A Comparison of Type D personality and Physiologic Variables in Coronary Heart Diseases with and without Surgery
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Abstract
The purpose of the present research was to compare type D personality and Physiologic variables in coronary heart diseases with and without surgery, and healthy persons. The research sample consisted of 84 patients with CHD (with and without surgery) who were admitted in Moddaress hospital and 44 healthy persons. To collect the data, Type D Personality Scale (DS14), and Demographic Check List were utilized. The frequency and prevalence of type D personality in coronary heart disease is 38/1% and in healthy group is 25%. The results showed that type D personality was more prevalent in coronary heart disease patients than in healthy persons. Also, significant difference was obtained in systolic blood pressure and body mass index (BMI) between coronary heart disease with and without surgery, and healthy group. But there is not a significant difference among 3 groups in diastolic pressure and blood group. Considering the high frequency of type D personality in coronary heart diseases, recognizing this construct and physiologic variables and controlling them can be useful, and focusing on these factors can cause better and more stable results.

1. Introduction
Cardiovascular diseases are the leading causes of mortality in developed and developing countries (Sol, Vander-Graaf, Goessens, Visserren, 2009) among which the coronary heart disease (CHD) is recognized as the most fatal cardiovascular disease, being the cause of more than 50% of cardiac deaths (Ridker, Genest & Libby, 2000). In cardiovascular disease, high cholesterol level, unhealthy lifestyle, as well as psychosocial variables have been identified as risk factors which explain more than 90% of the incidence causes of coronary heart diseases (Leon, Franklin Costa, Balady & Berra, 2005). Research conducted by Shakhessi (2002) demonstrated that more than 80% of CVD patients had hyperlipidemia.
One of the important variables effective on CVD is Type D personality. The concept of Type D personality indicates the interaction of specific traits that may have deleterious effects on health. There is a negative relationship between Type D personality and well-being of cardiovascular patients. Results indicate that tension/stress caused by Type D
personality affect the health through behavioral and physiological changes (Denollet, Conraads, Brutsaer, Clerck, Stevens & Vrints, 2003).

Type D personality has been considered as a risk factor in long-term prognosis of cardiac disease patients. According to Denollet (Denollet et al., 2003), Type D personality refers to individuals who spontaneously experience increased negative emotions (negative affectivity) and social inhibition. It is supposed that the presence of negative emotions is not only to be noticed as a risk factor, but also we should pay attention to the adaptive methods of the individuals against these negative emotions (Williams, O’Conner & Howard, Hughes, Johnstorn, et al. 2008). Negative affectivity has been associated with chest pain in the absence of coronary heart disease; however, it is also associated with real heart coronary disease. Therefore, negative emotions may act both as an intervening variable and as an actual risk factor (Denollet, Vaes, Brantsaert, 2000). Social inhibition is recognized by stable tendency to inhibit emotional experiences and behaviors in social interactions. Individuals with high levels of social inhibition mostly tend to inhibit the expression of their feelings and beliefs (Emons, Maier, Denollet, 2007). Pedersen et al. (Pedersen, Denollet, Ong, Serruys, Erdman & Van-Sonburg, 2007) showed in a study of 186 cardiac patients that 18% of the patients had Type D personality. Danneman et al. (Dannemann, Masteckhy, Einsle, Smucker, Zimmermann, Joraschky, Weidner, 2010) showed in a study, examining Type D personality in 126 cardiac patients with coronary artery bypass graft surgery (CABG) and valvular heart surgery, that 26% of patients had Type D personality before surgery while 11% displayed Type D personality traits before and after the surgery as well.

Considering increased prevalence of Type D personality and the role of this type and physiological variables in coronary heart disease, and because of the limited number of studies on this field, conducting the current research is of a great importance. The aim of this study is to compare the prevalence rate of Type D personality and physiological variables in coronary heart disease patients with and without surgery to that of in healthy individuals.

2. Method

This research is of a descriptive type. The inclusion criteria for patients consisted of: 1- receiving a diagnosis of coronary heart disease, 2- their treatment method to be surgery or nonsurgical coronary artery revascularization 3- education level not lower than high school diploma, 4- having good clinical condition (not being under effect of anesthetics, not suffering from pain) so that they can complete questionnaires in a conscious state, and 5- being volunteer to take part in the study with full consent.

The healthy/non-patient sample of this study are all who referred to the cardiovascular research center of Shahid Modarres specialized hospital following the center’s call for participation in a research project to examine the condition of cardiovascular health. Totally 120 questionnaire were distributed to the patient group 84 out of which were completed and returned. After eliminating those with inadequate information, the present sample consisted of 40 patients with surgery and 44 ones without surgery in addition to a non-patient group consisting of 44 individuals were used for data analysis.

After getting the permission and fulfilling the required coordination, subjects were informed of the aims of the study and were explained that the research had no relevance to the patient’s treatment course. Then, the questionnaires were handed out and, when their clinical test results and the data obtained by medical examinations were ready, the questionnaires were gathered and completed.

