

The Relationship between Type D Personality and Multidimensional Health Locus of Control among University Students Population

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Type D personality is predictive of adverse clinical outcome and psychological distress in cardiac patients. The mechanisms by which type D personality influences health are largely unknown. The aim of this study is to investigate the relationship between type D personality and the health locus of control. A sample of 588 students (370 females and 218 males) were selected, according to the cluster random sampling method, from the students of Tabriz University and were asked to complete a questionnaire about type D personality and Multidimensional Health Locus of Control. Research data were analyzed by statistical methods of Pearson correlation and stepwise regression analyses. The results showed that, through dimensions of Health Locus of Control, only the relationship between negative affect and social inhibition with health locus of control of powerful others were positive and statistically significant. Also, regression analysis showed that components, such as negative affect and social inhibition were good predictors for health locus of control of powerful others. Based on these findings, we conclude that people with type D personality have high health locus of control of powerful others; and both dimensions, i.e., negative affect and social inhibition, are correlated with high powerful others' health locus of control.

Keyword: Type D personality, negative affects, social inhibition, Multidimensional Health Locus of Control

Psychological risk factors have been implicated in the onset and progression of cardiovascular disease (CVD) and associated with impaired

health status (Spindler, Krus, Zwisler & Pedersen, 2009). A number of psychological risk factors for cardiovascular disease (CVD) have been identified, such as depression, low social support and hostility (Denollet, 2005). A personality type which has received significant attention in the health literature recently, especially among cardiac populations, is the 'distressed' or type D personality (Polman, Borkoles & Nicholls, 2010). The construct of type D was developed by Denollet of the University of Tilburg in 1995. This type was initially discovered in cluster analysis of neuroticism and extraversion data from cardiac patients in The Netherlands (Williams, Carroll & O'Connor, 2009).

Type D is characterized by high levels of negative affectivity (NA) and social inhibition (SI). People with high levels of NA are likely to experience distress, anxiety, irritability, pessimism, and worry. NA is also related to a negative view of oneself, the world, the future, and others. SI is associated with individuals being tense, having fewer personal ties, and being uncomfortable when socializing with other people (Kupper, Denollet, de Geus, Boomsma & Willemsen, 2007).

The type D personality construct was originally developed in Belgian patients with ischemic heart disease, but the value of the construct has subsequently been confirmed in patients with peripheral arterial disease, chronic heart failure, arrhythmia, and in patients treated with revascularization procedures (Pedersen et al., 2009). Type D appears to be a significant risk factor for morbidity and mortality among cardiovascular patients, independent of other biomedical predictors, psychosocial predictors, and disease severity. In their recent reviews, Kupper, Denollet, de Geus, Boomsma & Willemsen (2007), and Pedersen & Denollet (2006) reported that type D is an independent predictor of increased mortality among patients with coronary artery disease. Also, individuals with type D personality appear to experience higher levels of chronic stress, emotional difficulties, and social difficulties (Denollet, 1998). For example, type D personality has been associated with more symptoms of depression (Schiffer, Pedersen, Broers, Widdershoven & Denollet, 2005) and anxiety

(Van Den Broek, Nyklicek, Van Der Voort, Alings & Denollet, 2008), chronic tension, anger, pessimism (De Fruyt & Denollet, 2002), high levels of obsolescence (Polman, Borkoles & Nicholas, 2010), lack of perceived social support, lower subjective well-being and self-esteem, and dissatisfaction with life (De Fruyt & Denollet, 2002).

Also, the clinical problems associating with mood in patients with type D personality is seen more. In addition, suicidal tendencies in people with type D personality are more, too (Schiffer et al, 2008). Isazadegan, Bashirpour and Sheikhi (2011), in a study on the university students, showed that type D personality has a significant relation with general health and all of its dimensions. The results of the study by Masoudnia (2010) indicated that students with type D personality, compared with those with non-D type personality, in terms of general health, in general, and in terms of the components of physical symptoms, anxiety and insomnia, social dysfunction, and severe depression were different, and came to the conclusion that type D personality is a very powerful construct in explaining and predicting public health of university students.

