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Comparison of the Effectiveness of Dialectic Behavioral Therapy and Schema Therapy on Emotion Regulation and Rumination of Obese Women

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ABSTRACT

Objective: The aim of this study was to compare the effectiveness of dialectical behavior therapy and schema therapy on emotion regulation and rumination in obese women in Tonekabon in 2020.

Methods: The research method is quasi-experimental with pre-test-post-test design with control and follow-up groups. The statistical population of the study consisted of all obese women in Tonekabon, from which 45 people were selected by purposive sampling method and randomly assigned to two experimental groups (15 people in each group) and one control group (15 people). The experimental group received dialectical behavior therapy for 12 sessions of 60 minutes, the experimental group received 12 sessions of 60 minutes, and the control group remained on the waiting list. The instruments used in the present study included the emotion regulation Questionnaire (Garnowski and Craig, 2006) and rumination (Nolen and Hooksma, 1991) was measured. The analysis of the data obtained from the questionnaire was performed in two descriptive and inferential sections (Analysis of variance with repeated measures).

Results: The results showed that the difference between schema therapy and dialectical behavioral therapy group at the level of 0.05 is significant for the components of positive refocusing and positive reassessment. Positive re-evaluation and positive re-evaluation compared to the schema therapy group. The results also showed that the difference between schema therapy and dialectical behavioral therapy group at the level of 0.05 is significant for rumination.

Conclusions: The present study also showed that dialectical behavior therapy and schema therapy in the follow-up phase can improve research variables in women with obesity.

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Introduction

Obesity and overweight are among the most significant public health challenges in modern societies. Obesity is associated with a wide range of adverse health consequences, including cardiovascular diseases, hypertension, stroke, diabetes mellitus, various cancers, and premature mortality (Lean, 2023). A substantial body of research has investigated the psychological underpinnings of obesity, identifying eating behavior as one of the most critical behavioral factors contributing to its onset and maintenance (Mesmar & Steinle, 2020).

Several theoretical perspectives have been proposed to explain the eating habits and styles of individuals with overweight and obesity. Among these, three classical models are particularly noteworthy.

The psychosomatic theory posits that some individuals are unable to correctly differentiate between physiological hunger and emotional states, often eating in response to emotions—a pattern known as emotional eating. The externality theory suggests that obese individuals tend to eat in response to external environmental cues rather than internal hunger signals, a style referred to as external eating. Finally, the restraint theory attributes abnormal eating behaviors among obese individuals to dietary restriction; in other words, individuals who consciously restrain their eating develop a stronger desire to eat, a pattern labeled restrained eating (Rabbani Parsa et al., 2018).

Understanding and identifying eating behaviors can assist in designing appropriate therapeutic programs and can also serve as a predictor of eating responses and weight reduction success. Indeed, eating behavior is a strong predictor of overeating under emotional conditions (Qiu & Hou, 2020).

Body weight represents a fundamental dimension of individual differences, exerting a pervasive influence on nearly all aspects of human life. While it is primarily linked to physical health, it is also associated with various psychological conditions, including anxiety, depression, and rumination (Bedolla-Barajas et al., 2021).

Rumination is defined as a persistent preoccupation with a particular thought or topic—an enduring class of conscious, repetitive thoughts centered on a specific theme, occurring without external stimuli. Rumination may intensify the effects of negative mood on problem-solving and motivation, bias cognition toward negativity, and impair an individual's ability to resolve problems effectively (Heidarian et al., 2016). During this process, individuals often make exaggerated

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estimations of negative outcomes, assume excessive responsibility for preventing or causing them, and attempt to control intrusive thoughts (Moberly & Dickson, 2016).

Obese individuals who are unable to manage their emotional responses to daily life events experience more intense and prolonged psychological distress. Furthermore, studies have shown that obese individuals frequently experience elevated negative affect and, when they believe that eating can improve their mood, they tend to eat in response to negative emotions to regulate these feelings (Jesus Cofre Lizama et al., 2021). Consequently, emotions exert a significant influence on eating behavior (Pisetsky et al., 2017). Repeated attempts to suppress or modify emotions can be psychologically detrimental, and this adverse effect can often be observed in behaviors such as emotional overeating (Harrison et al., 2016).

