Palestinian university women had poor knowledge of heart disease, and many reported having risk factors. Evaluation of baseline knowledge of heart disease and specific risk factors is helpful and can guide tailoring of health prevention strategies to be more effective. Early screening targeting the younger generation is also important to help detect the risk factors in their earliest stages. The screening results may also induce individuals to take action.

Keywords: Heart disease, Palestinian, Knowledge, University women, Risk factors

1. Introduction

Despite an improvement in awareness of heart disease in women in the past 15 years as a result of educational and public awareness efforts, knowledge of heart diseases remains unacceptable. Lack of knowledge regarding one's disease can prevent possible lifestyle modifications and eventually cardiac health (Kayaniyil, et al., 2009). The barriers to women's lack of awareness of heart disease include lack of knowledge, lack of personal perceived susceptibility or risk for heart disease, and lack of health promoting behaviours (Mosca et al., 2013). Even with increased knowledge about risk factors and improved treatment options between 1997 and 2009, heart disease and stroke, respectively, remain the first and third leading cause of death and disability in developing and developed countries (World Health Organization), every year, an estimated 17 million people die of Coronary Vascular Diseases, particularly from heart attacks and strokes (World Health Organizations, 2013). Moreover, 8.6 million women die worldwide from heart disease each year, accounting for a third of all deaths in women (Women Heart Foundation, 2007). In addition, three million women die from stroke each year (Women's Heart Foundation, 2007).

According to the World Health Organization (2013) more than 60% of the global burden of the coronary heart disease occurs in developing countries. It is projected that the burden of coronary heart disease will rise from around 47 million Disability-adjusted life years (total burden of disease) globally to 82 million Disability adjusted life years in 2020. It is also estimated that by 2030, nearly 25 million people will die from Coronary Vascular Diseases, mainly from heart disease and stroke. Overall heart disease is projected to remain the single leading cause of death (World Health Organization, 2013). In 2008, nearly half million women died from cardiovascular disease, representing more deaths than from cancer, chronic lower respiratory disease and Alzheimer's disease combined (Roger et al., 2012). Furthermore, in women, heart disease is too often a silent killer – nearly two thirds of women who died suddenly had no previous symptoms (Mozaffaria et al., 2015).

In addition to the staggering rates of death and disability due to CVD, there are more burdens that CVD imposes. An estimated \$503 billion were spent in 2010 in healthcare expenditures and lost productivity due to CVD-related disability and death (CDC, 2010). Socially, the burden of CVD may include loss of employment for both the affected individual and caregiver, relocation due to loss of employment, the need to be closer to healthcare centres, or school-aged children dropping out of the education system to assume the role of caregiver (Gazlano, 2007).

Improving CVD knowledge remains an important goal, as it is integral to promoting healthy lifestyles and preventing the number one killer among women. Low levels of education, low health literacy, low socioeconomic status, and short comings in clinician and public health education have been considered as

barriers to increase knowledge (Mosca et al., 2011; Olomu et al., 2010). Presumably, improving CVD knowledge through health education among women at highest risk may improve CVD outcomes. On the other hand, the prevention of CVD/CHD traditionally relies on the control of risk factors among individuals as a major element of any strategy.

Consequently, there is a critical need to increase awareness and education about heart disease among women. A recent study revealed that only 13% of women believe the condition to be a personal threat (Mosca et al., 2006). Women must be made aware of the risk factors of heart disease to increase awareness and personal vulnerability to the disease. "There is a need to dispel the myth that [heart disease] is a male disease, and for health education promotion to focus on raising the awareness among women of their potential risk of developing [heart disease]" (Ruston & Clayton, 2002). To close the gap in awareness about heart disease among women, continued research is needed to uncover women's health beliefs about the condition. Women need to understand the impact heart disease has on their gender. Until women perceive themselves vulnerable to this disease, they will not attend to messages about prevention (Robertson, 2001).

Accordingly, the purpose of this study was to examine the current knowledge levels, health beliefs, personal risk factors, and health-promoting behaviours related to heart disease among selected university female employees, and to identify factors that contributed to increased perceived susceptibility to heart disease.

2. Methods

2.1 Study design and population

The research questions were addressed using a cross-sectional descriptive research design. The study population included all female employees of Al-Quds University. The study sample included three classifications of female employees: civil service, administrative professional, and faculty. Participants were enrolled from April through June 2016. Exclusion criteria included known history of coronary artery disease, and history of cerebrovascular disease.