To collect the required data, the following instruments were utilized:

2.1. Biographic and Physiological Checklist: It was developed by the researcher on the basis of previous studies on similar issues and the risk factors for cardiovascular disease. The checklist included information about weight and height (to calculate BMI), blood pressure, smoking, diabetes background, laboratory test results and angiography, echocardiography, and EF records of the patient.

2.2. Type D Personality Scale (DS14; Denollet, 1998): The type D personality scale is developed by Denollet (1998). It contains 14 items and assesses negative affect and social inhibition components. Cronbach’s alpha coefficients gained for negative affect and social inhibition subscales were 0.88 and 0.86, respectively. The coefficient of concurrent validity of this scale compared to Type A personality Scale reported as 0.63 (Jonge, Denollet, Vannmelle, Kuypur, Honig, Hschence & Ormet, 2007).
3. Results

Results showed that 47.64% of the patients had a heart disease background less than one year, 19.1% 1-5 year, 17.9% 6-10 years, 11.9% 11-20 years and 3.6% more that 20 years. Mean age of the coronary heart disease patient groups with and without surgery were respectively 54.8±11.71 and 52.61±11.03 years. 67.8% (79 patients) were men and 32.2% (17 patients) were women. 73.8% of the patients (62 persons) had a background of diabetes. In addition, mean systolic pressure of the patients with surgery was 130 mmHg and of those without surgery was 134.3 mmHg. Mean HDL in patients with and without surgery were 45.45 and 48.42, respectively. Mean body mass index (BMI) in coronary heart disease patients group with and without surgery were 25.87 and 26.28, respectively. Mean LDL of patients with surgery was 98.51 and of those without surgery was 97.83. Mean cholesterol in coronary heart disease patients group with and without surgery were 165 and 151, respectively. TG in coronary heart disease patients groups with and without surgery were 161 and 130, respectively.

Table 1. Frequency Distribution, and percentage and chi square of Type D personality and physiological variables in coronary heart disease patients and healthy persons

| Variable                  | Levels | Groups     | Frequency | Chi Square |
|---------------------------|--------|------------|-----------|------------|
|                           |        | Healthy    | Without Surgery | With Surgery |           |
| Type D personality        | Yes    | 11         | 14         | 18         | 43         | 27.12 (.001) |
|                           | No     | 23         | 30         | 22         | 85         |           |
| Diabetes                  | Yes    | 41         | 30         | 32         | 103        | 8.76 (.01)  |
|                           | No     | 5          | 14         | 8          | 25         |           |
| EF                        | <30    | 1          | 23         | 19         | 42         | 1.30 (.32)  |
|                           | 30-50  | 23         | 20         | 18         | 38         |           |
| Cigarette                 | 0-10   | 44         | 34         | 28         | 106        | 32.86 (.001) |
|                           | 11-20  | 0          | 7          | 10         | 17         |           |
|                           | 21-30  | 0          | 2          | 5          |           |           |
| BMI                       | 0-18.5 | 02         | 14         | 18         | 1          | 54         | 14.90 (.01) |
|                           | 18.5-25| 10         | 24         | 15         | 49         |           |
|                           | 25-35  | 10         | 6          | 16         | 22         |           |
|                           | 35-40  | 2          | 0          | 0          | 2          |           |
| SBP                       | <80    | 37         | 13         | 19         | 69         | 30.41 (.001) |
|                           | 80-89  | 37         | 10         | 7          | 5          | 75         |
|                           | 90-99  | 8          | 6          | 6          | 12         |           |
|                           | >100   | 1          | 4          | 2          | 7          |           |
| DBP                       | <80    | 37         | 32         | 29         | 94         | 3.28 (.28)  |
|                           | 80-89  | 37         | 15         | 15         | 6          | 21         |
|                           | 90-99  | 8          | 7          | 6          | 21         |           |
|                           | >100   | 1          | 4          | 2          | 7          |           |
| HDL                       | 0-30   | 4          | 10         | 10         | 24         | 7.19 (.01)  |
|                           | >35    | 40         | 22         | 23         | 85         |           |
| LDL                       | 0-130  | 35         | 26         | 23         | 84         | 9.9 (.62)   |
|                           | >130   | 2          | 1          | 1          | 4          |           |
| TG                        | 0-200  | 37         | 26         | 22         | 85         | 1.7 (.25)   |
|                           | >200   | 2          | 5          | 4          | 14         |           |
| Chol                      | <200   | 31         | 29         | 22         | 82         | 8.59 (.001) |
|                           | >200   | 10         | 3          | 3          | 2          |           |
Table 1 shows that frequency of Type D personality is 45% (18 persons) in coronary heart disease patients group with surgery, 31.8% (14 persons) in patients group without surgery, and 25% (11 persons) in healthy group. Moreover, there is a significant difference ($p < 0.01$) between coronary heart disease patients with and without surgery and healthy individuals in terms of cigarette consumption ($x^2 = 32.86$). No significant difference was gained between EF rate in coronary heart disease patients and that of in healthy individuals. On the other hand, there gained a significant difference ($p < 0.01$) between coronary heart disease patients with and without surgery and healthy group in terms of systolic blood pressure (SBP) ($x^2 = 30.41$) and BMI ($x^2 = 14.90$), but the difference of diastolic blood pressure (DBP) among three groups was not significant. Also, Table 1 demonstrates that there is a significant difference ($p < 0.05$) between the levels of blood HDL ($x^2 = 7.19$) and cholesterol ($x^2 = 8.59$) in coronary heart disease patients with and without surgery and healthy individuals while there gained no significant difference between LDL and TG in above mentioned groups.

