Effect of Mindfulness Strategies Training Based on Decreasing Stress on Blood Pressure Related to the People Personality

Alipur Ahmad, Ali Akbaril Mahnaz and Malek Zadeh Akram
Department of Psychology, Payame Noor University, Tehran, Iran

Abstract: The aim of this study is to identify effect of mindfulness strategies training based on decreasing stress on blood pressure related to the people personality. All of the population who referred to Kovsar Heart Hospital were considered in this study. The selections of patients are voluntarily and personality test AB and D were done accidentally. Patients were placed in control and experimental group. The experimental group was taught based on Kabat-Zin and homework protocols treatment. The results of MANCOVA results indicated that the results of identify mindfulness strategies training based on decreasing stress on blood pressure related to the people personality of experimental group were meaningful. That means the blood pressure of this group was decreased after teaching. Other results showed that teaching have similar influences not only on A personality and D personality but also on both sexes of males and females. Furthermore, no significant difference was seen.

Key words: Mindfulness, stress, blood, A personality, D personality

INTRODUCTION

At a conference in 2014, it was declared that hypertension in Iranian society is about 25.5% which was about 11% in 1991 (Ahmadpoor *et al.*, 1998). Various factors can lead to hypertension such as cardiovascular disease, autonomic nervous system, smoking, personality type, diet, hypercholterolemia, anger and stress. One of the factors that usually affect the other characteristic of the person is a personality type which was defined by Fridman and Rosednman for the first time. Type A individuals are aggressive, competitive, impatient, irritated, fast paced in talking, ambitious and perfectionist. Type B individuals are easy going and the quality of life is their priority. They are organized and cautious while others cause stress by their irrational believes in their lives. Type A individuals because of their personality traits create stress in their lives (Gangi, 1998; Baghiani *et al.*, 2002). The relationship between personality type A and cardiovascular disease and hypertension is proved. Anger and stress reduces the effects of the parasympathetic system in function of heart and also increase catecholamine and fat in the blood. Type A individuals have high level plasma which has bad effects of their health. Likewise, the level of blood cholesterol that affects their blood pressure is high (Pahlavian and Mahjub, 1999). Fridman and Rosednman after conducting some researches about the effects of personality type on heart diseases concluded that cardiovascular disease and hypertension in Type A individuals is based on their anxiety and impatience. But after obtaining these results, the other findings were

contradictory (Shakerinia, 2000). For instance, contradictory results of researches conducted by Low and Burg caused Denollet to introduce another personality type with different personality traits such as anxiety, depression and social alienations. Then Denollet made a scale for measuring it and he called this scale personality Type D (Hamid, 2000; Sadrnia and Chehri, 2001). Different researches demonstrated that Type A individuals suffer from heart diseases and particularly from hypertension. These individuals have lower social communications and they are isolated while for other people who have high social communications, normal blood pressure and less cardiovascular disease were reported.

Some other researchers have demonstrated that stress causes hypertension in all personality types. During a stressful situation, vessels and internal organs won't let blood pass to the heart muscles, therefore, heart beat and blood pressure rise. When stress vanishes, the blood pressure backs to normal. Lazarus and folkman believed that what makes hypertension a dangerous disease is continuation of stress. When stress last longer the hypertension will become chronic high blood pressure as a disease. In this case, pressure in congested blood vessels increases and this amount of pressure causes malfunctioning of the heart. Researchers have investigated individuals with what characteristics and personality type experience permanent stress and the results demonstrated that behavioral patterns, personality traits and stress affects the emergence of cardiovascular disease in an individual. Scholars and researchers are investigating to find some treatment methods for

psychological disorders and physical illnesses with mental and psychological origins. Studies about mindfulness skills demonstrated the importance of teaching these skills which can reduce the feelings of stress, anxiety and confusion effectively. Also it is illustrated that in stressful situations the patient's conscious awareness first increases and then decreases. Mindfulness meditation can be effective in alertness (consciousness) and reduces pain in individuals. With mindfulness training in stress reduction, it is concluded that theses trainings are effective in alleviating symptoms of anxiety, stress and worry). Specialists believe in the role of psychiatric intervention in reducing patient's blood pressure (Jouzi, 1994).

