Coronary Artery Bypass Graft Patients' Perception about the Risk Factors of Illness: Educational Necessities of Second Prevention

Abstract

Background: Patients' beliefs about the cause of cardiac disease (perceived risk factors) as part of the global psychological presentation are influenced by patients' health knowledge. Hence, the present study aimed to assess the relationship between actual and perceived risk factors, identification of underestimated risk factors, and indication of underestimation of every risk factor. **Materials and Methods:** In this cross-sectional study, data of 313 coronary artery bypass graft (CABG) patients admitted to one hospital in the west of Iran were collected through a demographic interview, actual risk factors' checklist, open single item of perceived risk factors, and a life stressful events scale. Data were analyzed by means of Spearman's correlation coefficients and one-sample Z-test for proportions. **Results:** Although there are significant relations between actual and perceived risk factors related to hypertension, family history, diabetes, smoking, and substance abuse ($P < 0.05$), there is no relation between the actual and perceived risk factors, and patients underestimate the role of actual risk factors in disease ($P < 0.001$). The patients underestimated the role of aging (98.8%), substance abuse (95.2%), overweight and obesity (94.9%), hyperlipidemia (93.1%), family history (90.3%), and hypertension (90%) more than diabetes (86.1%), smoking (72.5%), and stress (54.7%). **Conclusion:** Cardiac patients seem to underestimate the role of aging, substance abuse, obesity and overweight, hyperlipidemia, family history, and hypertension more than other actual risk factors. Therefore, these factors should be highlighted to patients to help them to (i) increase the awareness of actual risk factors and (ii) promote an appropriate lifestyle after CABG surgery.

Keywords: *Cardiovascular disease, patients' perception, risk factors, second prevention*

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Introduction

Cardiovascular diseases (CVDs) are one of the most common chronic diseases and one of the main causes of mortality worldwide.[1] In the past years, approximately 15 million persons in Iran were affected by CVDs, while a large part of the general population is at risk of developing cardiovascular pathologies in the next decades.[2] Cardiac risk factors include biological, environmental, physiological, behavioral, and psychological factors.[3] For example, a recent study by Compare *et al.* suggested that personality traits such as social inhibition and anger are associated with the presence and severity of CVDs.[4] Moreover, the link between emotional regulation and depression seems to represent a potential mediator between heart and mind.[5] All these cardiac risk factors have a direct effect on the incidence and persistence of CVDs.[6] In addition, they can affect the patients' health attitudes.[7] Indeed, according to the health belief model, patients' attitudes, cognitive beliefs, and their emotional reactions to disease and treatment can predict their health behaviors independently.[8-10] For example, poor adherence to treatment represents a major limitation in the management of patients at a high risk of cardiovascular events.[11] However, the mismatch between actual and perceived risk factors may affect the patient's cognitions[12] and lead to increased anxiety.[13,14] Patients' beliefs about the cause of cardiac disease (perceived risk factors) are part of the global psychological presentation of disease which is affected by patients' health literacy.[7] It has been suggested that wrong thoughts about cardiac disease and its risk factors can increase the probability of negative outcomes and of further hospitalization.[15] In addition, perceived risk, or personal beliefs about the probability of facing health threats, and the true perception of risk factors of disease could promote a healthy lifestyle.[16] Indeed, according to Byrne *et al.*,[10] secondary

prevention needs longtime management of risk factors by patients with the persistent cardiac disease. Although, failure of rehabilitation and secondary prevention programs and the inability of patients in the lifestyle modification is a result of their dysfunctional beliefs about disease.

Although Perkins-Porras *et al.*[7] found that there is a relation between actual and perceived risk factors, other studies indicated that there is no proportion between actual and perceived risk factors among patients.[12,16] This lack of proportion could be explained by patients' poor knowledge and awareness of risk factors. A recent study, for example, reported that 25% of people have no correct perception about unhealthy nutrition, poor exercise, and smoking in the incidence of CVDs.[17] There is more worry about some of these risk factors, and it has been suggested that 83% of cardiac patients with diabetes and 69% of cardiac patients who smoke have a poor perception about the role of these risk factors in their cardiac problems.[16] Based on different studies, patients consider stress (21%–64.4%), smoking (11.3%–58.8%), hypertension (3.2%–53.9%), hereditary and genetics (4.3%–48.8%), unhealthy nutrition (13.3%–46.6%), overweight and obesity (0.5%–39.4%), and other factors as the main causes of their disease.[7,18-21] Approximately 10%–65% of patients are unable to identify the cause of their disease,[18,21] while about 60% of cardiac patients have two or more risk factors for a further cardiac event.[16] Thus, cardiac patients usually underestimate the risk of disease and its risk factors. These cognitions may increase the risk of illness.[16]