Since eating behavior can serve as a coping strategy for managing negative emotional states such as stress, loneliness, boredom, and anxiety (Giusti et al., 2021), research in this area has sought to explain obesity through the lens of emotional regulation mechanisms. Empirical evidence indicates that obese individuals consume food more frequently in response to negative emotions than those with normal weight (Robinson et al., 2015). Similarly, Van Strien (2018), reported a positive correlation between negative emotions, body mass index (BMI), and eating style.

In a study by Rommel et al. (2012), obese and normal-weight women were compared regarding eating habits and emotional awareness. The results indicated that obese women scored lower on emotional awareness and more frequently used eating behavior as a self-regulation strategy.

Based on these findings, self-regulation strategies play an important role in shaping the emotional behavior of obese individuals. These strategies represent cognitive processes used to manage emotionally arousing information (Duarte et al., 2015), and emphasize the cognitive dimension of coping. When faced with stressful situations, individuals may employ various emotion regulation strategies, including rumination, self-blame, other-blame, catastrophizing, positive refocusing, positive reappraisal, acceptance, and planning (Gilkinson et al., 2021).

Self-regulatory styles may manifest as unconscious processes (e.g., selective attention) or conscious processes (e.g., rumination or self-blame) (Crane et al., 2013). Studies have shown that, even under experimental conditions, the use of maladaptive self-regulation strategies is associated with greater food consumption, whereas the use of adaptive strategies such as cognitive reappraisal shows no relationship with food intake (Braden & O'Brien, 2021). In a study examining the effects

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of suppression, cognitive reappraisal, and neutral control conditions on eating behavior, most participants in the cognitive reappraisal condition refrained from selecting unhealthy foods (Kachooei et al., 2016). Maladaptive self-regulation has been found to correlate positively with negative affect, psychological distress, and increased eating behaviors (Akbarizadeh et al., 2021; Khodapanah et al., 2018), whereas the use of adaptive strategies such as cognitive reappraisal and acceptance has been associated with lower distress and reduced negative affect (Kaveh & Tabe Bordbar, 2017).

One of the most effective therapeutic approaches for enhancing emotion regulation and reducing rumination among obese individuals is Dialectical Behavior Therapy (DBT). DBT has been successfully applied to a broad range of psychological disorders, including personality disorders (Barnicot et al., 2016), substance use disorders (Pellegrini et al., 2021), and obesity (Robinson et al., 2021). Its effectiveness has also been established in treating mood and emotional disorders (Rahmani et al., 2018).

In DBT, the therapist initially aims to stabilize the client's behavioral functioning, subsequently teaching behavioral and emotional regulation skills to enhance well-being, assist in overcoming life challenges, and ultimately support the pursuit of pleasurable and meaningful goals. The DBT model is grounded in three theoretical frameworks: behavioral science, dialectical philosophy, and Zen mindfulness practices. It incorporates four fundamental skill domains for personal change: mindfulness, distress tolerance, emotion regulation, and interpersonal effectiveness (Soltani et al., 2018).

Empirical studies have demonstrated that DBT can effectively reduce binge-eating behaviors (Accurso et al., 2018), depression, and rumination among obese patients (Sasdelli et al., 2018). Additionally, research indicates that DBT enhances self-regulation abilities in individuals with obesity (Musetti et al., 2018).

Conversely, schemas contribute to cognitive biases in interpreting life events, which manifest in interpersonal psychopathology as misunderstandings, distorted attitudes, inaccurate assumptions, and unrealistic expectations (Pugh, 2015). Schema Therapy (ST) focuses on self-defeating patterns of thought, emotion, and behavior originating in childhood and recurring throughout life. These patterns, known as early maladaptive schemas, contribute to the development of psychological disorders (Ghorbanalipoor et al., 2017). Early maladaptive schemas represent the deepest layer of

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cognitive structures, which are activated under specific conditions and expressed through an individual's interactions with others and the environment (Doomen, 2018).

Tasca and Balfour (2014), found that individuals with anorexia nervosa exhibit higher levels of attachment insecurity and disturbed emotional states. Moreover, schema therapy has been shown to effectively modify early maladaptive schemas, particularly in the domains of disconnection/rejection and impaired autonomy/performance.

