



## Compare emotional self-regulation and perceived stress in patients with cardiovascular diseases and non-patients

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### Abstract

*The aim of this study is to compare emotional self-regulation and perceived stress in patients with cardiovascular diseases and non-patients. This study is from the comparative researches. The study population included all patients with cardiovascular diseases that in the first six months of 2014 referred to the National Bank hospital. The sample of this study consisted of 120 subjects with cardiovascular diseases and non-patients (60 patients with cardiovascular disease and 60 non-patients) that were selected as purposive sampling among patients of cardiovascular referred to National Bank hospital; the selection of non-patient subjects was done among the relatives of patients. The Cohen Perceived Stress Scale and March emotional self-regulation strategies questionnaire in order to analyze the data, multi-way ANOVA (MANOVA) was used. Results showed that there is a significant difference between patients with cardiovascular disease and non-patients in all components of emotional self-regulated including: cognitive, behavioral, focusing on repositioning and focusing on changing emotion, reduce negative emotions and increase positive emotions. In perceived stress, patients with cardiovascular disease than non-patients with negative perception have higher stress and with positive perception have lower stress.*

**Key words:** *emotional self-regulation, perceived stress, cardiovascular diseases*

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### 1. Introduction

Cardiovascular diseases are the most common diseases in adults and one of the biggest causes of death in people over 35 years, according to recent research, cardiovascular diseases are the cause of 1.4 deaths in the world (Uemufra and Pisa, 1988). On the other hand, in the last two decades, the geographical distribution of these diseases has changed; death from CVD in developing countries is more than developed countries. The World Health Organization (WHO) has placed prevention of these diseases in developing countries among health priorities (International Health Steering Committee, 1991). It is predicted that by 2020 nearly 25 million deaths occurs each year due to cardiovascular disorders and this disease is considered in the first rank of life-threatening and debilitating (Cohns, Genet, 1996). According to some researchers and scholars, cardiovascular diseases in low ages Iran are more than ever on the rise (Heidari Pahlaviyan, Gharekhani and Mahjub, 2007). According to static reported from district 13 of Tehran in 2001, 8.8% of men and 12.7% of women of this district had been suffering from heart disease (Khoosfi, Monirpour, Birshak and Peyghambari, 2006).



Research on the rise in recent years suggest that psychosocial stresses are risk factor independent of age, sex and other classic risk factors of physical of heart diseases that by Psycho-neuro-physiological mechanisms and stimulation of the autonomic nervous system especially sympathetic increase the incidence of cardiovascular responses and help to maintaining cardiovascular diseases (Schwartz et al., 2003; Atkinson et al., 2000).

Also in the past few decades, extensive research is conducted in the etiology of cardiovascular diseases and role of psychological factors such as personality traits, behavioral pattern, physical reactivity, self-involvement, control, anxiety, depression, neurosis, anger spilled out in heart diseases has been reviewed and approved (Social problem solving, 2002).

Emotional self-regulation is said to a series of attempts that is done by the person to regulate emotional states, the increase of positive emotions and reduction of negative emotions; It is closely related to self-awareness and refers to methods by which to control and to examine the behavior and actions. Control theory of emotional self-regulation states that we through self-awareness compare our behaviors with our standard and if there was a gap, trying to reduce it (Daividsen, 2002 Quated by Amjadian, 2011). Study the relationship of self-regulation as a personality trait with health was taken into consideration by Grossarth and Eysenck (1995) for the first time in a self-regulation questionnaire that was able to specify weak or strong health in non-patients and patients; Results of the study of researchers showed that self-regulation mediates effects of physical risk factors on the health; So although physical risk factors obviously have relation with health when there are psychological risk factors (low level of self-regulation), their traumatic consequences on health is increasing (Grossarth, Eysenck and Boyle, 2000). The researchers also found that increasing self-regulation using cognitive-behavioral therapy improves the habits associated with patient's health and significantly reduces death (Grossarth and Eysenck, 1991).