According to some studies, psychologists and researchers of behavioral domain are interested in clarifying interventions in the field of psychological and psychosomatic diseases these training and techniques not only should be related to the patients determination and behavior but also shouldn't have side effects and the patient should be able deal with it and at the same time it should be affordable. In recent years, one of the alternative therapies was Mindfulness-Based Cognitive Therapy (MBCT). The experts of psychological treatments consider these methods as the most effective psychological treatments. This treatment is not aimed at changing the content of the opinions and in the psychological model it is assumed that the active treatment mechanisms the change of dysfunctional assumptions and core beliefs are based on logical structures. As a consequence of these changes the symptoms are relieved while the third wave of mindfulness treatments integrates acceptance in cognitive therapy and supports some processes such as contact with the present time, changing one's relationship with his thoughts, repression reduction and internal experience avoidance, psychological flexibility increase and finally supports behavioral changes. In Iran there is a sharp increase in hypertension among people despite medical treatments. Therefore, finding therapies with optimized process of curing this illness seems important. Also in previous researches the impact of training on personality types has not been evaluated. This study investigates treatments of mindful-based stress reduction due to personality type in order to find a psychological treatment to treat this deadly disease.

MATERIALS AND METHODS

Participants of this study are all patients with high blood pressure who were taken to Kosar heart disease hospital in Shiraz and were diagnosed with hypertension. The participants are selected randomly among volunteer patients of Kosar heart disease hospital in Shiraz. The

participants in this research must be able to read and write Persian fluently. Minimum age of them was 35 year and maximum 55 year. After obtaining permission for conducting the research from the hospital's authorities, a briefing session was held for the patients with heart disease and then the process of research and taking samples took place.

First, blood pressure of patients was measured and recorded and then they asked to fill out the questionnaire which contained 25 questions presented by Fridman and Rosednman. Individuals based on the results of this questionnaire are classified into two groups of personality types of A and B (>13 scores have the personality type of A and the scores below 13 have the personality type of B. The obtained reliability of the questionnaire in Shakerinia's research is 0.89 and in this study is 0.76. As mentioned before, this questionnaire is for investigating the two types of personality, type A individuals have a strong tendency to make progress also they are hostile, competitive, under time pressure and they experience unbalanced life.

Type B individuals are vice versa, they are calm and they experience a balanced life without stress. Personality type D and its related questionnaire has been investigated and introduced by Denollet in 1988. This questionnaire contains 14 questions which identifies type D individuals who have negative affections and social inhibitions. Obtained Cronbach's α = 0.88 by Denollet. In 2012, this test was conducted by Bagherian and Bahrami and Obtained Cronbach's α of normalization in Iranian society was 0.86 in sick individuals and 0.75 healthy individuals. Each item had five choices 0-4 (0 = completely wrong to 4 = completely true) and the assessment was taken place based on theses scores.

Subsequently, after evaluation another meeting was held with the participents who were selected in the previous session. In second meeting 20 individuals with personality type A and 20 individuals with personality type D were randomly selected and divided into two groups of control group and experimental group. Control group in terms of education level, age, blood pressure and family economic status were similar to the experimental group. After selection, experimental group participated in training sessions for 4 week (2 h sessions twice a week). They were taught mindfulness-based stress reduction

based on Kabat-Zinn treatment protocol. In addition, patients were taught to do their homework 30 min a day in 5 day a week. Patients were given manual to do their homework.

Pre-test: Before intervention, blood pressure of all individuals in both groups of control and experimental was checked and recorded.

Intervention

First session: Communicating and conceptualizing the problem, mindfulness based stress reduction procedures and its role in health and well-being was described by research evidence. Then both groups about the date and duration of other sessions and how the research would go on were informed.

Second session: Meditation techniques, relaxation of tension and muscle relaxation and how to sit and meditate were taught and then relaxation with closed eyes for 14 groups of body muscles (forearm, arm, back muscles, legs, thighs, abdomen and chest, shoulders and neck, lips and jaw, eyes and upper and lower frontal) were performed.

Third session: the same as previous session, then relaxation with closed eyes for 6 groups of body muscles (hand, arm, legs, thighs, abdomen and chest, shoulders and neck, lips and jaw, eyes and frontal) were performed. At the end of these sessions, participants were given homework and they should do meditation techniques by tensioning and relaxing the muscles for 20 min at least once before attending the other session.

Forth session: breathing techniques were presented and after getting familiar with mindfulness of breathing and relaxation techniques like breathing, even saying calm and comforting words when you breathe in and out without thinking about anything else and with closed eyes through the following steps.

Fifth session: Body scanning technique was performed with eyes closed.

Sixth session: At this meeting the following steps of mindfulness thoughts were taught.

First stage: Focusing attention on the mind without thinking about anything else through mental concentration on a point or a cross sign.

Second stage: At this stage a negative thought about oneself was induced by the trainer. Several times the participants recall this negative thought and they terminate the thought based on received instructions.

Third stage: At this phase a positive thought about oneself was induced by the trainer. Several times the participants recall this positive thought and they terminate the thought based on received instructions.

Seventh session (complete mindfulness): Meditation techniques were presented as following stages.