A variety of therapeutic programs have been designed for the treatment and prevention of obesity and its associated health complications, most of which emphasize reducing caloric intake and increasing physical activity. Given their cost-effectiveness, time efficiency, and profound influence on cognitive restructuring and self-awareness, these interventions are valuable tools for weight management and relapse prevention.

Considering the existing literature, the limited number of comparative studies in this field, and the serious risk of obesity and its accompanying physical and psychological problems within the Iranian population, it is crucial to investigate effective psychological interventions for this condition and its comorbidities. Since psychological factors play a pivotal role in the development and maintenance of obesity, the application of psychotherapeutic interventions is essential for more effective treatment of this chronic disorder. Accordingly, and in light of the increasing interest in weight-loss interventions, the present study aimed to compare the effectiveness of Dialectical Behavior Therapy and Schema Therapy on emotion regulation and rumination among obese women. The main research questions were as follows:

Can Dialectical Behavior Therapy and Schema Therapy significantly improve emotion regulation and reduce rumination in obese women? and which of the two approaches demonstrates greater effectiveness?

Material and Methods

The present study was quasi-experimental research, and the design used in this study was a pretest–posttest design with two experimental groups and one control group.

The statistical population included all obese women in Tonekabon City in 2020 who visited nutrition and diet therapy clinics during the autumn and winter seasons.

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Initially, the sampling method was purposive, and only those who were referred as patients with obesity disorder were included in the study.

Then, the patients were interviewed and clinically evaluated by a nutrition specialist, and during this process, based on diagnostic criteria and Body Mass Index (BMI), those who were diagnosed as obese were selected from 97 clients of nutrition and diet therapy clinics.
A total of 45 individuals were selected and randomly assigned to two experimental groups and one control group (15 participants in the Dialectical Behavior Therapy group, 15 in the Schema Therapy group, and 15 in the control group).

The BMI of participants was calculated by dividing weight (in kilograms) by the square of height (in meters).

Weight was measured using a digital scale with an accuracy of 100 grams, and height was measured with a non-stretchable measuring tape with an accuracy of 0.5 centimeters.

The inclusion criteria for participants were as follows: having obesity disorder confirmed through clinical examination by a nutrition specialist; BMI equal to or greater than 30 kg/m² (note that overweight is defined as $25 \leq BMI < 30$, obesity as $BMI \geq 30$, and normal weight as $18.5 \leq BMI \leq 24.9$); absence of acute or chronic psychological problems; having at least a high school diploma; being female; age range between 25 to 60 years; and no participation in psychotherapy programs during the past six months.

The exclusion criteria included having a specific medical condition indicating obesity and lack of consent to participate in the study.

It should be noted that the screening method in the present study was based on scores one standard deviation below the mean in the research questionnaires.

Cognitive Emotion Regulation Questionnaire: This questionnaire is an 18-item instrument that measures self-regulation strategies in response to threatening and stressful life events on a five-point scale, ranging from 1 (*never*) to 5 (*always*), according to the following nine subscales: self-blame, other-blame, rumination, catastrophizing, positive refocusing, planning, positive reappraisal, putting into perspective, and acceptance (Garnefski & Kraaij, 2007). A higher score indicates greater use of that specific cognitive strategy. The Cronbach's alpha coefficients for the subscales of this questionnaire range from 0.71 to 0.81, and the test–retest reliability coefficients over a 14-day interval have been reported between 0.48 and 0.61 (Garnefski & Kraaij, 2007). In

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Iran, alpha coefficients for the subscales of this test ranged from 0.62 to 0.91, and test–retest reliability with a one-week interval ranged between 0.75 and 0.88 (Abad & Khoshkonesh, 2020). The factor analysis using the principal components method has shown that the questionnaire has a seven-factor structure, including positive refocusing/planning, positive reappraisal/putting into perspective, acceptance, other-blame, self-blame, rumination, and catastrophizing. The content validity of the questionnaire was examined based on the judgment of eight psychology experts, and the Kendall's coefficients of concordance for the subscales ranged from 0.81 to 0.92. In the study of Khodapanah et al. (2018), the Cronbach's alpha for negative (maladaptive) strategies was 0.89. Self-regulation strategies can be considered along a single dimension (cognitive coping) or divided into two types: more adaptive (positive/effective) and less adaptive (negative/maladaptive) strategies. Positive refocusing/planning, positive reappraisal/putting into perspective, and acceptance are among the more adaptive strategies, while self-blame, other-blame, rumination, and catastrophizing are among the less adaptive strategies.

Ruminative Response Scale: Nolen-Hoeksema and Morrow (1991), developed a self-report questionnaire that evaluates four types of different responses to negative mood. The Response Styles Questionnaire includes two subscales: The Ruminative Response Scale and the Distraction Response Scale. The Ruminative Response Scale consists of 22 items, in which respondents rate each statement on a four-point scale from 1 (*never*) to 4 (*almost always*) (Treynor et al., 2003). Based on empirical evidence, this scale has high internal consistency, with Cronbach's alpha coefficients ranging from 0.88 to 0.92. Various studies have reported the test–retest correlation for the ruminative response scale as 0.67 (Rasaei & Ebrahimi, 2022). This scale was first translated from English into Persian. The predictive validity of the Ruminative Response Scale has been examined in numerous studies, showing that it can predict the severity of depression during follow-up periods in both clinical and non-clinical samples, even when controlling for variables such as baseline depression or stress factors. Furthermore, research findings indicate that this scale can determine individual vulnerability to depression and even predict the onset of a clinical depressive episode. The validity of the questionnaire, assessed by correlating it with the Metacognitive Beliefs Questionnaire, was 0.65 ($p < 0.001$), indicating high validity.

Dialectical Behavior Therapy Sessions: Dialectical Behavior Therapy was based on the work of Linehan (1993), and implemented by Salbach-Andrae et al. (2008), for a three-month period

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consisting of 12 sessions (each 60 minutes). Patients attended one session per week in a group therapy format, and DBT was delivered according to the following session content:

Table 1. DBT summary Sessions

Session	Content Summary
1	Establishing initial contact, building trust and cooperation, familiarizing members with each other, reducing group tension, presenting treatment rationale, explaining group rules, agreeing on therapy goals, reviewing members' suggestions for improving session outcomes, and scheduling session times.
2	Discussing unpleasant events and experiences and their effects on emotions, exploring methods for distress control, teaching attention-shifting strategies for managing distress, and assigning practice of recording distressing thoughts and situations.
3	Reviewing previous homework, continuing discussion of distress techniques, introducing and assigning practice of radical acceptance for managing emotional distress.
4	Reviewing completed homework, summarizing previous lessons, introducing advanced distress tolerance methods such as taking breaks, living in the present moment, using affirmations, and applying new coping strategies. Participants were assigned to use various techniques depending on the type and intensity of distress and to monitor their effectiveness.
5	Reviewing homework, discussing mindfulness and its effects on emotional management, teaching mindfulness practices such as "wise mind" and intuition, assigning daily meditation and recording its impact.
6	Reviewing previous assignments, conducting mindfulness meditation, receiving feedback from participants, teaching decision-making based on mindfulness (nonjudgment, radical acceptance, mindful communication), and assigning daily mindfulness practice.
7	Reviewing previous homework, discussing emotions and their nature, exploring types of emotions and their effects, and teaching emotion reduction techniques such as increasing positive emotions and opposite action; assigning emotion recording exercises.
8	Reviewing prior tasks, discussing effective versus ineffective communication, analyzing the outcomes of poor communication, and teaching assertiveness strategies to balance one's own and others' needs; assigning practice of interpersonal communication skills.
9	Reviewing previous exercises, continuing communication skills training such as identifying needs, moderating demands, saying "no," and making requests; assigning real-life application.
10	Reviewing assignments, summarizing all prior sessions, evaluating therapeutic progress and goal achievement, and reviewing future perspectives and treatment termination.
11	Reviewing previous assignments and applying problem-solving and opposite-action skills for negative emotions.
12	Reviewing previous sessions and exercises and conducting the posttest assessment.

Schema Therapy Sessions: Group Schema Therapy was conducted based on Young's schema therapy model (Young et al., 2006), for all participants in the schema therapy group. After the pretest was administered to both experimental groups, the schema therapy group underwent 12 sessions (each 60 minutes, twice weekly). The control group did not receive any treatment, and the posttest was conducted one week after the completion of therapy for both groups. This intervention was delivered by a qualified schema therapist in clinical and counseling centers.

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Table 2. Schema Therapy Sessions

Session	Content Summary
1	Reviewing session structure and group rules, establishing agreements, introducing schema therapy concepts, completing pretest questionnaires, building rapport and trust, and assigning homework.
2	Reviewing prior assignments, teaching the relationship between schema therapy, food consumption, and eating behavior, explaining cognitive processes, and reinforcing group trust; assigning homework.
3	Reviewing homework, teaching about the inner child concept, explaining maladaptive schemas, and identifying contributing factors; assigning homework.
4	Reviewing prior homework, identifying and activating schemas through imagery related to significant people, helping patients experience schema-related emotions; assigning homework.
5	Reviewing previous tasks, introducing coping styles, discussing examples among group members; assigning related tasks.
6	Reviewing prior assignments, testing schema validity through gathering confirming and disconfirming evidence, redefining schema beliefs; assigning homework.
7	Reviewing previous homework, assessing pros and cons of coping responses, introducing schema cards and schema record forms; assigning homework.
8	Reviewing previous homework, applying imagery dialogue and schema confrontation techniques, empowering patients to fight against maladaptive schemas; assigning homework.
9	Reviewing previous homework, facilitating dialogue between schema and healthy self-using “empty-chair” and letter-writing techniques, identifying behavioral change targets; assigning homework.
10	Reviewing previous tasks, discussing behavioral change strategies, teaching emotion and impulse control skills; assigning homework.
11	Reviewing prior homework, discussing schemas such as self-sacrifice, subjugation, emotional deprivation, and emotional inhibition, teaching healthy emotional expression; assigning homework.
12	Reviewing prior sessions, reinforcing fatigue tolerance and frustration endurance based on self-discipline schema, preparing for final posttest assessment.

The data obtained from the questionnaires were analyzed using SPSS software (version 24) in both descriptive and inferential sections. Descriptive statistics (mean and standard deviation) and repeated measures analysis of variance (ANOVA) were used to analyze the data.

Results

In this section, the descriptive statistics (means and standard deviations) of the study variables—emotion regulation and rumination—are presented across the pretest, posttest, and follow-up phases for all three groups (Dialectical Behavior Therapy, Schema Therapy, and Control).

Table 3 presents the means and standard deviations of the subscales of emotion regulation and rumination in the three assessment phases for each group.

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Table 3. Means and Standard Deviations of Emotion Regulation and Rumination Scores Across Phases

Variable	Group	Pretest M(SD)	Posttest M(SD)	Follow-up M(SD)
Self-Blame	DBT	11.33 (2.35)	9.33 (2.29)	10.00 (1.65)
Self-Blame	ST	11.53 (2.17)	10.47 (2.53)	10.80 (2.46)
Self-Blame	Control	11.60 (1.88)	11.33 (1.95)	11.47 (2.33)
Other-Blame	DBT	11.67 (2.69)	8.07 (2.79)	8.33 (2.90)
Other-Blame	ST	11.73 (2.99)	9.87 (2.90)	9.47 (2.70)
Rumination (CERQ)	DBT	11.80 (2.08)	9.00 (2.73)	9.40 (2.38)
Rumination (CERQ)	ST	11.60 (2.23)	10.33 (2.72)	10.80 (2.73)
Catastrophizing	DBT	11.73 (2.58)	9.00 (2.48)	9.07 (2.52)
Catastrophizing	ST	11.80 (2.43)	10.33 (2.02)	10.47 (1.89)
Positive Refocusing	DBT	10.87 (2.39)	12.80 (2.11)	12.80 (2.57)
Positive Refocusing	ST	9.00 (2.20)	10.80 (1.90)	11.53 (2.39)
Refocus on Planning	DBT	9.33 (2.44)	13.67 (2.19)	13.40 (1.68)
Refocus on Planning	ST	8.07 (1.53)	11.80 (2.01)	12.27 (1.83)
Positive Reappraisal	DBT	11.33 (2.69)	13.80 (1.82)	13.93 (1.58)
Positive Reappraisal	ST	10.07 (1.39)	12.80 (1.78)	13.47 (1.77)
Putting into Perspective	DBT	10.33 (2.53)	12.80 (2.01)	12.80 (2.21)
Putting into Perspective	ST	11.07 (1.91)	12.60 (1.92)	12.53 (2.45)
Acceptance	DBT	9.33 (2.23)	14.13 (2.56)	13.53 (2.62)
Acceptance	ST	10.40 (2.85)	12.67 (1.92)	12.40 (2.35)
Rumination (RRS)	DBT	43.07 (6.79)	36.87 (6.29)	38.67 (6.16)
Rumination (RRS)	ST	42.87 (6.22)	30.07 (4.82)	28.60 (5.63)
Rumination (RRS)	Control	42.73 (4.67)	40.13 (8.77)	42.27 (9.05)

As illustrated, both experimental groups showed improvement across phases. Scores on maladaptive emotion regulation components (self-blame, other-blame, catastrophizing, and rumination) decreased, while adaptive components (positive refocusing, planning, positive reappraisal, and acceptance) increased following treatment. Similarly, both therapeutic interventions were associated with a reduction in rumination as measured by the Ruminative Response Scale. A repeated-measures ANOVA was conducted to compare changes between the DBT and ST groups across the emotion regulation subscales.

Table 4. Repeated-Measures ANOVA for Emotion Regulation Components

Variable	Source	SS	df	MS	F	p	η^2
Self-Blame	Between Groups	9.63	1	9.63	1.65	0.21	0.06
Other-Blame	Between Groups	24.30	1	24.30	3.00	0.09	0.10
Rumination (CERQ)	Between Groups	13.33	1	13.33	1.80	0.19	0.06
Catastrophizing	Between Groups	13.33	1	13.33	2.61	0.12	0.08
Positive Refocusing	Between Groups	30.00	1	30.00	7.45	0.01*	0.21
Refocus on Planning	Between Groups	26.13	1	26.13	5.91	0.02*	0.17
Positive Reappraisal	Between Groups	7.50	1	7.50	2.31	0.14	0.07
Putting into Perspective	Between Groups	0.30	1	0.30	0.08	0.78	0.01
Acceptance	Between Groups	16.13	1	16.13	3.16	0.09	0.10

*Significant at $p < 0.05$

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As shown in Table 4, significant differences were found between DBT and ST groups for the components positive refocusing and refocus on planning ($p < 0.05$). Accordingly, DBT demonstrated greater efficacy in enhancing these adaptive emotion regulation strategies compared to ST. A repeated-measures ANOVA was also conducted for rumination (RRS scores).

Table 5. Repeated-Measures ANOVA for Rumination

Source	SS	df	MS	F	p	η^2
Between Groups	346.80	1	346.80	11.05	0.002**	0.28
Within Groups	878.67	28	31.38	—	—	—

*p < 0.05, ** p < 0.01

As shown, the difference between the DBT and ST groups in rumination scores was statistically significant ($p < 0.01$), indicating that Schema Therapy was more effective in reducing rumination compared to DBT. To further examine group differences, Scheffé post-hoc tests were applied.

Table 6. Scheffé's test for Emotion Regulation and Rumination (Experimental vs. Control Groups)

Variable	Comparison	Mean Difference	SE	p
Self-Blame	DBT – Control	0.80	0.50	0.03*
Self-Blame	ST – Control	0.87	0.50	0.03*
Other-Blame	DBT – Control	2.27	0.86	0.04*
Catastrophizing	DBT – Control	2.67	0.71	0.001**
Positive Refocusing	DBT – Control	1.80	0.76	0.002**
Positive Refocusing	ST – Control	2.13	0.76	0.001**
Refocus on Planning	DBT – Control	3.60	0.64	0.001**
Refocus on Planning	ST – Control	3.20	0.64	0.001**
Positive Reappraisal	DBT – Control	2.27	0.72	0.001**
Positive Reappraisal	ST – Control	2.27	0.72	0.001**
Acceptance	DBT – Control	4.00	0.65	0.001**
Acceptance	ST – Control	1.80	0.65	0.01*
Rumination (RRS)	DBT – Control	3.40	1.83	0.001**
Rumination (RRS)	ST – Control	10.07	1.83	0.001**

*p < 0.05, ** p < 0.01

The results demonstrated that both DBT and ST produced significant improvements in emotion regulation and reductions in rumination compared to the control group ($p < 0.05$). However, DBT was more effective in enhancing positive refocusing and positive reappraisal, whereas ST had a greater impact on reducing rumination. Follow-up assessments confirmed that these effects persisted over time, indicating the durability of both interventions.

