Article

The effect of mindfulness-based stress reduction on caregiving in romantic relationships of overweight women: A quasi-experimental design

Leila Shojaei[1], Anahita Khodabakhshi-Koolaee[2,3*], Zabih Pirani[3], Davood Taghvaei[3]

[1]Department of Counseling, Arak branch, Islamic Azad University, Arak, Iran
[*2]Department of Psychology & Educational Sciences, Faculty of Humanities, Khatam University, Tehran, Iran
[3]Department of Psychology, Arak branch, Islamic Azad University, Arak, Iran

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***Corresponding author:**
Associate Professor, Department of Psychology and Educational Sciences, Faculty of Humanities, Khatam University, Tehran, Iran

Email:
a.khodabakhshid@khatam.ac.ir

Abstract

Background: Taking care of romantic relationships in couples depends on marital satisfaction and a better understanding of each other's needs. Physical changes such as weight gain and obesity can make people develop negative perceptions of their body and appearance and endanger caregiving for romantic relationships in couples.
Objectives: The present study aimed to examine the effect of mindfulness-based stress reduction (MBSR) therapy in caring for romantic relationships in overweight women.
Methods: This experimental study was conducted with a pre-test and post-test design on 30 overweight women. A total of 30 women were selected using convenience and were placed block randomization method in the experimental and control groups (each with 15 members). The experimental group received the MBSR intervention in twelve 90-minute sessions. The data were collected using the Caregiving Questionnaire (CQ; Kunce & Shaver, 1994) and analyzed through multivariate analysis of variance (MANOVA) in SPSS-v24 software.
Results: The findings showed that the MBSR intervention significantly improved caregiving in romantic relationships in overweight women who underwent the intervention. F value calculated for the pre-intervention and post-intervention scores for the components of proximity (F=17.56, p=0.001), sensitivity (F=8.08, p=0.001), cooperation (F=42.05, p=0.001), and non-obsessive control (F=24.31, p=0.001) were significant.
Conclusion: MBSR techniques can lead to adaptive behaviors and positive psychological states in women and improve romantic behavior. MBSR, when used with weight loss treatments, can help to enhance the satisfaction with and quality of marital relationships in married women.

Implications of this paper in nursing and midwifery preventive care:
- Obesity and overweight affects diseases such as high blood pressure, diabetes, heart and brain strokes and other physical diseases. Female obesity especially causes infertility problems. In general, obese women need more time to conceive. Also, care during pregnancy is a serious challenge for midwives and nurses. On the other hand, obesity has a negative effect on people's perceptions of their physical appearance and disrupts sexual relations between couples. This will lead to a delay in women's fertility. Teaching nutritional health, self-care behaviors and mental health helps midwives and nurses to prevent serious problems in obese women.

Introduction

Weight gain and obesity have currently become one of the public health challenges in communities. Obesity is associated with adverse health outcomes such as heart disease, hypertension, stroke, diabetes, various types of cancer, and premature death [1]. One of the most important behavioral factors underlying overweight and obesity in people is eating behavior [2]. The eating habits and styles of obese and overweight people have their roots in their childhood. Thus, emotional eating habits can be induced by external stimuli and preventing eating in childhood [3]. Identifying people's eating behaviors, in addition to contributing to developing effective treatment plans, can also play a role in predicting people's eating behaviors and meeting their success rate in losing weight. Eating behavior is a good predictor of overeating in emotional situations [4].

Recently published data show that excess weight gain occurs more rapidly in young women and men [5] and is associated with further weight gain in the future [6]. There is concern that earlier onset of obesity is associated with less recovery and more negative consequences [7] such as increased mortality [8] and some chronic diseases, including coronary heart disease, type 2 diabetes,

cancer, high blood pressure, stroke, sleep apnea, breathing problems, and arthritis [1]. In Iran, the overall prevalence of overweight and obesity in the entire population was 35.09% [9].

