The Effect of Components of Emotional Intelligence on Physical Health Indicators of Hospitalized Cardiac Patients

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Received:12/3/2013 Revised:4/19/2014 Accepted:5/26/2014

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Abstract

Introduction:
Anxiety and depression weaken and impair the function of the body’s immune system, causing vulnerability against various diseases. There is a high correlation between emotional intelligence and exposure to various diseases. Emotional intelligence skills also accelerate health recovery. The main aim of the present study was to examine the effects of emotional intelligence components on blood pressure level and the pulse rate of patients with cardiovascular diseases.

Material and Method:
This quasi-experimental study was conducted on 30 women with coronary heart diseases hospitalized in the Modarres Hospital, Tehran. Patients were randomly divided into control and experimental groups. After measuring their blood pressure and pulse rate, the components of emotional intelligence were taught to the experimental group in seven 90-minute sessions. The two groups’ blood pressure and pulse rate were measured again. The data were analyzed using t-test.

Results:
The results showed that the components of emotional intelligence significantly (P<0.05) reduced the blood pressure of women with coronary heart diseases (P≤0.003 and P≤0.006), but it did not have a significant impact on their heart rate (P≥0.978).

Conclusion:
The components of emotional intelligence significantly reduced the blood pressure of women with coronary heart diseases; therefore, the results of the present study can be used in planning preventive and therapeutic interventions, such as training programs for patients with cardiovascular diseases.

Keywords: EmotionalIntelligence, Blood Pressure, Pulse Rate, Cardiovascular Disease

Introduction
Cardiovascular disorders are diseases that affect the heart and the circulatory system. Essential hypertension and coronary heart disease are two types of cardiovascular diseases that are highly affected by mental stress (1). However, evidence suggests that people who are physiologically reactive to mental stress are more likely to become afflicted with coronary artery diseases.

Among all types of diseases, coronary artery disease is the major cause of human mortality in the West. In the United States, more than 50% of people over the age of 45 are deceased due to cardiovascular diseases (2). The main cause of heart disease and sudden death is Atherosclerosis. The accumulation of fat in the inner layers of the coronary artery walls blocks the arteries and prevents blood from flowing to the
heart muscle, thus resulting in heart attack and sudden death (3).

After careful investigation, epidemiologists have identified seven physical risk factors for coronary artery disease, including, being male, smoking, having high blood pressure, high cholesterol, physical activity, genetic factors and, more recently, psychological factors (2). In some cases, psychological stressors cause cardiovascular diseases; however, when such factors do not seem to have caused the disease by themselves, they can still certainly be related to its onset, persistence and exacerbation (4).

Recent studies have discovered the developmental precursors of behavioral type A and also methods of changing this behavior and reducing the risk of coronary heart disease (5). Emotional intelligence signifies the capacity of the individual to accept the reality, their openness to experience and their ability to solve emotional problems and cope with stress and momentum (6). Nowadays, many scientists and researchers have turned their attention to the impact of emotional intelligence on the individual’s personal and social life and their success and failure. Emotional intelligence is another aspect of human intelligence that includes awareness of emotions and using them for making the right decisions in life and to endure psychological trauma (6).

Emotional intelligence includes both internal and external elements. Its internal elements include, the level of self-awareness, self-concept, sense of independence, capacity for self-fulfillment and also determination. Its external elements include, interpersonal relationships, ease of empathy and sense of responsibility (7).

Results of recent studies reveal a high correlation between emotional intelligence and the propensity for developing a variety of diseases. Stress, anxiety and depression weaken and impair the immune system and cause vulnerability to diseases. On the other hand, emotional intelligence skills accelerate the regaining of health and even reduce the rate of disease recurrence (8).

Behavioral medical interventions, particularly in cases of hypertension and coronary heart disease, have been focused on minimizing anger and aggression for years, as research has suggested these two qualities to be risk factors for these diseases. On the one hand, developing emotional intelligence can enhance the individual’s stability in the face of failures, regulate his mental state and mood, gain him self-mastery and the ability to overcome temptations and avoid sinking deep into painful thoughts. Emotional intelligence is an aspect of social intelligence that enables the prediction of behaviors and control over one’s feelings and emotions toward other people’s behaviors (9). Emotional intelligence skills help the individual’s own health through mood and temper management in stressful situations before emotions take over. The direct relationship between emotional intelligence and a good healthy life indicates the significance of paying attention to emotions, gaining constant awareness of them and using them as a guide for behavior.