4. Discussion and conclusion

The aim of this study was to compare Type D personality and physiological variables in coronary heart disease patients with and without surgery and healthy individuals. The results showed that the rate of Type D personality in coronary heart disease patients with and without surgery is higher relative to healthy individuals (40% in patients with surgery, 31.59% in patients without surgery and 25% in healthy individuals). This rate of prevalence is in line with the study conducted by Pedersen et al. (Pedersen & Herrmann-Lingen, 2010). The prevalence rate of Type D in patients with heart failure was reported 31.91% in their study. Yu et al. (Yu Thompson; Man Yu, Pederson & Denollet, 2010) showed that Type D personality is a valid cross-cultural construct which is not limited to a specific culture. According to them, prevalence of Type D personality was 31% and it was not dependent to transient emotional conditions. In a study, Pedersen & Denollet (2004) came to the conclusion that the prevalence of Type D personality in both groups of patients (25%) and healthy (24%) was almost the same. In the present study, the prevalence rate of Type D personality in healthy group was exactly in accordance with that of in Denollet’s study, but the prevalence rate in patients group gained much higher (33.59%) one of the reasons of which could be the difference in the sample sizes of these two studies. The explanation can be given for this result is that Type D personality can be a predictor of consequences that are detrimental to health; that is to say, tendency to express negative emotions and to inhibit self-expression have negative effects on the individual’s mental health, so that negative affect is associated with vulnerability to anxiety and depression as well as social inhibition with intrapersonal stressors and admitting failure. Moreover, it is possible to indicate that individuals with Type D personality who have an endurable tendency to experience negative emotional states would experience more anxiety and worry, phobia, and irritability. These states, in turn, make the heart’s coronary system vulnerable and interrupt the process of treatment (Denollet, Vaes & Brautsaert, 2000).

Results demonstrated that cigarette consumption rate in coronary heart disease patients relative to healthy individuals is higher. Smoking as the major risk factor for incidence of coronary artery disease, results in degeneration of muscular tissue of the heart (the myocardium) due to cut-off of blood flow in coronary artery and play a role in developing aorta aneurism and symptomatic valves diseases and ischemic attacks. In addition, cigarettes –with its acute adverse effects on blood pressure and sympathetic activity, and by decreasing myocardial oxygen consumption – play a role in the formation of blood clots within blood vessels (Barua, Ambrose, Srivastava et al., 2003).

In this study, the SBP level ($p < 0.001$) in coronary heart disease patients with and without surgery relative to healthy group is higher. SBP and pulse pressure are more important than diastolic pressure. The systolic hypertension dissociation indicates a pathophysiologic status in increased blood pressure which proves that the elasticity of arteries has been reduced and dose not necessarily accompany high mean arterial blood pressure.

In this study, the body mass index rate ($p < 0.05$) in coronary heart disease patients with and without surgery relative to the healthy group is higher. These results are in line with the study conducted by Chobanian, Bakris, Black, et al. (2003). High BMI relative to biological effects of physical activity has stronger relevancy to cardiovascular problems (Mora, Lee, Buring & Ridker, 2006).
The level of blood LDH in coronary heart disease patients relative to healthy individuals is higher. This result is in line with the study done by Brewer (2004). Lipoprotein has a strongly reverse relationship with the risk of vascular disease. Reverse cholesterol transport process may explain the protective role of HDL against death caused by coronary disease. On the basis of this hypothesis, HDL can help remove cholesterol from the walls of blood vessels causing the peripheral catabolism to increase and improve. Moreover, HDL can transfer antioxidant enzymes which decrease the oxidation rate of phospholipids in atheromatous lesions. The cholesterol level in coronary heart disease patients relative to healthy individuals is higher. This result is in line with Brewer’s study (2004). High level of cholesterol correlates with death caused by coronary heart disease. Stable high level of cholesterol predicts the risk of cardiovascular events in future, so timely interventions and preventions can be effective.

Considering relatively high frequency of Type D personality in coronary heart disease patients relative to the healthy group as well as the role of some physiologic variables (HDL, SBP and BMI), paying attention to these factors can be helpful because focusing on them can lead to better and more stable treatment results. In addition, these variables can lead people towards the more healthy state by producing protective effects. With regard to the role of these variables in health-related behaviours, we can step towards prevention, treatment and planning health programs for coronary heart disease patients.

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