

Comparing the Effectiveness of Metacognitive Therapy and Cognitive Behavioral Therapy in Improving Binge-Eating Symptoms and Metacognitive Beliefs among Individuals with Binge-Eating Disorder

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ABSTRACT

Purpose: This study aimed to compare the effectiveness of metacognitive therapy and cognitive behavioral therapy in reducing binge-eating symptoms and dysfunctional metacognitive beliefs among individuals with binge-eating disorder.

Methods and Materials: This quasi-experimental study employed a pretest–posttest design with a two-month follow-up and two intervention groups. The statistical population comprised all individuals with binge-eating disorder who attended the Tehran Binge Eating Association in 2025. Thirty eligible participants were selected through purposive sampling and randomly assigned to either a metacognitive therapy group or a cognitive behavioral therapy group, with 15 participants in each group. Both groups received 12 group-therapy sessions. Data were collected using the Binge Eating Scale developed by Gormally et al. (1982) and the Metacognitions Questionnaire developed by Wells and Cartwright-Hatton (2004). After removing two outlier scores, data from 28 participants were analyzed using analysis of covariance in SPSS version 27.

Findings: Metacognitive therapy produced a significantly greater reduction in binge-eating symptoms than cognitive behavioral therapy at posttest, and this superiority was maintained at the two-month follow-up ($p < .001$). Metacognitive therapy also resulted in a significantly greater reduction in the total score of dysfunctional metacognitive beliefs at posttest; however, the between-group difference was not significant at follow-up. Component-level analyses indicated that metacognitive therapy was significantly more effective in reducing positive beliefs about worry, the need to control thoughts, cognitive confidence, and cognitive self-consciousness at both posttest and follow-up ($p < .001$). Nevertheless, no significant difference was observed between the two treatments in negative beliefs concerning the uncontrollability and danger of thoughts ($p > .05$).

Conclusion: Metacognitive therapy appears to be more effective than cognitive behavioral therapy in reducing binge-eating symptoms and modifying several dimensions of dysfunctional metacognitive beliefs in individuals with binge-eating disorder. However, booster sessions and longer follow-up periods may be necessary to consolidate changes in overall metacognitive beliefs.

Keywords: Metacognitive Therapy; Cognitive Behavioral Therapy; Binge-Eating Symptoms; Metacognitive Beliefs; Binge-Eating Disorder

1. Introduction

Binge-eating disorder is a clinically significant eating disorder characterized by recurrent episodes of consuming unusually large amounts of food within a limited period, accompanied by a subjective loss of control and marked psychological distress. Unlike bulimia nervosa, binge-eating episodes are not regularly followed by compensatory behaviors such as self-induced vomiting, fasting, or excessive exercise. The disorder is frequently associated with rapid eating, eating in the absence of physical hunger, continuing to eat until uncomfortably full, eating alone because of embarrassment, and experiencing guilt, shame, or disgust afterward. Although binge eating may initially function as a means of reducing negative emotional arousal, its short-term soothing effect is commonly followed by intensified self-criticism, body dissatisfaction, and further emotional distress, thereby reinforcing a recurrent cycle of dysregulated eating. Contemporary clinical evidence indicates that binge-eating disorder is a heterogeneous condition shaped by interacting biological, psychological, interpersonal, and sociocultural processes rather than by a single causal mechanism (Giel et al., 2022).

The clinical importance of binge-eating disorder extends beyond the immediate experience of uncontrolled eating. The disorder is associated with obesity, metabolic complications, impaired physical functioning, reduced quality of life, psychiatric comorbidity, and substantial psychosocial burden. Individuals with binge-eating disorder frequently report depression, anxiety, emotion-regulation difficulties, impulsivity, interpersonal problems, and persistent dissatisfaction with body weight and shape. Long-term medical risks are particularly concerning because repeated binge eating and associated weight gain may contribute to metabolic dysregulation. Evidence from population-based research has shown a markedly increased risk of type 2 diabetes among individuals with binge-eating disorder and related eating disorders (Raevuori et al., 2015). The condition also places a considerable burden on health systems. Individuals with binge-eating disorder tend to use medical and psychiatric services more frequently and incur higher health-care costs than people without the disorder, even when demographic and medical factors are considered (Watson et al., 2018). These consequences underscore the need for interventions that address not only the observable binge-eating episodes but also the cognitive, emotional, and metacognitive processes that sustain them.

The etiology of eating disorders is complex and multifactorial. Genetic liability, neurobiological sensitivity, temperament, developmental experiences, family processes, social pressures, and psychological vulnerabilities may interact across the lifespan. Genetic studies indicate that eating-disorder phenotypes are partly heritable and that their development reflects the interaction of genetic predispositions with environmental influences (Trace et al., 2020). Broader reviews of eating-disorder causation have similarly emphasized the contribution of biological vulnerabilities, puberty-related changes, negative affect, perfectionism, weight and shape concerns, social comparison, and sociocultural ideals (Culbert et al., 2021). In binge-eating disorder, these risk factors may be expressed through heightened reward sensitivity, difficulty inhibiting behavior under emotional pressure, rigid dietary restraint, negative body evaluation, and maladaptive attempts to cope with distress. Consequently, binge eating can be understood as both a behavioral symptom and a regulatory strategy that becomes reinforced when individuals repeatedly use food to escape, suppress, or alter unwanted internal experiences.

Emotion regulation is especially relevant to the onset and maintenance of binge-eating behavior. Many individuals with binge-eating disorder experience difficulty identifying, tolerating, and modifying emotional states. Negative emotions may increase urges to eat, while binge eating temporarily narrows attention and reduces emotional awareness. However, the subsequent guilt and self-condemnation intensify the negative emotional state that originally triggered the episode. Research on emotion-focused cognitive behavioral interventions has shown that improving emotional awareness, self-regulation, and adaptive coping may reduce binge-eating symptoms (Torres et al., 2020). Case-based evidence has also suggested that emotion-focused cognitive behavioral therapy can enhance body compassion and reduce binge eating among women with the disorder (Saadatmand et al., 2023). Nevertheless, emotion regulation does not operate independently of cognition. Individuals interpret emotions, eating urges, and intrusive thoughts through beliefs about what these internal experiences mean and how they should be managed. Therefore, a comprehensive account of binge eating requires attention to both cognitive content and beliefs about thinking itself.

