

Mediators for Effect of Mindfulness in Promoting Marital Satisfaction: Modeling Structural Equations in an Experimental Study

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Abstract

Objective: The present study evaluated the model of mediating variables concerning effectiveness of mindfulness in improving women's marital satisfaction.

Method: This study was quasi-experimental with pre-test, post-test and control groups. The statistical population included every married woman in Tehran in the year 1396 (2017). The research sample was composed of 60 married women with moderate marital satisfaction. They were chosen using the convenient sampling technique and were randomly assigned to control and experimental groups. The experimental group attended 8 sessions of Mindfulness-Based Stress Reduction (MBSR) and the control group was on a waiting list. Both groups answered the Five Facet Mindfulness Questionnaire (FFMQ), the Depression, Anxiety, and Stress Scale (DASS), Difficulties in Emotion Regulation Scale (DERS), Interpersonal Reactivity Inventory (IRI), Needs for Intimacy Questionnaire of Bagarazi, Positive and Negative Affect Scale (PANAS) and the Couple Satisfaction Index (CSI) before and at end of intervention. The data were analyzed by Structural Equation Modeling (SEM) using PLS-22 and SPSS-23.

Results: In the initial hypothetical model, which included the direct effect of mindfulness on marital satisfaction and its indirect effects through psychological distress, emotion regulation, empathy, marital intimacy and positive emotion on marital satisfaction, coefficients of all model paths were significant at 95% level except direct path of mindfulness to marital satisfaction ($t = 1.14$), marital intimacy to marital satisfaction ($t = 0.48$) and positive affection to marital satisfaction ($t = 1.75$). After removing the non-significant paths, the model was tested again and the model fit index (GOF = 0.47) was a very good fit for the modified overall model.

Conclusion: The results identified mindfulness-based stress reduction intervention was effective in enhancing marital satisfaction through reducing psychological distress and improving emotion regulation and empathy.

Key words: *Marital Relationship; Mindfulness; Personal Satisfaction; Statistical Model*

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Intimate relationships have great impact on our lives so much so that they can be both a source of joy and happiness and a source of resentment and unhappiness. Happiness and physical health are tied to the quality of relationships (1-3). One of the most important intimate relationships is the one that is formed by marriage (4). Research on intimate relationships has been more focused on troubled or vulnerable couples. With the advent of positive psychology in the twentieth century and the shift in focus of psychology from disorder to psychological happiness and well-being (5), the study of increasing positive emotions in couples and improving marital quality has also expanded. Strengthening relationships can have significant benefits, even in well-functioning couples. Improving the ability to overcome challenges in life and parenting more effectively is one of the most important benefits of strengthening couples' relationships (6). However, few controlled clinical trials have been conducted to improve relationships of well-functioning couples, and most clinical research has been conducted on development of appropriate therapies for troubled couples (7, 8) or early preventive interventions for premarital or at-risk couples (9, 10).

In recent years, with the advent of the third wave of psychotherapy, use of mindfulness has been considered both in the field of treatment and in the field of promoting well-being (11). Mindfulness-based interventions and mindfulness exercises (such as meditation, yoga, and conscious mind walking) expand skills to respond to emotional needs (attunement) because they are basic methods for educating the brain to be more responsive and caring about itself (12). Intrapersonal harmony develops the brain and promotes neuronal integration of executive function, empathy, and emotional regulation (13).

Despite the many positive uses of mindfulness, the following question has not yet been clearly answered: how does mindfulness work? What are its operating mechanisms? Although there is a wide range of research literature including qualitative research, feasibility studies, controlled clinical trials, behavioral studies, and neuroscience research for mindfulness, there is little research on introducing a complete theoretical framework for mindfulness and description of mechanisms behind mindfulness meditation practice (14). In the field of mindfulness communication mechanisms, experimental research is scarce and based on related studies, several potential mechanisms for the effect of mindfulness on improving performance of romantic relationships have been introduced (15). In various studies, variables such as psychological distress (16, 17), difficulty in emotion regulation (18, 19), acceptance (20), empathy (21), self-regulation (22) and positive emotion (23) are some of the consequences of increasing mindfulness that plays a role in increasing marital satisfaction. Carson *et al.* (22) also found that engaging in positive couple interactions and

participating in exciting and engaging activities together is the main mechanism for the effect of mindfulness on increased marital satisfaction.

In summary, based on studies, mindfulness plays an important role in increasing the satisfaction of a couple's relationship, and mindfulness-based interventions increase marital satisfaction (24-26). Iranian studies also support the impact of these interventions in Iranian culture (27-29). However, this research has been largely focusing on incompatible couples seeking divorce. Ismaeilpour (30) examined compatible couples, but in that study, the MBSR-based relationship enhancement protocol was implemented and there is the need for further research on the impact of other mindfulness interventions as well as influence of participation of one of the spouses in the intervention of mindfulness on the promotion of marital satisfaction and the prevention of marital dissatisfaction.

