Health Promotion Perspectives, 2013, 3(2), 217-229
doi: 10.5681/hpp.2013.025
http://journals.tbzmed.ac.ir/HPP

Functional Status, Anxiety, Cardiac Self-Efficacy, and Health Beliefs of Patients with Coronary Heart Disease

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ARTICLE INFO

Article type:
Original Article

Article history:
Received: Nov 03 2013
Accepted:Dec 19 2013
e-published:Dec 31 2013

Keywords:
Functional status,
Trait anxiety, State anxiety,
Cardiac self-efficacy,
Coronary heart disease

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ABSTRACT

Background: Beliefs and emotions could effect on functional status, quality of life, and mortality amongst patients who are suffering coronary heart disease (CHD). Current study examined the role of anxiety: trait/ state, self-efficacy, health beliefs, and functional status among patient with history of CHD.
Method: In this correlational study, 105 hospitalized and outpatients patients suffering CHD in Tehran Heart Center Hospital participated by using convenience sampling method in 2012. Cardiac self-efficacy, Seattle Angina, and research-designed health beliefs questionnaires were used to gather data.
Results: The functional status in CHD patients showed significant relationships with gender, job, and type of medical insurance of the participants (All p_s<0.05). In addition , perceived vulnerability to face again cardiac attack in the future, perceived severity of next cardiac attack, anxiety, state anxiety and trait anxiety (All p_s<0.05) had significant and negative relationships with functional status. Conversely, the cardiac self-efficacy had a positive and significant relationship (P<0.001) with functional status.
Conclusion: Psychological factors have important role in functional status and quality of life of patients who suffering CHD. Therefore, it is necessary to emphasize on supportive and complementary programs to promote Cardiac Rehabilitation Programs.

Citation: Allahverdipour H, AsghariJafarabadi M, Heshmati R, Hashemiparast M. Functional Status and Its Relation to Anxiety: Trait/State, Cardiac Self-Efficacy, and Health Beliefs of Patients with Coronary Heart Disease. Health Promot Perspect 2013; 3(2): 217-229.

Introduction

Coronary heart disease (CHD) is the one of the main cause of morbidity and mortality in most countries[1]. Although mortality from CHD has declined over the last 30 years, it is known as one of the priorities for primary and secondary prevention programs in the health systems[2].Evidence based researches showed causality effects of psychological factors on CHD[3,4].Psychological factors are essential to understanding the onset and progress of the CHD, its treatment, and how patients make lifestyle changes and cope with the issues associated with cardiac conditions and how they achieve to their optimal performance after treatment. The relation between psychosocial factors and CHD

as well as its consequences has been identified as an important public health issue[5]. Numerous prospective cohort studies indicated that the presence of psychological distress has been associated with occurrence CHD[6-8], with effect sizes that are comparable to conventional risk factors such as hypertension, obesity, and physical inactivity[9]. As a result the value of treating psychological distress using a range of modalities has been considered in clinical and research work in CHD[10].

Cardiovascular disease also is the main cause of disability and limitation of daily activity for 11.5% of the population[11]. Moreover, it is the leading cause for social security disability and hospital bed day use[12]. Although cardiovascular mortality has not declined dramatically since the mid-1960s, the prevalence of CHD has declined and also it was reported that in the 1986, the cost of indirect costs of cardiovascular disease related lost activity and productivity was $65 billion which was more than direct medical costs of CHD[5]. One recent study has shown a weak relation between angiographic measures of CHD severity and functional capacity as measured by the Duke Activity Status Index or by the Medical Outcomes Study SF-36[6]. In the latter study, the relation between the number of occluded coronaries and self-reported physical functional capacity was no stronger than the relation between social class and physical functional capacity[13].Additionally, cardiac catheterization, anxiety and depression at initial assessment were predicting factors for physical function, activity interference, and role function in social and family domains up to 1 year later[7]. These findings indicate that the psychological variables including anxiety, cardiac self-efficacy and beliefs affect on the ability and performance of patients who are suffering CHD.