Cognitive behavioral therapy is one of the most established psychological treatments for eating disorders. Its central assumption is that dysfunctional beliefs about eating, weight, body shape, and self-worth contribute to restrictive

dieting, body checking, avoidance, and binge-eating episodes. Treatment commonly includes psychoeducation, self-monitoring, regular eating, reduction of dietary restraint, cognitive restructuring, problem-solving, exposure to avoided foods, modification of body-related behaviors, and relapse prevention. Enhanced cognitive behavioral therapy extends this framework across eating-disorder diagnoses by targeting shared maintaining mechanisms. Systematic review evidence has supported the effectiveness of enhanced cognitive behavioral therapy in reducing eating-disorder psychopathology across different diagnostic presentations (Atwood & Friedman, 2020). Randomized research has likewise demonstrated that enhanced cognitive behavioral therapy can improve eating-related symptoms and associated psychological difficulties (Jung et al., 2020). These findings have positioned cognitive behavioral therapy as a major evidence-based intervention for binge-eating disorder.

Studies conducted with individuals specifically affected by binge-eating disorder have generally supported the usefulness of cognitive behavioral interventions. Cognitive behavioral therapy may reduce the frequency of binge episodes, improve eating regularity, weaken rigid dietary rules, and modify negative beliefs regarding weight and appearance. Research among patients with obesity and binge-eating disorder has shown that cognitive behavioral treatment can produce meaningful clinical improvement, although response rates and long-term outcomes vary across participants (van Riel et al., 2023). Comparative research has also indicated that cognitive behavioral approaches may reduce food craving and maladaptive eating patterns among women with binge-eating disorder (Aghababaei & Khalatbari, 2019). Similarly, cognitive behavioral therapy and schema-focused interventions have been found to improve emotional eating and related interpersonal vulnerabilities, although their relative effectiveness may differ across outcomes (Borhani Naeini et al., 2024). Such findings support the clinical value of cognitive behavioral therapy while also suggesting that some patients retain residual symptoms or relapse after treatment.

One reason for variable treatment response may be the presence of comorbid or maintaining factors that are not fully addressed by standard cognitive restructuring. Trauma-related symptoms, dissociation, chronic shame, and interpersonal difficulties can influence the course of treatment. Evidence indicates that trauma and dissociative experiences may affect the outcome of cognitive behavioral therapy for binge-eating disorder and may complicate the

modification of eating behavior (Serra et al., 2020). In addition, cognitive behavioral treatment typically focuses on evaluating the accuracy and usefulness of specific thoughts, whereas some patients remain trapped in persistent worry, rumination, self-focused attention, threat monitoring, and attempts to suppress or control thoughts. These processes may continue even when the content of individual beliefs has been challenged. Accordingly, researchers have increasingly examined metacognitive mechanisms that regulate how people respond to thoughts and emotions rather than focusing exclusively on what they think.

Metacognition refers to the beliefs, knowledge, monitoring processes, and regulatory strategies that individuals apply to their own cognitive activity. It includes beliefs about the usefulness, danger, controllability, and meaning of thoughts. The metacognitive model proposes that psychological distress is maintained by a cognitive attentional syndrome consisting of repetitive negative thinking, inflexible self-focused attention, threat monitoring, and maladaptive coping responses. Positive metacognitive beliefs, such as believing that worry, rumination, or preoccupation is useful, encourage prolonged engagement with distressing thoughts. Negative metacognitive beliefs, such as believing that thoughts are uncontrollable or dangerous, increase fear of internal experiences and motivate suppression, avoidance, reassurance seeking, or behavioral escape. These strategies paradoxically strengthen the salience and persistence of unwanted cognition. Metacognitive therapy was developed to interrupt this pattern by changing the individual's relationship with thoughts and modifying the beliefs that control cognitive processing (Wells, 2013).

The metacognitive perspective is particularly relevant to binge-eating disorder because binge eating may be embedded in a cycle of distressing thoughts, attentional fixation, and maladaptive attempts at mental control. Individuals may believe that thinking repeatedly about food, weight, or previous eating failures will help prevent future loss of control. Others may regard eating as a necessary way to stop worry, regulate rumination, or escape intolerable self-awareness. At the same time, they may perceive food-related thoughts and eating urges as uncontrollable, dangerous, or predictive of inevitable failure. Profiling studies have identified distinctive metacognitive difficulties among individuals with binge-eating disorder, including dysfunctional beliefs regarding worry, cognitive confidence, control of thoughts, and heightened awareness of internal cognitive activity (Palmieri et al., 2021). The development

of a disorder-specific measure of metacognitions about binge eating further reflects the growing recognition that beliefs about binge-related cognition may represent an important clinical target (Palmieri et al., 2023).

Network-based research provides additional evidence that metacognition is closely interconnected with emotion regulation and binge-eating psychopathology. In individuals with binge-eating disorder, dysfunctional metacognitive beliefs may occupy central positions within networks of eating symptoms, emotional dysregulation, and maladaptive coping (Aloi et al., 2021). Rather than serving merely as secondary reactions to binge eating, metacognitive processes may actively organize the way individuals attend to urges, interpret emotional states, and respond to intrusive thoughts about food and body image. Recent research has also suggested that metacognition may function as a transdiagnostic factor across eating-disorder presentations. Latent profile findings indicate that distinct metacognitive patterns can be identified across diagnostic groups and may help explain differences in symptom severity and emotional functioning (Aloi et al., 2024). This transdiagnostic relevance is important because binge-eating disorder often shares mechanisms with other eating disorders while retaining distinctive behavioral and motivational features.

Impulsivity and emotion dysregulation may further strengthen the relationship between metacognition and disordered eating. Individuals who act rapidly under emotional pressure may be particularly vulnerable when they also believe that thoughts and urges cannot be controlled. Maladaptive coping responses can then mediate the progression from internal distress to eating-disorder behavior. Evidence suggests that coping strategies and emotion-regulation difficulties mediate associations among impulsivity, metacognition, and eating-disorder symptoms (Estévez et al., 2024). From this perspective, binge eating is not produced solely by impulsivity or negative emotion; rather, it emerges through the individual's interpretation and regulation of those experiences. A person who views an eating urge as temporary and manageable may respond differently from someone who believes that the urge is uncontrollable and must be immediately neutralized through eating. Metacognitive treatment therefore seeks to weaken the perceived necessity of reacting to internal events.

Metacognitive therapy differs from conventional cognitive behavioral therapy in several important respects. Instead of extensively disputing the factual content of automatic thoughts, it targets the processes that make thoughts persistent and influential. Treatment may involve

developing a metacognitive formulation, identifying the cognitive attentional syndrome, practicing attention training, using detached mindfulness, postponing worry or rumination, modifying positive and negative metacognitive beliefs, and reducing maladaptive thought-control strategies. The individual learns that thoughts and urges can be noticed without extended analysis, suppression, judgment, or behavioral enactment. Systematic review and meta-analytic evidence has shown that metacognitive therapy is effective across a range of psychiatric disorders and may produce substantial reductions in anxiety, depression, and repetitive negative thinking (Normann & Morina, 2018). More recent evidence on metacognitive interventions has reinforced their broader efficacy and clinical applicability, while also emphasizing the need for further disorder-specific comparative trials (Andersson et al., 2025).