There is little information, especially on how mindfulness improves a couple's relationship. Study of mediators is the first step in understanding mechanisms of change therapy (31). Previous research, sometimes theoretically and hypothetically and sometimes by examining several limited mediating variables, has tried to explain the relational mechanisms of the relationship mindfulness, but there is still a research gap in this field. Research that coherently combines all the assumed mediating variables together and the importance of each in increasing marital satisfaction in an experimental study has not yet been investigated.

On the other hand, research has shown that interpersonal relationships are more important for women than men, and that the quality of marital relationships in women is stronger than in men (32). Also, Iranian studies (33, 34) have shown that Iranian women have lower marital satisfaction than men. Given this issue and research support for the key role of women in continuing conflict in couples (35) as well as the role of women's mindfulness in improving relationships after marital conflicts (36), in the present study we examined the mechanisms behind effect of mindfulness training on women's marital satisfaction. The main question of the present study is that when women learn mindfulness in a mindfulness-based intervention, what factors change which increase their satisfaction with their marital relationship? In fact, what are the mediating variables of the effect of mindfulness on marital satisfaction, and how do these variables affect women's marital satisfaction?

Materials and Methods

Research Design

The present research project is a quasi-experimental study with pre-test, post-test and control groups. Participants were recruited from the city of Tehran using advertisements for women interested in receiving a mindfulness-based stress reduction program. 130 women volunteered to take part in this program. All volunteers

filled Locke and Wallace's (1995) Marital Adjustment Test (MAT) (38) and were tested for the inclusion and exclusion criteria. Based on research on students (39), $M = 116$ and $SD = 28$ were the basis of calculations. The sampling method of the current study was volunteer sampling.

Inclusion criteria for the current research included being married, moderate marital satisfaction (values within one standard deviation of the mean in MAT), consent to participate in research as well as signing the written consent form. Exclusion criteria included severe psychological disorder that has caused hospitalization, history of substance abuse, history of infidelity, regular participation in yoga or mediation courses at time of research and participation in couple therapy sessions or other psychological courses.

To calculate the sample size in an intervention study with pre-test between the two groups, the following formula is used when the sample size in the two groups is equal to each other ($n = n_1 = n_2$).

$$n = ((\sigma_{diff}^2 + \sigma^2_{diff}) (Z_{\alpha} + Z_{\beta})^2 / (\mu_1 - \mu_2)^2)$$

Previous studies in Iran have obtained a large effect size on the effect of mindfulness on marital satisfaction (examples- Madani and Hojjati (37): 0.93; Motahhari, Ahmadi, Behzadpour and Azmoudeh (29): 1.6; Yousefi and Sohrabi (27): 0.95). Accordingly, in the present study, the effect size was considered 0.93, $\alpha = 0.05$ and $\beta = 0.2$ to calculate the sample size. Assuming $\sigma_1^2 = \sigma_2^2 = \sigma^2$ and using the effect size index using Cohen's formula, which is $d = (\mu_1 - \mu_2) / \sigma$, the above formula is converted to the following form and the sample size was as follows:

$$N = 2 (Z_{\alpha} + Z_{\beta})^2 / d^2 = 2 \times 7.84 / 0.93^2 = 15.68 / 0.8649 = 18.12 = 18$$

Using the above calculations, the sample size was calculated at 18 people in each group. Considering the probability of sample loss and using PLS for SEM, 30 people in each group and a total of 60 people were considered. 72 of the volunteer women were eligible and 60 answered pre-test questionnaires. The program was introduced to them and they filled the informed consent form. Afterwards, they were randomly assigned to the experimental group ($n = 30$) and the control group ($n = 30$). The experimental group took part in eight 120 to 150 minute sessions with one session a week. Maximum number of absentee sessions was 2, and all participants followed this protocol.

In addition, absentees attended compensatory meetings or listened to the recorded voices of the meeting, which were placed in a telegram group and conducted home exercises.

During data collection, for treatment and analysis stages, participants were assured that their information would remain confidential and would be analyzed anonymously (code: 9-8, professional code of ethics: psychology and counseling organization of Islamic Republic of Iran,

1386). Furthermore, the ethics committee of Shahed University approved this research to ensure that it is carried out in an ethical manner (IR.Shahed.REC.1396.71).

The control group was on a waiting list and after intervention took part in MBSR sessions. Of the 30 experimental group participants, three were excluded from the final analysis due to distorted questionnaires. In the control group, the results of seven people were not included in the analysis due to simultaneous participation in other psychology classes (one of the exit criteria). Finally, the results of the experimental group with 27 subjects and the control group with 23 subjects were analyzed.

Questionnaires were administered by a fellow researcher (a female with a bachelor's degree in psychology), and the MBSR program sessions were conducted by the main researcher herself who had completed training courses (under the supervision of an MBSR training instructor who was a direct student of Kabat-Zinn).

The tools used in this study were:

-Demographic information: This form included demographic information of subjects such as age, sex, education, field of study, job, marriage duration, number of children and history of substance abuse, history of marital infidelity, history of physical illness, history of mental disorder, and psychiatric hospitalization.