First stage: The participants were asked to breathe normally, then inhale and exhale deeper than the previous ones at the same they should pay attention to the passage of air in and out during breathing and controlling it according to movements of the chest and abdomen. They repeat comforting words in mind when they inhale and exhale.

Second stage: The scanning sessions were due to the movement of the body through the abdomen and chest when breathing, focusing on the body and its movements with deliberate awareness of the body organs such as hands, feet, eyes, mouth, ears and skin, focusing on hearing by listening to the sounds around. At the end of this session, subjects were asked to use deep inhale and exhale techniques before bed for 20 min and mindfulness, techniques of tasting while eating food for 20 min as their homework.

Eighth session: The last meeting conclusions and issues raised in previous sessions were presented. For ending, the participants were asked to use mindfulness techniques in their daily life and help themselves to improve their health. It is necessary to mention that at the end of all sessions, participants were asked to keep their eyes open for 2 min after performing each technique for each muscle group in order to avoid falling asleep.

Post-test: After teaching all the techniques, blood pressure of all individuals in both groups were checked and recorded.

RESULTS AND DISCUSSION

Before plan performance of mindfulness training for stress reduction t-test had done to be sure from lack of blood pressure difference in pretest level. The outcomes of these tests indicated that there is no significant difference between experimental group blood pressure (systolic and diasystolic) and the control group (male and female).

As it is presented in Table 1, after the plan performance the blood pressure of experimental group were lower in both group (systolic and diasystolic) in both sexes (male and female) with compare to pretest as well as the control group. The average blood pressure of systolic personality type A control female was 13.56 in posttest and 13.57 in pretest while the average blood pressure of systolic personality type A experimental female was 13.50 in pretest and 13 in posttest. Furthermore, the average blood pressure of systolic personality type D control female was 13.45 in pretest and

Table 1: Blood pressure descriptive data in pretest (before plan performance) and posttest (after performance of mindfulness training) of experimental and control group

Groups	Sex	Personality	Average after training	Average before training	SD after training	SD before training	Data numbers
Systolic	Female	A personality	13.59	13.57	0.70	7.00	7
blood		D personality	13.45	13.42	1.27	1.25	7
pressure	Male	A personality	14.17	14.14	1.06	1.00	7
control group		D personality	13.55	13.57	0.70	72.0	7
Systolic	Female	A personality	13.50	13.00	1.15	1.00	7
blood		D personality	13.44	13.15	1.57	1.20	7
pressure	Male	A personality	14.20	13.28	1.38	1.31	7
experimental group		D personality	13.60	13.28	0.95	0.53	7
Diasystolic blood	Female	A personality	9.200	9.000	1.29	1.26	7
pressure control group		D personality	8.550	8.570	1.13	1.11	7
	Male	A personality	9.260	9.280	0.95	0.93	7
		D personality	9.000	9.000	0.75	0.57	7
Diasystolic	Female	A personality	9.000	8.850	1.06	1.00	7
blood pressure		D personality	8.590	8.570	0.70	0.50	7
experimental group	Male	A personality	9.300	8.710	0.95	0.86	7
		D personality	9.100	8.280	0.81	0.87	7

Table 2: Multivariate tests for a relationship between dependent variables (systolic and diasystolic blood pressure)

Effect	Multivariate tests	F-values	Significance level
Group	Pylayy test	43.43	0.001
	Wilk's Lambda test	43.43	0.001
	Forty Hatlyng	43.43	0.001
	The biggest test root	43.43	0.001

13.45 in posttest. But in experimental group it was 13.44 in pretest and 13.15 in posttest. However, the average blood pressure of systolic personality type A control male was 14.17 in pretest and 14.14 in posttest while the average blood pressure of systolic personality type A experimental male was 14.20 in pretest and 14.28 in posttest. Moreover, the average blood pressure of systolic personality type D control male was 13.55 in pretest and 13.57 in posttest while the average blood pressure of systolic personality type D experimental male was 13.60 in pretest and 13.28 in posttest. In diasystolic the average blood pressure of female control group with A personality pretest was 9.2 and posttest was 9 but the experimental group of this type was 9 in pretest and 8.85 in posttest. Furthermore, the average blood pressure of te diasystolic female control group with D personality pretest was 8.85 and posttest was 8.57 but the experimental group of this type was 8.59 in pretest and 8.57 in posttest. However, in diasystolic the average blood pressure of male control group with A personality pretest was 9.26 and posttest was 9.28 but the experimental group of this type was 9.30 in pretest and 8.71 in posttest. Moreover, the average blood pressure of the diasystolic male control group with D personality pretest was 9 and posttest was 9 but the experimental group of this type was 9.1 in pretest and 8.28 in posttest.