Initial investigations of metacognitive therapy for binge-eating disorder have been promising. A treatment approach directed at modifying beliefs about worry, rumination, and uncontrollability may reduce the cognitive pressure that precedes binge episodes. By practicing detached mindfulness and flexible attentional control, individuals may become less reactive to food-related thoughts and emotional triggers. Clinical evidence has suggested that metacognitive therapy can reduce binge-eating symptoms and improve associated psychological processes (Robertson & Strodl, 2020). However, the literature remains limited compared with the extensive research base for cognitive behavioral therapy. Moreover, not all interventions described as metacognitive are identical; some focus primarily on metacognitive beliefs, whereas others integrate interpersonal, emotion-regulation, and schema-related components.

Comparative investigations are therefore necessary to determine whether metacognitive approaches offer benefits beyond those produced by established cognitive behavioral treatment. One comparative study of metacognitive interpersonal therapy for eating disorders and cognitive behavioral therapy examined their effects among non-underweight adults with eating disorders and highlighted the potential value of therapies that target metacognitive and interpersonal processes (Fioravanti et al., 2023). Although such findings broaden the evidence base, conclusions specific to binge-eating disorder remain constrained by heterogeneous samples, different treatment formats, and variation in outcome measures. It is also unclear whether any superiority of metacognitive therapy is limited to immediate symptom reduction or persists after treatment has ended.

Follow-up assessment is particularly important because binge eating is often recurrent, and treatment-related cognitive changes may weaken when participants encounter stressful or high-risk situations.

Another important issue concerns the distinction between reductions in binge-eating symptoms and changes in dysfunctional metacognitive beliefs. A treatment may reduce binge frequency through behavioral structure and dietary regulation without substantially modifying beliefs about worry, cognitive control, or the danger of thoughts. Conversely, a therapy may produce broad metacognitive change that gradually influences eating behavior. Cognitive behavioral therapy is expected to improve binge eating by establishing regular eating, reducing dietary restraint, restructuring eating- and body-related beliefs, and strengthening coping skills. Metacognitive therapy is expected to operate more directly on repetitive negative thinking, attentional inflexibility, detached responding to thoughts, and beliefs about mental control. Comparing these treatments across both symptom and metacognitive outcomes can therefore clarify whether their mechanisms and durability differ.

The need for such research is especially relevant in clinical settings where individuals with binge-eating disorder commonly present with overlapping cognitive, emotional, and behavioral problems. Existing evidence supports cognitive behavioral therapy as an effective intervention, but treatment nonresponse, residual metacognitive dysfunction, and relapse remain important concerns. Metacognitive therapy provides a theoretically distinct approach that may more directly address the persistent worry, rumination, cognitive self-focus, and thought-control beliefs associated with binge eating. Yet relatively few controlled studies have compared these interventions using repeated assessments and an active treatment comparison. Examining both immediate posttreatment outcomes and maintenance over a follow-up period can provide stronger evidence regarding their relative clinical utility.

Accordingly, the present study aimed to compare the effectiveness of metacognitive therapy and cognitive behavioral therapy in reducing binge-eating symptoms and dysfunctional metacognitive beliefs among individuals with binge-eating disorder at posttest and two-month follow-up.

2. Methods and Materials

2.1. Study Design and Participants

This applied study used a quasi-experimental pretest–posttest design with a two-month follow-up and two active intervention groups. Participants were assigned to either a metacognitive therapy group or a cognitive behavioral therapy group. Both groups were assessed at three measurement points: before the intervention, immediately after completion of the treatment sessions, and two months after the intervention. The independent variable was the type of psychological intervention, whereas the dependent variables were binge-eating symptoms and dysfunctional metacognitive beliefs. The statistical population consisted of all individuals with binge-eating disorder who attended the Tehran Binge Eating Association during 2025. From this population, 30 eligible individuals were selected through purposive sampling and randomly allocated to the metacognitive therapy and cognitive behavioral therapy groups, with 15 participants in each group. Each group received 12 group-based treatment sessions delivered twice weekly. The inclusion criteria were a diagnosis of binge-eating disorder based on the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition criteria and confirmation of the diagnosis by a clinical psychologist; an age range of 18 to 50 years; absence of severe comorbid psychiatric disorders, including schizophrenia, bipolar disorder, and other psychotic disorders; no use of psychiatric medications likely to affect appetite or mood; sufficient literacy to read, understand, and complete the study questionnaires; provision of written informed consent; and willingness and practical ability to attend the treatment sessions regularly. The exclusion criteria included voluntary withdrawal from the study, absence from more than 20% of the treatment sessions, discontinuation of treatment before completion of the intervention, development of an acute physical or psychiatric condition during the study, initiation of a new psychiatric medication that could influence the study outcomes, and failure to complete the posttest or follow-up assessments.

2.2. Measures

The Binge Eating Scale was developed by Gormally et al. (1982) to assess the severity of binge-eating symptoms, particularly among individuals with overweight or obesity. The scale consists of 16 items assessing both behavioral manifestations of binge eating, such as rapid eating,

consumption of unusually large quantities of food, and eating alone, and cognitive-affective characteristics, including guilt, perceived loss of control, and preoccupation with eating. Each item contains three or four descriptive statements, and respondents select the statement that most closely reflects their current condition. The response alternatives are scored from 0 to 3, producing a total score ranging from 0 to 46, with higher scores indicating more severe binge-eating symptoms. Scores below 17 indicate the absence of clinically significant binge-eating symptoms, scores from 18 to 26 indicate moderate binge-eating severity, and scores of 27 or above indicate severe binge eating. Previous international studies have reported satisfactory internal consistency for the scale. When compared with a semi-structured diagnostic interview for eating disorders, the scale demonstrated a sensitivity coefficient of .85. In a study of 344 individuals with obesity, Ricca et al. reported sensitivity and specificity coefficients of .84 and .75, respectively. The psychometric properties of the Persian version were examined by Dejkam, Moloodi, Mootabi, and Omidvar (2009). Its content validity was confirmed by two psychologists and one nutrition specialist, while reliability coefficients of .72 for test–retest reliability, .67 for split-half reliability, and .85 for Cronbach’s alpha were reported. Using a cutoff score of 17, the sensitivity and specificity of the Persian version were reported as 84.6% and 80.8%, respectively. In the present study, the Cronbach’s alpha coefficient for the scale was .81.