Perceived Stress is a psychological state or process that the person perceives his physical and psychological well-being threatening. In fact, stress depends on how the perception of individual from situations and accidents. May be a situation is safe for a person and for someone else perceived as a threat (Clark, 2010). The perceived severity of stress is one of the main components of health belief model which is based on psychological learning theory (Becker, Maiman, Kirascht, Haefner and Drachman, 1977; Rosenstock, 1990; Sheeran and Abraham, 1995). According to this model, the perceived severity stress is considered one of the basic factors explaining the possibility of adopting coping strategies by people in stressful situations. Perceived severity stress refers to a person's belief in the seriousness of stress. Most likely, the person acts to adopt specific coping strategies when believes the physical effects, the negative social and psychological due to stress and important consequences (for example, changing social relationships, loss of independence, pain and suffering, disability and even death). Based on two above variables, the more seriousness perceived of stress is higher, as well as the possibility of adopt front action increases (Rosenstock, 1990).

According to what was mentioned above, the researchers plan to compare emotional self-regulation and perceived stress in patients with cardiovascular disease and non-patients. According to the above, the question is whether there is a difference in emotional self-regulation and perceived stress in patients with cardiovascular disease and non-patients?

## 2. Background of Research

The results of Asmakhany Akbarnejad, Aghazadeh and Asbaghi (2013) represents a significant difference between level of education and ways of coping strategies of the patients in all three dimensions ( $P>0.05$ ). However, it was observed that there is a significant



relationship between positive stress and level of education in the patients ( $P > 0.05$ ). Pour Afzal, Seyed Fatemi, Inanloo and Haghani (2013) in their study concluded that almost all nursing students (99.3%) have reported the level of perceived stress in average or higher. Statistically there was a significant and reverse correlation between perceived stress and resilience. The researchers argue in the end that given the significant and reverse correlation of perceived stress with resilience in nursing students, learning stress management strategies such as increasing resilience during four-year program in the form of workshops and role-play and other new methods of education to prepare them to enter the realm of work and services in health system seems essential. Soltani Shal, Agha Mohammadiyan Sherbaf and Karshaki (2013) in their study showed that emotional intelligence significantly has been effective on perceived stress, coping strategies and quality of life. In addition, the personality type D significantly influenced perceived stress and coping strategies. Perceived stress and coping strategies had a direct role in the quality of life and played a significant mediating role in the relationship between personality type D and emotional intelligence and quality of life in patients with coronary heart disease. Heidari Pahlaviyan, Gharakhani and Mahjub (2010) showed that psychosocial stress and the use of inefficient methods of coping with stress are associated with the occurrence of myocardial infarction, it is valuable in cardiovascular disease prevention and rehabilitation programs paid more attention to the role of stress in disease etiology and persistence. Masoudnia (2009) in his study investigated the role of perceived severity stress on ways to deal with stress among 373 students of Yazd University, and showed there is a significant difference between people with different levels of perceived stress in ways to deal with stress only in two components of avoidance coping and active coping. Hierarchical multiple regression analysis showed that perceived severity stress had no part in explaining the variance in coping strategies

Kershaw et al (2014) in a longitudinal study showed that stressful life events and more social pressures were associated more with a higher incidence of coronary artery disease and myocardial infarction. The results of this study showed that the risk of behavioral and biological factors not has any relation to the prevalence of coronary artery disease and myocardial infarction.

Appleton, Loucke, Buka and Kubzansky (2013) in their study showed that for every one unit of standard deviation increase in childhood distress preparation, 30% risk of cardiovascular diseases increases. Also, for every one unit increase in attention, cardiovascular diseases risk reduces 8%. For men, a unit increase in childhood distress readiness, cardiovascular diseases risk increases 17%. The researchers argue that perhaps be able to prevent cardiovascular diseases in adulthood with emotion regulation training of childhood. Kok et al (2013) in their study investigated this hypothesis, which a dynamic spiral motion strengths the relationship between positive emotions and physical health continuously, the findings of this study was led to identify the mechanism (perceived social connections) through which positive emotions are led to physical health. These results suggest that positive emotions affect positive social connections and physical health of each other in a dynamic spiral model.