Anxiety has been also defined as a stimulus, a trait, a motive, and a drive[13]. These can be differentiated into state anxiety and trait anxiety. State anxiety is a transitory emotional condition reflective of one's interpretation of a particular stressful situation at a particular period of time or feeling at a particular moment in time. Trait anxiety is the enduring of personality characteristic that refers to relatively stabilizing individual differences that characterizes people's anxiety or general feeling of anxiety[14].

The importance of anxiety in the development and progression of CHD is less well established. Large-scale prospective studies have demonstrated a significant link between anxiety and sudden cardiac death[14]. But studies documenting an association between anxiety and the development of coronary artery disease have been inconclusive[15].Suls and Bunde found a relatively weak association between anxiety and hard cardiac events[16].Anxiety is an independent predictor of major cardiac events in patients with stable coronary disease[17, 18]. Additionally, the precise mechanisms by which negative affectivity may influence the development and prognosis of CHD remain unknown. Furthermore, negative emotions probably adversely affect behavioral factors such as smoking, diet, exercise, and compliance with medical care, thus increasing the risk of cardiovascular morbidity and mortality. Psychological factors also appear to influence directly biological pathways that are important in the development and progression of CHD[19].

Moreover perceptions of CHD risk appear to be positively correlated with a desire to make risk-reducing behavioral changes and with actual behavioral change. Perceptions of personal risk occupy a central role in Health Belief Model (HBM) [20]. The HBM suggests that perceptions of risk play a critical role in a patient's compliance with recommended health behaviors. In a comprehensive review of the HBM and of cardiovascular risk factor reduction behaviors, perceived vulnerability was a significant contributor in almost half the studies that assessed behaviors related to CHD such as screening for hypertension[21]. The HBM postulates that people will be more likely to adhere to CHD preventative recommendations if they feel susceptible to CHD, think CHD is a severe disease, perceive they are

able to obtain a preventative programs, and receive some sort of a cue to action[21].Additionally, the construct of self-efficacy has extended far beyond the psychological arena and has been demonstrated to affect health behaviors and chronic disease management in many chronic disease settings[22]. Importantly, self-efficacy is a modifiable characteristic; many health behavior interventions have been shown to improve patients' self-efficacy [23-25].

The accomplishment of this research is necessary, since, first, the research deals with one of the main distresses of health realm, and health psychology, i.e. the effective factors for abilities/potentials, functional status and finally the health of coronary heart patients, that the specialists and experts of health area are still in search of the methods to promote it in chronic patients. Secondly, high prevalence and mortality rate of cardiovascular diseases, social and psychological complications resulted from it show that these diseases has converted to a major problem of health realm in 20th and 21st centuries[26]. Thirdly, no research has until now been conducted in Iran about abilities and functional status of CHD patients, moreover, the negligible conducted researches which now exist in this area have not addressed the role of significant variables like anxiety, health beliefs and cardiac self-efficacy.

The current study examined the role of anxiety: trait/ state, self-efficacy, health beliefs, and functional status among patient with history of CHD.

Materials and Methods

Participants& Procedures

This study was descriptive-correlational approach which 105 patients with history of cardiovascular disease who had received medical treatment in Tehran Heart Disease Hospital, participated in this project in 2012. Sample size of study was determined based on pilot study of size 30 subjects, considering the relationship between cardiac self-efficacy and functional status as primary outcome (r=.0335). Based on a confidence level of 95%, a power of 80%, two tailed test and utilizing G-Power software, at least a total of 105 subjects were calculated to recruit in the study. A convenience sampling design was used to recruit the eligible patients in to study.

Before completing questionnaires participants were taught how to complete questionnaires. Additionally mental status interview and history interview to examine the psychological and physical preparedness of the patients was conducted. Due to the acute and serious condition of patient who was unable to participate in this study, were excluded from study.

The Tabriz University of Medical Sciences Research & Ethics Committee approved the study. In addition, to conduct this study, all patients provided their written, signed, informed consent before completing the questionnaire and also it was coordinated by medical doctors and nursing manger of Tehran cardiac center's hospital for recruiting data.