The 30-item Metacognitions Questionnaire, developed by Wells and Cartwright-Hatton (2004), is the short form of the original Metacognitions Questionnaire and is designed to assess individuals’ beliefs about their own thinking processes. The instrument contains 30 items distributed across five subscales: positive beliefs about worry, negative beliefs concerning the uncontrollability and danger of thoughts, cognitive confidence, need to control thoughts, and cognitive self-consciousness. Items are rated on a four-point Likert scale ranging from 1, indicating “do not agree,” to 4, indicating “agree very much.” The total score therefore ranges from 30 to 120. Higher total or subscale scores indicate stronger and more dysfunctional metacognitive beliefs within the corresponding domain. Psychometric evaluation of the original version demonstrated satisfactory internal consistency, with Cronbach’s alpha coefficients for the total scale and subscales ranging from .76 to .93 and a test–retest reliability coefficient of approximately .75 for the total score. In Iran, Shirinzadeh (2006) examined the factor structure and psychometric properties of the Persian version

and confirmed its construct validity. The Cronbach’s alpha coefficient for the total scale was reported as .91, while coefficients for positive beliefs about worry, uncontrollability and danger, cognitive confidence, cognitive self-consciousness, and need to control thoughts were .87, .84, .81, .80, and .71, respectively.

2.3. Interventions

The metacognitive therapy protocol was developed according to the theoretical and clinical framework proposed by Wells (2009, 2013) and was delivered in 12 group sessions held twice weekly. The first session introduced the treatment structure and the metacognitive model, explained the role of the cognitive attentional syndrome and dysfunctional metacognitive beliefs in the maintenance of binge-eating behavior, established treatment goals, and assigned participants to record binge-eating situations, associated thoughts, and eating behaviors. The second session focused on developing an individualized metacognitive formulation, examining the relationships among attention, thoughts, emotions, and binge-eating behavior, and identifying maladaptive coping strategies, with homework involving the monitoring of attention, thoughts, and binge-related behaviors. The third session introduced attention training techniques and taught participants to shift attention voluntarily from internal thoughts to external stimuli, followed by daily attention-control practice. The fourth session addressed detached mindfulness and trained participants to observe thoughts without judgment, evaluation, suppression, or behavioral response. The fifth session focused on identifying and modifying positive metacognitive beliefs about worry, rumination, and binge eating through therapeutic dialogue and behavioral experiments. The sixth session targeted negative metacognitive beliefs concerning the uncontrollability and danger of thoughts and impulses and sought to strengthen participants’ perceived cognitive control. The seventh session addressed maladaptive coping responses, including avoidance, thought suppression, reassurance seeking, and other behaviors that maintained binge-eating difficulties, and emphasized separating thoughts from actions. The eighth session focused on modifying dysfunctional cognitive-processing strategies by reducing worry, rumination, threat monitoring, self-focused attention, and maladaptive coping and replacing them with more flexible metacognitive processing. The ninth session facilitated the generalization of acquired skills by identifying

high-risk situations and internal and external triggers for binge eating and applying metacognitive strategies in everyday contexts. The tenth session reviewed and consolidated metacognitive skills and strengthened self-efficacy in managing binge-eating urges. The eleventh session focused on relapse prevention through the identification of early warning signs, management of lapses, and development of an individualized relapse-prevention plan. The final session summarized the treatment, reviewed all acquired skills, and helped participants formulate a long-term self-management and maintenance plan.

The cognitive behavioral therapy protocol was developed according to Fairburn's (2008) transdiagnostic cognitive behavioral approach to eating disorders and was implemented in 12 group sessions held twice weekly. The first session introduced the treatment model, explained the binge-eating cycle, clarified treatment objectives, and taught self-monitoring of eating behaviors, with participants instructed to record their daily food intake. The second session reviewed self-monitoring records and introduced the establishment of a regular pattern of eating through planned meals and snacks. The third session involved the development of an individualized cognitive behavioral formulation and the identification of triggering and maintaining factors related to binge eating. The fourth session focused on reducing dietary restraint by identifying rigid food rules, decreasing extreme dieting practices, increasing flexibility in food choices, and gradually exposing participants to previously avoided foods. The fifth session taught participants to identify and restructure dysfunctional automatic thoughts and beliefs concerning food, eating, weight, and body shape. The sixth session addressed excessive concerns about weight and physical appearance, reduced body checking and body avoidance, and introduced behavioral exercises designed to improve body image. The seventh session explored the relationship between emotional states and binge eating and trained participants in alternative emotion-regulation and coping strategies. The eighth session provided structured problem-solving training to help participants manage daily difficulties and reduce stress-related eating. The ninth session identified obstacles to treatment progress, modified behaviors that maintained binge eating, and strengthened the practical application of previously learned skills. The tenth session reviewed treatment achievements, reinforced adaptive eating behaviors, and enhanced self-efficacy in controlling binge-eating episodes. The eleventh session focused on recognizing high-risk situations, anticipating setbacks,

managing lapses, and developing a personalized relapse-prevention plan. The twelfth session consolidated the treatment gains, reviewed the complete set of cognitive and behavioral skills, and established a maintenance program based on continued self-monitoring, regular eating, cognitive restructuring, and relapse-prevention strategies.

2.4. Data Analysis

The data were analyzed using SPSS version 27. Descriptive statistics, including the mean and standard deviation, were initially calculated to summarize participants' scores on binge-eating symptoms, the total metacognitive beliefs score, and the metacognitive belief subscales across the pretest, posttest, and follow-up assessments. Before conducting the inferential analyses, the dataset was screened for missing values, entry errors, and extreme observations. Two outlying scores were identified and excluded from the inferential analyses; therefore, the final statistical analyses were conducted using data from 28 participants. To compare the effectiveness of metacognitive therapy and cognitive behavioral therapy while statistically controlling for baseline differences, univariate analysis of covariance was performed separately for the posttest and two-month follow-up scores, with the corresponding pretest score entered as the covariate. The analyses examined between-group differences in binge-eating symptoms, the total score of dysfunctional metacognitive beliefs, and each metacognitive belief subscale. Prior to conducting the analyses of covariance, the relevant statistical assumptions, including normality of score distributions, homogeneity of variances, linearity between the covariate and dependent variables, and homogeneity of regression slopes, were evaluated. Statistical significance was assessed at the .05 level.

3. Findings and Results

The demographic characteristics of the participants indicated that the mean age of individuals in the metacognitive therapy group was 34.70 years ($SD = 8.20$), whereas the mean age of participants in the cognitive behavioral therapy group was 35.90 years ($SD = 7.50$). In the metacognitive therapy group, 4 participants (26.7%) held a high school diploma, 7 participants (46.7%) held a bachelor's degree, and 4 participants (26.7%) held a master's degree. In the cognitive behavioral therapy group, 3 participants (20.0%) held a high school diploma, 8 participants (53.3%) held a bachelor's degree, and 4

participants (26.7%) held a master's degree. Thus, the two treatment groups were generally comparable in terms of age and educational level. Although 30 participants initially

entered the study, two outlying observations were excluded from the inferential analyses, and the final analyses were conducted using data from 28 participants.