-Marital Adaptation Test (MAT, 38): This scale is a short self-report tool designed to measure quality of marriage with 15 items. It shows how the respondent agrees with his or her spouse about a number of activities that play a fundamental role in marital adjustment. This test has been used in several studies so far (40-42). The reliability of the test in the mentioned studies has been changed by calculating Cronbach's alpha in the range of 0.81 to 0.89. The distinctive validity of these tools has also been confirmed in Sadeghi's (41) research.

-Couple Satisfaction Index (CSI, 43): CSI is a 32-item self-report questionnaire that has high measurement accuracy and high convergence validity with other relationship satisfaction scales (43). In a meta-analysis study, Graham *et al.* (44) obtained Cronbach's alpha of 0.94 for this scale. Factor structure, structural validity, convergent validity and reliability of this scale were examined for the first time in Iran by Forouzeh Yekta *et al.* (39) in 150 married students of Tehran University and Shahed University. In the results of exploratory factor analysis, four factors of happiness in marriage, warmth of relationship, degree of togetherness and ensuring correct spouse selection in the Persian version of the couples' satisfaction scale were identified. The reliability of the questionnaire was obtained at 0.96 by calculating Cronbach's alpha. The convergence of this questionnaire with Lac and Wallace Marital Adaptation Test (MAT) was calculated to be 0.90.

The Five Facet Mindfulness Questionnaire (FFMQ) (45): This questionnaire is a self-report scale with 39

questions and five factors of mindfulness including observation, description, conscious action, non-judgmental acceptance, and lack of response to internal experiences. This questionnaire shows good internal consistency and significant relationships in predicted aspects of the types of mind-related structures in the various examples, and Cronbach's alpha coefficient reported at 0.090 (45). In research conducted by Tamnaeifar *et al.* (46), the validity of the structure of this test was confirmed by examining the five-factor structure of the questionnaire and all the indicators showed a relatively favorable fit. Cronbach's alpha coefficients between 0.63 in the non-reactive factor and 0.87 in the action factor were reported in conscious action. Cronbach's alpha coefficient of the whole questionnaire was 0.85, which indicates the internal consistency of this questionnaire. The reliability of the re-test of this questionnaire was obtained at between 0.76 and 0.86.

Depression, Anxiety and Stress Scale (DASS-21) (47): This questionnaire consists of 21 items that measure symptoms of negative emotions (depression, anxiety and stress). Lovibond and Lovibond (47) reported internal consistent coefficients (Cronbach's alpha) of the three subscales of depression, anxiety, and stress to be 0.91, 0.81, and 0.89, respectively. In Iran, Sahebi *et al.* (48) obtained the internal consistency of the scales using Cronbach's alpha for depression, anxiety and stress scales at 0.77, 0.79 and 0.78, respectively. Also, the correlation between depression scale of DASS with Beck's depression test was 0.70, the correlation between anxiety scale of DASS with Zang anxiety test was 0.67 and the correlation between stress scale of DASS with perceived stress test was 0.49; all of which were significant at $P < 0.001$.

Difficulties in Emotion Regulation Scale (DERS) (49): This scale measures various dimensions of difficulty in emotional regulation. In a study of the reliability and validity of this scale, Gratz and Roemer (49) reported Cronbach's alpha coefficient of 0.93 and for each of the subscales more than 0.80, which is a sign of good internal consistency of this scale. Also, the reliability of its retest in a period of 2-8 weeks was reported to be appropriate. The Iranian version of this test was validated by Khanzadeh *et al.* (50). Cronbach's alpha coefficients for each of the subscales ranged from 0.66 to 0.88, and the reliability of retesting after one week for each subscale ranged from 0.79 to 0.91. Also, in relation to the validity of the structure, all subscales of this scale showed a positive correlation with Beck's anxiety and depression checklist.

Interpersonal Response Index (IRI, 51): This index measures empathy and cognitive aspects using three subscales. Davis (51) reported the Cronbach's alpha coefficient for all three subscales to be between 0.71 and 0.77. He also reported a test-retest reliability after a four-week period to be between 0.62 and 0.80. In Iran for the Persian version, Allah Gholilo (52) has obtained

Cronbach's alpha coefficient and reliability coefficient of retesting of this scale at 0.77 and 0.76, respectively, and has reported its validity as favorable and has reported its validity as favorable.

Needs for Intimacy Questionnaire (53): This questionnaire was designed to assess intimacy needs in 8 dimensions: emotional, psychological, rational, sexual, physical, spiritual, aesthetic and recreational-social. After confirming the content validity of this questionnaire, Etemadi (54) obtained the concurrent validity and the reliability coefficient using Cronbach's alpha method for the whole questionnaire, 0.58 and 0.94, respectively. In addition, Khamseh and Hosseinian (55) calculated the reliability of each dimension of intimacy by the retesting method, which for emotional, psychological, intellectual, sexual, physical, spiritual, aesthetic and socio-recreational intimacy were 0.89, 0.82, 0.81, 0.91, 0.80, 0.65, 0.76 and 0.51, respectively. This indicated the acceptable reliability of this scale.

