

Original Article

Comparing mindfulness and type D personality between women with non-cardiac chest pain and healthy women in Tehran city

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(Received: 13 Apr 2016; Revised: 20 Apr 2016; Accepted: 24 Jun 2016)

Abstract

Introduction: With regard to the importance of psychological factors in the appearance of physical pain, this research is performed with the aim of comparing mindfulness and type D personality between women.

Methods: The number of samples in this research includes 60 female diagnosed with non-cardiac chest pain that were selected from two hospitals and heart clinic with convenience sampling method and they were compared with 60 healthy women without chest pain who had the criteria to enter the research. The subjects answered to two questionnaires of Mindful Attention Awareness Scale (MAAS) and type D personality.

Results: The results show that there is a significant difference for type D personality (negative affectivity and social inhibition) between the women diagnosed with non-cardiac chest pain and healthy women in Tehran ($P < 0.05$).

Conclusion: With regard to the results of research that represent the difference of mindfulness and type D personality in women with non-cardiac chest pain compared to healthy people, it is suggested to use psychological interventions both for treatment and the recovery of this group of patients supervised by specialists.

Declaration of Interest: None.

Key words: Body mind relation, Chest pain, Personality inventory.

Introduction

Non-cardiac chest pain is a common problem that physicians are facing with in clinics. More than half of the patients that are referred to heart center are suffering from chest pain with no cardiac origin (1). The information about epidemiology of non-cardiac chest pain is relatively limited in USA and other locations in the world. Nowadays, chest pain is the second factor of people's presence in the emergency sector of hospitals in terms of prevalence, though only 35% of the people that have experienced chest pain refer to hospitals (2).

The first important and critical step for managing the patients with chest pain is to investigate potential life threatening factors due to symptoms (3).

Psychological factors in patients with non-cardiac chest pain are identified that are common in about 75% of these people (4). About 66% of the patients with chest pain are identified without any cardiac explanation for their pain. These patients experience non-cardiac chest pain that can be related to various psychological and physiological factors, but often no physical disease is observed and there is a weak feeling of concerning symptoms (5). Non-cardiac chest pain is mostly common in young women (6). There are important statistical differences between men and women in perceiving pain and its appearance. Women

mostly show higher sensitivity to pain compared to men (7).

Studies of panic disorder reported increased anxiety and depression in the patients with non-cardiac chest pain. There was no important difference in people with coronary heart disease and ordinary people (8). A few available practical studies state that higher levels of anxiety sensitivity and full-time attention for physical symptoms show more severe chest pain (9). Another research showed that psychological factors are effective in the appearance of non-cardiac chest pain (10).

Psychological approach is among the psychological factors that interact with non-cardiac chest pain and it is the conceptual style of supervising. In these people, there is a higher possibility that they consider the negative symptoms related to their circumstance and physical conditions and this style is related to high anxiety levels (11). Social conditions and circumstance is one of the other psychological factors that are interacting with non-cardiac chest pain. There is a lower possibility for this people to receive social support in facing with stress. Less social support is related to weaker interpersonal relations (12).

Mindfulness is among the psychological factors effective on pain. Mindfulness is an unintentional contemplation on the current events and is defined as a type of receptive awareness without any judgment from the events that are occurring. Mindful people perceive interior and exterior realities freely and without falsification, and have a great ability in facing with a wide range of thoughts, emotions and experiences (including pleasant and unpleasant) (13). Mindfulness makes the person able to create a relationship essentially different from the experience of interior feelings and behavioral orientation based on rational responsibility instead of automatic reactivity. By targeted use of supreme mind operations including attention, awareness, kind attitude, curiosity and sympathy, mindfulness can apply control on emotional reactions via preventing cortex of limbic system (14). Mindfulness assists people to understand that negative excitements may happen, but they aren't fixed and constant element of personality. Also, it gives the person the ability to respond with speculation and

contemplation instead of responding the events involuntarily and without contemplation. Mindfulness is a method for better life, facilitating pain and making life rich and meaningful (15). Mindfulness is a skill that allows the person to less respond to the thing that is happening and is a method of contact with positive, negative and natural experiences that causes the decrease of overall suffering and their welfare (16). According to the opinion of Kabat-Zinn, this observation has many applications avoiding judgment about people with chronic pain (17). It has been specified in neurobiological level that mindfulness causes interaction between two hemispheres of brain and between limbic system and cortex of brain (18). Mindfulness and its exercise results into more balanced emotional states via creating uniform and powerful neural fibers and networks. With more amplification of such uniform neural fibers, there are higher balance between right and left hemispheres of the brain or emotional and logical parts, more emotional balance, more flexibility in responding (performing more adapted selections) and more capacity for empathy and self-awareness (19).