2.2 Survey Instrument

All participants completed a self-administered questionnaire in Arabic, designed by the researcher, measured knowledge about heart disease, including risk factors, health beliefs related to heart disease, personal risk factors for heart disease, and health-promoting behaviours. The survey instrument consisted of four parts. Part I measured level of knowledge and awareness about heart disease. Part II was designed to measure the HBM constructs (perceived susceptibility, perceived severity, perceived benefits, and perceived barriers). Part III was designed to measure health-promoting behaviours. Part IV consisted of items addressing cues to action, personal risk factors for heart disease, and demographic data including age, education, marital status and place of residence were collected. The presence of heart disease risk factors was obtained from a questionnaire developed by the primary researcher. Questions were related to the self-reported presence of HTN, diabetes, dyslipidaemia, and whether the participants were overweight, smokers, or physical inactivity.

2.3 Piloting of the Instrument

The questionnaire was pre-tested in a pilot study with participants recruited from the same University, and were later excluded from the original study. Fifteen participants matching the inclusion criteria for the study completed the questionnaire. The purpose of the pilot study was to determine the interpretability of the questions, identify potential data processing problems and estimate the length of time a respondent would take to complete the questionnaire. All participants indicated that the instrument was clear, understandable and imposed little burden and they were able to complete the questionnaire within twenty minutes. Based on the results of these participants, a number of minor adjustments were made to the original version of the questionnaire. One question relating to health history was reworded. Stability of the instrument was demonstrated by test-retest reliability and internal consistency reliability. Items were tested for reliability in the current study and results revealed that Cronbach's alpha coefficient was 0.85.

2.4 Procedures

To reach a greater number of Women College; a list including number, names and type of work (civil service, administrative professional, and faculty) was obtained from the human resource office at Al-Quds University. Over 300 participants were approached and agreed to complete the survey.

2.5 Statistical Analyses

Data were analysed using the IBM SPSS Statistics Version 23. Descriptive statistics provided means, standard deviations, percentages, and frequencies for the variables of interest. Total scores for heart disease knowledge were calculated by summing the total number of correct answers, with higher scores indicating more knowledge.

2.6 Ethical considerations

The study was approved by the higher education ethical committee of Al Quds University. Permissions from the participants were obtained regarding the conduction of the study, written informed consent was obtained from all participants who agree to participate in the study. The confidentiality of participants was protected by providing code number for each participant at the stage of data collection and analysis. In addition, the collected questionnaires were kept in a locked cabinet to keep the participants information private and confidential. Participants' participation was completely voluntary and they assured that their responses will be confidential. The participants were informed that only aggregated data will be communicated to health care providers.

3. Results

A total of 350 women were recruited and invited to fill out the self-administered questionnaire; 320 agreed to participate in the study for a response rate of 87.5%. Table 1 provides an overview of the respondents' sociodemographic and general characteristics. The age of the women ranged from 29 to 58 years, the average age was 33 years, more than half were married (58.2%), about one-third had a college degree, more than half had more than college degree.

Table 2 describes the percentages of correct response to each individual item regarding the knowledge about heart diseases. The sample had an average heart disease knowledge score of 45.9% out of a maximum score of 100% (M = 20.03, SD = 2.30, Min = 1.00, Max = 13). Examining specific questions regarding general knowledge of heart disease revealed that a very low percentages of the respondents (15.0%, n = 42) correctly identified heart disease as the leading cause of death in women, and among them, respectively, 79.6% correctly identified smoking as risk factors for heart diseases. Additionally, the majority of respondents (85.4%, n = 239) were aware that engaging in regular physical activity could lower the risk of heart disease, while only 23.9% and 33.6% identified high blood pressure and high blood cholesterol as major risk factors for heart disease. Surprisingly, only 16.1% of the respondents were able to correctly identify heart disease as the greatest health threat for women.