Table 1

Descriptive Statistics for Binge-Eating Symptoms and Metacognitive Beliefs Across the Study Assessments

Variable	Assessment	Metacognitive Therapy, M (SD)	Cognitive Behavioral Therapy, M (SD)
Binge-eating symptoms	Pretest	33.13 (4.46)	33.20 (5.62)
	Posttest	22.07 (1.39)	26.07 (2.34)
	Two-month follow-up	23.27 (2.05)	27.13 (1.88)
Metacognitive beliefs	Pretest	40.20 (2.51)	43.20 (2.40)
	Posttest	38.27 (4.91)	40.93 (3.38)
	Two-month follow-up	39.87 (3.46)	41.07 (3.77)

As presented in Table 1, the mean binge-eating symptom score decreased from pretest to posttest in both intervention groups. However, the reduction was more pronounced in the metacognitive therapy group, whose mean score decreased from 33.13 to 22.07, compared with a reduction from 33.20 to 26.07 in the cognitive behavioral therapy group. At the two-month follow-up, binge-eating scores increased slightly in both groups compared with the posttest scores; nevertheless, the follow-up means remained lower than the corresponding pretest means. The metacognitive therapy group also retained a lower mean binge-eating score than the cognitive behavioral therapy group at follow-up. Total metacognitive belief scores similarly decreased from pretest to posttest in both groups, with a larger descriptive reduction in the metacognitive therapy group. At follow-up, some of the posttest improvement in metacognitive beliefs was attenuated in both groups, suggesting a partial return of dysfunctional metacognitive beliefs over time. Inferential analyses were therefore conducted to determine whether the observed between-group differences remained statistically significant after controlling for baseline scores.

Before conducting the analyses of covariance, the assumptions underlying the statistical procedures were examined. The results of the Shapiro–Wilk and Kolmogorov–Smirnov tests indicated that the distributions of binge-eating symptoms, total metacognitive beliefs, and metacognitive belief component scores did not significantly depart from normality. The skewness and kurtosis coefficients were also within acceptable ranges. Examination of scatterplots supported a linear association between the pretest covariates and the corresponding posttest and follow-up outcomes. The homogeneity-of-variance assumption was considered acceptable, and the interactions between treatment group and the relevant pretest covariates were nonsignificant, supporting the homogeneity of regression slopes. After data screening, two extreme observations were excluded from the inferential analyses. Accordingly, the principal assumptions of analysis of covariance were satisfied, and ANCOVA was considered appropriate for comparing the treatment groups while controlling for their pretest scores.

Table 2

Analysis of Covariance Comparing Metacognitive Therapy and Cognitive Behavioral Therapy

Outcome	Assessment	SS	df	MS	F	p	Partial η^2
Binge-eating symptoms	Posttest	116.036	1	116.036	31.205	< .001	.555
	Follow-up	100.321	1	100.321	24.035	< .001	.490
Total metacognitive beliefs	Posttest	46.664	1	46.664	7.701	.010	.235
	Follow-up	0.060	1	0.060	0.006	.937	.001
Positive beliefs about worry	Posttest	175.083	1	175.083	41.140	< .001	.662
	Follow-up	567.307	1	567.307	214.710	< .001	.911
Need to control thoughts	Posttest	336.448	1	336.448	47.011	< .001	.691
	Follow-up	453.094	1	453.094	107.426	< .001	.836
Cognitive confidence	Posttest	167.903	1	167.903	51.150	< .001	.709
	Follow-up	244.680	1	244.680	69.103	< .001	.767
Negative beliefs about uncontrollability and danger	Posttest	9.801	1	9.801	0.282	.601	.013

	Follow-up	31.510	1	31.510	1.809	.193	.079
Cognitive self-consciousness	Posttest	178.869	1	178.869	29.814	< .001	.587
	Follow-up	98.284	1	98.284	17.238	< .001	.451

As shown in Table 2, after controlling for pretest scores, a statistically significant difference was found between metacognitive therapy and cognitive behavioral therapy in posttest binge-eating symptoms, $F(1, 25) = 31.205, p < .001$, partial $\eta^2 = .555$. The effect size was large, indicating that treatment type accounted for 55.5% of the adjusted variance in posttest binge-eating symptoms. A significant between-group difference was also observed at the two-month follow-up, $F(1, 25) = 24.035, p < .001$, partial $\eta^2 = .490$, demonstrating that the superiority of metacognitive therapy in reducing binge-eating symptoms was maintained over the follow-up period. For total dysfunctional metacognitive beliefs, the posttest difference was statistically significant, $F(1, 25) = 7.701, p = .010$, partial $\eta^2 = .235$, indicating a large treatment effect in favor of metacognitive therapy. However, the difference in total metacognitive beliefs was not significant at follow-up, $F(1, 25) = 0.006, p = .937$, partial $\eta^2 = .001$, suggesting that the posttest superiority of metacognitive therapy in the total score was not maintained.

The component-level analyses showed significant treatment effects on positive beliefs about worry at posttest, $F(1, 21) = 41.140, p < .001$, partial $\eta^2 = .662$, and follow-up, $F(1, 21) = 214.710, p < .001$, partial $\eta^2 = .911$. Significant differences were also found for the need to control thoughts at posttest, $F(1, 21) = 47.011, p < .001$, partial $\eta^2 = .691$, and follow-up, $F(1, 21) = 107.426, p < .001$, partial $\eta^2 = .836$; cognitive confidence at posttest, $F(1, 21) = 51.150, p < .001$, partial $\eta^2 = .709$, and follow-up, $F(1, 21) = 69.103, p < .001$, partial $\eta^2 = .767$; and cognitive self-consciousness at posttest, $F(1, 21) = 29.814, p < .001$, partial $\eta^2 = .587$, and follow-up, $F(1, 21) = 17.238, p < .001$, partial $\eta^2 = .451$. In contrast, treatment-group differences were not significant for negative beliefs about the uncontrollability and danger of thoughts at either posttest, $F(1, 21) = 0.282, p = .601$, partial $\eta^2 = .013$, or follow-up, $F(1, 21) = 1.809, p = .193$, partial $\eta^2 = .079$.