Measures

Demographics

The demographic characteristics and disease-specific characteristics included age, gender, marital status(single/married), literacy level, body mass index, tobacco use(yes/no), having medical insurance (yes/no) history of diabetic mellitus(yes/no), and co-morbidity with psychiatric disorder.

Cardiac Self-Efficacy Scale

Cardiac self-efficacy was measured by Cardiac Self-Efficacy Scale[27]. This instrument was developed to measure self-efficacy associated with heart disease. It was a16-item scale with two sub-dimensions including the control of symptoms (8 items) and the maintenance of function (5 items), and an additional 3 items measuring obesity, smoking and dietary habit only for applicable subjects. Items were scored by ordinal 5-point Likert-type scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). In this study, the scoring was conducted with the

sum of items except for the 3 specific items (obesity, smoking, and dietary habit). Scores ranged from 0 to 52 with higher score indicating a greater level of cardiac self-efficacy. The estimated reliability coefficients was 0.87that indicating a good level of internal consistency.

Seattle Angina Questionnaire (SAQ)

The Seattle Angina Questionnaire (SAQ) is a disease-specific self-administered functional status measure for patients with coronary artery disease[28]. The instrument is comprised of 19 questions that quantify five clinically relevant domains of coronary artery disease: physical limitation (9 items), anginal stability (1 items), anginal frequency (2 items), treatment satisfaction (4 items), and disease perception (3 items). Each domain of the SAQ has been independently validated and shown to be reliable and responsive to clinical change[14].

The SAQ is scored by assigning each response an ordinal value and summing across items within each of the five subscales. Scale scores are then transformed to a 1 to 100 scale by subtracting the lowest possible scale score, dividing by the range of the scale and multiplying by 100. Each scale monitors a unique dimension of coronary artery disease, and no summary score is derived. The estimated reliability coefficients was 0.85 that indicating a good level internal consistency.

State-Trait Anxiety (SATI)

The STAI is a 40 items self -valuation questionnaire which includes separate measures of state and trait anxiety[29]. This instrument used all original items with no modification whatsoever. The State-Anxiety scale (STAI Form Y-1) consists of twenty statements that evaluate how respondents' feel about anxiety "right now, at this moment" through four response rate include *not at all*, *somewhat*, *moderately so*, and *very much so* which scored 1- 4. The Trait-anxiety scale consists of twenty statements that assess how people "generally feel" about anxiety with four rating response codes: 1 (*almost never*), 2 (*sometimes*), 3 (*often*), and 4 (*almost always*). A rating of 4 indicates the presence of a high level anxiety and 1 indicates the absence of anxiety. The anxiety level was found by calculation of scores. The range of scores is from 20-80, the higher the score indicating greater anxiety. A number of reliability and validity tests have been conducted on the STAI and have provided sufficient evidence that the STAI is an appropriate for anxiety studies in research and clinical settings[30]. The reliability coefficients for state anxiety and trait anxiety were 0.85 and 0.71that indicating good and reasonable internal consistency, respectively.

Perceived threat of occurring next cardiac attacks

Two dimensions of Perceived threat include perceived susceptibility of facing another cardiac attack and severity of cardiac attack scales were designed based on HBM theoretical structures. Susceptibility or vulnerability of patient to face again cardiac attack in the future was measured by using six items scale which example of items was "I believe that a heart disease will never occur more in my heart". In addition, severity of next cardiac attack was measured by using five items scale which example of items was "I believe that the next occurrence of the heart disease would be killing".Ordinal 5-point Likert-type scale with: 1 ="strongly disagree," 5= "strongly agree" (at opposite ends of the continuum), and 3 ="neutral" (in the middle) was applied to measure these two variables.The reliability coefficients for perceived susceptibility and severity were 0.63& 0.68 respectively that indicating moderate level of internal consistency.

Statistical Analysis

The data was analyzed by using SPSS13 software (SPSS Inc. IL, Chicago, USA). Data were presented by mean (SD) and frequency (%) for quantitative and qualitative variables, respectively. The normality of data was assessed and confirmed by one sample K-S test. To investigate the relationship between functional status with baseline characteristics, and relationship between functional status-

with psychological factors, a univariate- multivariate hierarchical strategy was applied controlling for baseline characteristics.