Bonier, Chamot and Pemeger (2004) at the end of their study concluded that perceived stress is an important risk factor for poor mental health and suggest that the dominance and self-esteem are the major factors supporting mental health among young people.



### 3. Research hypotheses

1. Compare emotional self-regulation (cognitive, behavioral, focusing on repositioning, focusing on the change of emotion and reduce negative emotions and increase positive emotions) in patients with cardiovascular diseases and non-patients
2. Compare perceived stress (positive perception of stress, negative perception of stress) in patients with cardiovascular diseases and non-patients

### 4. Research Methodology

The current study method is comparative. The study population included all patients with cardiovascular diseases that in the first six months of 2014 referred to the National Bank hospital. The sample of this research was selected as purposive sampling from among those who had the conditions of enter to study: having education, lack of serious medical problems of comorbidity, lack of serious psychiatric disorders and consent and cooperation in implementing project; selection of non-patients was done among relatives of patients. The sample consisted of 120 people, including 60 patients with cardiovascular diseases and 60 non-patients. The tool measuring the study included a questionnaire of March's emotional self-regulation strategies. Questions of this questionnaire are largely taken from self-regulation's comprehensive guidebook written by Larsen and Priz Mike. The questionnaire contains 44 questions that included dimensions of cognitive, behavioral, changing position, changing emotions, decrease negative mood and increase positive mood. March's emotion regulation strategies test is from close tests 7 -option that is formed from never to always and scored from 0 to 6. The reliability of the questionnaire is reported on 60 patients (30 males and 30 females) using the two halves 0.75 and using Cronbach's alpha 0.80 (Moorkani Salehi, 2006). The second questionnaire is the Perceived Stress Scale. This scale was prepared in 1983 by Cohen, Kamarck and Mermelstein with 3 versions: 4, 10 and 14 is a material that is used to measure common perceived stress in the past month. This scale is designed for a group of society that at least has Diploma degree. The 14-item questionnaire will be used in this research. This scale has two subscales: (1) negative perception of stress (items 1-2-3-8-11-12 and 14) and 2 subscale of positive perception of stress (items 4-5-6-7- 9-10 and 13). The questionnaire has been translated and validated in Iran by Narimani and Aboulghasemi, they evaluated validity and reliability of the questionnaire as desirable (Abolqasemi and Narimani, 2006). In a study by Amin Yazdi (1998), Cronbach's alpha coefficient of questionnaire was obtained 0.81. Ebrahimi and Ghafari (2006) normalized the test and Cronbach's alpha coefficient was obtained 0.84. In addition, for data collection, after receiving a letter of introduction, the case of subjects who had declared their consent to participate in research, was investigated if there are criteria for inclusion the study included: recognize cardiovascular problems by specialists (having a hospitalization record), no recognizable medical problem at the same time, lack of mental disorders and the ability to read and write, research objects for subjects was explained and then survey questionnaires were completed as an interview. Non patient's samples were selected among the companions of patients hospitalized and questionnaire as interview was completed. To describe the statistical analysis, the frequency distribution tables, calculate mediocrity indexes and



distribution variance was used. In addition to descriptive statistical methods for data analysis (classification and description information), the multivariate analysis of variance (MANOVA) was used to examine the research hypotheses.