People with chronic anxiety, long periods of bitterness and sadness, constant pessimism and stress or constant hatred and malevolence, who lack adequate emotional intelligence to deal with emotional problems, are twice as likely as others to develop diseases such as asthma, headache, joint pain, gastrointestinal ulcers and heart diseases (6). Researchers do not consider cognitive abilities good predictors of one’s ability for being adaptive to stressful situations and believe emotional intelligence to play a significant role in this issue and consider its low levels indicative of the risk of affliction with neurological disorders (10). The examination of emotional intelligence in patients with depression and anxiety has also revealed people with severe forms of these two conditions to have very low emotional intelligence.
The inability to express emotions is associated with negative mood and signs of depression and those with low emotional intelligence, even if aware of their negative emotional experiences, have difficulty managing them (11). The present study aims to improve the physical health indicators of cardiac patients through teaching the components of emotional intelligence, as these skills can reduce risk factors associated with cardiovascular and coronary heart diseases associated with lifestyle (12). As people with higher emotional intelligence enjoy better physical health, the main objective of the present study is to investigate the effectiveness of emotional intelligence skills on physical health indicators in heart disease patients hospitalized for systolic blood pressure, diastolic blood pressure and pulse.

**Material and Methods**

The present quasi-experimental study is designed in the form of an intervention with a statistical population including all women admitted to Modarres Hospital of Tehran in May 2012 for coronary heart disease, of whom 30 were selected through the convenience sampling method and according to Cohen’s table. The statistical power of the test was calculated to be 0.97, given $\alpha=0.05$ and an effect size of 0.50 (13). After selecting the subjects, they were randomly placed into either the experimental group or the control group ($N=15$ in each). Inclusion criteria consisted of, being a woman, being aged 40 to 60, having no history of hospitalization due to mental disorders, being afflicted with coronary heart disease for a period of 2 to 5 years and having a history of hypertension. For ethical considerations, informed consent forms were distributed among the subjects, who were assured of the confidentiality of their information. The two groups were then evaluated in terms of two health indicators, blood pressure and pulse.

Once previously-trained researchers trained the experimental group on emotional intelligence skills based on Goleman’s theory of emotional intelligence, Gottman’s emotional intelligence coaching techniques and the components of the Bar-On model of emotional intelligence over a course of seven 60-minute sessions, the health indicators of both the experimental and the control groups were once again evaluated (14).

Training sessions were held for the experimental group while the control group did not receive any intervention; therefore, the subjects were aware of the group to which they belonged. The control group was promised their own training sessions on emotional intelligence once the experimental group’s training sessions ended.

The pretest and the posttest data were analyzed in SPSS 16 software and using the analysis of covariance and the linear graph for comparing the mean systolic pressure, diastolic pressure and pulse. The statistical significance level was set at $P \leq 0.05$. Table 1 summarizes the material taught on emotional intelligence during the 7 training sessions.

<table>
<thead>
<tr>
<th>Evaluation, interview, test</th>
<th>Session 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional self-awareness, recognizing the emotions and feelings of others</td>
<td>Session 2</td>
</tr>
<tr>
<td>Self-assertiveness and self-respect, interpersonal skills and empathy</td>
<td>Session 3</td>
</tr>
<tr>
<td>Learning stress management and social responsibility</td>
<td>Session 4</td>
</tr>
<tr>
<td>Problem-solving, flexibility</td>
<td>Session 5</td>
</tr>
<tr>
<td>Happiness and optimism, review of previous sessions</td>
<td>Session 6</td>
</tr>
<tr>
<td>Evaluation, interview, test</td>
<td>Session 7</td>
</tr>
</tbody>
</table>

**Results**

Pars Journal of Medical Sciences, Vol. 12, No. 2, Summer 2014
Both the experimental and the control groups were matched in terms of the demographic variables of age and gender. The mean age of the samples (n=30) was 53.33 ± 5.405 years (experimental group: 53.33 ± 6.125 years; control group: 53.53 ± 4.793 years).