Caregiving in adult intimate relationships refers to a wide range of behaviors that are complementary to the partner's attachment behavior, such as helping or assisting, providing comfort and reassurance, providing a secure base, and encouraging autonomy [10]. Caregiving behavior in romantic relationships was proposed by Kunce and Shaver following John Bowlby's attachment theory. Caregiving fulfills the needs of the mutual partner and leads to the reduction of confusion and thus it depends on the caregiver's attachment style [11]. The capacity to create intimate emotional bonds with others - sometimes in the role of caregiver and sometimes in the role of care seeker - is a key feature of effective personality functioning and mental health. In addition, caring responsiveness (such as availability, responsiveness, and engagement) has a positive and strong relationship with marital relationship stability [12]. According to Kunce and Shaver (1994), caregiving has 4 dimensions: (a) Sensitivity vs. Insensitivity: the ability to pay attention and accurately understand signs of distress and need in the partner; (b) Proximity vs. Distance: a person's tendency to provide physical and emotional access and closeness, as a tool to relieve a troubled partner, (c) Cooperation vs. Control: the individual's tendency to take on too much of the partner's problem, in such a way that it minimizes the partner's opportunities to find their solutions (in contrast to cooperation which refers to supporting the partner's efforts to solve their problems), and (d) Compulsive Caregiving: A person's tendency to be overly involved in the partner's life and problems, with minimal attention to his/her real needs. Thus, caring behaviors in couples can affect their romantic relationships [13].

Overweight and obesity are directly associated with negative body image and sexual functioning in women [14]. One of the effective therapeutic interventions for overweight women is MBSR. Research shows that MBSR intervention is effective in reducing the psychological distress in overweight and obese women [15]. This approach was introduced by Kabat-Zinn and teaches a person to use mindfulness-based exercises to reduce negative responses caused by emotional distress. Mindfulness helps people learn to accept experiences as separate experiences from themselves and as a transitory state and subject to change (16-17). MBSR therapy helps to reduce and maintain weight [17]. Moreover, many overweight and obese people have various psychological symptoms such as anxiety, depression, emotional regulation problems, and eating addiction. MBSR can be considered as a part of comprehensive medical care for obese people [18]. A study found that MBSR can help reduce weight-related negative experiences [19]. However, there are conflicting results about the effectiveness of MBRS. For instance, a study showed that mindful eating did not affect weight loss [20].

Nevertheless, research has shown that MBSR can help improve romantic relationships between couples. For example, the couples who attended the MBSR program for 6 weeks reported that this intervention helped mutual understanding, intimacy, appreciation, and care for each other [21]. Indeed, the application of MBSR intervention has an effective role in romantic relationship well-being [22]. Another study also showed that mindfulness-based relationship enhancement was effective in improving the relationship, satisfaction with the relationship, independence, kinship, intimacy, acceptance of each other, optimism, spirituality, peace, and less psychological distress in couples. Indeed, the couples who experience more happiness in their relationships are exposed to lower levels of stress and they tend to adopt more effective stress coping strategies [23].

In another study, Kozlowski showed that the application of mindfulness increases awareness and attention to one's experience in the present moment in a non-judgmental way. Studies have suggested a direct relationship between mindfulness and satisfaction with romantic relationships. Mindfulness can help to increase individual well-being, emotional skillfulness, enhancements in sexual satisfaction, increased empathy, and healthier stress responses [24], leading to higher levels of couple relationship quality [25].

Obesity and overweight impose direct and indirect costs on the healthcare system of a community and lead to psychological distress and social and

family problems in overweight people. MBSR therapy is one of the psychological and non-pharmacological treatments proposed to cope with obesity-related problems and seems to be effective in improving the psychological and marital status of overweight people. To this end, the present study aimed to examine the effect of mindfulness-based stress reduction (MBSR) therapy on caregiving in romantic relationships of overweight women.

Methods

This experimental study was conducted using a pre-test-post-test design with a control group. The study population included all the women suffering from obesity who visited a nutrition and diet therapy clinic in District 1 of Tehran from late March to late September 2023. A total of 30 women were selected using convenience and were placed by block size 4 randomization method in the experimental and control groups (each with 15 members). The sample size was estimated using the Fleiss sample size estimation equation [26], where σ=1.61 [15], $2d^2$=4.507, Power=0.9, and α=0.05. In the mentioned equation, σ is the standard deviation showing the degree of dispersion from the mean and d is the confidence interval that indicates the probability that a parameter will fall between a pair of values around the mean. Accordingly, the sample size for each group was estimated at 12.07. However, for statistical robustness, the sample size was considered 15 persons per group.