Table 3

Pairwise Comparisons of Adjusted Means Between the Treatment Groups

Outcome	Assessment	Adjusted M, MCT	Adjusted M, CBT	Mean Difference (MCT – CBT)	SE	p	95% CI for Difference
Binge-eating symptoms	Posttest	21.929	26.000	-4.071	—	< .001	—
	Follow-up	23.214	27.000	-3.786	—	< .001	—
Total metacognitive beliefs	Posttest	38.290	40.900	-2.610	—	.010	—
	Follow-up	39.870	40.724	-0.854	—	.937	—
Positive beliefs about worry	Posttest	12.891	18.037	-5.146	0.802	< .001	[-6.815, -3.478]
	Follow-up	11.833	21.096	-9.263	0.632	< .001	[-10.578, -7.949]
Need to control thoughts	Posttest	14.255	21.388	-7.134	1.040	< .001	[-9.297, -4.970]
	Follow-up	15.646	23.925	-8.279	0.799	< .001	[-9.940, -6.617]
Cognitive confidence	Posttest	21.909	26.948	-5.039	0.705	< .001	[-6.505, -3.574]
	Follow-up	22.815	28.899	-6.084	0.732	< .001	[-7.605, -4.562]
Negative beliefs about uncontrollability and danger	Posttest	20.498	21.716	-1.218	2.294	.601	[-5.989, 3.554]
	Follow-up	23.123	25.306	-2.183	1.623	.193	[-5.559, 1.193]
Cognitive self-consciousness	Posttest	22.721	27.922	-5.201	0.953	< .001	[-7.183, -3.220]
	Follow-up	24.965	28.821	-3.856	0.929	< .001	[-5.787, -1.924]

The pairwise comparisons presented in Table 3 showed that the adjusted posttest mean for binge-eating symptoms was significantly lower in the metacognitive therapy group than in the cognitive behavioral therapy group, with adjusted means of 21.929 and 26.000, respectively. The corresponding adjusted means at follow-up were 23.214 and 27.000, indicating that the significantly greater reduction achieved through metacognitive therapy persisted two months after treatment. For total metacognitive beliefs, the adjusted posttest mean was significantly lower in the metacognitive therapy group than in the cognitive behavioral therapy group, whereas the adjusted follow-up means did not differ significantly. Thus, the superiority of metacognitive therapy in reducing the total metacognitive belief score was evident immediately after treatment but was not maintained at follow-up.

At the component level, the metacognitive therapy group had significantly lower adjusted scores than the cognitive behavioral therapy group for positive beliefs about worry at posttest, with a mean difference of -5.146 , $p < .001$, and follow-up, with a mean difference of -9.263 , $p < .001$. The metacognitive therapy group also had significantly lower scores for the need to control thoughts at posttest, with a mean difference of -7.134 , $p < .001$, and follow-up, with a mean difference of -8.279 , $p < .001$. Similarly, cognitive confidence scores were significantly lower in the metacognitive therapy group at posttest, with a mean difference of -5.039 , $p < .001$, and follow-up, with a mean difference of -6.084 , $p < .001$. Significant differences were also found for cognitive self-consciousness at posttest, with a mean difference of -5.201 , $p < .001$, and follow-up, with a mean difference of -3.856 , $p < .001$. However, the groups did not differ significantly in negative beliefs about the uncontrollability and danger of thoughts at either posttest, with a mean difference of -1.218 , $p = .601$, or follow-up, with a mean difference of -2.183 , $p = .193$. Overall, metacognitive therapy was more effective than cognitive behavioral therapy in reducing binge-eating symptoms and most dimensions of dysfunctional metacognitive beliefs, although its advantage in the total metacognitive belief score was not sustained at the two-month follow-up.

4. Discussion and Conclusion

The present study compared the effectiveness of metacognitive therapy and cognitive behavioral therapy in reducing binge-eating symptoms and dysfunctional metacognitive beliefs among individuals with binge-eating

disorder. The findings showed that both interventions reduced binge-eating symptoms from pretest to posttest, but metacognitive therapy produced a significantly greater reduction than cognitive behavioral therapy. This advantage remained significant at the two-month follow-up, indicating that the effects of metacognitive therapy on binge-eating symptoms were not limited to the immediate posttreatment period. The results also showed that metacognitive therapy was more effective than cognitive behavioral therapy in reducing the total score of dysfunctional metacognitive beliefs at posttest. However, this between-group difference was no longer significant at follow-up. At the component level, metacognitive therapy produced significantly greater reductions in positive beliefs about worry, the need to control thoughts, cognitive confidence, and cognitive self-consciousness at both posttest and follow-up. In contrast, the two interventions did not differ significantly in reducing negative beliefs about the uncontrollability and danger of thoughts at either assessment point.

The greater effectiveness of metacognitive therapy in reducing binge-eating symptoms is consistent with the metacognitive account of psychological disorders, according to which maladaptive patterns of attention, repetitive negative thinking, and dysfunctional beliefs about cognition contribute to the persistence of emotional and behavioral symptoms. From this perspective, binge eating is not maintained only by beliefs about food, weight, and body shape, but also by the manner in which individuals respond to intrusive thoughts, distressing emotions, eating urges, and self-critical mental events. Metacognitive therapy directly targets the cognitive attentional syndrome, which includes worry, rumination, threat monitoring, self-focused attention, and ineffective thought-control strategies. By weakening these processes, individuals may become less likely to interpret food-related thoughts and urges as requiring immediate behavioral action (Wells, 2013). The current findings therefore support the proposition that changing the regulation of cognition may be particularly beneficial for reducing recurrent loss-of-control eating.

The present results align with previous evidence showing that metacognitive interventions can produce substantial improvements across psychiatric conditions. Systematic reviews and meta-analyses have demonstrated that metacognitive therapy is effective in reducing symptoms associated with anxiety, depression, repetitive negative thinking, and related forms of psychological distress (Andersson et al., 2025; Normann & Morina, 2018). Although binge-eating disorder has received less attention in

the metacognitive treatment literature, the current findings are consistent with evidence indicating that metacognitive therapy can reduce binge-eating symptoms by modifying beliefs and regulatory strategies associated with worry, rumination, and perceived uncontrollability (Robertson & Strodl, 2020). The sustained superiority observed at follow-up suggests that participants may have continued to use detached mindfulness, flexible attention control, and alternative responses to eating-related thoughts after treatment ended.

The findings are also compatible with research demonstrating that dysfunctional metacognitive processes are central to the psychological structure of binge-eating disorder. Individuals with this disorder may hold positive beliefs that repetitive thinking is useful, such as believing that worrying about food or weight will prevent future overeating. They may simultaneously endorse negative beliefs that eating-related thoughts and urges are uncontrollable or dangerous. These beliefs can increase cognitive monitoring and emotional distress, which may ultimately intensify the urge to binge eat. Research profiling metacognition in binge-eating disorder has identified difficulties in cognitive confidence, thought control, positive beliefs about worry, and cognitive self-consciousness (Palmieri et al., 2021). The development of a disorder-specific questionnaire assessing metacognitions about binge eating further supports the view that beliefs about eating-related cognition are clinically meaningful and distinguishable treatment targets (Palmieri et al., 2023).