In the univarite analysis, each variable were entered in the regression model individually to assess its relationship with functional status. In the multivariate analysis a two-step hierarchical strategy was used wherein in the first step, a backward strategy to select significant baseline characteristics was applied at P=0.1. In the second step, the entire psychological factors were entered in the model. The final model consisted of significant baseline characteristics and all psychological factors. The qualitative variables were entered as indicators. The regression assumptions of residual normality, homogeneity of residual variances, residual independence, and co-linearity were assessed and confirmed using normal probability plot, residual versus predicted values plot, Durbin-Watson Statistics (values between 1.5 to 2.5 as the acceptable range), and Variance Inflation Factor (VIF<5 as the acceptable values). All the assumptions were fulfilled. To assess the simultaneous relationships of functional status scales and demographic and psychological factors a multivariate regression analysis was conducted and Wilks' Lambda was used to assess the relationships. Additionally, regression coefficients and their 95% confidence intervals were presented.

Results

The mean age of participants was 54.95 (SD 14.36) years, and its range was between 25- 83. Of all participants 48 (49.9%) were male and 50 (51.0%) were female and also the majority of subjects 85(83.3%) was married and literacy level of 50 (50%) participant were at the elementary and secondary level, 27(27.0%) were in the high school level, and 12 (12.0%) had high education status (Table 1). In addition, of the participants 17.8% (18/105) were currently tobacco user, 28.4% (29/105)had history of diabetes mellitus, and19.0% had psychiatric disorder and also the mean of body mass index was 27.41 (SD 4.24).

Table 1: Study participants characteristics

Variables	Summary Statistics	
	n	*Percent*
Gender		
Female	50	51.0
Male	48	49.0
Marriage		
Married	85	83.3
Single	5	4.9
Widow	10	9.8
Divorced	2	2.0
Economic		
High	3	3.0
Average	79	78.2
Low	19	18.8
Job		
Full-Time	18	18.0
Part-Time	8	8.0
Retired	26	26.0
Unemployed	7	7.0
Other	41	41.0
Literacy Level		
Elementary	36	35.3
Secondary	14	13.7
High school	27	26.5
Higher Education	25	24.5
Insurance		
Medical Services	35	34.3
Social security	53	52.0
Other	14	13.7
Cigarette		
Yes	18	17.8
No	83	82.2
Diabetes		
Yes	29	28.4
No	73	71.6
Psychiatric		
Yes	19	19.0
No	81	81.0
Family		
Yes	64	62.7
No	38	37.3
	Mean	Std. Deviation
Age (Year)	54.96	14.36
BMI(Kg/m2)	27.41	4.24

The functional status in CHD patients showed significant relationships with gender, job and having medical insurance of the par-

ticipants based on univariate analysis (All $P<0.05$), so that males compared with females, full time job compared with other types of job and medical services insurance compared with other types of insurance had higher scores of functional status (Table 2).Perceived vulnerability to face again cardiac attack in the future, perceived severity of next cardiac attack, anxiety, state anxiety and trait anxiety had significant and negative relationships with functional status.

Table 2: Relationship between functional status and participants baseline characteristics

Variables	B	SE	Beta	*P*-Value
Gender				
Female	Referent			
Male	10.12	3.54	0.28	**0.005**
Marriage				
Married	Referent			
Single	-7.85	8.40	-0.09	0.353
Widow	-0.75	6.10	-0.01	0.903
Divorced	-9.45	13.06	-0.07	0.471
Economic				
High	Referent			
Average	-13.84	10.64	-0.32	0.196
Low	-18.47	11.23	-0.40	0.103
Job				
Full-Time	Referent			
Part-Time	-7.81	7.55	-0.12	0.304
Retired	-7.59	5.45	-0.19	0.167
Unemployed	-14.98	7.92	-0.21	0.061
Other	-11.34	5.03	-0.31	**0.026**
Literacy Level				
Elementary	Referent			
Secondary	-4.34	5.66	-0.09	0.445
High School	-6.69	4.57	-0.17	0.147
Higher Education	-2.92	4.86	-0.07	0.549
Insurance				
Medical Services	Referent			
Social Security	0.07	3.84	0.01	0.985
Other	-13.01	5.56	-0.25	**0.020**
Cigarette				
Yes	Referent			
No	-2.82	4.72	-0.06	0.551
Psychiatric				
Yes	Referent			
No	2.38	4.62	0.05	0.608
Family				
Yes	Referent			
No	-2.16	3.72	-0.06	0.562
Age	0.21	0.13	0.17	0.106
BMI	-0.34	0.47	-0.08	0.478