Positive and Negative Affect Scale (56): This scale is a 20-item self-assessment tool designed to measure two dimensions of mood: "positive emotion" and "negative emotion." The reliability of the test was reported through Cronbach's alpha method and retesting for positive and negative emotions was 0.88, 0.87, 0.68 and 0.718, respectively (56). Bakhshipour and Dejkam (57) obtained the same reliability for both scales in the Cronbach's alpha method equal to 0.87. In factor confirmation analysis, the two-factor model was the most appropriate model. The positive emotion subscale of this scale was used to measure positive emotion in this study.

MBSR-Based Stress Reduction program protocol: In this study, the guide of Kabat-Zinn (MBSR) program protocol (58) was used, which in addition to numerous foreign studies has been used in numerous studies in Iran and its effectiveness has been proven (59). The program runs over an eight-week period with an agenda for each session:

The first session; introducing members to the group, introducing a mind-based stress reduction program, practicing raisin meditation, practicing body meditation training, and presenting summary sheets of meetings and recording official meditations. Session two; exercise body meditation practice, introduction of executive style or action style versus lightness, knowing the value here and now by recording pleasant events. Session three; performing meditation focused on physical movements (yoga), explaining the logic of yoga exercises, teaching three-minute breathing space. Session four; exercise five minutes of seeing or hearing, meditating on awareness of breathing, body, sounds and thoughts, defining stress, emotional, physical, mental and behavioral consequences of stress, the importance of assessing and believing in stress perception, interruption technique or STOP. Session five; sitting meditation focused on the soul, body, sounds and thoughts, half-way assessment: what did you learn from the exercises? how to deal with

negative emotions: avoidance, disgust and blocking or drowning, and mental rumination. The right way: a way between the two: decisive acceptance, meditation, coping with problems. Session six; meditation on self-awareness, body and finally mountain meditation, communication mindfulness, distribution of communication beliefs and group discussion questionnaires, all kinds of passive, aggressive and daring behavioral patterns, active listening skills and introduction of listening barriers, bold commenting steps. Session seven: Body-centered sitting meditation, voices and thoughts along with kindness meditation, introducing conflict resolution styles, teaching non-speaking skills, negotiation skills training. Session eight: Body meditation practice training, planning to use skills learned in the future and starting a new lifestyle, participants' opinions about course sessions and presenting the beginning of a new lifestyle and how to continue training in the future.

Statistical method

The novelty of this study is using the Structural Equation Modeling (SEM) in an experimental study. The partial least squares SEM (PLS-SEM) is used to estimate complex cause-effect relationship models with latent variables as the most salient research methods across a variety of disciplines (60). We used the change mean scores between the experimental and the control group in this model. Mindfulness changes due to intervention was an independent variable. Changes in psychological distress, emotion regulation, empathy, marital intimacy, and positive emotion as mediating variables, and marital satisfaction changes as dependent variables were introduced.

Results

Descriptive results

The mean age of subjects was 36 (SD = 8) in the experimental group and 37 (SD = 9) in the control group and there was no significant difference between the two groups in terms of age. The most frequent education level in the experimental group was bachelor's and master's level (both 37%) and in the control group, bachelor's level (43%) and the two groups did not differ significantly in terms of education level ($X = 2.80$ and $P = 0.73$). The average marriage duration of the experimental group was 13 years (SD = 9) and control group was 14 years (SD = 10), the highest frequency of marriage duration in both groups was over 15 years and the results of the comparison of the two groups showed that there was no significant difference between the two groups in this regard ($t = -0.54$ and $P = 0.59$).

Modeling results

The PLS method for evaluating structural equations consists of three steps: A) fitting measurement models, B) fitting the structural model, and C) fitting the general model.

A) Evaluation of fit criteria related to measurement models

Measurement models refer to the questionnaires used for each variable. Three criteria of reliability, convergent validity and divergent validity are used to evaluate the fit of the measurement models. An examination of the values obtained for all questionnaires showed that the measurement models used were appropriate.

B) The fit of the structural model

The first and most basic criterion for evaluating the fit of a structural model in this software is the significant coefficients of z , or the same t -value values that are calculated using the Bootstrapping command. These coefficients are shown in Figure 1. The significance level for the values of t is 2. In other words, the coefficients must be greater than 2 to be able to determine their significance at the 95% confidence level.

The model tested in Figure 1 shows the coefficients of all model paths except the direct path of mindfulness to marital satisfaction ($t = 1.14$), marital intimacy to marital satisfaction ($t = 0.48$) and positive affection to marital satisfaction ($t = 1.75$) is significant at 95% level. These results are shown in Table 1.

In order to modify the proposed model, the three paths of mindfulness, marital intimacy, and positive affection for marital satisfaction were removed, and the model was re-examined. Figure 2 shows the modified model with t values.

As can be seen in Figure 2, all t values are greater than 2 and significant, and the structural fit of the modified model is confirmed.