## 5. Findings

### 5-1 descriptive findings

Table 1. Descriptive indicators of emotional self-regulation score and its components in patients with cardiovascular diseases and non-patients

Static indexes of variables	Group	n	Mean	SD	Minimum	Maximum
Cognitive	Cardiovascular	60	29	9.9	24	49
	Non-patient	60	53.6	7.32	46	67
Behavioral	Cardiovascular	60	81.29	7.64	51	132
	Non-patient	60	128.1	6.28	118	141
Focus on repositioning	Cardiovascular	60	52.51	6.35	28	88
	Non-patient	60	89.13	5.31	80	101
Focus of change emotion	Cardiovascular	60	59.5	9.88	32	97
	Non-patient	60	97.4	7.74	82	112
Reducing negative emotions	Cardiovascular	60	81.76	10.56	46	124
	Non-patient	60	128.1	9.62	111	151
Increase positive emotions	Cardiovascular	60	19.17	4.6	34	44
	Non-patient	60	44.53	3.1	38	49
Total	Cardiovascular	60	110.86	11.67	66	185
	Non-patient	60	186.53	9.85	173	213

Information of above table shows that score of patients with cardiovascular diseases in all of the components of emotional self-regulation is lower than non-patients.



Table 2. Descriptive Index of score of perceived stress in patients with cardiovascular disease and non-patients

Static indexes of variables	Group	n	Mean	SD	Minimum	Maximum
Negative perception of stress	Cardiovascular	60	23.95	4.51	14	32
	Non-patient	60	21.28	4.1	13	35
Positive perception of stress	Cardiovascular	60	23.68	3.35	16	31
	Non-patient	60	25.42	5.78	16	59

As the information of above table shows that patients with cardiovascular diseases in negative perceptions of stress have achieved a higher score compared to non-patients; but in the positive perception of stress, non-patients have achieved higher score.

### 5-2 analytical findings

To investigate the hypotheses tests, parametric tests of multivariate analysis of variance were used. The first condition is normality if distribution of data, so first study of normality of the dependent variable data was done, to verify the normality and homogeneity of variance related to the study variables, the test of box and Levin was used.

#### The first hypothesis:

There is a difference between the components of emotional self-regulation (cognitive, behavioral, focusing on repositioning, focusing on the change of emotion and reduce negative emotions and increase positive emotions) in patients with cardiovascular diseases and non-patients.

Before testing the hypotheses, assumptions are examined using MANOVA.

#### Homogeneity of variance-covariance matrix

Table 3. Summary of the equivalence test of box covariance matrix

Box static	F	Degree of freedom 1	Degree of freedom 2	Sig
706.148	31.801	21	51212.449	0.001

Results of table above shows that the covariance matrix observed of dependent variable is equal in groups (P =0.001, F =31.801, Box s M =706.148).

#### Homogeneity of variance of groups





Table 4. Summary of Levine test to check the homogeneity of variances of two groups in score of emotional self- regulation's components

Heterogeneity of variance test				
Components	Lone statistics	Degree of freedom 1	Degree of freedom 2	Sig
Cognitive	2.245	1	118	0.136
Behavioral	2.132	1	118	0.146
Focus on repositioning	1.957	1	118	0.163
Focus of change emotion	4.702	1	118	0.031
Reducing negative emotions	0.613	1	118	0.435
Increase positive emotions	0.305	1	118	0.581

The results of the above table about investigating homogeneity of variances of components of emotional self-regulation show that in all aspects, this condition is established.

Table 5. Summary of multivariate analysis of variance to compare two groups in components of emotional self- regulation

effects	Wilks Lambda	F	Degree of freedom	Degree of freedom of error	Sig	Power of test
Group	0.087	196.971	6	113	0.001	0.913

Given the amount of Wilks Lambda test (0.087) and F calculated (196.971) with degrees of freedom 113 and 6 can reject the null hypothesis ( $p < 0.01$ ). In other words, it could be argued that there is a significant difference at least in one of the components of emotional self-regulation between patents of cardiovascular diseases and non-patients. In order to determine whether in which one of the dimensions, there are differences between the two groups, ANOVA was used.