The data of Table 2 usage of multivariate tests (Pylayy test, Wilk's Lambda test, Forty Hatlyng and the biggest test root) indicated that there is a significant relationship between dependent variables, therefore the conditions of MANOVA analysis can be used.

Accordance to the amount of F from variance analysis some variables can be considered in a way that significantly differs from dependent and independent variables ($p<0.01$). The results of descriptive statistics demonstrated that the average of systolic and diasystolic blood pressures are reduced in all cases after mindfulness training while these changes are rare in the average of blood pressure in the control group. In order to consider the average differences significant of experimental groups before and after training and also consider the significance of the effect of experimental blood pressure the analysis of covariance was done. The outcomes of this analysis are shown in Table 3. These results presented that the blood pressure changes of experimental group have significant differences in comparison with the control group. It means mindfulness training had an influence on systolic blood pressure ($p = 0/001$) and Diasystolic blood pressure ($p = 0/006$) which leaded to its reduction significantly. Further results showed that significant changes occurred in the grades of experimental group after and before mindfulness training which reduced the systolic blood pressure ($p = 0/001$) and diasystolic blood pressure ($p = 0/014$) and the reduction of blood pressure in the experimental group was significant. The effect of mindfulness training on blood pressure which depended on the sex was not meaningful. Interaction of personality and blood pressure didn't have significant relations that showed the identical influence of mindfulness training on D and A personality group.

The results of the study demonstrated that mindfulness training was significant on blood pressures which were noticed in the experimental group of both sexes and both personality types. Fridman proved the relation of hostility, anger and depression with cardiovascular disease.

Table 3: Multivariate analysis of covariance test in considering the influence of mindfulness training on systolic and diasystolic blood pressure

Reference/dependent variable	Sum of squares	Degrees of freedom	Mean square	F-values	Significance level	Degree of influence
Group						
Systolic	7.360	1	47.060	80.450	0.001	0.630
Diasystolic	0.870	1	22.000	8.460	0.006	0.150
Systiolic before training						
Systiolic after training	47.060	1	47.060	47.060	0.001	0.910
Diasystiolic after training	0.220	1	0.220	0.220	0.014	0.450
Diasystiolic before training						
Systiolic after training	0.310	1	0.031	0.330	0.510	0.070
Diasystiolic after training	31.290	1	31.290	31.290	0.001	0.860
Sex						
Systiolic after training	0.015	1	0.015	0.160	0.680	0.040
Diasystiolic after training	0.017	1	0.017	0.160	0.680	0.040
Personality						
Systiolic after training	0.008	1	0.008	0.083	0.770	0.002
Diasystiolic after training	0.065	1	0.065	0.630	0.430	0.014
Sex×group						
Systiolic after training	0.030	1	0.030	0.320	0.560	0.007
Diasystiolic after training	0.002	1	0.002	0.018	0.890	0.000
Sex×personality						
Systiolic after training	0.460	1	0.460	5.100	0.710	0.003
Diasystiolic after training	0.020	1	0.020	0.230	0.750	0.002
Sex×group×personality						
Systolic	0.460	1	0.460	5.020	0.030	
Diasystolic	0.040	1	0.460	0.380	0.530	

Several researches have indicated that behavior patterns and stress are effective in heart disease. The results of these studies besides Dekeyser study showed that mindfulness skills can influence the decrease of stress, anxiety and disorder. Researchers found out that conscious awareness of the patient is increased under stressful situation but after that mindfulness skills can be operative on awareness and pain reduction. Steinv and Dickens did the mindfulness training on stress reduction and concluded that trainings were effective in balancing the stress and anxiety symptoms. Moreover, the experts discovered that the patients. who suffers from hypertension have fewer social connections and they are dissociable while the people with more social connections have lower blood pressure. In another research who studied the coronary heart disease demonstrated the higher range of anger and irritation in heart disease patients in addition to the positive relationship between them. Heydari in a study on cardiovascular patients showed that there is no relation between personality type A and cardiovascular disease in contrast with its relation existig between aggression and hostility. Another research which studied the 80 cardiovascular patients showed the relation of lower endurance and hostility with heart disease. Consideration of different elements on cardiovascular disease and blood pressure concluded that stress is one of the factors which has influenced either alone or in the companion of other factors. The experts emphasized the role of patient's psychological intervention on reduction of blood pressure.

CONCLUSION

According to the previous studies and the outcomes of this research, medical staff are suggested to prescribe psychological treatments instead of chemotherapies that have side effects as well as high expenses. In the cases which chemotherapy is avoidable, psychological treatments also can be used in addition to the chemotherapy, especially mindfulness plan which consists the reduction of stress that it is proved to be significant in this study. These treatments not only can be used for hypertension patients but also they are efficient in all people and they can be trained for other disease preventions and treatments especially for cardiovascular patients.

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