

## Comparison of Temperament and Character Traits in Patients with Coronary Heart Disease and Normal Population

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**Abstract:** The purpose of this study is comparing temperament and character traits, in patients with coronary heart disease to normal subjects. This is a causal-comparative study. The population include patients referred to SediqehTahereh Rehabilitation Center which among them, 115 patients were selected by convenience sampling. To choose normal people, 115 persons were selected from among all normal people in Isfahan by convenience sampling. The two groups were matched in terms of age, education and gender. Assessment tools are questionnaires of temperament and character. Data were analyzed using software in SPSS18. The results showed a significant difference MANOVA between the two groups in: Components of avoid injury, reward dependence and self-directed. There is not a significant difference in other components. It seems that personality characteristics play an important role in this disorder. To identify and control these variables can help to reduce symptoms of the disease.

**Key words:** Temperament and character traits, anxiety sensitivity, emotion regulation strategies, coronary heart disease, normal people

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### INTRODUCTION

For decades, epidemiologists have examined the rate and frequency of coronary artery diseases in different cultures. The results of their studies show that the cardiovascular disease is dieses for developed societies; it means that the incidence rate of heart disease in industrial societies is more than other countries (Sarafino and Edward, 2006). According to the researches, this disease is the most prevalent reason for the hospitalization of adults (Keaton, 2007). It is predicated that until 2020, the heart disease will kill 25 million people yearly (Shepherd and While, 2012). On the other hand, the cardiovascular disease is the first factor of death in different countries and in 2030, it will be the most common reason of mortality in the world. In addition to the death, this dieses leads to the considerable incidence of incapability and it will be the main reason of health expenses America Heart Association, claimed by Sniehotta *et al.* (2005).

Cardiologists believe that many identified physical factors are related to the heart disease. These factors can

be high blood pressure, high level of bad cholesterol, diabetes, lack of physical activity, overweight and genetics. However, evidence suggests that these factors extremely predicate 50% for outbreak of this disease and aforementioned physical factors cannot lead to the outbreak and continuation of coronary heart disease (Andreoli *et al.*, 2005). The poor lifestyle and neglecting health behaviors are among the factors which can provide the causes for cardiovascular disease.

Psychological systems emphasize the effects of mental dynamic factors like emotions and personality on accepting disease (Denollet, 2005). Personality is a psychological variable which influences all the human behaviors in the personality and social life (Fresan *et al.*, 2004).

It seems that personality differences are significant factors which lead to the different reactions against emotions, stress and everyday problems of life. Moreover, it can be the basis of human mortality as a result of coronary heart disease. In fact, identification and change of negative personality properties which play effective role in outbreak of disease and also attention to the

positive aspect of personality which lead to individual resistance are absolutely necessary in treatment of different physical diseases and health promotion of people (Marques *et al.*, 2005).

Lee *et al.* (2014) in a research incident CHD had lower on openness and extraversion scores than those without. Logistic regression models revealed an inverse association between openness factor z-scores. These researchers conclude that High openness appears to be an independent protective factor for incident CHD in the community.

Caprara *et al.* (1995) showed that CHD patients reported to be more emotionally susceptible than non-infarcted subjects. Moreover, they evaluated themselves as even more susceptible one year after the infarction. Puterman *et al.* (2013) in a study on patients with heart disease showed that negative mood, high perceived stress, depression, anxiety and negative thought are among the psychological variables involved in this disease.

Furthermore, investigations have shown that there is a meaningful relationship between personality type D with anger and coronary heart disease (Williams *et al.*, 2008; Broek *et al.*, 2007). Lee *et al.* (2014) also in a research showed that people with heart attack in comparison with control group had more characteristics such as emotional instability, anxiety, depression, introspection and sensitivity. Totally, they were anxious introverted. Examination of these studies shows that some personality factors play fundamental role in vulnerability to illness. Today, one of the aspects of personality which has been examined on chronic diseases is the biological model of personality. Cloninger has presented a model including normal and abnormal personality. Moreover, Geoffrey Gray's theory had important role in infrastructure of his theory to make TCI.

In the first step, he believes that natural systems in brain have functional organization composed of different and independent systems for activating continuance and behavior inhibition in response to the certain groups of stimuli. Behavioral activation is in response to the new stimuli and symptom of reward and release from punishment. Therefore, in such capability, individual differences are referred to the "Novelty seeking". Inhibition is a behavior in response to the punishment stimuli and lack of reward. Individual differences in ability to interrupt or behavioral inhibition are called harm avoidance (vulnerability). The behavior which is reinforced by reward is usually continues a period of time after stopping reward. Individual difference in continuance of response after stopping reward was called "reward-dependence" by Cloninger. Thus, in the part of

nature, he introduced these three dimensions that each includes four subscales and then called the fourth scale as persistence which lacks subscale (Cloninger, 2006).