The second criterion for assessing suitability of the structural model is R^2 coefficients related to the hidden endogenous variables of the model and shows the effect of an exogenous variable on an endogenous variable and three values of 0.19, 0.33 and 0.67 as the value of the criterion is considered for weak, medium and strong values of R^2 (61). These values, calculated by the PLS Algorithm command, are shown in Table 2, and as can be seen, for all variables, the R^2 coefficient is above 0.33, and the suitability of the structural model fit is confirmed by this method.

C) Fitting the general model

The general model includes both parts of the measurement model and the structural model, and with the approval of its fit, the fit of the model is completed. The fit index of the general model is GOF, which is calculated from the following formula:

$$GOF = \sqrt{\text{Communality} \times R^2}$$

“Communality” Value is the mean of the common values of the variables and “ R^2 ” is the mean of the coefficients of the hidden endogenous variable within the model, which are shown in Table 2.

$$GOF = \sqrt{0.59 \times 0.38} = 0.47$$

Wetzels, Odekerken-Schroder, and Van Oppen (62) has been suggested three values of 0.01, 0.25 and 0.36 as

weak, moderate, and strong values for GOF. Accordingly, the value of 0.47 for GOF indicates a very good fit of the modified overall model.

In order to examine the relationships between the variables and the effect of each on the other, the standard coefficients of factor load (beta coefficients) for each of the paths was calculated by the PLS Algorithm command, which is shown in Figure 3 and Table 3.

As can be seen in Table 3, with increasing the mindfulness unit, psychological distress was at 0.59 and difficulty of emotion regulation decreases by 0.68. Also, level of empathy increases by 0.59. On the other hand, by one-unit reduction in psychological distress, marital

satisfaction increased by 0.22. By reducing the difficulty of emotion regulation, marital satisfaction increased by 0.32, and by increasing empathy by one unit, marital satisfaction increased by 0.23. These results showed that training mindfulness decreased psychological distress and emotion regulation difficulty and improved empathy and these changes led to enhanced marital satisfaction .

Based on the results, the direct path of mindfulness to marital satisfaction is not significant ($t = 1.14$) and it was shown that the effect of mindfulness on marital satisfaction is not direct and is through mediating variables.