The criteria for enrollment in the study were: (1) Overweight women diagnosed by a nutritionist, (2) a body max index (BMI) of 30 kg/m^2 (BMI was measured as the weight in kilograms divided by the height in meters squared, the weight was measured using a digital scale with a sensitivity of 100 grams, the height was measured using a tape measure with an accuracy of 0.5 cm, and overweight was defined as BMI of 25-30 kg/m^2, and obesity was defined as BMI $\leq$ 30, with a score from 18.5 to 24.9 being normal), (3) not having acute and chronic psychological problems based on diagnosed by a doctor, (4) having at least a diploma, (5) the age range of 25 to 45 years, (6) a score of less than 1 standard deviation for Caregiving Questionnaire (CQ) based on the scoring in questionnaire, and having 1 child at least. The exclusion criteria were: (1) attending other psychological programs in the last 6 months or during the study, and (2) absence of more than 3 intervention sessions.

The data were collected by administering the Caregiving Questionnaire (CQ) to the samples in the two groups before and after intervention. This 32-item instrument was developed by Kunce and Shaver (1994) and contains 4 subscales of Proximity vs. Distance (items 1, 4, 7, 9, 12, 22, 25, and 29), Sensitivity vs. Insensitivity (items 2, 4, 6, 8, 10, 14, 18, 20, and 28), Cooperation vs. Control (items 3, 13, 16, 21, 23, 26, 30, and 32), and Compulsive Caregiving (items 5, 11, 15, 17, 19, 24, 27, and 31). Some items (1, 3, 5, 6, 10, 12, 14, 15, 17, 19, 21, 22, 23, 28, 29, and 32) are scored inversely. Each subscale is measured by 8 items scored on a 6-point Likert scale [13]. The response format is Likert-type, with response options ranging from 1 (nothing like me) to 6 (very similar to me). High scores reflect high levels of closeness, sensitivity, non-controlling, and non-compulsive caregiving [27]. Kunce and Shaver (1994) reported the reliability of the subscales from 0.80 to 0.87 using Cronbach's alpha method and 0.77 to 0.88 with the test-retest method with a one-month interval. They also confirmed the convergent validity of the questionnaire by estimating its correlation with the Adult Attachment Scale. The resulting correlations ranged from 0.31 to 0.87 and were significant at the 0.05 level [13]. This Questionnaire translated to Persian by Malek Asa and et al. (2017) and the Cronbach's alpha reliability reported for all subscales ranged from 0.70 to 0.77 [28]. In this study, Cronbach's alpha values for the subscales ranged from 0.69 to 0.87.

After obtaining the code of ethics and necessary permits for conducting the intervention program, the content of the MBSR sessions was developed based on the literature [29-31] and approved by subject-matter experts and researchers. The mindfulness-based stress reduction (MBSR) therapy sessions were held for the participants in the experimental group each week on Tuesdays from 10:00 to 12:00 at a nutrition and diet therapy clinic. A total of 12 sessions were held and each session lasted 60 to 90 minutes. The implementation of the interventions was done by a. PhD candidate of counseling psychology. During the intervention, the participants in the control group did not receive any treatment, and

the post-test was also conducted one week after the completion of the MBSR intervention for the experimental group. Table 1 summarizes the process and content of the intervention sessions:

Table 1: A summary of the MBSR therapy sessions

Sessions	Content and procedure
1	Introducing group members, describing the content of the training sessions, defining overeating and bulimia nervosa, complications, and emotional distress, introducing mindfulness, meditation, the purpose and benefits of mindfulness, and the relationship between mindfulness and reducing pain and stress, performing body scan meditation for 30 minutes (by focusing on a part of the body while breathing), asking the participants to do the same exercise at home.
2	Asking the members to do the body scan meditation, discussing this experience and the homework, talking about the obstacles to doing the exercise (such as restlessness and mind wandering), and mindfulness solutions to this problem (being non-judgmental and letting go of disturbing thoughts), discussing the differences between thoughts and feelings by stating that events do not directly create a certain emotional state in us, rather it is our thoughts and perceptions about that event that create our emotions. Asking the participants to do the meditation in a sitting position. The homework for the next session: Mindfulness is a pleasant event, sitting meditation, body scan meditation, and mindfulness as a new daily activity.
3	Mindfulness training, sitting on the floor, walking, and smiling exercise, asking the participants to eat a raisin with all their feelings and then discuss about this feeling, asking the participants to apply what they learned about eating a raisin to brush their teeth or wash the dishes, seeing and listening exercise by looking and listening non-judgmentally for 2 minutes followed by sitting meditation and breathing while focusing on bodily sensations, discussing the homework, performing a three-minute breathing space exercise in three steps (noticing the experience right now, directing attention to the breath and the sensations of the breath, and noticing the breath and sensations of the body), and performing a mindful movement exercise. Homework: sitting meditation, body scan or a mindful body movement, three-minute breathing space exercise, mindfulness of a new daily activity, and mindfulness of an unpleasant event.
4	Performing sitting meditation while focusing on breathing, body sounds, and thoughts (sitting meditation with four focuses), discussing stress responses to difficult situations and alternative attitudes and behaviors, and performing mindful walking exercises. Homework: sitting and body scan meditation, or mindful movement exercise followed by a three-minute breathing space exercise (in an unpleasant situation)
5	Performing sitting meditation and mindful body movements including exercises to quickly reduce stress, deal with problems and obstacles to achieve mindfulness, strengthen motivation, relax, strengthen tolerance, and get rid of negative emotions. Assignments: sitting meditation, three-minute breathing space exercise during an unpleasant event, and mindfulness of a new daily activity.
6	Performing a three-minute breathing space exercise, mindfulness, and positive psychology, finding potential capabilities, enjoying the moment, and adopting a positive perspective, using a notebook as a gratitude notebook. Paired homework: creating, thinking, and diverse views while highlighting that the content of thoughts is mostly not real, four meditation exercises performed consecutively for one hour. Assignments: choosing a combination of meditations preferred by the participants followed by a three-minute breathing space exercise on an unpleasant event and mindfulness of a new daily activity.
7	Discussing how mindfulness can reduce depression and anxiety, fighting automatic thoughts, not focusing on problematic thoughts, coping with anxiety using mindfulness, coping with pain, and using mindfulness to control pain. Homework: drawing a table and recording experiences, thoughts, feelings, and physical sensations
8	Performing meditation with four focuses on whatever comes into consciousness at the moment: What is the best way to take care of oneself, how to be flexible, and how to enjoy natural beauty. Performing an exercise to determine which of the events in their life are pleasant and which ones are unpleasant, and how to make with enough pleasant events in it followed by a three-minute breathing space. Homework: Doing a combination of meditation preferred by the participants
9	Discussing that negative thoughts limit our connection to experience (thoughts are not truths), sitting meditation, homework check, how to work with emotional pain, our suffering is not equal to us but we can do things for healing and health, and presenting assignments
10	Identifying symptoms of relapse and developing a plan of action to cope with this situation (how to take good care of oneself), sitting meditation, reviewing homework, and presenting assignments

11	Reviewing the presented materials and instructions to be used in the future, a fresh start for the rest of life, regular mindfulness exercises to maintain balance in life, physical examination practice, and homework assessment
12	Reviewing the content of the training sessions, discussing the techniques and exercises that the participants did not intend to follow, encouraging the participants to find positive reasons for doing so, distributing a pamphlet, performing the final mediation (ball, stone, bead), and administering the post-test