While the studies are suggestive of a potential causal link between type D and CVD, little is known about the specific pathways which may explain this relationship. Pedersen and Denollet (2006) suggest that type D may have its effect through either psycho-physiological or behavioral pathways. Indeed, previous research which was sought to uncover specific psycho-physiological routes has met with some success. It seems that one of these variables is health locus of control (Williams, Carro, & O Connor, 2009).

Multidimensional Health Locus of Control (MHOLC) is a cognitive factor, which predicts health behavior. Rotter (1966) proposed a concept of "Locus Of Control," as a variable representing a personality that relates to how an individual recognizes the relationship between results are controlled by the behavior and reinforcement (Takeda, 2005). Rotter (1966) developed the Internal-External Locus of Control Scale as a unidimensional measure of generalized expectancies regarding locus of

control. Early research recognized that generalized measures of locus of control were insufficient for predicting specific behaviors, in particular within the health field (Wallston, 2005). Therefore, the Multidimensional Health Locus of Control Scale was developed as a unidimensional measure (internal-external) of beliefs regarding the controllability of one's own health. However, Levenson (1974) proposed a model of locus of control with three dimensions: internal, external-chance, and external-powerful others.

Three dimensions of Health Locus of Control (HLOC), a belief system reflecting the extent to which people perceive personal control over their health, are commonly identified and differentially associated with health outcomes. Internal HLC (IHLC) or beliefs that health outcomes are controlled by personal traits and behaviors is often inversely related to depression, anxiety and physical functioning (Burker, Evon, Galanko and Egan, 2005). Powerful Others HLC (PHLC), or beliefs that health outcomes are controlled by other individuals such as health professionals, relatives or friends, is more frequently associated with adjustment among people with acute health conditions. Whereas, Chance HLC (CHLC), or beliefs that health outcomes are controlled by random luck or chance, is frequently related to poor emotional functioning (Hatamlo Sadabadi, 2009).

Health locus of control is related to various health behaviors and attitudes. For example, internal locus of control is positively related to perceived health, positive perceptions of health professionals, and health-related information seeking, and negatively related to irrational health beliefs and negative perceptions of health professionals. Belief in the control of powerful others over one's health is positively correlated with self-reported medication adherence and negatively correlated with perceived health and negative perceptions of health professionals (McDonald-Miszczak, Maki & Gould, 2000). Franco et al. (2000) found that women at risk for ovarian cancer that scored high on the powerful others subscale of the MHLC scale were more likely to comply with their

doctors' recommendations. As well, higher scores on the powerful others subscale predicted compliance with doctors' recommendations regarding having a mammogram. Chance locus of control has been found to positively correlate with irrational health beliefs and self-reported medication adherence (McDonald-Miszczak et al., 2000). Results obtained by Steptoe and Wardle (2001) suggest that unhealthy lifestyles may be associated with a greater sense of powerlessness over one's health, as exhibited by beliefs in the roles of chance and powerful others in determining one's health (Turriff-Jonasson, 2004). The majority of studies looking at chronic illness and MHLOC have found that higher Internal Locus of Control is predictive of advantageous psychosocial adjustment. This conclusion has been made with cancer patients, individuals during end-stage renal disease chronic pain patients, and individuals with spinal-cord injury (Hatamlo Sadabadi, 2009). However, some studies have found no association between MHLOC and psychosocial adjustment in cancer or between MHLOC and psychological distress in cardiac illness (Fowers, 1994). Also, in several studies on patients with chronic illness (e.g. cardiovascular disease, cancer, end-stage renal disease, spinal cord injuries, traumatic brain injuries, and chronic pain), Internal HLOC was positively related to psychological adjustment and higher perceived health status (Blood, Dineen, Kauffman & Raimondi, 1993; Pucheu, Consoli, D'Auzac, Français & Issad 2004). However, other studies have reported a less clear relationship between HLOC and adjustment to illness (De Boer, Ryckman, Pruyn & Van den Borne, 1999; Fowers, 1994; Friedman, Baer, Lewy & Lane, 1988), and a few studies have found that a more external control orientation is associated with better adjustment (Burish et al, 1984; Franco et al, 2000).