Dependent Variable: Functions

As a result by increasing the score of the each psychological factor, the score of functional status decreases significantly. Conversely, the cardiac self-efficacy had a positive and significant relationship with functional status; by increasing the score of car-

diac self-efficacy the score of functional status increases significantly.

In addition, the results of the two-steps hierarchical modeling lead in selecting education and insurance among the participant's characteristics and all psychological factors except for anxiety which were removed by modeling itself, because of severe collinearity. Literacy level of high school compared to elementary level, having medical services insurance compared with other types of insurance had higher scores of functional status. Among the study constructs the cardiac self-efficacy had a positive and significant relationship with functional status; as a result, by increasing one unit in the score of cardiac self-efficacy the score of functional status increases by 1.74 units. However, Perceived vulnerability to face again cardiac attack in the future, perceived severity of next cardiac attack, State-anxiety and Trait-anxiety showed no significant relationship with functional status (Table 3).In addition, adding the second set of variables including perceived susceptibility and severity, cardiac self-efficacy, and anxiety significantly added the predictive ability of functional status by 18.7% [F Change (5, 181) = 4.48, *P*=0.001].

Finally in the Tables 4 and 5 multivariate modeling showed that vulnerability, severity and to some extent State Anxiety variables were simultaneously related to functional status scales.

Also multivariate modeling revealed some significant relationships among individual functional status subscales and psychological factors including "efficacy with Physical Limitation", "vulnerability with Anginal Stability", "severity with Treatment Satisfaction ","State Anxiety with Treatment Satisfaction", and to some extent "efficacy with Anginal Frequency" and" Trait Anxiety with Treatment Satisfaction".

Table 3: Results of multivariate two-steps hierarchical modeling for relationship between functional status with psychological factors and baseline characteristics

Variables	Adjusted B	SE	Beta	*P*-value
First Step Hierarchical Model				
Education				
Elementary	Referent			
Secondary	-6.78	5.08	-0.13	0.185
High School	-10.67	4.30	-0.27	**0.015**
Literacy Level	-8.73	4.54	-0.20	0.058
Insurance				
Medical Services	Referent			
Social Security	-1.94	3.61	-0.05	0.592
Other	-9.77	5.38	-0.18	0.073
Second Step Hierarchical model				
Vulnerability	-0.10	0.05	-0.19	0.065
Severity	-0.90	0.71	-0.18	0.208
Health Beliefs	0.21	0.36	0.09	0.554
Cardiac self-efficacy	1.67	0.40	0.44	**<0.001**
Anxiety	---- a			
State-anxiety	0.02	0.19	0.01	0.924
Trait-anxiety	-0.22	0.24	-0.11	0.380

Dependent Variable: functional status/ R Square for the first part = 13.6%, R Square for the second part = 18.7%, Total R Square = 32.3%/ There was significant predictive ability of second part of the model (F Change (5, 181) = 4.48, *P*=0.001)/ a: Anxiety was removed by modeling itself, because of severe collinearity.