The superiority of metacognitive therapy may also be explained by its direct impact on repetitive negative thinking. Binge-eating episodes are often preceded by prolonged rumination about body dissatisfaction, perceived dietary failures, negative emotions, interpersonal stress, or anticipated loss of control. Cognitive behavioral therapy commonly examines the content and accuracy of these thoughts, whereas metacognitive therapy focuses more specifically on whether the individual continues to engage with them and which beliefs regulate that engagement. Training participants to observe thoughts without evaluating or suppressing them may reduce the emotional escalation that precedes binge eating. Attention-training techniques may additionally help individuals disengage from internally focused monitoring and shift attention toward neutral or task-relevant environmental information. As a result, an eating urge may be experienced as a temporary mental event rather than as an uncontrollable command.

The significant reduction in binge-eating symptoms in the cognitive behavioral therapy group is nevertheless consistent with a substantial evidence base supporting cognitive behavioral approaches for eating disorders. Cognitive behavioral therapy targets irregular eating, restrictive dietary rules, negative automatic thoughts, body checking, avoidance, and overvaluation of weight and shape. Systematic review evidence supports enhanced cognitive behavioral therapy as an effective treatment across eating-disorder diagnoses (Atwood & Friedman, 2020). Randomized findings have similarly shown that enhanced cognitive behavioral therapy can reduce eating-disorder psychopathology and improve associated psychological functioning (Jung et al., 2020). Research specifically involving obese patients with binge-eating disorder has also shown that cognitive behavioral treatment can produce clinically meaningful reductions in binge eating, although treatment response varies across individuals (van Riel et al., 2023). Thus, the present findings should not be interpreted as indicating that cognitive behavioral therapy was ineffective, but rather that metacognitive therapy produced a larger reduction under the conditions of this study.

The effectiveness of cognitive behavioral therapy in the present study is also consistent with research showing that interventions targeting dysfunctional beliefs, emotional eating, and maladaptive coping can reduce binge-eating symptoms. Comparative studies have indicated that cognitive behavioral therapy can reduce food craving and problematic eating patterns in women with binge-eating disorder (Aghababaei & Khalatbari, 2019). Other research has shown that cognitive behavioral and schema-focused interventions may improve emotional eating and related psychological vulnerabilities (Borhani Naeini et al., 2024). Emotion-focused cognitive behavioral interventions have also been associated with reductions in binge-eating symptoms, particularly when they strengthen emotion-regulation skills and adaptive coping (Saadatmand et al., 2023; Torres et al., 2020). These findings suggest that behavioral regulation, cognitive restructuring, and emotional processing are all relevant components of effective treatment.

The stronger posttest reduction in total dysfunctional metacognitive beliefs following metacognitive therapy was theoretically expected because this treatment was specifically designed to modify beliefs about cognition. Participants were trained to identify positive beliefs about worry and rumination, challenge beliefs concerning the necessity of thought control, reduce self-focused

monitoring, and develop greater flexibility in responding to mental events. Cognitive behavioral therapy may indirectly alter some metacognitive beliefs by reducing distress and improving cognitive coping; however, it primarily addresses the content of dysfunctional thoughts concerning food, body weight, shape, and personal worth. Consequently, metacognitive therapy was more likely to produce immediate changes in the overall metacognitive belief system.

This interpretation is supported by evidence describing metacognition as a transdiagnostic factor across eating disorders. Latent profile research has shown that individuals with eating disorders can be differentiated according to patterns of dysfunctional metacognition and that these patterns are associated with symptom severity and emotional difficulties (Aloi et al., 2024). Network analysis has likewise identified close relationships among metacognitive beliefs, emotion regulation, and binge-eating symptoms, suggesting that metacognitive variables may occupy central positions in the maintenance network of the disorder (Aloi et al., 2021). Furthermore, coping strategies and emotion-regulation difficulties have been shown to mediate associations among impulsivity, metacognition, and eating-disorder symptoms (Estévez et al., 2024). These findings help explain why an intervention that directly modifies metacognitive regulation may influence both eating behavior and broader psychological processes.

The absence of a significant between-group difference in the total metacognitive belief score at follow-up requires careful interpretation. One possible explanation is that the overall metacognitive score combines several conceptually distinct components, some of which changed significantly and others that did not. Although metacognitive therapy retained its superiority on positive beliefs about worry, need to control thoughts, cognitive confidence, and cognitive self-consciousness, no significant advantage emerged for negative beliefs about uncontrollability and danger. The unchanged component may have reduced the magnitude of the difference in the total score. In addition, some improvement in the cognitive behavioral therapy group may have continued after treatment, narrowing the between-group difference at follow-up. Cognitive restructuring, self-monitoring, and successful management of binge-eating episodes may gradually weaken broader dysfunctional beliefs about thinking, even when these beliefs are not explicitly targeted.

Another explanation is that global metacognitive beliefs may require longer treatment or booster sessions to remain

stable. Participants may have learned to use metacognitive techniques during the structured intervention but experienced difficulty maintaining them consistently after therapist contact ended. Stressful life events, interpersonal conflict, body dissatisfaction, or renewed eating urges may reactivate habitual cognitive strategies. This interpretation is consistent with the recurrent nature of binge-eating disorder and the heterogeneity of factors involved in its maintenance (Giel et al., 2022). The disorder is associated with emotional, interpersonal, biological, and sociocultural vulnerabilities, and durable change may therefore require continued practice and periodic reinforcement.

The finding that metacognitive therapy was more effective in reducing positive beliefs about worry at both posttest and follow-up is especially important. Positive metacognitive beliefs encourage individuals to engage in worry and rumination because they view these activities as protective or useful. A person may believe that repeatedly analyzing food intake will prevent future binges or that worrying about body weight will increase self-control. In practice, prolonged mental engagement may heighten distress, increase attentional fixation on food, and reduce behavioral flexibility. Metacognitive therapy directly challenges the perceived usefulness of these processes through verbal reattribution and behavioral experiments. The large and sustained effect on this component suggests that participants learned that worry was neither necessary nor effective for controlling eating behavior.

Metacognitive therapy also produced greater reductions in the need to control thoughts. Attempts to suppress thoughts about food, eating, or body image can paradoxically increase their frequency and emotional salience. When individuals believe that unacceptable thoughts must be eliminated, the recurrence of those thoughts may be interpreted as evidence of personal failure or loss of control. Detached mindfulness provides an alternative in which thoughts are allowed to occur without suppression, extended analysis, or behavioral response. The sustained reduction in the need to control thoughts may therefore reflect a fundamental change in participants' relationship with internal experiences. Rather than struggling against eating-related cognition, participants may have become more capable of allowing thoughts to pass without acting on them.

The significant findings for cognitive confidence indicate that metacognitive therapy may have changed participants' beliefs about memory, attention, and cognitive competence. Low cognitive confidence can lead individuals to distrust

their internal judgments, repeatedly monitor their behavior, seek reassurance, or depend on rigid external rules. In binge-eating disorder, this may be expressed as uncertainty about hunger and satiety, lack of trust in one's ability to regulate eating, or repeated checking of dietary decisions. By increasing flexible attentional control and reducing maladaptive monitoring, metacognitive therapy may strengthen confidence in the ability to manage cognition without excessive control strategies. This explanation is compatible with research identifying cognitive confidence as an important feature of metacognitive dysfunction in binge-eating disorder (Palmieri et al., 2021).

The greater reduction in cognitive self-consciousness may similarly reflect reduced preoccupation with internal mental activity. Excessive cognitive self-consciousness involves persistent monitoring of one's thoughts and can amplify awareness of food-related cognition, urges, and self-critical evaluations. Although self-awareness can sometimes support regulation, excessive monitoring may increase distress and make intrusive thoughts appear more significant. Metacognitive therapy encourages flexible rather than continuous self-focused attention. This may have helped participants disengage from internal monitoring and direct attention toward adaptive behavior and external demands.

In contrast, the absence of significant differences in negative beliefs about uncontrollability and danger may indicate that these beliefs are more resistant to brief intervention. Such beliefs may be deeply connected to repeated experiences of losing control during binge episodes. Participants who have repeatedly attempted and failed to stop binge eating may possess strong experiential evidence that thoughts and urges are uncontrollable. Twelve sessions may have been sufficient to modify beliefs about the usefulness of worry and the necessity of thought control but insufficient to fully revise beliefs formed through a long history of perceived behavioral failure. These beliefs may also be influenced by comorbid anxiety, trauma, or dissociation. Previous evidence suggests that trauma and dissociative symptoms can affect response to cognitive behavioral therapy in binge-eating disorder (Serra et al., 2020); similar factors may also interfere with changes in deeply rooted beliefs about cognitive danger and uncontrollability.

The present results are also broadly consistent with comparative evidence suggesting that treatments targeting metacognitive and interpersonal processes can be useful for adults with eating disorders. Metacognitive interpersonal

therapy has demonstrated promising outcomes when compared with cognitive behavioral treatment in non-underweight individuals with eating disorders (Fioravanti et al., 2023). However, the current study extends this area by focusing specifically on binge-eating disorder and by examining both eating symptoms and separate metacognitive dimensions. Given the complex etiology of eating disorders, including genetic, developmental, emotional, and sociocultural influences (Culbert et al., 2021; Trace et al., 2020), it is unlikely that a single treatment mechanism will be sufficient for every patient. The findings instead suggest that metacognitive therapy may be particularly appropriate when repetitive negative thinking, excessive internal monitoring, and dysfunctional beliefs about cognition are prominent.

Overall, the findings indicate that metacognitive therapy may offer a clinically valuable alternative or complement to cognitive behavioral therapy for binge-eating disorder. Its stronger effect on binge-eating symptoms and several metacognitive components suggests that treatment gains may arise from reducing maladaptive cognitive regulation rather than solely modifying food- and body-related thought content. Nevertheless, the disappearance of the between-group difference in the total metacognitive belief score at follow-up highlights the need to distinguish immediate treatment effects from durable change. It also suggests that maintenance strategies may be essential for consolidating broad metacognitive improvement.

The present study had several limitations. The sample was small and was selected purposively from individuals attending a single association in Tehran, which limits the generalizability of the findings to other clinical settings, geographic regions, age groups, and cultural populations. The absence of a no-treatment or wait-list control group made it impossible to determine the extent to which improvement reflected specific treatment effects rather than repeated assessment, expectancy, or nonspecific therapeutic factors. The follow-up period was limited to two months and may not have been sufficient to assess relapse or long-term maintenance. Two outlying observations were removed, further reducing statistical power. Outcomes were assessed primarily through self-report measures and may therefore have been affected by recall bias, social desirability, or participants' interpretations of questionnaire items. Treatment adherence, therapist competence, and fidelity to the protocols were not independently assessed, and potentially influential variables such as body mass index, duration of disorder, trauma history, psychiatric

comorbidity, and prior treatment experience were not included in the analyses.

Future studies should recruit larger and more diverse samples through multisite clinical settings and use randomized controlled designs that include wait-list, treatment-as-usual, or supportive-therapy comparison groups. Follow-up periods of six months, one year, or longer would provide more reliable evidence regarding relapse and durability of treatment effects. Researchers should incorporate clinician-administered diagnostic interviews, behavioral records of binge episodes, ecological momentary assessment, and physiological or anthropometric indicators alongside self-report questionnaires. Future studies could also examine whether changes in metacognitive beliefs mediate reductions in binge-eating symptoms and whether emotion regulation, impulsivity, trauma, dissociation, or baseline metacognitive profiles moderate treatment response. Dismantling studies may clarify which elements of metacognitive therapy, such as attention training, detached mindfulness, or modification of positive beliefs, contribute most strongly to improvement. Comparative research could additionally evaluate combined or sequential models in which cognitive behavioral strategies are integrated with metacognitive techniques.

In clinical practice, therapists should assess metacognitive beliefs, repetitive negative thinking, attentional fixation, and thought-control strategies in addition to eating behavior, body image, and dietary restraint. Metacognitive therapy may be especially useful for patients who experience persistent rumination, perceive eating urges as uncontrollable, or repeatedly use food to disengage from distressing thoughts. Clinicians should provide structured practice of detached mindfulness and attention-control exercises and should connect these skills directly to high-risk eating situations. Because some global metacognitive changes may weaken after treatment, booster sessions, maintenance meetings, written relapse-prevention plans, and continued home practice should be incorporated whenever possible. Treatment selection should remain individualized, with cognitive behavioral, metacognitive, emotional, and interpersonal strategies combined according to each patient's maintaining mechanisms and clinical needs.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the study and participated in the research with informed consent. This article is derived from the first author's doctoral dissertation at the Shiraz Branch, Islamic Azad University, Shiraz, Iran. The study was approved by the Research Ethics Committee of the Shiraz Branch, Islamic Azad University, under ethics code IR.IAU.SHIRAZ.REC.1403.130.

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