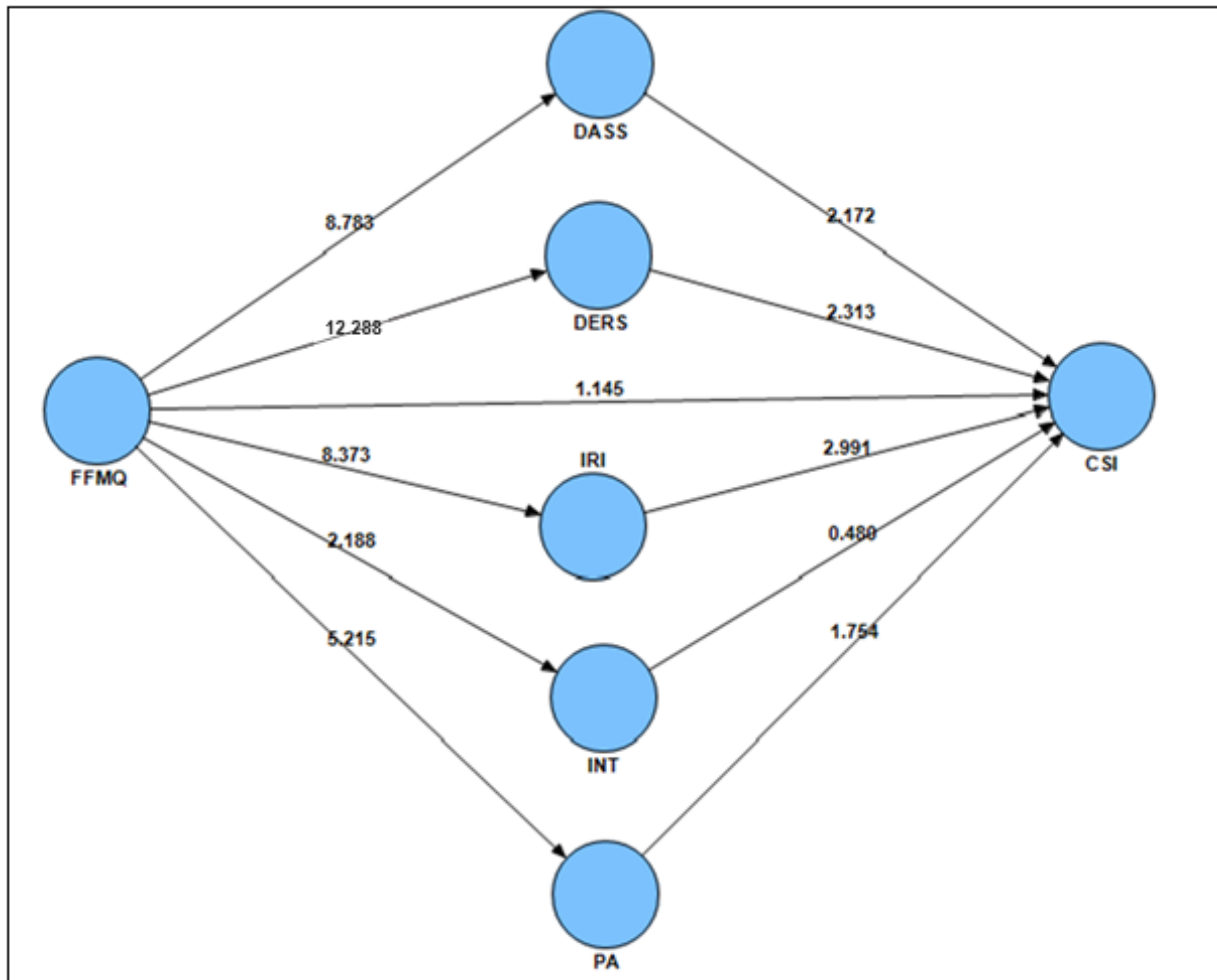


Figure 1. Test of the Proposed Model of Mediating the Variable of Effect Mindfulness and Its Effect on Marital Satisfaction in Women with t Statistics

Mindfulness: FFMQ, Couple Intimacy: INT, Psychological Distress: DASS, Positive Emotion: PA, Difficulty of Emotion Regulation: DERS, Empathy: IRI, Marital Satisfaction:

Table 1. Results of t Values and Standard Coefficients in Test of Proposed Model of Mediating the Variable of Effect Mindfulness and Its Effect on Marital Satisfaction in Women

Path	t values	standard coefficient (beta)
Mindfulness to psychological distress	8.76	-0.59
Mindfulness to emotion regulation	12.29	-0.69
Mindfulness to empathy	8.37	0.61
Mindfulness to couple intimacy	2.19	0.19
Mindfulness to positive emotion	5.21	0.38
Mindfulness to marital happiness	1.14	0.19
Psychological distress to marital satisfaction	2.17	-0.26
Emotion regulation to marital satisfaction	2.31	-0.29
Empathy to marital satisfaction	3	0.33
Couple intimacy to marital satisfaction	0.48	0.02
Positive emotion to marital satisfaction	1.75	0.19