There are many investigations performed on the role of mindfulness-based interventions in decreasing acute, chronic, depression, anxiety, somatic diseases and decrease of pain catastrophizing on patients. These investigations represent that mindfulness is effective on decrease and improvement of pain, depression and anxiety.

Having the assumption that personality characteristics can adjust the relation between physical and psychological health with stress and occurrence of disease; psychological investigation of disease-creating bases need the study of personality characteristics that are constant during time and positions (25).

Personality points a complex organization of tendencies and characteristics and can be in relation with important resultants of life including health and disease (26). The concept of type D personality represents the interaction of some specific characters that may have harmful effects on health. Type D personality has two components: Negative affection that points the tendency of experiencing negative affections during time and different situations.

Second, social inhibition that is the tendency for preventing the expression of these affections in social interaction (27). The people who get high score in the area of negative emotionality are not merely sad or restless, but they have negative view about themselves, report more physical symptoms and tend to attend inappropriate and harmful incentives (26). The people who receive a high score in the area of social inhibition frequently feel self-absorption, tension, sadness and unsafe (25).

Negative affections point the tendency of person to experience negative feelings such as anger, hatred and anxiety in different situations. However, social inhibition points the tendency of person in avoiding to express these negative excitements in order to avoid from not to be approved by others (25). One of the social inhibition aspects is insecurity and low competency during communication with others. Patients with social inhibition may be afraid of rejection or negative reaction by doctor and not to refer to doctor when it is necessary (28). These patients with high scores are weak in inhibition and the patients with type D personality are weak in self-management risk and advisory behavior. This disability in consultation for their cardiac symptoms is because of their tendency for experiencing negative feelings and anxiety (29). Type D people are vulnerable to stress and have restricted abilities in returning from stressful events and they highly use passive coping strategies in facing with stress and they don't search for appropriate mental surveillance (30). Type D personality is a stable personality structure that not only can be specifically attended in relation with heart diseases, but it is also searchable about other psychic-physical diseases (31). Type D personality is related to startle disorder, depression and mental pathology of non-cardiac chest pain (32).

There is a strong relation between type D personality and psychosomatic symptoms and muscular pain (33). In patients with non-cardiac chest pain, psychological factors are mostly remained indistinguishable because mainly the patients themselves are considering physical factors more than psychological factors (34). Type D personality is related with the presence

of mental pathology in non-cardiac chest pain (32).

Since psychological factors are very important in creating, severing and curing non-cardiac chest pain and as the variables of mindfulness and type D personality affect health sector, and there is no research addressing these two variables in the patients with non-cardiac chest pain and since women in society have higher sensitivity in society towards mental events and have influential, important and key role in relation with family.

Methods

This is a casual-comparative research; statistical group of patients included all women with non-cardiac chest pain that referred to Shahid Lavasani Hospital, Sina Hospital and Tehran Heart Center in winter 2013 and accurate diagnosis of non-cardiac chest pain was performed by cardiologist with primary tests and actions such as electrocardiogram, exercise test and/or in some cases with regard to negative result of angiography. Patient sample of this research included 60 women with non-cardiac chest pain in age range of 25 to 40 years and 20 persons were selected from each hospital with convenience sampling method. The sample of healthy group was also 60 female attendants of the patients who referred to the mentioned health centers that were matched as the comparison group to patient group in terms of age. All subjects were qualified to other criteria including education higher than diploma. No use of psychotic drugs and no acute psychic disorder in addition to age range and for patient groups there was also the history of heart disease in addition to the mentioned cases.

In this research, questionnaire fulfillment was performed with interview by researcher for illustration and lack of any ambiguity. In this regard, the questions were individually read for each subject and after explaining each question; the patient specified his/her intended response. Among the advantages of this method is validity of questionnaire data and confidence for responses and its disadvantage, which is time consuming.

The tools used in this research for data collection area: 1- Mindfulness attention awareness scale:

Mindful attention awareness scale was designed and complied by Brown and Ryan for evaluating mindful attention and conscious in the current time (13). This questionnaire has 15 questions and higher scores represent higher mindfulness. Brown and Ryan considered the reliability and validity of this tool appropriate in a range of their studies (13). This tool is used as mindfulness measure tool by McCracken, Gant-Gilbert and Wales; McCracken and Thompson in order to analyze mindfulness role for chronic pain (35). Cronbach's alpha coefficient in the sample of this research is obtained equal to 0.9 for mindfulness scale.

