



Gender Differences in Patients' Beliefs about Biological, Environmental, Behavioral, and Psychological Risk Factors in a Cardiac Rehabilitation Program

Mozhgan Saeidi¹, Saeid Komasi^{1*}, Ali Soroush², Ali Zakiei³, Jalal Shakeri⁴

¹ Master of Clinical Psychology, Cardiac Rehabilitation Center, Imam Ali Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran

² Sports Medicine and Lifestyle Intervention, Specialist, Imam Reza Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran

³ Researcher of Social Development and Health Promotion Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran

⁴ Psychiatrist, Kermanshah University of Medical Sciences, Kermanshah, Iran

ARTICLE INFO

Article type:
Original article

Article history:
Received: 21 May 2014
Revised: 25 Sep 2014
Accepted: 30 Sep 2014

Keywords:
Cardiac Rehabilitation
Gender Differences
Patients' Beliefs
Risk Factors

ABSTRACT

Introduction: There are significant gender differences in the epidemiology and presentation of cardiovascular diseases (CVDs), physiological aspects of CVDs, response to diagnostic tests or interventions, and prevalence or incidence of the associated risk factors. Considering the independent influence of gender on early dire consequences of such diseases, this study was conducted to investigate gender differences in patients' beliefs about biological, environmental, behavioral, and psychological risk factors in a cardiac rehabilitation program.

Materials and Methods: This study has cross sectional design. The sample was composed of 775 patients referred to cardiac rehabilitation unit in Imam Ali Hospital in Kermanshah, Iran. The data were collected using clinical interview and patients' medical records. The data were analyzed using descriptive statistics such as mean, standard deviation, and chi-square test. To do the statistical analysis, SPSS version 20 was utilized.

Results: As the results indicated, there was a significant difference between the beliefs of men and women about risk factors of heart disease ($\chi^2= 48.36$; $P<0.01$). Men considered behavioral (55.1%) and psychological (33.7%) risk factors as the main causes of their disease, respectively. On the other hand, women regarded psychological (38.2%) and behavioral factors (26.6%) as the most common causes of cardiac conditions, respectively. Both men and women considered stress as the most important heart disease risk factor (21% and 22.3%, respectively). Also, women were less aware of the risk factors, compared to men.

Conclusion: From the patients' perspective, psychological and behavioral risk factors were the most important causes of cardiovascular diseases (CVDs); moreover, stress was the most influential risk factor for developing cardiac diseases. Thus, learning to control and manage these risk factors can help to prevent the development of CVDs and reduce the occurrence of subsequent cardiac events.

► Please cite this paper as:

Saeidi M, Komasi S, Soroush A, Zakiei A, Shakeri J. Gender Differences in Patients' Beliefs about Biological, Environmental, Behavioral, and Psychological Risk Factors in a Cardiac Rehabilitation Program. *J Cardiothorac Med.* 2014; 2(4):215-220.

Introduction

Cardiovascular diseases (CVDs) are the leading cause of mortality, worldwide. According to various reports, in 2004, CVD was responsible for 32% and 27% of deaths in women and men,

respectively. In fact, CVD is the main cause of mortality in 54% of women and 43% of men in Europe (1). In addition, 1 out of every 4 Americans is expected to present with some form of CVD by 2030 (2). Today, millions of people are

*Corresponding author: Saeid Komasi, Cardiac Rehabilitation Center, Imam Ali Hospital, Kermanshah University of Medical Sciences, Shahid Beheshti Boulevard, Kermanshah, Iran. Tel: +98 833 8380698; Mobile: +98 918 572 6991; E-mail: S_komasi63@yahoo.com

© 2014 mums.ac.ir All rights reserved.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

unknowingly exposed to various risk factors associated with CVDs (3). These risk factors can be divided into several categories including biological, environmental, behavioral, and psychological factors. Biological factors are uncontrollable and individuals have no power over them. However, awareness of the role of these heart disease risk factors is of high significance. These factors include age (4), gender (5), family history (genetics), and hereditary hyper cholesterol (4). Environmental factors are as follows: smoking, water and air pollution, toxic substances, and dust. Behavioral factors are controllable to some extent and can be modified to reduce the risk of CVDs. These factors include smoking (6, 7), high cholesterol level (4), obesity (8, 9), sedentary lifestyle (10), hypertension (11, 12), diabetes (3), alcohol and drug abuse, and poor nutrition (4). Psychological factors are also important in the etiology and prognosis of CADs (12). Acute psychological factors such as stressful events, sudden bursts of anger, unexpected mood disorders, and severe emotional agitation could be the cause of myocardial infarction (MI) or sudden cardiac death (13).