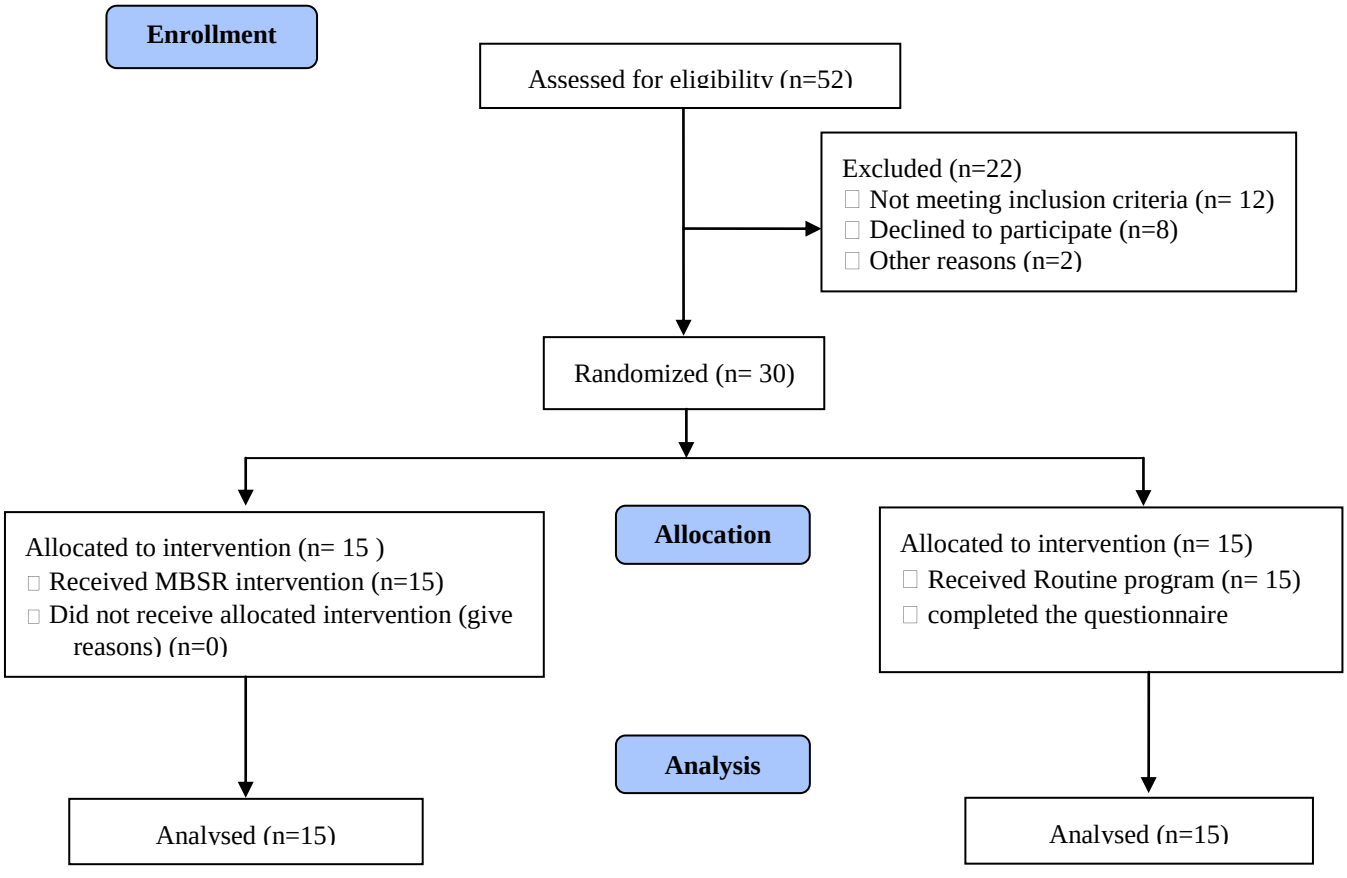

Figure 1: CONSORT Flow Diagram of rreporting enrolment, allocation, and analysis of participants

To comply with the ethical protocols, five intervention sessions were conducted for the samples in the control group. Besides, the contents of other MBSR sessions were provided to the control group in the form of brochures and pamphlets. Before conducting the intervention, some instructions were provided to the participants about the objectives of the study, the requirement for completing all items in the questionnaire, and assuring the participants about the confidentiality of their data. The participants could also leave the study at any stage they wished. The participants were also informed of the training protocols and the duration of the study. The training schedule was predetermined upon the participants' agreement. After the intervention, the participants in both groups completed the questionnaire again as the post-test. The protocol for this study was approved by the Iran National Committee for Ethics in Biomedical Research with code IR.IAU.ARAK.REC.1401.087 (https://ethics.research.ac.ir).