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Discussion

This study aimed to compare the effectiveness of Dialectical Behavior Therapy (DBT) and Schema Therapy on emotion regulation and rumination in obese women. The results indicated that the difference between Schema Therapy and the DBT group was significant at the 0.05 level for the components of positive refocusing and positive reappraisal. Therefore, based on the mean scores in the post-test stage, it can be concluded that Dialectical Behavior Therapy had a significantly greater impact on changing the components of positive refocusing and positive reappraisal compared to the Schema Therapy group.

In line with the obtained results, Pourmohammad (2022), conducted a study entitled "The Effectiveness of Dialectical Behavior Therapy Techniques on Mindfulness, Emotion Regulation, and Distress Tolerance in Improving the Symptoms of Bulimia Nervosa." The results showed that DBT led to a significant reduction in the symptoms of bulimia nervosa and depression, while its effect on anxiety symptoms was not significant. Based on the findings of this research, it can be stated that Dialectical Behavior Therapy, as a novel approach, can be beneficial in reducing binge eating, purging, and depression, as well as improving emotion regulation in patients with bulimia nervosa.

Accurso et al. (2018), used DBT training sessions to reduce binge eating behaviors, and their results demonstrated that DBT was effective in treating binge eating. Therefore, this method is recommended alongside other treatments for reducing binge eating in patients with obesity.

Roosen et al. (2012), conducted a study titled "The Effectiveness of Group Dialectical Behavior Therapy on Emotion Regulation in Patients with Obesity and Overweight." The results indicated that DBT increased emotion regulation in patients with obesity.

To explain the obtained results, it can be argued that Dialectical Behavior Therapy, which aims to achieve behavioral stability and processing, is a non-pharmacological method and a set of techniques for creating changes in how individuals think, live, and behave (Asmand et al., 2015). DBT emphasizes skill training, acceptance, and the validation of emotions. The different dimensions of this skill training include teaching interpersonal effectiveness skills, mindfulness, emotion regulation, increasing frustration tolerance, and validation skills. Training in DBT skills, such as mindfulness and emotion regulation skills, leads to an increase in the components of positive refocusing and positive reappraisal of emotion regulation in individuals with obesity.

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Furthermore, in DBT, individuals learn to be aware of their emotional state at any given moment and to focus their attention on various ways of expressing emotions and subsequent behaviors. Consequently, DBT enables individuals to increase their emotion regulation by accepting their states without judgment and changing factors that need to be modified.

On the other hand, DBT emphasizes returning emotions to a functional level, so that unpleasant emotions become adaptive and helpful. The goal of DBT is to reduce the suffering of individuals struggling with emotional problems, and to achieve this goal, it teaches skills in distress tolerance, mindfulness, emotion regulation, and effective communication (Feldman et al., 2009). An important objective of DBT is to create a balance between change and acceptance. The core skill of acceptance teaches individuals with obesity to change behaviors that cause them more suffering while simultaneously accepting themselves with all their strengths and weaknesses, discovering their values, using them to cope with stressful situations, and achieving a more satisfying life through committed actions and implementing their intentions.

Using self-encouraging coping thoughts increases self-confidence and motivation to avoid emotional eating. Conversely, attention-redirection skills enable individuals to flexibly direct their attention to creative and novel mental images when thoughts about eating intrude, thereby disengaging their mind from further preoccupation with eating. Additionally, teaching emotion regulation skills by making individuals aware helps them learn to observe the natural cycle of their emotional processes and tolerate their intense feelings without resistance or avoidance. The technique of "acting opposite" to intense emotional urges is a strategy that prevents futile emotional reactions and simultaneously helps individuals moderate their intense feelings, such as the urge to repeat eating-related actions and thoughts. Teaching and learning these skills by individuals with obesity leads to a gradual increase in their emotion regulation and its components of positive refocusing and positive reappraisal.