In other hand, There are significant gender differences in the epidemiology and presentation of CVDs (coronary atherosclerosis, coronary physiology and ischemic heart disease), physiological aspects of CVDs, response to diagnostic tests and interventions, and prevalence or incidence of the associated risk factors (1, 14). Several studies have examined various factors contributing to cardiac conditions such as physical (physical and sexual activities), psychological (anger, depression, anxiety, frustration, stress, earthquakes, war, and terrorism), chemical (caffeine and alcohol use) and environmental (pollution) factors (2). The rates of these factors were significantly higher among women, compared to men (14), and almost half of women were unaware of the risk factors (15). Although many of these factors are common among men and women, risks of traditional factors such as hypertension, diabetes, inactivity, and alcohol consumption are somewhat higher in women than men (16). In fact, female gender is related to early dire consequences of cardiac conditions (14), and women are less likely to be discharged from the hospital, compared to men (17).

Nevertheless, in the past, cardiovascular diseases (CVDs) was believed to primarily occur in men. However, this misconception is being slowly overcome given the increasing public awareness of the fact that CVD is also a leading cause of death among females. One previous study showed that the mortality rate associated with CVD is higher among women than men (18). Although

knowledge of men and women about these conditions, identification of CVD risk factors, and information about the signs and symptoms of acute MI are poor (15), men's beliefs about the causes of cardiac conditions differ from those of women. Based on the results of a previous study, women identified stress, genetics, high cholesterol, and smoking as the main causes of their disease, whereas men regarded nutrition, smoking, stress, and genetics to be the main influential factors, respectively (19). In another study, women considered nutrition and stress as the major causes of their illness, while men identified work, stress, obesity, smoking, and nutrition as the main factors, respectively (15). However, Patients' beliefs about the causes of cardiac conditions play an important role in establishing an effective therapeutic relationship between physicians and patients, psychological adaptation, and compliance with treatment recommendations (20); they may also affect the acceptance of psychological interventions by the patients (21). Patients with more dysfunctional beliefs are more anxious and have lower physical functioning than other patients (22). Although some studies have shown an insignificant relationship between actual and perceived risk factors in patients (23), others have indicated a strong association between patients' beliefs about the causes of CVD and the associated risk factors (20, 24, 25). Thus, with regard to Clarify the relationship between patients' beliefs and heart disease risk factors (20, 24, 25) and considering the role of these factors in the pathology and course of treatment in men and women, this study was conducted to investigate gender differences in patients' beliefs about biological, environmental, behavioral, and psychological risk factors in a cardiac rehabilitation program.

Materials and Methods

In the present study, a cross sectional design was applied. The study population consisted of 830 cardiac patients, who were referred to the cardiac rehabilitation center of Imam Ali Hospital during 2010-2013 in Kermanshah, Iran. An inclusion criterion was to be younger than 85 years. Therefore, 55 patients were excluded from the study due to either aging or lack of cooperation. Finally, 775 patients were included in the study sample. Data were collected using clinical interviews and patients' medical records. In this study, patients' beliefs were grouped in one of the four categories of heart disease risk factors including biological, environmental, behavioral, and psychological factors. Thus, upon arrival of the patients in the rehabilitation process, questioned by a clinical psychologist in this section about the occurrence causes of heart

disease from the perspective of the patients, in a clinical interview. Then, she recorded in the patient's medical history the data obtained in the field, along with demographic characteristics and their records. Finally, for data analysis, descriptive statistics including mean and standard deviation were calculated and comparison of means and Chi-square test were performed, using SPSS version 20.

Results

Patients' demographic characteristics are shown in Table 1.