Table 4: Results of multivariate regression to assess the simultaneous relationships of functional status and psychological factors

Psychological Factors	Wilks' Lambda	$F_{(5,69)}$	*P*-value
Vulnerability	0.84	2.66	.029
Severity	0.81	3.18	.012
Cardiac self-efficacy	0.90	1.60	.172
State Anxiety	0.86	2.33	.052
Trait Anxiety	0.92	1.23	.306

Discussion

The findings of current study overall revealed that cardiac self-efficacy, Perceived vulnerability to face again cardiac attack in the future, perceived severity of next cardiac attack, state anxiety, and trait anxiety significantly increased 18.7% of the predictability of functional status that indicate positive role of these psychological factors on personal capacity to overcome consequences of CHD and improve quality of life of these patients.The findings of this paper have shown that state anxiety and functional status (r=.51, *P*>0.01) have negative and significant relationship.

Table 5: Relationships among functional status scales and psychological factors in multivariate regression modeling

Functional Status Scales	Psychological Factors	B	SE	L	U	*P*-value
Physical Limitation	Vulnerability	-0.17	0.61	-1.39	1.04	.778
	Severity	0.20	0.84	-1.47	1.87	.810
	Cardiac self-efficacy	1.73	0.66	0.41	3.06	.011
	State Anxiety	0.34	0.33	-0.32	0.99	.310
	Trait Anxiety	-0.39	0.43	-1.25	0.46	.364
Anginal Stability	Vulnerability	-2.15	0.95	-4.05	-0.26	.026
	Severity	0.65	1.31	-1.97	3.26	.623
	Cardiac self-efficacy	0.99	1.04	-1.08	3.06	.346
	State Anxiety	-0.08	0.51	-1.11	0.94	.876
	Trait Anxiety	-0.84	0.67	-2.17	0.51	.218
Anginal Frequency	Vulnerability	0.62	0.77	-0.92	2.15	.425
	Severity	-1.43	1.06	-3.54	0.68	.181
	Cardiac self-efficacy	1.49	0.84	-0.19	3.16	.081
	State Anxiety	-0.34	0.42	-1.16	0.49	.423
	Trait Anxiety	-0.25	0.54	-1.34	0.83	.645
Treatment Satisfaction	Vulnerability	-0.41	0.46	-1.33	0.51	.377
	Severity	1.99	0.64	0.72	3.26	.003
	Cardiac self-efficacy	0.22	0.51	-0.79	1.23	.665
	State Anxiety	-0.67	0.25	-1.16	-0.17	.009
	Trait Anxiety	0.56	0.33	-0.10	1.21	.093
Quality of Life	Vulnerability	-0.57	0.60	-1.76	0.62	.342
	Severity	-0.51	0.82	-2.15	1.13	.537
	Cardiac self-efficacy	0.98	0.65	-0.33	2.28	.139
	State Anxiety	-0.13	0.32	-0.77	0.52	.693
	Trait Anxiety	-0.31	0.42	-1.15	0.53	.463

L: 95% Confidence Interval Lower Bound/ U: 95% Confidence Interval Upper Bound

State anxiety itself is only able to explicate 26% of functional status variance of CHD patients which has high explication ability in explaining functional status along with all other variables like the control of symptoms, vulnerability and overall self-efficacy.
Moreover due to lower power of explication of total anxiety and trait anxiety , there would be removable from the model which it is consistent to Stuck, et al.and McCormick, et al. findings [31,32].

However; anxiety is fundamental problem among the patients waiting for surgery, according to Michel's theory of illness [33], anxiety is the result of unspecific disease symptoms which is experienced or evaluated but, based on findings of current study anxiety has a direct relationship to the functional status of CHD patients. Although in this research, the data were aggregated without considering the disease phase of the participants (pre-surgery operation or post-surgery) but findings show that anxiety, in an overall or general circumstances specifically state anxiety, can be considered as an effective factor in ability or inability of CHD patients. The other point which could be concluded by this finding is that the functional status of CHD patients retains more under the temporary excitements and emotions than the stable emotions status. Considering that cardiovascular responses keep themselves severely under the influence of excitation and the malfunctioning of automatic nervous system, this nervous system is the responsible of creating temporary, severe and unstable excitations (state anxiety), in fact, the fundamental role of these excitements in functional status of patients depends upon sympathetic[34].In addition to anxiety, the variable of control of symptoms (r = .39, *P*> 0.01), and cardiac self-efficacy (r = .32, *P*> 0.01) had positive and significant relationship with functional status. A large volume of researches exist which have investigated about the relationship between cardiac self-efficacy and CHD[22,34,35], that the most of them are in consistency with the our findings based on the impact of self-efficacy and self- control on functional status. Most of these studies endeavored that after monitoring other different variables like depression, anxiety and all other influencing variables on health and functional status, to investigate the pure effects of cardiac self-efficacy and self-control over functional status[36-38]. The findings of these researches like the present research show the key importance of cardiac self-efficacy and self-control over functional status and the improvement of quality of life of CHD patients.