The independent t-test was used for examining the study assumption. The normal distribution assumption of the variables was investigated using the Kolmogorov-Smirnov test, with results showing the pretest and the posttest scores to have no significant deviation from the normal distribution; the Smirnov Z values for systolic and diastolic blood pressure and pulse were calculated as 1.233, 0.90 and 0.577 in the pretest and 1.102, 0.607 and 0.991 in the posttest.

The variance homogeneity assumption was examined in the two groups using Levene’s test, results of which showed no significant difference between the experimental group and the control group in terms of the variations of systolic and diastolic blood pressure and pulse (F= 2.377, 0.714, 0.124 P-value= 0.0, 134.0, 405.727).

![Figure 1](image1.png)

**Figure 1**

Comparison of systolic blood pressure in the experimental and the negative control groups

![Figure 2](image2.png)

**Figure 2**

Comparison of the mean score of the pretest and the posttest diastolic blood pressure in the experimental and the negative control groups

![Figure 3](image3.png)

**Figure 3**
As shown in Figures 1, 2 and 3, the mean systolic and diastolic blood pressure in the experimental group decreased after training on components of emotional intelligence while their mean heart rate (pulse) increased. The $t$-test was used for data analysis, results of which are shown in Tables 2 and 3.

Table 2: Systolic and diastolic blood pressure and pulse in cardiac patients before training on emotional intelligence

<table>
<thead>
<tr>
<th>Dependant Variables</th>
<th>T-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$T$</td>
</tr>
<tr>
<td>Systolic Blood Pressure</td>
<td>Variance Homogeneity Assumption</td>
</tr>
<tr>
<td>Diastolic Blood Pressure</td>
<td>Variance Homogeneity Assumption</td>
</tr>
<tr>
<td>Pulse</td>
<td>Variance Homogeneity Assumption</td>
</tr>
</tbody>
</table>

Based on values shown in Table 2, the t-test results are -0.204, -0.267 and 0 for the variables of systolic blood pressure, diastolic blood pressure and pulse, which are not significant given $P \leq 0.05$. In other words, there is no significant difference between the groups before training on emotional intelligence (i.e. the pretest).

As shown in Table 3, the t-test results are -3.151 and -2.697 for the variables of systolic and diastolic blood pressure, which are significant given $P \leq 0.05$. In other words, there is a significant difference between the groups after training on emotional intelligence (i.e. the posttest). Training on emotional intelligence significantly reduces systolic and diastolic blood pressure in coronary artery disease patients. The t-test result for the pulse variable is -0.144, which is not significant given $P \leq 0.05$. In other words, there is no significant difference between the groups in their pulses after training on emotional intelligence (i.e. the posttest). Training on emotional intelligence has not significantly affected pulse in coronary artery disease patients.
Table 3: Systolic and diastolic blood pressure and pulse in cardiac patients after training on emotional intelligence

<table>
<thead>
<tr>
<th>Dependant Variables</th>
<th>T-Test Degrees of Freedom</th>
<th>Significance Level</th>
<th>Difference in Means</th>
<th>Standard Error of Difference</th>
<th>95% Confidence Interval for the Differences Lower Boundary</th>
<th>Upper Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic Blood Pressure Variance Homogeneity Assumption</td>
<td>-</td>
<td>28</td>
<td>0.012</td>
<td>-1.3333</td>
<td>0.49441</td>
<td>-2.34609</td>
</tr>
<tr>
<td>Diastolic Blood Pressure Variance Homogeneity Assumption</td>
<td>-</td>
<td>28</td>
<td>0.004</td>
<td>-1.4000</td>
<td>0.44437</td>
<td>-2.31024</td>
</tr>
<tr>
<td>Pulse Variance Homogeneity Assumption</td>
<td>-</td>
<td>28</td>
<td>0.886</td>
<td>-0.3333</td>
<td>2.31201</td>
<td>-5.06927</td>
</tr>
</tbody>
</table>

**Discussion and conclusion**

The main objective of the present study is to investigate the effectiveness of training on components of emotional intelligence on physical health indicators in cardiac patients. Results of the study showed that training on emotional intelligence without employing other approaches, such as psychotherapy, family therapy and counseling, has had a significant effect on the patients’ blood pressure. Malouff, Einar, Nicola and Schutte carried out a meta-analysis on the relationship between emotional intelligence and health on 7898 people and found that higher emotional intelligence is associated with better health (15). In another research, Schutte, Malouff, Thorsteinssom, Bhullar and Rooke examined the relationship between emotional intelligence and mental health and found that higher emotional intelligence is significantly associated with better health. This study showed that emotional intelligence is associated with fatigue, stress and mental health, as lower emotional intelligence is associated with weaker psychosocial functions that might predispose the individual to symptoms of psychosomatic disorders (16).