There was no significant difference ($X^2= 5.85$; $P>0.05$) between the frequency of age groups of patients between male and female, based on Chi-square test. But, significant difference was observed in patients' employment status ($X^2= 713.83$; $P<0.01$), education level ($X^2= 140.65$; $P<0.01$), or marital status ($X^2= 164.27$; $P<0.01$).

Table 2 shows the beliefs of male and female patients about heart disease risk factors (biological, environmental, behavioral, and psychological factors).

As shown in Table 2, beliefs of men and women were significantly different in terms of heart disease risk factors ($X^2=48.36$; $P<0.01$); this difference was evident, especially in behavioral and psychological factors. Men mostly considered behavioral (51.1%) and

psychological (33.7%) risk factors as the main causes of their illness, respectively; on the other hand, women primarily mentioned psychological (38.2%) and behavioral risk factors (26.6%) as the major causes of their disease, respectively; also, women were less aware of the risk factors, compared to men.

Table 3 presents patients' beliefs about heart disease risk factors.

As it is indicated in Table 3, men believed that stress (21%) was the most important cause of heart disease; this view was similar to that of female patients (22.3%). The second most important factors were nutrition (16.5%) and grief (9.8%) for men and women, respectively. From men's perspective, smoking (11.2%) was the third leading cause of cardiac diseases, although women regarded hypertension (5.5%) as the third major cause. Also, it is noteworthy that 8.4% and 13.7% of men and women were unaware of the causes and risk factors for cardiac diseases, respectively. Given that the patients in this study were in the final stages of their treatment and were interviewed in a rehabilitation center, their lack of knowledge about the associated causes and risk factors is controversial and may challenge the whole process of training and treatment of cardiac patients.

Table 1. Cardiac patients' demographic characteristics and compare of them between women and men

Variable	Value	male		female		X ²	P
		Frequency	(Percent)	Frequency	(Percent)		
Age	Under 40 years	14	(2.7)	4	(1.6)	5.85	0.11
	41-50	94	(18.1)	31	(12.1)		
	51-60	213	(41)	115	(44.9)		
	61 years and over	198	(38.2)	106	(41.4)		
Education level	Illiterate	140	(27)	178	(69.5)	140.65	0.01*
	Primary	165	(31.9)	55	(21.5)		
	Less than high school diploma	25	(4.8)	1	(0.4)		
	Diploma	105	(20.3)	14	(5.5)		
	Bachelor	79	(15.3)	8	(3.1)		
Job	MS or PhD	4	(0.8)	0	(0)	713.83	0.01*
	Employee	71	(13.7)	3	(1.2)		
	Self-employed	183	(35.3)	1	(0.4)		
	Retired	170	(32.8)	10	(3.9)		
	Housekeeper	0	(0)	242	(94.5)		
	Farmer	83	(16)	0	(0)		
Marital Status	Unemployed	11	(2.1)	0	(0)	164.27	0.01*
	Married	508	(98.1)	170	(66.4)		
	Divorced	6	(1.2)	82	(32)		
	Separated	3	(0.6)	3	(2.2)		
	Single	1	(0.2)	1	(0.4)		

Table 2. Patients' beliefs about heart disease risk factors (biological, environmental, behavioral, and psychological factors)

Beliefs	male		female		Chi-square test	Significance Level
	Frequency	(Percent)	Frequency	(Percent)		
Biological	30	(3.2)	11	(2)	48.36	0.01 *
Environmental	30	(3.2)	17	(3.1)		
Behavioral	470	(51.1)	143	(26.6)		
Psychological	310	(33.7)	205	(38.2)		
Do not know	78	(8.4)	70	(13.7)		