Cloninger also considers three dimensions for the nature. In this set, he has defined the aspect of Self-defectiveness based on self-assumption as an independent person who has subsets of unity, respect, esteem, effectiveness, leadership and prospect. Moreover, the aspect of Cooperativeness based on self-assumption is existed as a part of human world and society and its derivations are social sense, compassion, conscience and desire to do charity. In addition to these two dimensions, Self-transcendence based on self-conception has been propounded as a part of world and its resources which is accompanied with mysterious illusions, religious faith and unconditional equanimity and patience. These aspects have been examined in the risk of various diseases such as addiction (Vitoratou *et al.*, 2015), bipolar and depression (Zaninotto *et al.*, 2015), hyper-activation, eating disorders (Lee *et al.*, 2015; Rodriguez *et al.*, 2014), eye movements (Lim *et al.*, 2014) and anxiety (Melegari *et al.*, 2015). This study sought to examine these factors in coronary heart disease.

## MATERIALS AND METHODS

The design of this research is Ex post facto. Statistical population included two groups:

- Patients group: all patients who referred to Sediqeh Tahereh artery- heart Rehabilitation Center of Isfahan from March 2012 until September 2013
- Normal group: all normal people who have referred Sediqeh Tahereh artery-heart Rehabilitation Center of Isfahan accompany with patients. They were in harmony with patients group from the aspect of gender, age variables and economical-social bases.

In the current study, in order to extending credit, 115 persons have been considered for each group. The entry criteria are as follows:

- All patients who were just artery- coronary heart patients from the viewpoint of cardiologist and were not suffering serious physical disease like diabetes, MS and other diseases. (They had no other disease).
- Age range between 35-85
- At least one year past disease
- Being healthy at the time of test (having no hearing and vision problems)
- According to the clinical interview, the patients have not severe mental disorders like schizophrenia, bipolar and other diseases simultaneously

In order to respect research ethics, anonymous questionnaires were given to the sample members for concealing their identity. The participants were assured that the resulted data will be applied in reaching the goals and hypotheses of current research. In order to analyze the data, the MANOVA was applied.

**Research instruments**

**Demographic form:** This form has been regulated by researcher and includes some questions related to the age, gender, marital status, education, job, income, drug use and smoking.

**Temperament Cloninger Inquiry (TCI):** This questionnaire has been made by Robert Cloninger in 2015. It includes normal and abnormal personalities. This inquiry has been provided for evaluating character traits and features which have been created in a person by genetics (nature) or by environment (temperament).

TCI includes 125 questions and subscales which are as follows: novelty seeking, harm avoidance, reward dependence, persistence, cooperativeness, self-defectiveness and self-transcendence, among them, the three first scales evaluate nature dimensions and three second scales evaluate temperament dimensions. Answering measurement is two-options (true and false) method. In this tool, grading the expressions is based on the scope of two-degrees of Yes-No and respondents should grade each component the score of zero to one, it means that yes takes zero and no takes one. The total values of components for each scope show the score.

The psychometric properties of the TCI have been extensively evaluated in normative and clinical samples (Cloninger, 2006). The Persian version of this nature and temperament questionnaire enjoys desirable stability and validity in non-clinical population of Iran (Kaviani and Pournaseh, 2005).

**Procedure:** At first, the cardiologist examined patients clinically and artery coronary patients received clinical diagnosis. Then, the researcher provided the primary explanations and prepared the patients for attending in the research. After specifying the sample, the questioners were distributed among people.

**RESULTS AND DISCUSSION**

**Findings:** The mean age of coronary heart patients is 61.29 and standard deviation is 8.58. The mean age of normal people is 58.88 and standard deviation is 8.24. Among the total members of sample who were

Table 1: Descriptive indicators of temperament and nature in the two groups of normal people and coronary heart patients

Components of personality	Heart coronary group		Normal group	
	Mean	SD	Mean	SD
temperament and nature				
Novelty seeking	8.62	3.13	8.71	2.72
Harm avoidance	8.56	3.93	9.68	3.07
Reward dependence	8.14	2.03	8.74	1.88
Persistence	3.19	1.25	3.25	1.27
Cooperativeness	16.64	3.79	17.78	2.56
Self-defectiveness	15.46	4.74	13.58	5.02
Self-sublimation	9.99	2.67	10.26	2.36