Type D personality questionnaire (DS14)

Type D personality questionnaire was made in 1998 by Denollet in order to measure the characteristics related to type D personality. Type D personality or helpless personality is defined by the interaction of two personality characteristics of constant and general that are: negative affection and social inhibition. This type of personality is specified by wide range of emotional disorders such as post-traumatic stress disorder and anxiety. The people of this type having unhealthy life style and damaged life quality and consequently by high level of psychological disorder statistics such as anxiety and depression are more prone to the disorders related to health and disease. This scale is a self-report tool and has 14 terms. Each sub-scale of type D personality questionnaire (negative affection and social inhibition) includes 7 terms. The range of scores for each sub-scale is between 0 and 28 and higher score represents clear characteristics of type D personality. The score 10 is reported as cut-off point of both

subscales. The total score of test is also in the range between 0 and 56. Denollet reported Cronbach's alpha coefficient based on this statistical society, equal to 0.88 for negative affection sub-scale and equal to 0.86 for social inhibition subscale. Also, the reliability of retest method was 0.72 for negative affection scale and was 0.82 for social inhibition sub-scale (36). Normalization of type D personality questionnaire on Iranian sample is performed including healthy people and patients (37).

Results

Research sample in this research included 120 persons 60 women with non-cardiac chest pain and 60 in control group. Total average age of the studied subjects in this section was 37.65 and its standard deviation was 5.90. Average age and standard deviation of the women with non-cardiac chest pain were 38.42 and 5.68 respectively and 36.88 and 6.07 for healthy subjects. The percentage of research subjects in terms of education level is: 38.3% of the subjects had diploma, 11.7% had associate degree, 31.7% had bachelor and 18.4% had postgraduate degrees.

Descriptive indicators are related to mindfulness and type D personality components are reported in table 1. According to the data of this table, average scores of mindfulness in women group with non-cardiac chest pain were lower than healthy women. However, average scores of negative affection and social inhibition in women with non-cardiac chest pain were higher than healthy women.

Table 1. Descriptive indicators in two groups

	Women with non-cardiac chest pain				Healthy women			
	Number	Mean	Standard deviation	Variance	Number	Mean	Standard deviation	Variance
Mindfulness	60	46.72	5.60	31.43	60	70.52	6.05	36.63
Negative affection	60	21.55	4.03	16.22	60	8.28	4.82	23.22
Social inhibition	60	17.52	6.53	42.69	60	7.01	4.88	23.85

The findings of correlation coefficient between mindfulness and type D personality components and education in patient group shows that there is a significant statistical relation between

education variable and each of mindfulness ($p=0.001$, $r=0.56$), negative affection ($p=0.001$, $r=-0.56$) and social inhibition ($p=0.001$, $r=-0.48$).

Because of the relation between education variable and mindfulness and type D personality components using covariance analysis test, the influence of the mentioned demographic influence was controlled.

In order to investigate the first hypothesis of research, the results of Levine test show that the pre-assumption of variance equality for mindfulness variable is established in two groups of the women with non-cardiac chest pain and healthy women ($F=0.51$, $p=0.21$); i.e.

the variances are equal in two groups and therefore it is possible to use multi-variance analysis.

ANCOVA analysis was performed for measuring the difference between two groups of the women with non-cardiac chest pain and healthy women in terms of mindfulness variable by controlling education level and the results are presented in table 2.

Table 2. Two group

Test	Sum of squares	Freedom degree	Variance	Coefficient F	Significance	Influence level	Statistical power
Education	19.61	1	19.61	0.57	0.45	0.005	0.12
Group membership	10444.81	1	10444.81	305.85	0.0001	0.72	1.00

As it can be seen from table 2, after controlling education level variable, the difference of mean scores of mindfulness between the women with non-cardiac chest pain and healthy women of Tehran city is significance ($p<0.05$). Therefore, the research hypothesis is confirmed. The level of influence shows that 72% of difference between two groups is explained by mindfulness. Statistical power of 1 represents the efficiency of sample volume for testing this hypothesis.

In order to investigate the second hypothesis of research using Levine test about the pre-assumption of the equality of variances for the

scores of type D personality in two groups of women with non-cardiac chest pain and healthy women, the findings show that pre-assumption of the equality of variances for type D personality negative affection exists in two groups of the women with non-cardiac chest pain and healthy women.

ANCOVA analysis was used for investigating the difference between two groups of women with non-cardiac chest pain and healthy women in terms of type D personality components that their results are presented in table 3.

Table 3. Two groups

Source of change		Sum of squares	Freedom degree	Mean squares	F	Significance	Influence level	Statistical power
Education	Negative affection	50.10	1	50.10	2.57	0.11	0.02	0.36
	Social inhibition	77.47	1	77.47	2.35	0.13	0.02	0.33
Group membership	Negative affection	2940.74	1	2940.74	151.11	0.0001	0.56	1.00
	Social inhibition	1682.46	1	1682.46	51.15	0.0001	0.30	1.00

Data in table 3 shows that after controlling the variable of education level, the difference of mean scores of type D personality components between the women with non-cardiac chest pain and healthy women of Tehran city ($p<0.05$). Therefore, the research hypothesis is confirmed. The level of influence shows that 56% of difference between two groups is explained by

negative affection and 30% is explained by social inhibition component.