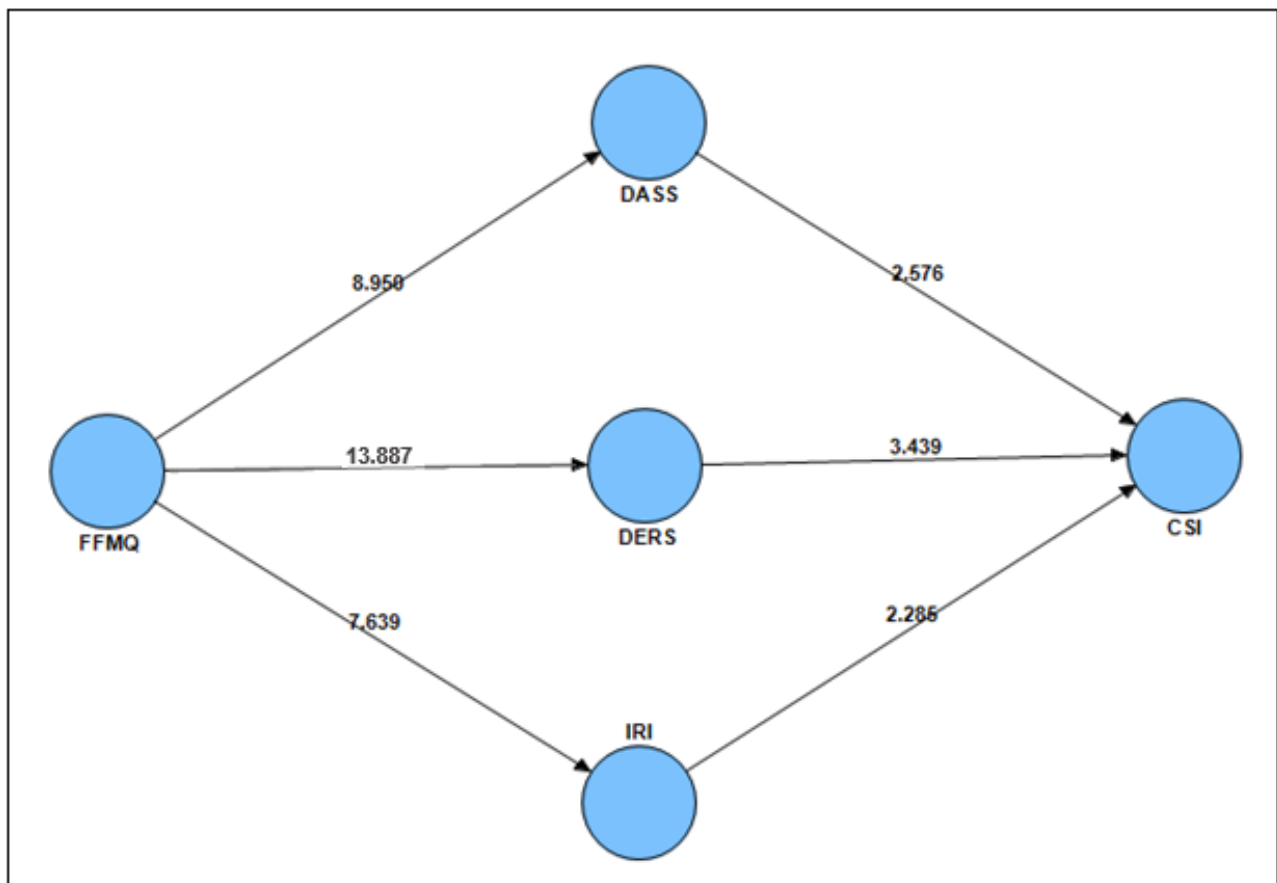


Figure 2. Modified Model of Mediating the Variable of Effect Mindfulness and Its Effect on Marital Satisfaction in Women with t Values

Table 2. Share Values and R2 Coefficients of Research Variables Such as Marital Satisfaction, Psychological Distress, Emotion Regulation, Empathy and Mindfulness

	Shared values	R2 coefficients
Marital Satisfaction	0.46	0.38
Psychological distress	0.71	0.35
Emotion regulation	0.63	0.46
Empathy	0.63	0.35
Mindfulness	0.53	
Average	0.59	0.38

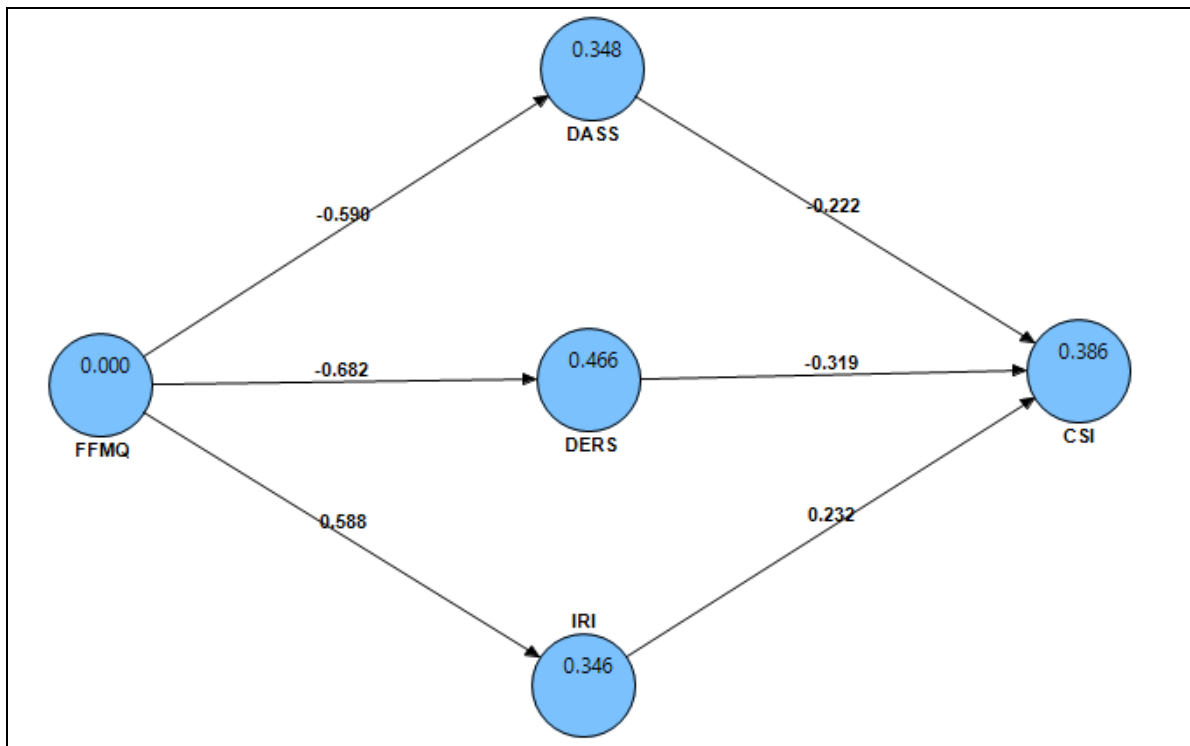


Figure 3. Test of the Modified Model of Mediating the Variable of Effect Mindfulness and Its Effect on Marital Satisfaction in Women with Standard Coefficients

Table 3. Beta Coefficients of the Variable Path in the Modified Model of Mediating the Variable of Effect Mindfulness and Its Effect on Marital Satisfaction in Women

Path	beta coefficient
Mindfulness to psychological distress	-0.59
Mindfulness to emotion regulation difficulty	-0.68
Mindfulness to empathy	0.59
Psychological distress to marital satisfaction	-0.22
Emotion regulation to marital satisfaction	-0.32
Empathy to marital satisfaction	0.23