Table 1 Frequencies and Percentages of Correct Responses to General Knowledge Items (n=280)

Item	Frequency (n)	Percentage Correct (%)
Engaging in regular physical activity can lower my risk of getting heart disease.	239	85.4
There is nothing you can do to prevent high blood pressure.	201	71.8
Smoking cigarettes does not affect the heart.	223	79.6
Only children from families at high risk for heart disease need to have their blood cholesterol levels checked.	219	78.2
What is the leading cause of death in women?	42	15.0
People with diabetes are more at risk for heart disease than non-diabetics.	174	62.1
The greatest health threat for women is:	45	16.1
Women and men have the same symptoms when having a heart attack.	154	55.0
What is a desirable blood pressure for adults?	67	23.9
Which group is at greatest risk for heart disease?	98	35.0
What is a desirable total blood cholesterol level for adults?	94	33.6
How many women are diagnosed with heart disease each year?	51	18.2
How many women are diagnosed with breast cancer each year?	64	22.9

Note. Level of general mean knowledge scores= 45.9%

3.1 Heart disease knowledge

The sample had an average heart disease knowledge score of 45.9% out of a maximum score of 100% (M = 20.03, SD = 2.30, Min = 1.00, Max = 13). The relationships between heart disease knowledge and the demographic data are displayed in Table 2.

Table 2 Relationships between heart disease knowledge scores and demographics (N = 280)

Measure	Group	Mean (SD)	F statistics (df)	P value
Age-group (in years)	20-29 (n=94)	19.44 (2.38)	8.34 (3)	<0.001
	30-39 (n=126)	20.75 (2.12)		
	40-49 (n=37)	19.62 (1.99)		
	50-59 (n=23)	19.17 (2.29)		
Marital Status	Married (n=163)	20.09 (2.34)	1.95 (3)	0.123
	Single (n=88)	19.67 (2.26)		
	Divorced (n=12)	20.75 (2.80)		
	Widowed (17)	20.88 (1.22)		
Education Level	less than 12 years (n=20)	20.10 (2.27)	0.046 (2)	0.955
	12-16 years (n=109)	19.98 (2.26)		
	more than 16 years (n=151)	20.06 (2.34)		
Place of residence	City (110)	20.03 (2.12)	0.137	0.872
	Village (138)	20.08 (2.32)		
	Camp (32)	19.84 (2.81)		

In Table 2, we noted that there is a significant differences between age-group and being knowledgeable about heart disease risk factors ($p = <0.001$). When looking at marital status differences and knowledge, there were no significant differences between marital status ($p = 0.123$). Also, there were no differences between employment status and heart disease knowledge ($p = .717$). However, no significant differences were detected for place of residence ($p = 0.872$), education level ($p = 0.955$) and their knowledge scores.

3.2 Personal Risk Factors for Heart Disease

Eight major personal risk factors were measured in this study (see Table 7). The most frequently reported personal risk factor was sedentary lifestyle as just over half of respondents (55.4%, $n = 155$) indicated that they were not physically active for 30 minutes or more, most days of the week. In addition, 23.6% ($n = 66$) of respondents reported heredity was a personal risk factor. Furthermore, over 12.8% ($n = 61$) indicated that they were either overweight or obese. When asked if they have been diagnosed with high blood pressure/borderline high blood pressure and/or have been prescribed medicine for high blood pressure, 144 respondents (14.6%, $n = 41$) indicated “yes.”

Nearly one in ten of respondents (11.1%, $n = 31$) indicated that they have been diagnosed with high cholesterol and/or have been prescribed medicine for high cholesterol. Fifty five respondents (19.6%) reported having smoked cigarettes or used other tobacco products in the past seven days.

Table 3 Frequencies and Percentages for Personal Risk Factors for Heart Disease (n=280)

Item	Frequency (n)	(%)
I am physically active or exercise for 30 minutes or more, most days of the week. ^a	155	55.4
Has anyone in your immediate family (parents, brother or sister) had a heart attack or been diagnosed with heart disease? ^b	66	23.6
Are you overweight or obese?	61	21.8
How old are you? ^c	5	1.8
Have you been diagnosed with high blood pressure /borderline high blood pressure AND/OR been prescribed medicine for high blood pressure?	41	14.6
Have you been diagnosed with high cholesterol AND/OR been prescribed medicine for high cholesterol?	31	11.1
In the past 7 days I have smoked cigarettes or used other tobacco products.	55	19.6
Have you been diagnosed with diabetes (high blood sugar) or borderline diabetes (pre-diabetes) AND/OR been prescribed medicine for diabetes or borderline diabetes?	33	11.8

Note: Total personal risk factors mean = 2.48, standard deviation = 1.62.

^a reverse coded for consistency. Frequency and percentage indicates those respondents who are not physically active most days of the week.