The collected data were analyzed using descriptive statistics (mean and standard deviation), Levene's test (to check the assumption of the equality of variance of variables), Kolmogorov–Smirnov test (to skewness and kurtosis for assess the assumption of normality of the distribution of the scores across the population), and multivariate analysis of variance (MANOVA). The significance level in the tests was considered 0.05. Data were analyzed in SPSS 24 software.

Results

The mean age of the samples was 38.3±5.5 years old. Table 2 shows the descriptive statistics for the samples' pre-test and post-test scores:

As can be seen, the mean scores for the samples in the MBSR group increased on the post-test compared to the pre-test, implying that the MBSR intervention was effective in improving the components of romantic relationships including proximity, sensitivity, and cooperation, and reducing compulsive control in overweight women.

Table 2: The descriptive statistics for the participants' pre-test and post-test scores

		Pre-test	Post-test
		Mean (SD)	**Mean (SD)**
Proximity Vs. Distance	MBSR	22.93(4.65)	31.20(5.49)
	Control	23.60(5.03)	23.07(7.44)
Sensitivity Vs. Insensitivity	MBSR	22.20(4.46)	29.07(3.92)
	Control	24.53(2.89)	23.47(5.26)
Cooperation Vs. Control	MBSR	22.93(4.46)	31.33(4.39)
	Control	21.07(2.71)	18.80(4.46)
Compulsive Control	MBSR	31.87(3.50)	26.93(5.23)
	Control	25.20(4.06)	23.87(6.02)

To run the multivariate analysis of variance (MANOVA), its assumptions (independence of observations, normality of distribution of the dependent variable, homogeneity of variances, and sphericity test) were first tested, and the assumption of normality of data was established. Table 3 shows the multivariate analysis of variance (MANOVA) for the effectiveness of MBSR therapy in caregiving in romantic relationships in overweight women.

Table 3: MANOVA for the components of caregiving in romantic relationships

Variable	Indicators	SS	df	MS	F	p	η2
Proximity Vs. Distance	Intragroup	503.17	1.33	377.86	17.56	0.001	0.30
	Interaction	301.45	2.66	113.19	5.26	0.001	0.20
	Intergroup	433.13	2.00	216.56	3.21	0.04	0.13
Sensitivity Vs. Insensitivity	Intragroup	133.75	1.79	74.71	8.08	0.001	0.16
	Interaction	109.81	3.58	30.67	3.32	0.02	0.14
	Intergroup	428.50	2.00	214.25	5.17	0.01	0.20
Cooperation Vs. Control	Intragroup	784.53	1.43	547.83	42.05	0.001	0.50
	Interaction	637.16	4.00	159.29	17.07	0.001	0.45
	Intergroup	1569.24	2.00	784.62	31.20	0.001	0.60
Compulsive Control	Intragroup	400.77	1.33	301.30	24.31	0.001	0.37
	Interaction	272.12	2.66	102.29	8.25	0.001	0.28
	Intergroup	634.02	2.00	317.01	6.84	0.001	0.25

The data in Table 3 concerning the intragroup effects show that the F value calculated for the pre-intervention and post-intervention scores for the components of proximity (F=17.56, p=0.001), sensitivity (F=8.08, p=0.001), cooperation (F=42.05, p=0.001), and non-obsessive control (F=24.31, p=0.001) are significant. Accordingly, there is a significant difference between the mean

scores for the components of proximity, sensitivity, cooperation, and non-obsessive control in the three pre-test, post-test, and follow-up stages.

Discussion

The present study examined the effect of MBSR therapy in caregiving for romantic relationships in overweight women. The results suggested that the women in the experimental group who attended twelve MBSR sessions reported higher scores in terms of caregiving in romantic relationships in the post-intervention stage. Likewise, previous studies have shown that MBSR interventions reduce people's stress caused by overeating due to emotional conditions. Thus, MBSR interventions can have a tremendous effect in reducing stress and creating positive feelings in a person. Moreover, the occurrence of stressful life events and psychosocial distress may be associated with stress-related overeating and obesity indicators. However, MBSR can help reduce some of the distress and stress experienced by obese people, but another part is still tied to deeper psychosocial problems in these people [32-34].

Mindfulness enables people to be aware of the pervasive vulnerabilities of their lives in the present and away from judgment [29-30]. As such, previous studies have revealed that MBSR can have a positive effect on the quality of couples' romantic relationships and relationship care. Indeed, MBSR can help couples become aware of negative relationships that have caused emotional distance from each other and improve their romantic relationships. Satisfactory relationships in couples are one of the most important predictors of their physical and mental health. Mindfulness interventions for couples also increase mindfulness, self-compassion, well-being, and quality of life [35,36].

Furthermore, mindfulness interventions help couples to pay less attention to the negative aspects of the couple's relationship by helping the spouse to pay attention to the positive characteristics and acceptance of their partner. Such interventions can also reduce negative emotion regulation and promote satisfaction with the romantic relationship in each partner [37,38]. Besides, another study showed that the mindfulness intervention reduced psychological distress, somatization, hostility, psychoticism, and paranoid ideation symptoms in couples. In addition, reducing relationship stress in couples helped to increase their romantic relationship [39]. MBSR can also help treat sexual aversion and low sexual arousal in women with sexual problems. Women with sexual apathy reported significant improvements in libido, overall sexual functioning, and sex-related distress after eight sessions of MBSR intervention. MBSR helped reduce their depressed mood and increase their libido [40]. Overall, mindfulness training helps couples increase their awareness of their feelings, emotions, beliefs, and recognition in the present moment without judgment and can improve their romantic relationships [41]. Furthermore, mindfulness has a positive relationship with conflict resolution in couples. Couples who effectively resolve their conflicts have more sexual satisfaction and more romantic relationships [42]. Mindfulness helps to improve effective relationships and strong communication, reduce interpersonal conflicts, and improve caregiving and romantic relationships and emotion regulation in couples, leading to the stability of couples' relationships [43,44].

Finally, the data in the present study showed that MBSR helped overweight women improve their caregiving and romantic relationships by applying MBSR techniques, developing closeness and emotions, and avoiding excessive control and obsessive care. MBSR exercises help a person manage her negative emotions and experience a wide range of thoughts and emotions without experiencing emotional turmoil [29]. In other words, MBSR makes a person maintain her emotional stability and avoid paying too much attention to negative thoughts when faced with spontaneous thoughts that have negative emotional content and disrupt the functions of a couple's relationship and just observe these thoughts.

This study was conducted with some limitations. For instance, the samples were selected using convenience and voluntary sampling from the women visiting a nutrition and diet therapy clinic in just one district in Tehran. Thus, future studies can address other aspects of romantic behavior such as gratitude and sympathy in both couples using other techniques such as couple therapy interventions.

Conclusion

The present study showed that MBSR can help improve the quality of romantic relationships in overweight women. Indeed, the application of MBSR techniques helps to reduce emotional problems in couples' lives. After performing MBSR exercises, the women participating in this study became aware of their automatic mental functions and their daily activities and showed moment-to-moment awareness of their thoughts and feelings. Thus, they were able to control their negative thoughts. Furthermore, a higher level of awareness of positive thoughts, emotions, and desires towards the spouse was one of the positive consequences of MBSR for the women. Finally, mindfulness coordinated adaptive behaviors and positive psychological behaviors in the women and promoted their romantic behavior.

Ethical Consideration

To comply with the ethical principles of voluntary participation, written informed consent was obtained from the participants for conducting and recording the interviews. The participants were also reassured of the confidentiality of their information. The protocol for this study was approved by the Iran National Committee for Ethics in Biomedical Research with code IR.IAU.ARAK.REC.1401.087 (https://ethics.research.ac.ir).

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Conflict of interest

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Authors' contributions

Conducting research, gathering and analysis data: Lelia Shojaei (Ph.D. Student), Conception, research design and written Article and final Approval: Anahita Khodabakhshi-Koolaee (Supervision). Data Analysis and final approval: Zabih Pirani and Davood Taghvaei (co-advisors).

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