115 persons of coronary heart group, 75 persons (64.3%) were in men group and 41 persons (35.7%) in women group. Applying MANOVA required observing some pre-hypotheses. Box's results ( $p < 0.05$ ;  $F = 2.21$ ) implies equality of covariance. The assumption of equality of covariance for the scores of two groups has been observed in the components of reward dependence, persistence and self-defectiveness. However, this matter has not been observed in the components of novelty seeking, harm avoidance, cooperativeness and self-sublimation. Furthermore, pre-hypothesis of covariance equality has not been realized. However, given the large sample sizes and >40 persons, using standard measuring tools and being space measure of dependent variable, parametric statistics can be used.

Table 1, the mean and standard deviation for the components of temperament and nature have been presented in the normal group and coronary heart patients. As it can be seen in Table 1, the mean of novelty seeking in coronary heart patients is 8.71 and in normal group is 8.62, the mean of harm avoidance in coronary heart patients is 9.68 and in normal group is 8.56, the mean of reward dependence in coronary heart patients is 8.74 and in normal group is 8.14, the mean of persistence in coronary heart patients is 3.25 and in normal group 3.19, the mean of cooperativeness in coronary heart patients is 17.78 and in normal group 16.64, the mean of self-defectiveness in coronary heart patients is 13.58 and in normal group is 15.46, the mean of self-sublimation in coronary heart patients is 10.26 and in normal group is 9.99.

Table 2, the results of analyzing MANOVA in the case of comparing personality nature and temperament components have been presented. As it can be seen in Table 2, there is a significant difference between coronary heart patients and normal people in the components of harm avoidance, reward dependence, cooperation and self-defectiveness. However, the difference is not significant in other components.

In this research, personality nature and temperament components in coronary heart patients and normal people are examined. Based on what was mentioned, it can be

Table 2: Results of analyzing MANOVA in the case of comparing personality nature and temperament components in the two groups of normal people and coronary heart patients

Rows	Component	Sum of square	df	Mean of squares	F-value	Significance	Eta <sup>2</sup>	Test power
1	Novelty seeking	0.4700	1	0.4700	0.05	0.816	0.001	0.06
2	Harm avoidance	72.410	1	72.410	5.79	0.017	0.030	0.67
3	Reward dependence	21.560	1	21.560	5.61	0.019	0.020	0.66
4	Persistence	0.2000	1	0.2000	0.13	0.721	0.001	0.06
5	Cooperativeness	74.670	1	74.670	7.11	0.008	0.030	0.76
6	Self-defectiveness	204.07	1	204.07	8.56	0.004	0.040	0.83
7	Self-sublimation	4.1900	1	4.1900	0.66	0.420	0.010	0.13

Lambda Wilkes = p<0/01, 3.39, 0/90

said that the level of harm avoidance, reward dependence, cooperation in coronary heart patients is more than this rate in normal people. Moreover, the level of self-defectiveness in normal people is more than this level in coronary heart patients. However, there is no meaningful difference between these two groups in the variables of novelty seeking, persistence and self-sublimation. The results of this study are compatible with the results of Williams *et al.* (2008), Yu *et al.* (2011). The investigations represents high amount of emotional disorders in coronary heart patients and it is reported that in these patients, there are high levels of stress, depression and anxiety as result of Obsessive-Compulsive Disorder (OCD). Moreover, people who are at the risk of coronary heart disease have some personality differences with normal people. They have more harm avoidance, malaise, worry and psychasthenia.

Different researches show that there is relation between Cloninger personality temperament and nature traits and heart disease, addiction and personality disorders (Christodoulou *et al.*, 1999; Conrad *et al.*, 2009). In his studies, Cloninger has propounded some properties for the three personality dimensions of novelty seeking, harm avoidance and cooperativeness. Some of these traits have high prevalence in coronary heart patients. He believes that, people who acquire high scores in harm avoidance are usually timid, nervous, anxious, shy, hesitant, disappointed, embarrassed, passive, pessimistic and unsafe individuals. People with high cooperativeness are known as sympathetic, affectionate, protector and righteous people and those who have low cooperativeness are smug, fanatic, slater and spiteful. It seems that these personality traits-harm avoidance, fear, anger, passivity and active engagement with the environment- have high prevalence in coronary heart patients.