In a study on patients with cardiovascular disease, Helgeson (1992) found that higher Internal HLOC was related to less psychological distress and better adjustment to illness at three-month follow-up. For those patients who were re-hospitalized within these three months for a second cardiac event, the relationship between Internal control expectancies and

psychosocial adjustment to illness was even stronger, suggesting even greater importance of MHLOC regarding disease progression or recurrence (Jamie, Alen & William, 2005).

Sturmer et al (2006) performed a prospective cohort analysis of MHLC and chronic disease development in a German population. The findings revealed that individuals with a high internal locus of control had a decreased risk of myocardial infarction, most likely related to willingness to participate in preventative health behaviors (Cherepakho, 2008). Patients with a high internal health locus of control have less distress and perform more preventive health behaviors that ultimately lead to reduce risk of myocardial infraction in this population (Sargent, 2006).

The majority of studies on type D personality have focused on its prevalence and effects in patients with a variety of cardiovascular diseases since type D construct was originally described and further developed in this patient group. Given the clinical relevance of findings on type D research in the context of cardiovascular disorders, it is also important to assess the potential relevance of type D construct among apparently healthy people than the general population. It would provide a more direct test of the notion that type D is not an epiphenomenon caused by cardiovascular disorder. Moreover, type D personality is based on normal personality traits rather than psychopathology which implies that it should be prevalent in the general population (Mols & Denollet, 2010). The aim of this study is to examine the relationships between type D personality and the Multidimensional Health Locus of Control in healthy people. Based on research and theoretical literature we suggest the following questions:

Question 1: Is there a relation between internal health locus of control and type D personality?

Question 2: Is there a relation between powerful others health locus of control and type D personality?

Question 3: Is there a relation between chance health locus of control and type D personality?

Method

The present study, in terms of the aim and data collection, is fundamental and correlational, respectively. Statistical population of the research covers all male and female undergraduate students of University of Tabriz during academic year of 2010-2011. First, a sample consisted of 588 students (370 females and 218 males) were selected through using the cluster random sampling method. The mean age of participants was 24 years old among whom about 65 percent belonged to the middle social-economical class. In terms of marital status, more than 80 percent were single.

Multidimensional Health Locus of Control (MHLC)

Unidimensional scales for measuring type of control were primarily designed by Wallston (1995). The researchers developed a 3 eight-item Likert scale (IPC SCALE) in order to generally measure the health locus of control. Then, they combined their unidimensional HLC Scale and Levenson's IPC Scale and developed the Multidimensional HLC (MHLC) Scale. The MHLC Scale consists of 3 six- item scales, also using the Likert format.

1. Internal HLC (IHLC) is the extent to which one believes that internal factors are responsible for health/illness.

2. Powerful Others HLC (PHLC) is the belief that one's health is determined by powerful others.

3. Chance HLC (CHLC) measures the extent to which one believes that health illness is a matter of fate, luck or chance.

This instrument helps to predict healthy behavior according to individual beliefs. Wallston health locus of control scale has 18 items. Each item has six options, from strongly agree to strongly disagree. There are six items out of the 18 for measuring the health internal control, and 12 items to measure the influence of factors like chance, powerful others, doctors, and other people in individual health which determine external health locus of control. There are six grades for items, from strongly agree

to strongly disagree, therefore, individuals' score for each subscale would vary from 6-36 which are not added to each other and would be independently calculated. The validity of the test, using test-retest method, was .60 for subscale (I), .51 for chance (C), and .77 for powerful others (P). Alpha coefficient, which shows the internal consistency, was .70, .75, and 0.69 for I, P, and C, respectively (Wallston, 2005). Also, in the present sample, the alpha reliability coefficients were .61, .58, and .67 for I, P, and C subscales, respectively.