Discussion

The results of structural equation modeling showed that in the initial hypothetical model, which included the direct effect of mindfulness on marital satisfaction and its indirect effects through psychological distress, emotion regulation, empathy, marital intimacy and positive emotion on marital satisfaction, the coefficients of all model paths at 95% level were significant, except for the direct path of mindfulness to marital satisfaction, marital intimacy to marital satisfaction, and positive affection to marital satisfaction. After removing the non-significant paths, the model was tested again and the model fitness index was calculated, which indicates that the overall fit of the modified model is very appropriate. Based on this, the model of the effect of mindfulness on marital satisfaction was confirmed through psychological distress, emotion regulation and empathy. The effect of mindfulness on psychological distress, emotion regulation, empathy, marital intimacy, and positive emotion was also confirmed. On the other hand, changes in the variables of psychological distress, emotion regulation, and empathy are effective in increasing marital satisfaction, but the two variables of marital intimacy and positive emotion do not have a significant effect on marital satisfaction. The results of this study are consistent with the results of various studies that show that mindfulness is more skilled in couple interactions, spouse acceptance, more empathy and higher marital satisfaction (24, 63-65). In fact, couple mindfulness exercises can help improve relationship function (22, 66, 67). Iranian studies have also shown the relationship between mindfulness and marital satisfaction (68) and the effectiveness of mindfulness-based therapies on increasing marital satisfaction and quality of life in couples (69) and reducing couples' irrational communication beliefs (70) has been shown. People with high awareness are better able to postpone judging in difficult relationship experiences and in times of conflict, and to deal constructively with their spouse. The processes of awareness and acceptance in mindfulness cause less emotional responsiveness in interpersonal relationships and consequently more positive relationships between spouses (63). Mindfulness also increases compassion and empathy, especially looking from another perspective and the importance of empathy (63). Awareness of experiences, which is related to mindfulness, increases the capacity to feel empathy with others and thus promotes the results of the relationship (21).

According to Baron and Kenny (71), if the relationship between the independent and dependent variables loses its significance by considering the mediating variables, it can be said that the mediating variables completely mediate the relationship between the variable and the dependent. The present study uses an experimental method and emphasizes findings of correlation studies that showed that mindfulness intervention (58) changes

psychological distress, emotion regulation, empathy, marital intimacy, and positive emotion in participants. In the relation between mindfulness and marital satisfaction, psychological distress, emotion regulation and empathy are mediators and their change is the mechanism of the effect of mindfulness intervention on increasing marital satisfaction.

In the field of mediating variables, the effect of mindfulness on marital satisfaction has been little studied and no similar study has been found that has studied these variables using structural modeling in an experimental study. The results of this study are consistent with the research of Jonse, Weltone, Oliver and Thoburn (72) and Khaddouma, Gordon and Strand (67). Jonse *et al.* (72) also found that spouses' attachment played a mediating role in the relationship between natural mindfulness and marital satisfaction. Natural mindfulness is an innate tendency of the individual to receive and be responsive to emotions, both internally and externally (13). Accordingly, the process of internal coherence (responsiveness to emotional needs) activates and develops neural circuits associated with internal immunity. Also, mindfulness coherence (responsiveness to emotional needs) to the spouse affects the individual's assessment of marital satisfaction and increases the activation and growth of neural circuits related to security and positive emotion in a romantic relationship (72). Khaddouma, Gordon and Strand (67) examined the effect of changes in various components of mindfulness on marital satisfaction and found that acting with awareness was associated with increased satisfaction with their relationship with their spouse, while the increase in the non-response aspect was related to the satisfaction of the relationship in the spouse and not in the individual. Also, the increase in the ability to pay attention to activities in the moment due to purposeful attention (conversely, react or act automatically), after passing the course was associated with increased satisfaction with the relationship in both spouses. These components are similar to the emotion regulation components that mediated marital satisfaction change in our study. Some researchers, such as Labelle, Campbell, Faris, and Carlson (73), believe that the structures of mindfulness and emotion regulation may overlap, and both mutually create changes during mindfulness intervention.

Limitation

Among the limitations of the present study are the selection of the sample by the available sampling method and the selection of individuals who had access to Telegram's cyberspace. Also, the sample group were married women in Tehran with moderate to high socio-economic level who were often in the stage of having children from the family cycle, so generalizing the results to other groups and newly married people and in the cycle without children, should be done with caution. In addition, intervention by the researcher herself, the

large number and length of questionnaires, are other limitations of this research.

Conclusion

The present study showed that MBSR intervention in women with moderate marital satisfaction increases marital satisfaction, and this is due to changes that occur in psychological distress, emotion regulation and empathy. In fact, mindfulness exercises in the intrapersonal dimension change the ways we deal with emotions and increase emotion regulation skills, so we use efficient coping behaviors during negative emotions. Mindfulness also reduce negative emotions such as anxiety, depression, and stress and this has many benefits for the couples such as not reacting automatically to anger, becoming physiologically calmer, not judging the spouse, accepting difficulties of life and not fighting them, becoming aware of the role of own behaviors in our spouse's reactions, and so on. All of these consequences play an important role in managing couples' conflicts. On the other hand, creating an open approach with curiosity as well as compassion to self and others, especially the spouse, increases satisfaction and happiness in general and marital satisfaction in particular.

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Conflict of Interest

None

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