As the results revealed, a meaningful difference was observed between coronary heart patients and normal people. Cooperativeness is originating from personality which is related to the social compatibility and company with social norms. High level of cooperativeness in coronary heart patients rather than normal people

comprises a lot of theoretical and practical implications, such that, it can be stated that these people have higher social responsibility and this matter is revealed in all aspects of life including family and job responsibilities. Social compatibility and conformity means that under the pressures within the group, person has passive role and often submit to the other group members. This matter can put a lot of pressure on individuals and predisposes the coronary heart disease in long term. Combining this factor with the next factor-self-defectiveness can intensify damages. As it showed above, in the trait of self-defectiveness, the normal people acquired higher scores rather than coronary heart patients. In explaining these results, it can be said that since people with high self-defectiveness have more acceptance towards their social liabilities and when they are in a group, experience a lot of accountability, solution and goal (Svrakic *et al.*, 2002). Therefore, they are at the risk of enormous mental pressure and should manage these pressures and negative emotions caused by that. However, low score in cooperativeness can represent enormous pressure on a person on which from one hand s/he has the role of cooperator and on the other hand tends to manage pressure and crisis. These two conflicting features together can lead to mental pressure tolerance and making stress. As the investigations have shown, the chronic stress in coronary heart patients is more than that in normal people. Such biological and environmental traits of one's personality can be mentioned as a basis for this chronic stress.

Analyzing results showed that the level of harm avoidance in coronary heart patients is more than that in normal people. Those who have high level of harm avoidance will experience more extended range of negative emotions (Cloninger, 2006). Experiencing this extension of negative emotions (anger, anxiety and depression) intensifies the severity of disease and people will experience more symptoms of higher intensity. According the results of this study, it seems that those people who have high level of harm avoidance (as a temperament dimension) and low level of self-defectiveness (as a nature dimension) have higher susceptibility to the coronary heart disease. The low level

of self-defectiveness in individuals refers to the situation on which people have lost their self-defectiveness at the time of stress experience and have become more immersed in their thoughts and inner world and then have experienced low self-esteem. On the other hand, the person avoids harmful factors, therefore, the two factors of self-defectiveness and harm avoidance together in high levels can play a significant role in experiencing chronic negative emotions.

Generally, it can be stated that, as a result of these personality traits, the people perceive more environmental stresses rather than normal population and these tensions affect health. People with high level of tension have extreme desire to do things that increase the possibility of getting sick or hurt them. Moreover, stressful situations cause secretion of adrenaline and noradrenaline and increase heartbeat. In other words, as a result of changes like increasing heartbeat and high blood pressure, heart's need for oxygen increases and it can cause a heart attack in people who have heart disease.

Response to the stress by releasing catecholamine and corticosteroid can increase the density of blood platelets and constriction of coronary artery blood vessels and as a result of that the risk of blood clots in arteries increases. Another interpretation can be this fact that personality and psychological variables may influence the coronary heart disease by behavioral ways such as disorder in conduct or failure to positive behaviors related to health. Furthermore, the results of current study are compatible with this conclusion that psychological factors have important role in coronary heart diseases.

On the other hand, regarding the role of personality traits in heart diseases, the Rozenski's viewpoint can be mentioned. He states that personality traits in occurrence of heart events act in two ways. On one hand, these traits can be the grounds for unhealthy living habits which play their roles in shaping heart diseases and on the other hand, the personality traits can accelerate the occurrence of heart diseases by setting pathophysiological mechanism.

Beside, although personality traits are among the underlying factors for coronary heart disease, it should be noted that the former disease may gradually change to depression and mental disorders due to prolonged illness and since the depression is one of the important factors of heart disease, the high level of scores in considered type of patients especially in traits with personality origin are from this type of depression.

### CONCLUSION

Generally, it can be stated that, there are some differences between people with coronary heart disease

and healthy people in some personality traits. These people tend to suffer more distress and worry and they feel more mental fatigue. Following the emotional disorders, they may lose their freshness state and novelty seeking and become less interested in environmental stimuli and more immersed in their thoughts and inner world. Accordingly, it is necessary to consider two personality factors of harm avoidance and self-defectiveness practically in different ways at different levels of prevention programs. There is a relationship between personality and some cardiovascular risk factors, supporting the role of personality factors across this disorder. It setting an evidentiary standard whether psychological factor can anticipate cardiac conditions.

### LIMITATIONS

The limitations of the present study are lack of available sampling and homogeneous heart patients according to disease type (treatment with medication, simultaneous drug treatment and surgery), failure to control the disease and failure to investigate genetic and environmental factors in disease. It is suggested that in order to better identification of manifest and latent psychological variables in accepting heart diseases, the structural models can be examined.

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