Type D Personality Scale

This scale was developed in 1998 by Denollet in order to measure type D personality structure. It has 16 items, 8 of which measure the negative affect subscale and the other 8 items measure the social inhibition. Participants respond on a scale " seldom", "sometimes", "often" and "always" (Denollet, 1998). Negative affections and social inhibition were highly correlated with the extraversion and neuroticism measures of the Big Five Personality Inventory in healthy individuals ($r=0.68- 0.59$) (Denollet, 2000) and cardiac patients ($r=0.68- 0.65$) (Denollet, 2005). The reliability of this scale is reported fine (Denollet, 1998). Howard, Hagsu & James (2011), reported that the alpha coefficient of the negative affection subscale is 0.87 and for the social inhibition subscale it is 0.75. Also, in the present research alphas were, 0.79 and 0.81, respectively.

Results

In this section the research results are presented. Table 1 shows the descriptive statistics (mean and standard deviation) of the research variables. As you can see, the descriptive statistics of the variables, such as mean and standard deviation, and considering the gender variable have been reported.

Table 1
Mean and SD of Research Variation According to Gender

Variables		Negative Affect	Social Inhibition	Internal Locus of Control	Powerful others Locus of Control	Chance Locus of Control
Male	M	13.16	11.02	27.7	19.19	19.78
(n ₁ =218)	SD	2.7	2.62	5.36	5.21	5.28
Female	M	13.53	10.44	27.35	18.67	20.71
(n ₂ =370)	SD	2.43	2.43	4.24	4.37	5.03
Total	M	13.34	10.73	27.53	18.93	20.24
(N=588)	SD	2.56	2.53	4.81	9.79	5.15

In order to investigate the relationship between type D personality and its subscales (negative affect and social inhibition) with health locus of control dimensions, Pearson's correlation coefficient has been used. Correlational matrixes are demonstrated in Table 2 to show the relationships between the variables.

Table 2
Correlational Matrix between Research Variables (N=588)

Variables	1	2	3	4	5
1. Negative affect	1				
2. Social inhibition	.69**	1			
3. Internal locus of control	-.006	.015	1		
4. Powerful others locus of control	.39**	.42**	.033	1	
5. Chance locus of control	.03	.08	.01	.136*	1

*P<.05, **P<.01

As represented in Table 2, according to the significant results of Pearson's correlations, there is solely positive and significant relationships

between negative affect and social inhibition with powerful others locus of control. There is no relation between the other dimensions of health locus of control with negative affect and social inhibition. In order to determine which one of the negative affect and social inhibition is a predictor, of the powerful others locus of control, the stepwise regression analysis was used, the results are presented in Table 3.

Table 3
Regression Analysis of Scores of Powerful others Health Locus of Control Variable Based on Scores of Negative Affect and Social Inhibition Predictor Variables

Model	Variable	R	R ²	Adjusted R ²	F	Sig	B	β	t
Step 1	Negative Affect	.32	.11	.11	69.02	.001	.48	.32	5.11
Step 2	Negative Affect						.41	.27	3.95
	Social Inhibition	.35	.12	.12	40.3	.001	.24	.14	2.56

As it is indicated in Table 3, regression has gone forward two steps. Results of regression analysis showed that negative affect component with coefficient can significantly explain 11 percent of the variation of powerful others locus of control. Also, results in the next step suggest that adding social inhibition component can significantly predict 12 percent of the variations of powerful others locus of control.

Discussion

Findings of the research showed that there was a positive and significant relationship between powerful others and each of the components of type D personality. That is, individuals with type D personality have higher powerful others locus of control. Although no

research has directly investigated their relationships, based on similar research, it can be said that these findings are consistent with findings of Epochelick, Wizisinka & Kaker (2009), and inconsistent with those of Burisch, Carey, Wallston, Stein, Jamison & Lyles (1984). Patients with cardiovascular disease have high external locus of control (Epochelick et al, 2009). Contrary to findings of this research, the results of Evanz, Ferrando, Rabkin & Fishman (2000) showed that chance health, locus of control, and helplessness are related to each other, and specially reported significant relationship between depression, hopeless feeling, and recent stressful events, which are inconsistent with the findings of present research. To explain these findings, one should suggest that control is highly important in different aspects of life. High control rates are related to better coping mechanisms, low stress side-effects, mental and physical health, toleration, dreams and less anxiety, high scores, more skills, and social popularity. Control in efficiency feeling, internal control, and pessimism is determined by social and environmental factors; thus, the concept of control is a learned dimension of personality (Hatamy et al, 2010).