Conclusion

The results of this research show that after controlling the variable of education level, the difference of mean scores for mindfulness between the women with non-cardiac chest pain

is lower than healthy women. These findings are consistent with the result of Davoodi and Nasimifar because it addresses the effectiveness of mindfulness-based stress decrease method on muscular pain improvement in women (20). Also, it is consistent with the findings of Kabat-Zinn et al. (22), Dunford and Thompson (23) and Frick et al. (24) in terms of the influence of mindfulness on pain decrease and physical disorder. The result of this research is consistent with the research of Abd-Alqaderi et al. (21) in an indirect way, because this research addresses the effectiveness of mindfulness-based cognitive therapy on pain decrease.

For explaining this finding, it can be said that since meditation causes a change in pain via increasing cognitive control and recovering histological evaluation of driving information, the set of interaction between expectations, impressions and cognitive evaluations that are in the heart of creating sensitive experience can be regulated via metacognitive ability of concentration without judgment on the current time (38). A positive relation is shown between meditation experience and decrease in pain in the studies (39). The decrease in the level of pain intensity by meditation is in relation with activity in anterior cingulate cortex and anterior insula (the regions that are involved in cognitive regulation of pain process).

Decreasing the level of unpleasant pain is related to activation of orbitofrontal cortex (the region that is involved in creating histological evaluation of sensory events) (38).

Mindfulness has a positive relation with mind peace and mental health. Mindfulness is based on attention and concentration oneself that this concentration on thoughts, feelings and perceptions results in the change of people conception from stressful events and assists to increase their ability in life control. Non-judgmental acceptance in mindfulness helps people to accept their physical symptoms and excitements including pain, and this issue causes the decrease of extra attention and sensitivity towards reporting physical symptoms and pain in them. Increase of awareness towards mental and physical feelings causes the people with pain to accept psychological problems related to pain and to decrease their negative

feelings towards mental effects of pain that has an important role in pain regulation.

Also, according to the results of research, mean scores of type D personality components i.e. negative affection and social inhibition in women with non-cardiac chest pain and healthy women of Tehran have significant difference ($p < 0.05$). The mean of type D personality components in the women with non-cardiac chest pain is higher than healthy women. This result is parallel to the findings of Bagherian (31), Kuijpers et al. (32) and Kenden et al. (33) because of the relation between type D personality and psychosomatic diseases and non-cardiac chest pain.

This study is parallel with the conclusion of Kuijpers et al. (32) that points non-cardiac chest pain has often psychological components, but selection of type D personality assists the identification of patients that are in the danger of complaining chronic chest pain and type D personality is related to the presence of psychopathology in non-cardiac chest pain and psychological selection of patients with non-cardiac chest pain must be included of type D personality category. In the explanation of this finding, it can be stated that type D personality can be an important determinant of problems in the area of emotional and social health. These problems, not only are not restricted to psychological confusions, but also include psychological symptoms and behaviors such as chronic use of benzodiazepines, continuous complaint of chest pain and inability in return to work (40).

Type D personality points the people that spontaneously experience high level of negative excitement and social inhibition (28). Type D personality has negative relation with the situation of mental health and adult persons with type D personality experience more symptoms of depression, anxiety and stress after impulse compared with the people with no type D personality. High level of negative affections in people with type D personality justifies the level of anxiety and depression and also physical symptoms (41). Negative affection was related to chest pain in the absence of coronary heart disease but it is also in relation with real coronary heart disease. Therefore, the negative affection may act both as an interferer variable

and also as a factor of real danger (29). The people with high level of social inhibition are more willing to prevent negative reactions of other people via extra control of self-expression (not to express and clarify own beliefs and characteristics) (42).

Psychological and personality variables may influence physical health of people via disorder in behavior or disability performance in positive behaviors related to health. Type D personality is a dangerous factor in the area of people health and its related life quality and the increase of psychological turbulences and clinical resultants and causes physical and mental disorders. The stresses of type D personality affect health via behavioral and physiological changes and the people with high stress have extreme tendency to perform the behaviors that increases the possibility of being patient and their harms.

The results of this research represent that non-cardiac chest pain is influenced by different psychological factors like mindfulness and type D personality and appropriate psychological interventions are suggested for cure and improvement of this group of patients under the supervision of experts. Among appropriate psychological interventions is mindfulness that can be effective in their pain reduction. Since the patients referring to non-cardiac chest pain just think about physical disease by pain appearance and since their problem is from psychological factors, it is necessary to train them to refer psychologists and/or psychiatrist for cure.

Among the limitations of this research is that the evaluation of the patients with non-cardiac chest pain is only performed in women society and there was the possibility of sampling in 3 health centers. It is suggested to consider mindfulness-based curing approaches in curing the patients with non-cardiac chest pain.

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