^b Risk factor for respondents who had family history of heart disease.

^c $n = 5$, Risk factor for respondents 55 years and older.

3.3 Health-Promoting Behaviors

Five health-promoting behaviours were measured in this study. See Table 8 for the frequencies and percentages of health-promoting behaviours. Results indicate that 143 respondents (51.1%) have had their blood pressure checked by a doctor or other health professional in the past 12 months, yet 94 respondents (33.6%) have had their blood cholesterol checked. Nearly two third of respondents (65.0%, $n = 182$) indicated that “in the past

seven days I have eaten five or more servings of fruit and/or vegetables most days.” Less than half (44.6%, n = 125) engaged in physical activity or exercise for 30 minutes or more, most days of the week (see Table 4).

Table 4 Frequencies and Percentages of Health-Promoting Behaviours (n=280)

Item	Frequency (n)	(%)
In the past 12 months I have had my blood pressure checked by a doctor or other health professional.	143	51.1
In the past 7 days I have smoked cigarettes or used other tobacco products.	55	19.6
In the past 12 months I have had my blood cholesterol checked by a doctor or other health professional.	94	33.6
In the past 7 days I have eaten 5 or more servings of fruit and/or vegetables most days.	182	65.0
I am physically active or exercise for 30 minutes or more, most days of the week (example: brisk walking, bicycling, swimming laps, aerobic dance, basketball, or similar aerobic activities).	125	44.6
Other Health-Promoting Behaviour:		
In the past 12 months I have had a mammogram.	55	19.6

4. Discussion

Our study investigated the baseline knowledge of heart disease and the prevalence of heart disease risk factors among all female employees of Al-Quds University in Palestine.

In addition to the poor knowledge possessed by the study participants about heart disease, they may not be aware of the specific actions to take to lower their heart disease risk. The findings also suggest that the majority of women don't perceive heart disease as a threat, but believe breast cancer poses a greater threat to their health. This is consistent with previous literature where most of the women considered themselves to be low to no risk for heart disease (Christian et al., 2007; DeSalvo et al., 2005; Gallagher et al., 2010; and Homko et al., 2008). Additionally, they may not be aware of their own personal risk. Without an awareness of personal risk, individuals may not take action to decrease their risk of heart disease. A possible reason that women underestimate the importance of heart disease risk may be that the issue is not often discussed (Robertson, 2001). A possible explanation of the lack of communication between health providers and their patients may be that there is a general focus on traditional women's healthcare issues, such as breast disease and gynaecologic problems (Lewis, 2007).

Our study showed that one in five Palestinian women in this sample had HTN. This is consistent with previous reports (Dalusung-Angosta, 2013; Dela Cruz & Galang, 2008). Researchers have linked HTN to dietary lifestyle (Dela Cruz & Galang, 2008; Ryan, et al., 2000). This case is true because traditional Arab food has already been replaced by a more westernized diet that is high in calories and fat and low in vegetables and fibre (Musaiger et al., 2011; Kelishadi et al., 2007).

A study by Lenk et al (2012) indicated that individuals with a four-year college degree were less likely to smoke than those who were not college graduates. The reported low prevalence of smoking by females in this study sample may be attributed to underreporting because female smoking is refused and culturally unaccepted in Arab countries. Therefore, female smokers need to smoke in secret.

According to the National Heart, and Blood Institute (2012), as men and women ages, they become more at risk of developing heart disease. Since one-fifth of our sample had an age above 40 years, the presence of heart disease risk factors in this population was to be expected. Our study also revealed that more than half of the sample did not participate in regular exercise. A possible explanation for the lack of exercise in this group could be explained by the lack of safe and suitable playgrounds, combined with a sedentary lifestyle due to urbanization, mechanization, and globalization might sufficiently explain the results that indicate physical inactivity. This finding is congruent with what has been reported by Williams and Jackson (2005), who reported that the lack of safe areas to play, diminished availability of resources (i.e., fewer sidewalks wherein to engage in walking or running regimens), and high-crime locales may impede physical activity.

Since several risk factors are blamed as major contributors for the onset of heart disease. For this reason, strategies to reduce risk factors or their severity are essential. Primary prevention programs that focus on diet, exercise, and the danger of heart disease should be emphasized. However, behavioural factors can be modified to influence health outcomes. Physical activity and healthy dietary behaviours have been proven to be effective in reducing the likelihood of heart disease, heart attacks, and strokes (Ignarro, Balestrieri, & Napoli, 2007; Myers, 2003). Moreover, these behaviours reduce the likelihood of risk factors that promote cardiovascular disease (CVD), including adult-onset diabetes, overweight, and obesity (Addison et al., 2006).

Since HTN, diabetes, and dyslipidaemia are common problems among Palestinian, early screening for these conditions is crucial. Screening helps detect and help prevent complications arising from these conditions. Screening results may also prompt individuals to take action.

5. Limitation

Our study should be interpreted with caution. The results cannot be generalized to all Palestinian women because it included female employees of Al-Quds University only. Despite these limitations, our study provides important preliminary data. They reflect the baseline knowledge of heart disease among this population.

6. Conclusion

The results of this study demonstrated poor knowledge about heart disease, and knowledge of risk factors were relatively low. In addition, Women do not perceive heart disease as a substantial health concern. Accordingly, heart disease in women will continue to be a public health priority as increasing number of aging women are at increased risk for heart disease morbidity and mortality. Given the frequent occurrence of multiple risk factors in women, a multifactorial approach to primary prevention and risk factor reduction should be encouraged to help reduce the prevalence and burden of heart disease among women in Palestine. Few women appreciated that heart disease is their major health problem. This gap between fact and perception highlights the need to increase women's awareness about their vulnerability to heart disease. Although death from heart disease is 4.5 times higher than death from breast cancer, women perceive breast cancer as their major health problem.

Changing the misperception women have about their health problems includes increasing their knowledge that favourable changes in lifestyle can reduce heart disease risks factors, and prevent cardiovascular disease and coronary heart disease. Lifestyle modifications can substantially alter morbidity and mortality from heart disease. Our results show the potential and possibility that if health promotion programs implemented and focus more on young women would have the potential to improve women's perception of their risk for heart disease and could encourage them to act on their enhanced perception are required to reduce overall heart disease morbidity and mortality.

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References

- Addison, C. C., White, M. S., Jenkins, B. W. & Young, L. (2006b). Combating the epidemic of obesity and cardiovascular disease: perspectives from school-aged children. *International journal of environmental research and public health*, 3(3), 268-273.
- Center for Disease Control and Prevention. (2010). Heart disease and stroke prevention: Addressing the nation's number one killer. Retrieved from: <http://www.cdc.gov/chronicdisease/resources/publications/AAG/dhdsp.htm>
- Christian, A. H., Rosamond, W., White, A. R., & Mosca, L. (2007). Nine-Year trends and racial and ethnic disparities in women's awareness of heart disease and stroke: An American Heart Association national study. *Journal of Women's Health*. 16(1), 68-81. doi:10.1089/jwh.2006.M072
- Dalusung-Angosta A. CHD knowledge and risk factors among Filipino Americans connected to primary care services. *J Am Assoc Nurse Pract*. 2013; 25(9): 503-512.
- Dela Cruz FA, Galang CB. The illness beliefs, perceptions, and practices of Filipino Americans with hypertension. *J Am Acad Nurse Pract*. 2008; 20(3): 118-127. <http://dx.doi.org/10.1111/j.1745-7599.2007.00301.x>
- DeSalvo, K. B., Gregg, J., Kleinpeter, M., Pedersen, R. B., Stepter, A., & Peabody, J. (2005). Cardiac risk underestimation in urban, African American women. *Journal General Internal Medicine*, 20(12), 1127-1131. doi:10.1111/j.1525-1497.2005.0252.x
- Gallagher, R., Marshall, A. P., & Fisher, M. J. (2010). Symptoms and treatment-seeking response in women experiencing acute coronary syndrome for the first time.
- Gazlano TA (2007) Reducing the growing burden of cardiovascular disease in the developing world. *Health Affairs* 26: 13–24.
- Homko, C. J., Santanmore, W.P., Zamora, L., Shirk, G., Gaughan, J., Cross, R. ...Petersen, S. (2008). Cardiovascular disease knowledge and risk perception among underserved individuals at increased risk of cardiovascular disease. *Journal of Cardiovascular Nursing*, 23(4), 332-337. doi:10.1097/01.JCN.0000317432.44586.aa
- Ignarro, L. J., Balestrieri, M. L. & Napoli, C. (2007). Nutrition, physical activity, and cardiovascular disease: an update. *Cardiovascular research*, 73(2), 326-340.
- Kayaniyil, S. et al. (2009). Degree and correlates of cardiac knowledge and awareness among cardiac inpatients. *Patient Education and Counseling*, 75(1), 99-107.
- Kelishadi, R., Ardalan, G., Gheiratmand, R., Gouya, M. M., Razaghi, E. M., Delavari, A., Majdzadeh, R., Heshmat, R., Motaghian, M. & Barekati, H. (2007). Association of physical activity and dietary behaviours in relation to the body mass index in a national sample of Iranian children and adolescents:

- CASPIAN Study. *Bulletin of the World Health Organization*, 85(1), 19-26.
- Lenk K, Rode P, Fabian L, Bernat D, Klein E, Forster J. Cigarette use among young adults: comparisons between 2-year college students, 4-year college students, and those not in college. *J Am Coll Health*. 2012; 60: 303-308. <http://dx.doi.org/10.1080/07448481.2011.607481>
- Mosca, L., Barrett-Connor, E., & Wenger, N. K. (2011). Sex/gender differences in cardiovascular disease prevention: What a difference a decade makes. *Circulation*, 124(19), 2145-2154. doi:10.1161/CIRCULATIONAHA.110.968792 [doi]
- Mosca L, Benjamin EJ, Berra K, et al. Effectiveness-based guidelines for the prevention of cardiovascular disease in women—2011 update: a guideline from the American Heart Association. *Circulation*. 2011;123:1243–1262.
- Mosca, L., Mochari, H., Christian, A., Berra, K., Taubert, K., Mills, T., ...Simpson, S.L. (2006). National study of women's awareness, preventive action, and barriers to cardiovascular health. *Circulation*, 113, 525-534. doi: 10.1161/CIRCULATIONAHA.105.588103
- Mozaffarian, D., Benjamin, E. J., Go, A. S., et al. (2015) . Heart disease and stroke statistics--2015 update: a report from the American Heart Association: A Report From the American Heart Association. *Circulation*, 131(4):e29-322. doi: 10.1161/CIR.0000000000000152.
- Musaiger, A. O., Bader, Z., Al-Roomi, K. & D'Souza, R. (2011). Dietary and lifestyle habits amongst adolescents in Bahrain. *Food & nutrition research*, 55.
- Myers, J. (2003). Exercise and cardiovascular health. *Circulation*, 107(1), e2-e5.
- National Heart L, and Blood Institute. Who is at risk for coronary heart disease? 2012. Available from: <http://www.nhlbi.nih.gov/health/health-topics/topics/cad/atrisk.html>
- Olomu AB, Grzybowski M, Ramanath VS, et al. Evidence of disparity in the application of quality improvement efforts for the treatment of acute myocardial infarction: the American College of Cardiology's Guidelines Applied in Practice Initiative inMichigan. *Am Heart J*. 2010;159:377–384.
- Williams, D. R. & Jackson, P. B. (2005). Social sources of racial disparities in health. *Health Affairs*, 24(2), 325-334.
- Lewis SJ. (2007). Cardiovascular disease in Postmenopausal Women : myths and reality. *The American journal of Epidemiology*, 166(5): 206.510.
- Roger, V.L, Go, A.S., Lloyd-Jones, D.M., Benjamin, E.J., Berry, J.D., Borden, W.B., ... Turner, M.B. (2012). Heart disease and stroke statistics--2012 update: A report from the American Heart Association. *Circulation*, 125, e12-e230. doi: 10.1161/CIR.0b013e31823ac046.
- Robertson RM. (2001). Women and cardiovascular Diseases :The Risks of Misperception and the need for Action. *Circulation*, 103(19): 2318-2320.
- Ruston, A., & Clayton, J. (2002). Coronary heart disease: women's assessment of risk – a qualitative study. *Health, Risk & Society*, 4(2), 125-137.
- Ryan C, Shaw R, Pliam M, et al. Coronary heart disease in Filipino and Filipino-American patients: Prevalence of risk factors and outcomes of treatment. *J Invasive Cardiol*. 2000; 12: 134-139.
- Women's Heart Foundation (2007). Women and heart disease facts. Retrieved from: http://www.womensheart.org/content/HeartDisease/heart_disease_facts.asp
- World Health Organization (2013). Heart disease fact sheet. Retrieved from: <http://www.who.int/mediacentre/factsheets/fs317/en/index.html>