Furthermore, the results showed that the difference between Schema Therapy and the DBT group was significant at the 0.05 level for rumination. Therefore, based on the mean scores in the post-test stage, it can be concluded that Schema Therapy had a significantly greater impact on changing rumination compared to the Dialectical Behavior Therapy group.

This finding is consistent with the confirmation of the third secondary hypothesis regarding the higher effectiveness of Schema Therapy for women with obesity. Calvert et al. (2018), conducted

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a study entitled "The Effectiveness of Group Schema Therapy on Psychological Problems in Individuals with Eating Disorders." The results showed that after Schema Therapy training, levels of depression, anxiety, and rumination were significantly reduced in these individuals.

Pourjaberi and DashtBozorgi (2019), conducted a study entitled "Investigating the Effectiveness of Schema Therapy on Eating Disorders and Rumination in Obese Adolescent Girls in Ahvaz." The results indicated that before the intervention, there was no significant difference between the experimental and control groups in terms of eating disorder and rumination, but after the intervention, the groups showed a significant difference in both variables. In other words, Schema Therapy led to a significant reduction in eating disorders and rumination in obese adolescent girls. Based on these results, it is recommended that counselors and therapists use Schema Therapy alongside other treatment methods to reduce eating disorders and rumination in obese adolescent girls.

To explain these results, it can be stated that Schema Therapy provides a model for breaking behavioral patterns. This strategy helps clients plan and implement behavioral tasks to replace maladaptive and ineffective coping responses with adaptive behavioral patterns. In addition to therapeutic techniques focused on attention training, Schema Therapy includes a wide range of specific therapeutic strategies designed to facilitate cognitive and emotional change. On the other hand, Schema Therapy addresses changing processes and activities such as negative rumination, threat monitoring, focus on danger, thought suppression, and behaviors like behavioral, cognitive, and emotional avoidance that depressed and severely obese individuals employ to cope with perceived dissonance and regulate the resulting negative emotions.

According to the principles of Schema Therapy, maladaptive schemas, as cognitive substrates, lead to the formation of irrational beliefs and possess cognitive, affective, and behavioral components. When activated, they generate levels of diffuse emotion that directly or indirectly lead to psychological distress. Cognitive disturbances and dysfunctional cognitions are risk factors for health that are recognized as a field of study and have expanded into anxiety disorders. Another characteristic of Schema Therapy is the acceptance of the normality and naturalness of these emotional needs.

Schema Therapy, by emphasizing the change of maladaptive coping styles and maladaptive schemas formed in childhood, and by explaining how they affect the processing and confrontation

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with life events, contributes to treatment and provides cognitive and behavioral techniques. Furthermore, by emphasizing the replacement of maladaptive coping styles and strategies with newer, more adaptive behavioral and cognitive patterns, it provides an opportunity for improving cognitive emotion regulation strategies for psychologically stressful conditions such as obesity.

Also, in explaining the other effectiveness of Schema Therapy, it should be said that the elements of this approach consist of cognitive-behavioral, Gestalt, attachment, object relations, constructivist, and psychoanalytic approaches within a single therapeutic model. This is while previous studies indicate impaired object relations in individuals with obesity. Additionally, studies suggest greater impairment in parent-child relationships during childhood in individuals with obesity and a higher prevalence of insecure attachment. Consequently, it seems logical that Schema Therapy, by combining various approaches (attachment, object relations, etc.) within a single therapeutic model, would be effective in treating rumination in patients with obesity.

A limitation of this study is that it was confined to the specific sample of women with obesity under investigation, and this sample may not be sufficiently representative of the broader population. Therefore, generalizing the results should be done logically and cautiously, primarily to the population from which the sample was drawn, and extended to other levels with precaution.

It is suggested that greater emphasis be placed on the role of psychological dimensions in the treatment process of individuals with obesity and overweight, and that attention be given to improving the condition of these individuals in treatment centers by moderating psychological factors.

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Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of Islamic Azad University.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection and analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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