Table (6) ANOVA between subjects to compare the components of emotional self-regulation

Source of change	Components	Sum of squares	Degree of freedom	Mean of squares	F	Sig	Size of effect
Group	Cognitive	13632.008	1	13632.008	460.833	0.000	0.796
	Behavioral	65426.700	1	65426.700	566.354	0.000	0.828
	Focus on repositioning	39494.408	1	39494.408	341.522	0.000	0.743
	Focus of change	43092.300	1	43092.300	289.352	0.000	0.710



	emotion						
	Reducing negative emotions	64914.008	1	64914.008	285.852	0.000	0.708
	Increase positive emotions	14191.875	1	14191.875	445.014	0.000	0.790
Error	Cognitive	3490.583	118	29.581			
	Behavioral	13631.667	118	115.523			
	Focus on repositioning	13644.583	118	115.635			
	Focus of change emotion	17573.700	118	148.927			
	Reducing negative emotions	26796.583	118	227.090			
	Increase positive emotions	3763.117	118	31.891			
Total	Cognitive	238401.000	120				
	Behavioral	1394928.000	120				
	Focus on repositioning	657917.000	120				
	Focus of change emotion	799194.000	120				
	Reducing negative emotions	1409885.000	120				
	Increase positive emotions	153901.000	120				

The results of analysis of variance of above table show that there is a significant difference between patients with cardiovascular diseases and non-patients in all components of emotional self-regulation include:

Cognitive ( $P=0.001$  F1 and 118= 460), behavioral ( $P=0.001$  F1 and 118=566.354), focusing on the changing position ( $P=0.001$  F1 and 118=341.55) and focus on change emotion( $P=0.001$  F1 and 118=289.35), decreasing negative emotions ( $P=0.001$  F1 and 118=285.85) and increase positive emotions ( $P=0.001$  F1 and 118=445.014). So in total it can be concluded that patients of cardiovascular diseases have lower emotional self-regulation than non-patients.

**The second hypothesis:** there is a difference between the perceived stress (positive perception of stress, negative perception of stress) in patients with cardiovascular diseases and non-patients.

Before testing the hypotheses, assumptions are examined using MANOVA.

Homogeneity of variance-covariance matrix





Table 7. Summary of the equality test of box covariance matrix

Box static	F	Degree of freedom 1	Degree of freedom 2	Sig
18.459	6.040	3	2506320.0	0.001

Results of above table shows that the covariance matrix observed of dependent variables is equal in groups ( $P = 0.001$ ,  $F = 4.055$ ,  $Box\ s\ M = 63.719$ ).

### Homogeneity of variance

Table 8. Summary of Levine test for homogeneity of variance in two groups in the score of components of perceived stress

Heterogeneity of variance test				
	Lone statistics	Degree of freedom 1	Degree of freedom 2	Sig
Negative perception of stress	1.927	1	118	0.168
Positive perception of stress	1.846	1	118	0.177

The results of the above table about investigating the homogeneity of variance of dimensions of perceived stress show that in both dimensions, this condition is established.

Table 9. Summary of multivariate analysis of variance to compare two groups in components of perceived stress

effects	Wilks Lambda	F	Degree of freedom	Degree of freedom of error	Sig	Power of test
Group	0.905	6.118	2	117	0.003	0.095

Given the amount of Wilks Lambda test (0.905) and F calculated (6.118) with degrees of freedom 117 and 2 can reject the null hypothesis ( $p < 0.003$ ). In other words, it could be argued that there is a significant difference at least in one of the components of perceived stress between patients with cardiovascular diseases and non-patients. In order to determine whether in which one of the dimensions, there is difference between the two groups, ANOVA was used.

Table (10). ANOVA between subjects to compare the dimensions of perceived stress



Source of change	Components	Sum of squares	Degree of freedom	Mean of squares	F	sig	Size of effect
Group	Negative perception of stress	213.333	1	213.333	11.458	0.001	0.089
	Positive perception of stress	2977.033	1	90.133	4.039	0.047	0.033
Error	Negative perception of stress	2977.033	118	18.616			
	Positive perception of stress	2633.567	118	22.318			
Total	Negative perception of stress	63792.000	120				
	Positive perception of stress	75048.000	120				

The results of analysis of variance in above table show that there is a significant difference among patients with cardiovascular diseases and non-patients in: negative perception of stress ( $P=0.001$   $F_1$  and  $118=11.458$ ) and positive perception of stress ( $P=0.047$   $F_1$  and  $118=4.039$ ). The third hypothesis is confirmed also in other words patients with cardiovascular diseases than non-patients with negative perception have higher stress and with positive perception have lower stress.