We previously mentioned that individuals with internal health locus of control believe that their behaviors and actions are determiners of their health (Wallston, 1992). Instead, those with external locus of control maintain that events and actions that happen in their lives are determined by medial forces such as doctors, chance, and opportunity and individuals do not have enough control over life events. Thus, they believe that man's attempts in altering the events process, have no use and they consider no value for their attempt (Zahednejad, Poursharifi & Babapour, 2011). Those with external locus of control are more nervous, full of grudge, dishonest, and more agitated, while those with internal locus of control have opposite traits. Moreover, decision making strategies are different among them; for example, internal locus of control ones have a tendency to keep good strategies and put aside unsuccessful strategies. It has been reported that individuals influenced by internal locus of control totally are healthier and

more productive, and that they search information, are purposeful and can cope with problems better, while individuals with external locus of control show some traces of lassitude and tiredness (Hatamlo Sadabadi, 2009). Internal health locus of control leads to control feeling and reduce the stress. Witz (1989) found that if individuals believe that they can cope with stress impressively, it can prevent chronic disease. Having the feeling of control can be influential in the improvement of life, mental health, and upgrading healthy behaviors. Reviewing the extant research shows that health locus of control is one of the psychological factors that relate to the health of cardiac patients. Generally, many studies have shown that there is a significant relationship between external health locus of control and psychological helplessness, while internal health locus of control is related to positive psychological adoption and varieties of hygienic consequences (Cherepakho, 2008).

Moreover, research findings showed that powerful others locus of control was predicted by negative affect and social inhibition. Burish, Carey, Wallston, Stein, Jamison & Lyles (1984) showed that individuals with external locus of control report much negative affect. Patients who had internal locus of control during that time were less feeble. Recently, Johnson, B. D., Stone, G. L., Altmaier, E. M., & Berdahl (1998) found that control perception was a predictor of quick improvement after cardiac disease. Furthermore, Stramer, Hesselbach & Amilong (2006) showed that high internal locus of control was related to reduction of heart Infarction. Beside the relationship between external locus of control and helplessness, findings support this hypothesis that control source is the regulator of psychological stress. Many studies have shown that external control leads to higher levels of comprehended stress compared with internal control. Parkes (1999) in his study about external control, concluded that in loneliness that environmental requests and decision making power were not balanced, stress levels were high, while this was not correct about the internal control (Hatamlo Sadabadi, 2009). This issue explains the relationship between external locus of control and its stress with negative

affect, because perceived stress is predicted through negative affect. About the prediction of powerful others locus of control through social inhibition, one might say that type D individuals who have higher powerful others locus of control and are influenced by others in their own decisions making and behaviors or believe in doctors' skills in treatments and carefulness, avoid showing their own feelings in communications with others because of the fear of rejection. According to the findings of Williams et al. (2008), social inhibition can influence the relationship between type D persons with doctors, treatment acceptance, and healthy behaviors promotion.

Limitations of the present study should also be noted that were as follows: First, generalization of these findings should be bases on the review of the relevant research, because the current research was done on healthy people who had type D personality. So, we should be careful about generalizing the findings of the research to patient groups, particularly people with heart disease; therefore, it is recommended that a similar study is done in the patient groups, such as people with heart disease, patients with high blood pressure, those with psychosomatic disorders, and even those with psychological disorders. Second, since the research method is correlational, it did not allow determining causal relationships, and it is suggested that the study is repeated experimentally, if possible. Third, the data obtained by means of self-evaluation tools is the other limitation of the study; hence, it is suggested that, along with self-evaluation data, the data obtained from clinical experts is also applied to avoid the bias arising from the nature of the data. Doing such actions may reveal new correlation patterns which can effectively expand our theory.

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