Table 3. Patients' beliefs about heart disease risk factors

Belief	male	female
	Frequency (Percent)	Frequency (Percent)
Stress	205 (21)	114 (22.3)
Lack of exercise	41 (4.2)	3 (0.5)
Overweight	7 (0.7)	1 (0.1)
Physical work	42 (4.3)	14 (2.7)
Cigarette	110 (11.2)	18 (3.5)
Substance Abuse	23 (2.3)	0 (0)
Nutrition	161 (16.5)	27 (5.3)
Anger and Rage	64 (6.5)	24 (4.7)
Cholesterol	35 (3.5)	26 (5.1)
Hypertension	20 (2)	28 (5.5)
Mourning	22 (2.2)	50 (9.8)
Diabetes	23 (2.3)	23 (4.5)
Genetics	30 (3)	11 (2.1)
Dust	14 (1.4)	6 (1.1)
War	13 (1.3)	2 (0.3)
Spouse abuse	0 (0)	4 (0.7)
Smoke bread	0 (0)	6 (1.1)
Passive smoking	1 (0.1)	5 (0.9)
Depression	9 (0.9)	8 (1.5)
Smoke and toxic substances	15 (1.5)	1 (0.1)
Methadone	2 (0.2)	0 (0)
Do not know	78 (8.4)	70 (13.7)
Other	39 (4)	18 (3.5)

Discussion

This study was conducted to investigate gender differences in patients' beliefs about biological, environmental, behavioral, and psychological risk factors in a cardiac rehabilitation program. The findings of this study suggested a statistically significant difference between beliefs of male and female patients regarding heart disease risk factors; this difference was evident, especially in psychological and behavioral risk factors. Primarily, men identified behavioral (51.1%) and psychological (33.7%) risk factors as the major causes of their illness, respectively. On the other hand, women considered psychological (38.2%) and behavioral (26.6%) risk factors as the main causes of their illness, respectively; this finding is consistent with previous studies (19). Male patients believed that stress is the major risk factor for their cardiac condition (21%), which was similar to women's view on the subject (22.3%). This finding is consistent with the results of previous research (19, 25, 26) and in contrast with other previously conducted studies (14, 15, 20).

The second most important risk factors for men and women were nutrition (16.5%) and grief (9.8%), respectively; moreover, smoking (11.2%) and hypertension (5.5%) were in the third place, respectively. These findings are similar to the results of several studies (11, 19, 20, 27) and inconsistent with the findings of one previous study (23). Also, in comparison with men, fewer women were aware of the associated risk factors. It is noteworthy that 8.4% of men and 13.7% of women were unaware of the causes of their disease and the associated risk factors; this finding is in congruence with previous

studies (11, 15, 23, 26). Considering the fact that subjects in this study were interviewed in the final stages of their treatment (at a cardiac rehabilitation center), lack of knowledge about the causes and risk factors of their disease is controversial and may challenge the whole treatment process and the available instructions for cardiac patients.

Patients' understanding, which entails the recognition of disease signs, search for the major causes, and changing behaviors, has a significant impact on the course of disease progression in all stages of the disease (28). In addition, patients' perception of cardiac conditions and the related experiences is effective in the prevention of these conditions (29). According to various surveys, patients' beliefs about the causes of cardiac diseases contribute to the establishment of effective therapeutic relationships between patients and physicians, psychological adaptation, and compliance with treatment recommendations (20); they may also affect patients' compliance with psychological interventions (21). Patients with more dysfunctional beliefs are more anxious and have lower levels of activity and physical functioning (22). Although some studies have demonstrated an insignificant relationship between actual and perceived risk factors by the patients (23), other studies have indicated a strong correlation between patients' beliefs about the causes of cardiac diseases and the associated risk factors (20, 24, 25).

Usually, patients consider smoking, family history, hypertension, obesity, poor nutrition, and stress (20, 23, 25) as the contributing risk factors. However, level of knowledge about cardiac conditions, identification of the associated risk factors, and awareness of the signs and symptoms of acute MI are poor in both men and women (15). Understanding of male patients about the causes of cardiac conditions differs from that of female patients. According to one previous study, in women's view, stress, genetics, cholesterol, and smoking were considered as the main causes of the disease; on the other hand, men considered nutrition, smoking, stress, and genetics as the major factors, respectively (19). In another study, women identified nutrition and stress as the major causes of their disease, while men regarded work, stress, obesity, smoking, and nutrition as the main contributing factors (15). Prevalence of risk factors mentioned by the patients shows that women are less aware of the risk factors. In fact, only 8% to 46% of women are able to detect cardiac diseases, and almost half of them are unaware of the risk factors. Although there are some studies indicating a lower rate of awareness among men, most reviews have

indicated that women's knowledge of cardiac conditions is insufficient, which is extremely worrisome (15).

The above-mentioned gender differences are noteworthy and suggest that the pathology of cardiac diseases is different between women and men; therefore, specific diagnostic and treatment strategies are required for females (18). Establishment of effective therapeutic relationships between patients and physicians, based on modifiable risk factors, can affect patients' beliefs, change their stressful lifestyles, and thus, improve secondary prevention (20). Also, since patients' acceptance of and compliance with therapeutic recommendations are associated with their knowledge, beliefs, and depression symptoms, raising their awareness and changing their beliefs can positively affect the course of treatment (24) and improve their compliance with psychological interventions (21). Thus, in order to increase individuals' understanding of cardiac conditions and the associated risk factors and modify their lifestyle, it is necessary that health professionals and patients share a common language (19). Clinicians and healthcare professionals should inform the patients about the psychological risk factors associated with cardiac diseases and familiarize them with preventive factors which can reduce the risk of CVDs (27). Therefore, providing information about cardiac rehabilitation should be tailored to the needs, beliefs, and certain cardiac conditions, regardless of the patient's race or ethnicity (26).

The limitations of this study were the low education level and older age of the subjects, which encumbered the interview progress and reduced patients' therapeutic participation. It is suggested that similar studies be carried out in stages before rehabilitation among all cardiac patients. It is necessary to reform the course of patients' treatment and training and teach individuals about the risk factors associated with cardiac diseases. In order to ensure the effectiveness of these interventions, evaluation should be also performed. If necessary, patients should be fully justified through individual counseling in order to control heart disease risk factors and prevent the recurrence of cardiac events.

Conclusion

From patients' perspective, psychological and behavioral risk factors were the most important causes of their illness; in addition, stress was the most influential factor. Thus, learning to control and manage these factors can help prevent the development of CVDs and the occurrence of subsequent cardiac events.

Conflicts of interest

The authors declare no conflicts of interest.

References

1. Vaccarino V, Badimon L, Corti R, de Wit C, Dorobantu M, Hall A, et al. Ischaemic heart disease in women: are there sex differences in pathophysiology and risk factors? *Cardiovasc Res*. 2011; 90: 9-17.
2. Wang L, Wang KS. Age Differences in the Association of Severe Psychological Distress and Behavioral Factors with Heart Disease. Hindawi Publishing Corporation. *Psychiatry J*. 2013; 2013: 979623.
3. Department of health. Cardiovascular Disease Outcomes Strategy Improving outcomes for people with or at risk of cardiovascular disease. Published to DH website, in electronic PDF format only 2013: 10-29.
4. Bath J, Bohin G, Jones C, Scarle E. *Cardiac rehabilitation*. 1sted. Wiley-Blackwell Pub; 2009: 47-55.
5. Ross RL, Serock MR, Khalil RA. Experimental benefits of sex hormones on vascular function and the outcome of hormone therapy in cardiovascular disease. *Curr Cardiol Rev*. 2008; 4: 309-22.
6. Balfour D, Benowitz N, Fagerstro K, Kunze M, Keil U. Diagnosis and treatment of nicotine dependence with emphasis on nicotine replacement therapy. *Eur Heart J*. 2000; 21: 438-45.
7. National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand. Reducing risk in heart disease: an expert guide to clinical practice for secondary prevention of coronary heart disease. Melbourne: National Heart Foundation of Australia; 2012: 4-18.
8. De A, Podder G, Adhikari A, Haldar A, Banerjee J, De M. Comparative Study of Risk Factors of Cardiac Diseases among Urban and Rural Population. *Int J Hum Genet*. 2013; 13: 15-9.
9. American Heart Association. *Obesity and Cardiovascular Disease*. Washington; 2013.
10. British Association for Cardiovascular Prevention and Rehabilitation. *The BACPR Standards and Core Components for Cardiovascular Disease Prevention and Rehabilitation*. 2nd Ed. London: BACPR; 2012: 1-22.
11. Péres DS, Magna JM, Viana LA. Arterial hypertension patients: attitudes, beliefs, perceptions, thoughts and practices. *Rev Saude Publica*. 2003; 37: 635-42.
12. Barth J, Volz, A, Schmid J-P, Kohls S, von Kanel R, Znoj H, et al. Gender Differences in Cardiac Rehabilitation Outcomes: Do Women Benefit Equally in Psychological Health? *J Womens Health (Larchmt)*. 2009; 18: 2033-9.
13. Bhattacharyya MR, Steptoe A. Emotional triggers of acute coronary syndromes: strength of evidence, biological processes, and clinical implications. *Prog Cardiovasc Dis*. 2007; 49:353-65.
14. Adel SM, Ramezani AA, Haydarei A, Javaherzadeh H, Behmanesh V, Amanei V. Gender-related differences of risk factor among patients

- undergoing coronary artery bypass graft in Ahwaz. *Saudi Med J*. 2007; 28: 1686-89.
15. Jensen LA, Moser DK. Gender differences in knowledge, attitudes, and beliefs about heart disease. *Nurs Clin North Am*. 2008; 43: 77-104.
 16. Askari SH, Mohammadi N, Ghorbani A, Ghafarzadegan R, Babahaji M, Torki Y. Comparison of Depression Level in Patients Prior to and After Implantable Cardioverter-Defibrillator. IDOSI Publications. *Advances in Biological Research* 2013; 7: 175-9.
 17. Glader EL, Stegmayer B, Norrving B, Terént A, Hulter-Asberg K, Wester PO, et al. Sex differences in management and outcome after stroke: a Swedish national perspective. *Stroke*. 2003; 34: 1970-5.
 18. Sharma K, Gulati M. *Coronary Artery Disease in Women: A 2013 Update*. Published by Elsevier Ltd. *Global Heart*; 2013: 105-12.
 19. Astin F, Jones K. Heart disease attributions of patients prior to elective percutaneous transluminal coronary angioplasty. *J Cardiovasc Nurs*. 2004; 19: 41-7.
 20. Perkins-Porras L, Whitehead DL, Steptoe A. Patients' beliefs about the causes of heart disease: relationships with risk factors, sex and socio-economic status. *Eur J Cardiovasc Prev Rehabil*. 2006; 13: 724-30.
 21. Day RC, Freedland KE, Carney RM. Effects of anxiety and depression on heart disease attributions. *Int J Behav Med*. 2005; 12: 24-29.
 22. Furze G, Lewin RJ, Murberg T, Bull P, Thompson DR. Does it matter what patients think? The relationship between changes in patients' beliefs about angina and their psychological and functional status. *J Psychosom Res*. 2005; 59: 323-9.
 23. Murphy B, Worcester M, Higgins R, Le Grande M, Larritt P, Goble A. Causal attributions for coronary heart disease among female cardiac patients. *J Cardiopulm Rehabil*. 2005; 25: 135-43.
 24. van der Wal MH, Jaarsma T, Moser DK, Veeger NJ, van Gilst WH, van Veldhuisen DJ. Compliance in heart failure patients: the importance of knowledge and beliefs. *Eur Heart J*. 2006; 27: 434-40.
 25. McCabe PJ, Barnason SA, Houfek J. Illness beliefs in patients with recurrent symptomatic atrial fibrillation. *Pacing Clin Electrophysiol*. 2011; 34: 810-20.
 26. Darr A, Astin K, Atkin K. Causal attributions, lifestyle change and coronary heart disease: illness beliefs of patients of South Asian and European origin living in the UK. *Heart Lung*. 2008; 37: 91-104.
 27. Tirodkar MA, Baker DW, Khurana N, Makoul G, Paracha MW, Kandula NR. Explanatory models of coronary heart disease among South Asian immigrants. *Patient Educ Couns*. 2011; 85:230-6.
 28. Hirani SP, Newman SP. Patients' beliefs about their cardiovascular disease. *Heart*. 2005; 91: 1235-9.
 29. Emslie C. Women, men and coronary heart disease: a review of the qualitative literature. *J Adv Nurs*. 2005; 51: 382-95.