## 6. Conclusion

The aim of this study was to compare emotional self-regulation and perceived stress in patients with cardiovascular diseases and non-patients. For this purpose, 60 patients with cardiovascular diseases and 60 non-patients were assessed through test of March's emotional self-regulation strategies and Cohen's perceived stress.

The findings of this study showed that there is a significant difference between patients with cardiovascular disease and non-patients in all components of emotional self-regulation consists of: Cognitive, behavioral, focusing on repositioning and focusing on the change of emotion and reduce negative emotions and increase positive emotions; This means that patients with cardiovascular diseases have lower emotional self-regulation than non-patient. This result is consistent with research findings of Appleton, Loucks, Buka and Kubzansky (2014) from the emphasis on the role of different emotion regulation strategies on cardiovascular health. They in their study concluded that for every one standard deviation increase in the re-evaluation strategy, risk of cardiovascular diseases, 5.9% decreases and an increase of one standard deviation in retention of emotion regulation, risk of cardiovascular diseases, 10 % increases. It can be argued that the use of effective strategies of emotional



regulation may promote cardiovascular health. The results of this research with the research findings of Appleton, Loucks, Buka and Kubzansky (2013) are consistent in order to emphasize the role of readiness of distress of childhood in increase of the risk of cardiovascular diseases and increasing role of focus on reducing the risk of cardiovascular diseases. In line with the results of this study, Kok et al (2013) considered the relationship between positive emotions and physical health; He concluded that the relationship between positive emotions and physical health through individuals' perception from positive social connections is mediated. Kok and colleagues showed that increase of positive emotions increases perception of social communication. The findings of this study was led to identify the mechanism (Perceived social connections) through which positive emotions are led to physical health. These results suggest that positive emotions affect positive social connections and physical health of each other in a spiral dynamic model. Considering the results of this study and other studies mentioned above, it can be argued that people with cardiovascular diseases compared with non-patients use maladaptive emotion regulation strategies especially more inhibition and positive emotion regulation strategies (such as re-evaluation) less.

The second hypothesis results showed that there is a significant difference among patients with cardiovascular diseases and non-patients in a negative perception of stress and the positive perception of stress; In other words patients with cardiovascular diseases than non-patients with negative perception have higher stress and with positive perception have lower stress. These results in a transactional model of stress (Lazarus and Cohen, 1973, 1977; Lazarus, 1975, Lazarus & Folkman, 1987) can be explained. This model suggests that stress is an interaction between the individual and the external environment and that stress responses occur when people assess a potentially stressful situation really stressful. Lazarus model from assessment describes people as psychological entities that assess the external world rather than merely have passive responses to it. This model emphasizes the active role of individuals in dealing with the external environment. The findings are consistent with results of Kershaw et al (2014); the researchers showed that stressful life events and more social pressures are associated with higher incidence of coronary artery disease and myocardial infarction. The results of this study are consistent with the research results of Bonier, Chamot and Perneger (2004) in order to emphasize the role of perceived stress on health. The researchers argue that perceived stress is an important risk factor for poor mental health. On the one hand, these results are consistent with the research results of Asmakhany Akbarinejad, Aghazadeh and Asbaghi (2013), Haghani (2013), Soltani Shal, Aghamohammadian Sherbaf and Karshaki (2013), in order to emphasize the role of perceived stress on health, resilience and quality of life. So considering the results of this research and other studies mentioned above can be argued that people with cardiovascular diseases compared to non-patients have high negative perception from stressful life events; It might be argued that people with cardiovascular diseases do not have a good impression of the events of everyday life, and this is one of the important reasons predisposing these individuals.

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