According to Bandura's theory[39]the ability to control is considered as a key factor for an effective coping against stressors. In other words, Stressors do lead to inability, but the inability to manage stressors cause development of inability. In the same manner, on the basis of Green and Meluri theory, cardiac self-efficacy is a mediating factor between awareness and behavior, since it is considered as the belief of individuals in their own abilities or potentials to perform a behavior[40].

The other aspects of findings of current study indicates that vulnerability and functional status (r=-.41, *P*>0.01) have a negative and significant relationship. The vulnerability along with the state anxiety, the control of symptoms, and cardiac self-efficacy in step third are able to explain the variance of functional status variable. The study of existing difference excess in determination coefficient shows that vulnerability explains only 5% ($\beta_{=}$-.21) of the variance of total functional status which it is consistent to findings of Walker [41] and Norman and Brain [42]. In Leventhal's model, patients' previous experience with illness is organized in a complex memory structure that issued to cluster and organize illness knowledge[43]. As a self-regulating model, it is described with three recurring stages (formation of cognitive representations; development of action plans; and appraisal of coping response) which guide an individual's coping or adaptive behavior[44]. Therefore, it can be explicated that the reason of negative effects of the vulnerability on functional status can be considered as resulted from representation of patients. In a form that this representa-

tion on the basis of theoretical model of Leventhal, organizes the operational or practical plans which cause the reduction in functional status. In short, this can be expressed that representation, determines the functional status of person, and since vulnerability is a catastrophic negative mental representation, results in a reduction of functional status of CHD patients. In addition, the experimental study of cardiac self-efficacy effects, anxiety and health beliefs with the help of manipulation in CHD patient's functional status by means of using different methods of psychotherapy like cognitive-behavioral therapy to repair inefficient health beliefs, as well as anxiety reduction and cardiac self-efficacy promoting cardiac rehabilitation program, could attain more powerful and trustful findings. However, this study is limited only to the existing relations across different variables.

Different existed variables may possibly affect the functional status of CHD patients, for instance, anxiety, medicament consumption, physical and social factors like social support, nutrition, exercise, and which were necessary to control in this study and the only pure effects of anxiety variables, cardiac self-efficacy and the effect of health beliefs on functional status of patients was discussed and studied. Therefore, it is proposed, that at one hand experimental methods should be used in future researches and on the other hand, the control of influential or effective variables should be considered in functional status of CHD patients, so that the more satisfactory and generalized findings are attained.

Conclusion

Healthy behavior, health status of CHD patients, state anxiety, the component of control of symptom of cardiac self-efficacy, vulnerability and cardiac self-efficacy play a fundamental and decisive role on functional status. On this base, it would be necessary to consider on control and manage of state anxiety in clinics and hospitals during hospitalization and after discharge and follow up of patients at home. By considering this fact, that the state anxiety is usually characterized or distinguished by the excitation of automatic nervous system (ANS) of the body, the methods which are proposed to reduce this anxiety (and to increase functional status) are: relaxation training, stress management ,and desensitization. One of the approaches used to promote healthy behavior and quality of life in coronary artery disease patients, is the self-efficacy promoting cardiac rehabilitation program.

Acknowledgements

Funding for the study was provided by the Deputy of Research of Tabriz University of Medical Sciences. Authors appreciate medical doctors, nurses and hospital staff of Tehran Heart Center Hospital for their sincere cooperation.

Competing interests

The authors declare that they have no competing interests.

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