In 2008, Bahrami, Jokar and Ghaderpour investigated the relationship between emotional intelligence and general health in 30 female managers. Results of the study revealed a reverse relationship between certain components of emotional intelligence and symptoms of physical and mental disorders, and that women with higher emotional intelligence cope better with physical and mental disorders (17). One of the main goals of training emotional intelligence is the proper management of emotions. One of the main emotions affecting blood pressure is anger. Research shows on the significance of the relationship between anger and chronic hypertension. Findings of the studies conducted by Goldstein, Shapiro and Guthrie (18) and Steven Harris et al. (19) are consistent with results of the present study. Another component of emotional intelligence training is the ability to tolerate stress and pressure and control anger. Results of studies conducted on the effect of relaxation on blood pressure are consistent with results of the present study. In a study conducted in Helsinki for determining the effect of progressive muscle relaxation (PMR) on blood pressure changes, respiratory parameters, heart rate and anger, Nikel et al. (20) concluded that systolic blood pressure significantly reduces after muscle relaxation. In another study conducted in London for determining the effect of muscle relaxation by itself and
then combined with biofeedback on reducing blood pressure and thus avoiding hospitalization, Little et al found that systolic blood pressure decreases after 6 weeks of muscle relaxation (21). Another research conducted by Thomas et al. on teaching healthy anger management and determining its effectiveness showed people who had completed their anger management training to have reduced aggression and lowered blood pressure, which is in line with results of the present study. Moreover, in another study conducted on the effect of muscle relaxation combined with biofeedback on blood pressure, Najafian and the Golestan Hashemi concluded that systolic and diastolic blood pressure reduce after muscle relaxation.

Moreover, results indicated that training on emotional intelligence does not have a significant effect on reducing pulse in cardiac patients admitted to Modarres Hospital of Tehran (P<0.05) (23). Studies indicate the lack of research on the effectiveness of training on components of emotional intelligence on reducing pulse in cardiac patients with coronary artery disease. Several studies have been conducted on the relationship between anxiety and pulse and the effect of relaxation techniques on reducing anxiety and pulse, including, a study by Schwarz et al on the effect of hopefulness on reducing pulse in cardiac patients (24), the one by Jebelameli, Neshatdoust and Molavi (25), another one by Nikbakht Nasrabadi et al. on the effect of Dr. Benson’s relaxation technique on reducing anxiety and pulse, and yet another one by Emami Zeydi et al on the effect of music therapy on vital signs such as pulse in patients undergone open heart surgery.

These results were not consistent with results of the present study, which might be due to the levels of anxiety in cardiac patients hospitalized after heart surgery or expecting surgery, as the close relationship between anxiety and pulse renders the pulse-reducing effect of training on emotional intelligence insignificant; it is therefore necessary to use other relaxation techniques alongside training on emotional intelligence in order to reduce anxiety and improve pulse. To conclude, training on components of emotional intelligence does result in reduced blood pressure in cardiac patients.

To clarify further, lower emotional intelligence can be claimed to contribute to the occurrence of physical problems, such as abnormal blood pressure. In other words, failure to manage anger, the control of which is a major objective of developing emotional intelligence, increases blood cholesterol and adrenaline and thus hardens the arteries and increases the probability of affliction with cardio-vascular disease. In addition, anger and aggression might also cause persisting blood pressure changes. To better take advantage of the present study, it is recommended to perform this intervention over longer periods of time so that its effectiveness can be thoroughly investigated. Moreover, in order to reduce blood pressure in cardiac patients and achieve desirable medical goals, it is suggested to use various materials in educational packages and to compare their results with results of the present study. Given the significance of emotional intelligence in one’s life, which is even more significant than innate intelligence, training on emotional intelligence is strongly recommended to be included in the syllabus and curriculum of schools and universities at younger age.

Acknowledgement
Hereby, we would like to express our gratitude to all the cardiac patients who participated in this research.

References: