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## Original Article

# *Effects of Metacognitive Training and Mindfulness-Based Cognitive Therapy on Couple Communication Patterns With the Mediation of Perceived Stress, Perceived Social Support, and Emotion Regulation in Patients With Coronary Heart Disease*

**Mohammad-ebrahim Maddahi[1], PhD; Akbar Nikpajouh[2], MD; Javad Khalatbari[3], PhD; Saied Malihia Zakerini[4], PhD; Sara Hashemi*[4], PhD**

## ABSTRACT

***Background:*** Psychosocial risk factors have been associated with coronary heart disease (CHD). Social support within couples' relationships has been shown to be important to health outcomes and adjustment to psychological and physical conditions in patients with CHD. Constructive interactions with the family—especially within couples— can reduce the level of perceived stress, increase perceived social support, and affect experienced emotions.

***Method:*** This research had a pretest-posttest experimental design with 2 experimental groups and 1 control group. A sample of 45 subjects was chosen through random sampling from among CHD patients at Rajaie Cardiovascular, Medical, and Research Center. The study population was then divided into 2 experimental groups and 1 control group. The measurement tools of the study were Cohen's Perceived Stress Scale, Multidimensional Scale of Perceived Social Support, Emotion Regulation Questionnaire (Gross & John), and Communication Pattern Questionnaire. The data were analyzed through multivariate analysis of covariance and stepwise regression analysis.

***Results:*** The findings of the study indicated that metacognitive therapy and mindfulness-based cognitive therapy had an effect on the reduction of perceived stress, increase of perceived social support, and improvement of emotion regulation and couple communication patterns among the CHD patients.

***Conclusions:*** The results of the present study can help achieve the objective of reducing stress, augmenting social support, enhancing emotion regulation and couple communication patterns, and—in general—improving mental condition. ***(Iranian Heart Journal 2018; 19(1):6-14)***

**KEYWORDS:** Metacognitive therapy, Mindfulness, Couple communication pattern, Perceived stress, Perceived social support, Emotion regulation, Coronary heart disease

[1] Department of Clinical Psychology, Shahed University, Tehran, IR, Iran.
[2] Rajaie Cardiovascular, Medical, and Research Center, Iran University of Medical Sciences, Tehran, IR, Iran.
[3] Department of Psychology, Azad University, Tonekabon Branch, Mazandaran, IR, Iran.
[4] Department of Psychology, Azad University, Karaj Branch, Alborz, IR, Iran.

***Corresponding Author:** Sara Hashemi, PhD; Department of Psychology, Azad University, Karaj Branch, Alborz, IR, Iran.
**Email:** hashemibahar@yahoo.com **Tel:** 09124028523

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Several studies have indicated that the prevalence of cardiovascular diseases is on the rise and that it is now deemed the leading debilitating disease the world over. In general, 25% of mortalities in the world and 32% of mortalities in developing countries occur due to cardiovascular diseases. It is estimated that by 2020, cardiovascular diseases—especially coronary heart disease (CHD)—will be the leading cause of incapacitation in the general population. [1] CHD is one of the main causes of mortality and morbidity in the world. [2] Studies have shown that the rate of this disease has increased by 20% to 25% in Iran. [3] CHD is due to the accumulation of plaques in cardiac arteries, which supply blood for the normal performance of the heart. The accumulation of plaques leads to narrow heart arteries and a decreased blood flow to cardiac muscles, creating disorder and disruption in the heart's performance. [4] CHD is the result of several risk factors, some of which are non-modifiable such as age, male gender, and family and some are modifiable such as blood pressure, diabetes, blood fat, obesity, low physical activity, and smoking. [5, 6]

The metacognitive approach is based on the notion that individuals suffer from anxiety because their metacognition leads to a certain pattern of responding to internal experiences, which itself causes the continuation of the negative emotions and consolidation of the negative beliefs. This pattern is termed "cognitive attentional syndrome", which comprises worry, rumination, stabilized attention, and self-regulation strategies or maladaptive coping behaviors. [7]

Mindfulness is defined as a stimulated attention state and awareness of whatever happens at the moment. [8] It emphasizes the growth of 3 qualities: avoiding judgment, intentional awareness, and focus on the current moment in the individual's attention. Focusing attention on the current moment leads to the process of becoming aware of all aspects of the immediate experience—including cognitive, psychological, and behavioral activities. By practicing techniques based on mindfulness, individuals become aware of their daily activities and the function of their mind in the past and future; consequently, they are enabled to control their thoughts, feelings, and physical states through moment-to-moment awareness and to become free of the daily and automatic mind, which is focused on the past and future. [9]

Modern medical/behavioral advancements have attracted the attention of health psychology experts to the key role of nonbiological factors in CHD. Studies on this disease have considered psychological and mental/social factors. [10] Today, research indicates that mental/social factors are associated with mortality rates and weak pre-awareness of CHD. [11]

Emotion regulation can be defined as the processes through which people can affect an emotion and the way they experience and express it. [12] Emotion management means the internal and external processes that control, evaluate, and change the emotional reactions of individuals to realize their goals, and any kind of deficit in emotion regulation can render individuals vulnerable to mental disorders like depression and anxiety. [13] The integration of the effects of psychotherapy interventions with a biological/mental/social approach on the basis of some pre-assumptions pertaining to mental/social pathology and communication patterns on the mental, physiological, and social functions of patients suffering from CHD is a step toward answering the query whether metacognitive therapy and mindfulness affect communication patterns in couples with the mediating role of perceived stress, perceived social support, and emotion regulation. Indeed, in the present study, we sought to determine whether perceived social support and emotion regulation could play a mediating role in relation to metacognitive intervention, mindfulness, and communication patterns of couples.

## METHOD

The present study was designed as semi-experimental and correlation investigation containing a pretest and a posttest in conjunction with a control group. The study population comprised 500 patients with CHD who referred to Rajaie Cardiovascular, Medical, and Research Center between 2015 and 2016. Among the 500 subjects, 160 patients with confirmed CHD were selected and then were evaluated using Christensen and Sullaway's Communication Pattern Questionnaire (CPQ). Among the subjects whose evaluation results exhibited a standard deviation less than that of the others (107 subjects), 45 patients were selected via simple random sampling. Thus, the study sample consisted of 45 male and female patients with CHD, who were divided into 2 experimental groups and 1 control group. The inclusion criteria were comprised of consent for participation in the study, myocardial infarction at least 3 months previously, maximum age of 65 years, minimum education level of high school diploma, and proficiency in the Farsi language.

The study participants were pretested. To that end, appropriate relationships were established with the patients, comprehensive history was taken, and the research tests were completed by the patients in a 2-hour session. Thereafter, an experimental group underwent metacognitive therapy for 8 two-hour sessions and the second experimental group underwent cognitive therapy based on mindfulness for 8 two-hour sessions. The control group did not receive any intervention. Upon the completion of the training period, all 3 study groups were posttested through the completion of relevant questionnaires. The questionnaire employed in the current study was Christensen and Sullaway's CPQ. This scale is composed of 35 questions and estimates the behaviors of couples during 3 steps of marital conflict: (1) when a problem happens in the relationship between the couples, (2) during the discussion on communication patterns, and (3) after the discussion on the communication patterns. Couples grade each behavior on a 9-degree scale Likert scale from 1 (never possible) to 9 (very possible). The CPQ is composed of 3 subscales: demand/withdraw communication, mutual constructive communication, and mutual avoidance communication. These 3 subscales were provided by Christian and Shenk (1991). Demand/withdraw communication is composed of 2 parts: demand/man withdraw and demand/woman withdraw. Christiansen and Hiwi (1995) estimated the reliability of this questionnaire. Cronbach's alpha for the CPQ subscales has been reported to range from 0.50 to 0.78. Hiwi et al [14] (1996) obtained the internal consistency for the subscale of 7-item mutual constructive communication and reported that Cronbach's alpha for men and women in this subscale was 0.84 and 0.81, respectively.

The subscale of perceived stress was introduced by Cohen in 1983. This subscale contains 14 items and is used for the measurement of perceived general stress in the preceding month. It measures thoughts and feelings on stressful events, control, overcome, coping with mental pressure, and experienced stresses. Doran et al[15] (2006) calculated Cronbach's alpha coefficient to be 0.74 for this questionnaire. Another tool used in the current study was the Multidimensional Scale of Perceived Social Support (MSPSS), designed by Zimmet et al [16] in 1988 in order to measure perceived social support on behalf of family, friends, and important people in the individual's life. This scale has 12 items and the respondents specify their opinion in a 7-item scale from 1 for totally disagree to 7 for totally agree. Bruner et al [17] in 2008 reported the internal consistency of this tool to be between 86 and 90 for the subscales of this tool and 86% for the total tool. The next tool is the Emotion Regulation Questionnaire (Gross & John). This questionnaire contains 10 items to measure emotion regulation strategies and has 2 dimensions of re-assessment and

repression. In the study of Gross and John, the internal correlation was reported to be 0.79 for assessment and 0.73 for repression. Finally, a demographic information questionnaire was used in the present study; the questionnaire was mainly regulated for the systematic collection of the personal information of the subjects including age, gender, education level, marital status, and history of physical/mental diseases.

**Table 1.** Summary of the programs

| Program Title | Series A | Series B |
|---|---|---|
| Documents (finding the causes) | Part 1 A | Part 1 B |
| Early conclusions (Part I) | Part 2 A | Part 2 B |
| Changes in the system of beliefs | Part 3 A | Part 3 B |
| Empathy ... (Part I) | Part 4 A | Part 4 B |
| Memory | Part 5 A | Part 5 B |
| Empathy ... (Part II) | Part 6 A | Part 6 B |
| Early conclusions (Part II) | Part 7 A | Part 7 B |
| Self-esteem and mood | Part 8 A | Part 8 B |
| Homework | homework | |

The metacognitive training workshop based on mindfulness was carried out in accordance with a method designed for the first time by Segal et al. [18] Here, teaching mindfulness was developed in 8 sessions of 2 hours according to the signs and symptoms of the participants' CHD.

**First Session:** Introducing the participants to each other and adjusting the general policy of the sessions by considering the confidentiality of the individuals' personal life in addition to performing the pretest and the primary exercise of eating raisins, conscious breathing, body monitoring, and doing homework on conscious breathing and body monitoring with the help of audio files.

**Second Session:** Teaching relaxation for 14 groups of muscles—including the forearms, arms, legs and thighs, belly, chest, shoulders, neck, lips, eyes, jaws, and the lower and upper parts of the forehead.

**Third Session:** Teaching relaxation for 6 groups: hands and arms, legs and thighs, belly and chest, neck and shoulders, jaws and lips, and forehead and eyes as well as homework for relaxation.

**Fourth Session:** Teaching the body monitoring technique; sitting meditation with emphasis on body perception (as the interpretation of opposite feelings and thoughts); teaching the technique of paying attention to the body's movement while breathing; introducing conscious walking; and homework for body monitoring, more conscious and longer sitting, conscious walking and conscious reactions to stress and anxiety, and eating with the help of mindfulness (eating with relaxation and paying attention to the taste and appearance of food).

**Fifth Session:** Talking on the completion of half of the training course and expressing the experiences, influences, and commitment to doing homework; conscious sitting (40 min) and developing the awareness of thoughts and mindfulness; discussing the role of mindfulness in responding to stress in daily life; homework for body monitoring, conscious walking, sitting, and breathing; and exercise on awareness vis-à-vis distinguished daily reactions (without conscious selection) and responding (conscious selection) in relationships with others.

**Sixth Session**: Long sitting meditation for 40 minutes; awareness of breathing, sounds, and then thoughts; reviewing the exercises and homework; discussing the preparation for all the periods; and homework for identifying emotions and naming them during the week.

**Seventh Session:** Full mindfulness; sitting meditation for 40 minutes; awareness of breathing, body, sounds, and then thoughts; reviewing the exercises and homework;

observing the relationships between activity and mood; and homework based on the previous exercise.

**Eighth Session:** Body monitoring, sitting meditation, briefly discussing and reviewing the current barriers to using the methods, finding solutions and thereafter continuing the exercises regularly, reviewing the previous contents, and finally arriving at conclusions.

In the present study, the data were analyzed using the multivariate analysis of covariance test and also stepwise regression analysis (path analysis). The statistical calculations and data analyses were done with SPSS, version 24, and the LISREL software.

## Findings

**Table 2.** Analysis of the covariance test for each dependent variable

| Source of Variance | Dependent Variable | Sum of Squares | Degree of Freedom | Mean Squared | F | Significance Level | Eta Squared |
|---|---|---|---|---|---|---|---|
| Group | Communication pattern of the couples | 1322299.249 | 1 | 1323299.249 | 48.553 | 0.000 | 0.669 |
| | Emotion regulation | 8088.620 | 1 | 8088.62 | 302.368 | 0.000 | 0.926 |
| | Intensity of perceived stress | 8859.410 | 1 | 8859.41 | 245.149 | 0.000 | 0.911 |
| | Perceived social support | 5777.557 | 1 | 5777.557 | 137.271 | 0.000 | 0.851 |

**Table 3.** Analysis of the covariance test for each dependent variable

| Source of Variance | Dependent Variable | Sum of Squares | Degree of Freedom | Mean Squared | F | Significance Level | Eta Squared |
|---|---|---|---|---|---|---|---|
| Group | Communication pattern of the couples | 78103.829 | 1 | 78103.829 | 53.883 | 0.000 | 0.692 |
| | Emotion regulation | 5712.820 | 1 | 5712.820 | 304.460 | 0.000 | 0.927 |
| | Intensity of perceived stress | 5823.716 | 1 | 5823.716 | 99.265 | 0.000 | 0.805 |
| | Perceived social support | 1441.308 | 1 | 1441.308 | 47.884 | 0.000 | 0.666 |

**Table 4.** Analysis of the covariance test for each dependent variable

| Source of Variance | Dependent Variable | Sum of squares | Degree of Freedom | Mean Squared | F | Significance Level | Eta Squared |
|---|---|---|---|---|---|---|---|
| Group | Communication pattern of the couples | 5828.32 | 1 | 5828.32 | 1.5 | 0.232 | 0.059 |
| | Emotion regulation | 188.66 | 1 | 188.66 | 9.65 | 0.005 | 0.287 |
| | Intensity of perceived stress | 382.7 | 1 | 382.7 | 5.09 | 0.033 | 0.175 |
| | Perceived social support | 1476.66 | 1 | 1476.66 | 35.62 | 0.000 | 0.598 |

**Table 5.** Results of the regression analysis test for the fourth hypothesis of the study

| Model | Non-Standardized coefficients | | Standardized coefficients | t | Significance Level |
|---|---|---|---|---|---|
| | beta | standard error | beta | | |
| **1 constant effect** | 228.39 | 14.7 | | 15.52 | 0.000 |
| **perceived stress** | -3.27 | 0.436 | -0.753 | -7.50 | 0.000 |
| **2 constant effect** | 167.44 | 52.65 | | 3.18 | 0.003 |
| **perceived stress** | 2.45 | 0.803 | -0.566 | -3.06 | 0.004 |
| **Emotion regulation** | 0.958 | 0.759 | 0.223 | 1.2 | 0.235 |
| **3 constant effect** | 156.36 | 54.65 | | 2.86 | 0.007 |
| **perceived stress** | 22.37 | 0.813 | -0.547 | -2.92 | 0.006 |
| **Emotion regulation** | 0.519 | 0.968 | 0.121 | 0.537 | 0.594 |
| **Perceived Social Support** | 0.767 | 0.957 | 0.143 | 0.802 | 0.427 |

The results in Table 5 show that the standardized coefficient of perceived stress was -0.752, which was statistically significant ($P < 0.05$). In the second model and after the input of emotional regulation, the standardized beta coefficient of perceived stress was still 0.223, which was of statistical significance ($P > 0.05$). In the third step, with the input of perceived social support to the equation, the standardized beta coefficient of perceived stress was -0.547, which constituted statistical significance ($P > 0.05$). In addition, the standardized beta coefficient of regulation was reduced, with its rate in the third step being 0.121—which was not statistically significant ($P > 0.05$). The standardized beta coefficient of perceived social support was 0.143, and this variable was not statistically significant ($P > 0.05$). Thus, only the perceived stress variable remained in the equation and the 2 variables of emotional regulation and perceived social support were removed from the equation.

## DISCUSSION

In the variable "communication patterns of couples" in the present study, the eta squared (effect size) was 66.9%, which means that about 66% of the between-group difference in terms of the communication patterns of the couples was related to the metacognitive therapy intervention. Furthermore, 92.6% of the between-group differences concerning the variable of emotion regulation, 91.1% regarding perceived stress, and 85.1% with respect to perceived social support were related to the metacognitive therapy intervention. Thus, the research hypothesis was confirmed with a confidence level of 99%. The obtained results are consistent with some previous studies such as those by Lund Green, Jonasson, Christenson, and Criston [19] (2015) and Reed, Chental, Sky, and Thompson (2013), who measured the effectiveness of psychological therapies on patients with heart diseases. [20] Moreover, our results are in line with the studies of Valizadeh, Hassanvandi, Mehrabi Zadeh Honarmand, and Afkari [21] (2013), Vanderhyden, Morris, and Vender Mullen [22] (2012), Wells and Welford et al [23] (2010), and Gwilliam et al [24] (2004), who measured the positive effects of metacognitive therapy on psychological variables in patients with different physical and mental conditions. All of these studies indicated the effectiveness of this type of intervention therapy. Our results are also consistent with the studies by Bergerson and Sunerhagen [25] (2011), Barnhofner et al [26] (2009), Fennel (2004), [27] and Wells et al [28] (2012), who measured the effectiveness of metacognitive therapy on depression.

During the metacognitive therapy, our study participants had an active participation and could express their opinions unambiguously. When an individual's relationships change emotionally, he/she can cause a change in someone else. For example, when a husband changes and tends to a more flexible position in expressing his emotions, his wife will respond in a kind way and vice versa. One of the important goals of metacognitive therapy like the methods based on mindfulness (the third-wave cognitive therapy), which was the second intervention in the current study and its effectiveness will be discussed later, is that individuals see the problem in another way, separate themselves from the problem, and evaluate their thoughts by moving away from thoughts. The fact is that stress in daily life is an inevitability, but it is vitally important that the individual cope with crises. Research on response to stressful situations shows that human beings tend to exhibit reactions against threats and symbols of risk but the severity of these reactions varies according to the extent a certain situation is perceived. Indeed, perceived stress is a psychological process or state in which individuals perceive that their psychological and physical well-being is being threatened. Studies have demonstrated that the victims of myocardial infarction suffer from severe stress several months before the incident.

Sources of support not only enable individuals to feel cared for and loved but also confer them self-esteem and self-worth. Individuals benefiting from sources of support feel that they are a part of the vast network of communications and can cope with stressful factors well.

## CONCLUSIONS

The results of the present study indicated that the participants were able to solve their problems by having social support because they knew that they could enjoy this support, if necessary. Thus, the mental/social adjustment rate of the patients with higher perceived social support was higher than that of the patients with lower perceived social support. It can be concluded that psychological factors affect the severity of CHD partly through the relationships of the individual suffering from this disease. The use of emotion regulation skills helps patients with CHD to better recognize their emotions and then study each emotion without feeling hopeless against it. The ability to identify and name a negative emotion, to accept the negative emotion if necessary, and to face it rather than avoid it is among the skills of emotion regulation, which can bolster emotion regulation strategies.

First and foremost among the limitations of the present study are its small sample size and absence of follow-up, as a result, we recommend future studies with large sample volumes and acceptable follow-up periods. On the other hand, it can be stated that determining the mechanism of the relationship between psychological factors and family relationships in patients suffering from CHD is one of the strong point of the current study. It is hoped that the findings of this study will be drawn upon in the design of preventive programs and performance of more extensive studies on CHD.

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