It is clear that cardiac patients underestimate the risk factors, but it is not obvious which factors are underestimated more than others. Therefore, the present study aimed to respond to three questions: (1) Is there any relation between actual and perceived risk factors? (2) Which risk factors are underestimated significantly? (3) What is the level of underestimation of each risk factor? It is possible that the responses are effective in the design of secondary preventions and future training in cardiac rehabilitation.

Materials and Methods

Design and context

In this cross-sectional study, a number of cardiovascular patients who were admitted to Imam Ali hospital in Kermanshah city, Iran, for coronary artery bypass graft (CABG), volunteered to participate before their discharge. This hospital is a specialized cardiac center located in western Iran, with a capacity of 214 beds.

Inclusion and exclusion criteria

Inclusion criteria included: (1) 30–80 years of age, (2) appropriate perception and emotional–physical abilities, (3) being able to understand the language and fluent speech. Exclusion criteria included: (1) fatigue and lack of tendency for participation and (2) having risk factors out of the assessed risk factors of this study. The study was conducted following the guidelines of the Declaration of Helsinki.

Participants

Among 368 CABG patients who were admitted in the department of cardiac surgery from May to August 2015, 333 patients met the inclusion criteria and therefore were included in this study. Overall, 35 cases were excluded (21 cases: aging, 3 cases: cognitive dysfunction, and 11 cases: refused to participate) from the study. In addition, twenty cases were excluded from the study due to different risk factors than those assessed in this study. Thus, the final sample was of 313 patients. Furthermore, *a priori* sample size analysis (level of error 0.05) suggested that a minimum of 188 participants were required to obtain significant results. Data were collected after obtaining written consent form.

Data collection

At first, researchers performed a short interview with patients to check the inclusion criteria. Then, demographic checklist was collected. The clinical psychologist of the team administered the life stressful events scale.[22] The psychologist read the questions and registered answers for patients with an age higher than 50 years and with illiterate patients. In addition, the team referred to the medical records to obtain more information. Perceived risk factors were assessed through a single-item question;[2,3,20,21] in addition, patients' viewpoints were recorded. Then, actual risk factors were assessed and recorded by a cardiologist. Finally, data were entered into SPSS software and analyzed.

Instruments

Demographics and actual risk factors' checklist

Actual risk factors' checklist was fulfilled through cardiologist's and clinical psychologist's interviews with patients. It included information about demographic variables (age, gender, education level, and occupational status) and actual risk factors (diabetes, hypertension, hyperlipidemia, body mass index, history of smoking, opiate abuse, and familial history of cardiac disease).[1,23] Body mass index was measured by a nutritionist.

Perceived cardiac risk factors

According to the new category about the perceived risk factors for CVDs,[2,3,13,20,21] we used an open single-item approach, asking all participants "Which factor do you know as the main factor for your disease?" Patients' responses were recorded accurately.

Holmes and Rahe Scale of Stress of Life Events

Holmes and Rahe Scale of Stress of Life Events questionnaire was made by Holmes and Rahe in 1963 to evaluate the presence of 41 stressful events ("list of recent events"). Based on this scale, the life changes during the

recent 6–12 months were evaluated and the total score was obtained through a sum of the scores. The item value is between 11 and 100. A total score ranging from 150 to 200 is associated with an increased probability (equal to 37%) to develop a future disease, while this probability increases to 50%–80% if scores are in ranges between 200–300 or higher than 300.[22] The reliability of this scale was measured by Vafaii,[24] which reported an acceptable internal validity (Cronbach's α = 0.68). We used a cutoff score of >150 to identify stressed participants.

Statistical analyses

Spearman's correlation coefficient was used for assessment of the relations between variables. In addition, one-sample Z-test for proportions was used to compare actual and perceived risk factors. The percentages of actual and perceived risk factors and the mean of the stress score were reported. All statistical analyses were performed using Statistical Package for the Social Sciences version 20.0 (IBM SPSS, Armonk, NY, USA). All statistical tests were two sided; $P \leq 0.05$ was considered statistically significant. Before analyses, statistical assumptions were checked;[25] results evidenced that all variables were normally distributed.

Results

The mean age of participants was 61 years and 63.6% of them were male. The demographic data and stress scores (computed from Holmes and Rahe Scale of Stress of Life Events questionnaire) of the entire sample are shown in Table 1.

Table 2 shows the correlation between actual and perceived risk factors. Results evidenced statistically

Table 1: The sample demographics and stress

Variable	Frequency (%)
Sex	
Female	114 (36.4)
Male	199 (63.6)
Education	
Illiterate	159 (50.8)
Under diploma	95 (30.3)
Diploma	34 (10.9)
Academic	25 (8.0)
Marital status	
Married	271 (86.6)
Divorced or widowed	42 (13.4)
Occupation	
Employee	21 (6.7)
Self-employed	106 (33.9)
Homemakers	109 (34.8)
Retired	50 (16.0)
Unemployed	27 (8.6)
Age (mean±SD)	61.39±10.9
Stress (mean±SD)	158.3±111.5
BMI (mean±SD)	26.67±3.86

SD: Standard deviation, BMI: Body mass index

significant relations between some actual and perceived risk factors, such as hypertension ($P < 0.001$), familial history ($P = 0.011$), diabetes ($P < 0.001$), smoking ($P < 0.001$), and substance abuse ($P < 0.001$). Results in women showed statistically significant correlations between a number of actual and perceived risk factors, such as hypertension ($P = 0.019$), diabetes ($P = 0.011$), and smoking ($P < 0.001$). Finally, results in men showed statistically significant correlations between actual and perceived risk factors which include hypertension ($P = 0.022$), familial history ($P = 0.023$), diabetes ($P < 0.001$), smoking ($P < 0.001$), and substance abuse ($P = 0.002$). There were no significant relations between other actual and perceived risk factors ($P > 0.05$).

Table 3 shows the proportionality between actual and perceived risk factors. The results of this table indicate that there is no proportion between any of the actual and perceived risk factors. Results evidenced that patients generally have a poor perception about actual risk factors and they significantly underestimate their role ($P < 0.001$). Based on the results of this table, overweight and obesity, hypertension, stress, genetics and familial history of cardiac disease, hyperlipidemia, diabetes, smoking, aging, and substance abuse are the prevalent actual risk factors. However, the prevalent perceived risk factors were stress, smoking, hypertension, diabetes, genetic and familial history, obesity, hyperlipidemia, substance abuse, and aging. Regardless of the ranking of perceived risk factors, the results indicate that patients underestimated the role of aging (98.8%), substance abuse (95.2%), overweight and obesity (94.9%), hyperlipidemia (93.1%), familial history (90.3%), hypertension (90%) more than diabetes (86.1%), smoking (72.5%), and stress (54.7%).

Discussion

This study was carried out to assess the patients' causal beliefs, identification of underestimated risk factors, and indication of underestimation of every risk factor. One of the main aspects of CVDs is the patients' beliefs about the causes of the disease itself (causal reference or perceived risk factor). According to the patients' view, this risk factor is the main cause of illness.[26] In accordance with a previous study,[7] our findings showed that there are significant relations between hypertension, familial history, diabetes, smoking, and substance abuse with perceived risk factors. Indeed, Perkins-Porras *et al*. reported that 90% of patients with smoking and hypertension, 72% of patients with familial history, 85% of patients with overweight and obesity, and 49% of patients with low physical exercise consider these factors as causes of their disease.[7]

In addition, according to other studies,[20,21,27] patients seem to have a poor perception about their actual risk factors and they significantly underestimate their role. Jensen and Moser[18] suggested that, compared to men,

Table 2: The correlation between the actual and perceived risk factors

Actual/perceived risk factor	Total (*n*=313)		Female (*n*=114)		Male (*n*=199)	
	r	*P*	*r*	*P*	*r*	*P*
Obesity	0.091	0.106	0.087	0.357	0.098	0.168
Hypertension	0.220	0.001	0.219	0.019	0.163	0.022
Stress	0.067	0.235	0.093	0.323	0.051	0.473
Family history	0.144	0.011	0.122	0.197	0.162	0.023
Hyperlipidemia	0.079	0.162	0.151	0.108	0.051	0.477
Diabetes	0.313	0.001	0.238	0.011	0.376	0.001
Smoking	0.406	0.001	0.321	0.001	0.371	0.001
Aging	0.094	0.096	-	-	0.126	0.076
Drug abuse	0.204	0.001	-	-	0.218	0.002

Table 3: The proportionality between actual and perceived risk factors, as assessed through binomial test

Risk factor	Actual risk		Perceived risk		Underestimation (%)	*P*
	n (%)	Ranking	*n* (%)	Ranking		
Obesity	215 (68.7)	1	11 (3.5)	6	94.9	0.001
Hypertension	170 (54.3)	2	17 (5.4)	3	90.0	0.001
Stress	148 (47.3)	3	67 (21.4)	1	54.7	0.001
Family history	124 (39.6)	4	12 (3.8)	5	90.3	0.001
Hyperlipidemia	102 (32.6)	5	7 (2.2)	7	93.1	0.001
Diabetes	101 (32.3)	6	14 (4.5)	4	86.1	0.001
Smoking	98 (31.3)	7	27 (8.6)	2	72.5	0.001
Aging	83 (26.5)	8	1 (0.3)	9	98.8	0.001
Drug abuse	42 (13.4)	9	2 (0.6)	8	95.2	0.001

women have more awareness of cardiac risk factors, but less than one-third of them can identify the actual risk factors. Age and socioeconomic demographics are the main factors related to underestimation of risk factors and risk of CVDs in general population.[28] The role of fasting blood sugar, obesity, high cholesterol, and hypertension is underestimated by cardiac patients in the development of further outcome of disease.[29-34] Based on another result, cardiac patients are aware of most of the risk factors as well, but they emphasize on one factor as the main cause of their disease severely. This is probably due to a sense of more control on disease.[35]

According to the results, although patients have better perception about stress, smoking, and diabetes, the causal role of these risk factors is underestimated in more than 50% of cases whereas the factors of aging, substance abuse, obesity and overweight, hyperlipidemia, familial history, and hypertension in more than 90% of cases. It seems that the type of attitude about the cause of disease and perceived risk factors are influenced by cultural differences.[26,36] Hence, each of the risk factors has a "special" ranking in different cultures. For example, one systematic review showed that patients know stress as a cause in 41% of cases and they refer to an unhealthy lifestyle only in 31% of cases.[37] After stress as the main cause of CVDs,[19,26] patients refer to the role of smoking, hypertension, misfortune, familial history, and physiologic risk factors such as diabetes as the major causes of CVDs.[7,17,18,20,21]

Our findings indicated that patients underestimate the role of aging more than the other factors. Indeed, aging is a risk factor for atherosclerosis.[38] In addition, aging as one nonspecific parameter and biomarker of CVDs has the greatest effect in the course of disease.[2] In line with one study,[34] it appears that obesity and hyperlipidemia are severely underestimated risk factors. Indeed, our results evidenced that overweight and obesity are in 11th rank of perceived risk factors (39.4% of estimation).[7] Therefore, cardiac patients are aware of the role of inappropriate nutrition and lack of exercise as well, but they tend to (i) emphasize on the role of stress[35] and (ii) underestimate overweight and obesity. Sanderson *et al*.[39] reported that only 35% of individuals know familial history as a cause of CVDs, but hypertension, despite underestimation, has a better situation compared to the others.[34] Hence, according to the role of correction of thoughts and patients' inefficient cognitions about risk factors in reducing anxiety and depression and medical costs and improving the quality of life, it is recommended that the correction of patients' wrong cognitions is concerned as a part of secondary prevention programs.[2,13]

Strengths and limitations

The assessment of nine risk factors of CVDs which include stress, smoking, hypertension, diabetes, genetic and familial history, obesity, hyperlipidemia, substance abuse, and aging, over than the past studies,[29-34] and applying the recommended short instrument for the assessment

of patients' perceived risk factors[2,3,13,20,21] are the positive points of our study. On the other hand, illiterate cases (51%), sampling from one hospital in the west of Iran, and lack of assessment of the other risk factors such as unhealthy nutrition and physical activity are concerned as limitations.

Conclusion

Cardiac patients seem to underestimate the role of aging, substance abuse, obesity and overweight, hyperlipidemia, family history, and hypertension more than other actual risk factors. Therefore, these factors should be highlighted to patients to help them to (i) increase the awareness of actual risk factors and (ii) promote an appropriate lifestyle after CABG surgery.

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Conflicts of interest

There are no conflicts of interest.

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