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A Comparison of the Effectiveness of Acceptance and Commitment Therapy (ACT) and Emotional Focused Therapy (EFT) on Impulsive Behaviors and Emotional Self-regulation in People with Obesity

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The aim of this study was to compare the effectiveness of acceptance and commitment therapy and emotion-focused therapy on impulsive behaviors and emotional self-regulation in obese individuals. The statistical population of the study was all women aged 20 to 30 who referred to nutrition clinics in Tehran in 1401. Impulsivity questionnaires (Bart et al., 1995) and emotional self-regulation questionnaires (Hoffman and Kashdan, 2010) were used to measure the research variables. The research method was a semi-experimental design with a pre-test/post-test and follow-up with a control group. For this purpose, 45 people were selected using convenience sampling and randomly assigned to two experimental groups and a control group (15 people each). Then, experimental groups received acceptance and commitment therapy and emotion-focused therapy for 8 sessions (one 90-minute session per

week).The groups were also evaluated in three time stages: pre-test, post-test, and three-month follow-up. Data were analyzed using repeated measures analysis of variance and Bonferroni post hoc tests.
The results of the study showed that there is a significant difference between the effectiveness of acceptance and commitment therapy and emotion-focused therapy on impulsive behaviors and emotional self-regulation in obese women. According to the findings, emotion-focused therapy was more effective in reducing impulsive behaviors and improving emotional self-regulation in people with obesity. Based on this study, it is recommended that therapists use acceptance and commitment therapy and emotion-focused therapy to reduce impulsive behaviors and improve emotional self-regulation in obese individuals.

Keywords*:* acceptance and commitment therapy, emotion-focused therapy, impulsive behaviors, emotional self-regulation, obesity.

Overweight and obesity are defined as the abnormal or excessive accumulation of fat in the human body (WHO, 2020). Obesity, as one of the leading causes of death in developed and developing countries, is one of the most significant challenges facing public health services in the 21st century(Simonnet et al., 2020). It is often associated with a great number of physical diseases (e.g., adult-onset diabetes, cardiovascular diseases, hypertension, and osteoarthritis) (Simonnet et al., 2020; Thibodeau et al., 2017) and social and economic harms (e.g., life expectancy and reduced productivity) (Okunogbe et al., 2021). Besides physical and social problems, obesity and overweight leave a significant impact on the development of psychological problems such as impulsivity and emotional self-regulation (Forbes, 2020). Impulsive behavior involves rapid, unplanned responses to internal or external stimuli, without regard for the negative consequences of these responses in the future (Moeller et al., 2001). People with high impulsivity are more likely to experience greater distress and have difficulty with emotional

self-regulation. As a result, they are more likely to engage in certain impulsive behaviors, such as binge eating. (Smith, et al., 2023; Giel, et al., 2021), making it more likely that obese people will resort to binge eating to cope with negative emotions when experiencing them later, causing more frequent binge eating in the future. In fact, based on the carried-out studies, the advent of impulsive behaviors (like binge eating) in individuals with obesity is probably due to a lack of adaptive emotional self-regulation strategies (Reinelt, et al., 2020).

Impulsivity is one of the psychological characteristics that has been suggested as an important factor in eating behaviors, weight gain, and the risk of obesity (Giel et al., 2021). When food is just eaten to meet the needs of feelings and emotions rather than hunger, it leads to emotional overeating. In response to emotional cues, emotional overeating is defined as eating in the absence of hunger (Laghi et al., 2015). Impulsive behaviors (for example, binge eating) in People with obesity may result from a lack of adaptive emotional self-regulation strategies (Casagrande et al., 2019). Emotional self-regulation involves factors such as awareness, acceptance, and understanding of one's emotions; the ability to control impulsive behaviors; and acting in accordance with desired goals while experiencing negative emotions (Gratz & Roemer, 2004). According to research, obese people use more maladaptive strategies to regulate their emotions due to impulse control problems and limited access to emotion regulation strategies (Fernandes et al., 2018). Actually, People with obesity face problems controlling their eating behaviors when experiencing intense negative emotions and this is also the result of their inability to self-regulate emotions and further overeat (Casagrande et al., 2019).

That is, they use eating to escape negative thoughts (such as self-deprecating thoughts following out-of-control eating). In the short term, this is likely to be reinforced by temporarily reducing negative thoughts and emotions, and, in turn, can increase the possibility of overeating, since they are unable to recognize hunger and negative emotions as the main reasons for their high desire for food. Moreover, the cognitive load of coping with such negative emotions may overcome the self-regulation process, so that individual with obesity will no longer maintain their control over eating behaviors (Favieri, Marini & Casagrande, 2021).

Acceptance and Commitment Therapy (ACT) helps individuals focus on the present moment, accept thoughts and emotions beyond their control without judgment, and commit to predetermined positive goals. In this kind of therapy, the therapist teaches clients how not to suppress negative emotions, how to detach from unwanted and intrusive thoughts, and how to accept and experience negative emotions rather than avoiding or reacting thoughtlessly(Hayes, Strosahl & Wilson, 2011).

In Emotion-Focused Therapy (EFT), emotions that have key significance are known as the driving force. This therapeutic approach provides a unique framework for dealing with emotional processes and, in this regard, uses targeted techniques to stimulate and facilitate changes in clients' emotional experiences. During treatment, clients can learn to regulate and express their emotional experiences more optimally by learning to label emotions properly, to regulate and moderate intense emotions, and to transform the main maladaptive and painful emotions (Pos & Greenberg, 2007). Regarding the fact that, according to the review of research literature, no previous study

has been carried out to compare the effectiveness of emotion-focused therapy and acceptance and commitment therapy on individual with obesity, the main question of the present study is how different the effects of acceptance and commitment therapy and emotion-focused therapy on impulsive behaviors and emotional self-regulation in People with obesity can be.

Method

The present quasi-experimental study includes two experimental groups and a control group, and its statistical population consists of all women (ranging in age from 20-30 years) who referred to nutrition clinics in Tehran in 2022. Among the women who referred to a nutrition clinic in District 4 of Tehran and were willing to participate in the therapeutic intervention, 45 were selected through convenience sampling according to the inclusion criteria. They were later randomly assigned to two experimental groups and a control group (15 per group). Then, the first experimental group received acceptance and commitment therapy, whereas the second group received emotion-focused therapy for a 90’ session per week, over 8 sessions. The groups were assessed in three time phases: pre-test, post-test, and follow-up. After the last training session, a post-test was administered simultaneously under the same conditions to both the experimental and control groups. Inclusion criteria included: having a record in Tehran nutrition clinics, age range 20 to 30 years, willingness, and informed consent to participate in the research project. Exclusion criteria included: absence from more than 2 education sessions and unwillingness to continue treatment. Repeated-measures analysis of Variance and Bonferroni post hoc tests were also used to analyze the data. Also, ethical considerations were fully

observed in the research. After obtaining participants' consent, they were assured of the confidentiality of their information, and they completed the questionnaires in a quiet environment without mentioning their names. Also, after the research period, educational interventions were implemented for members of the control group who were willing to participate in therapy sessions. The ethics code of the present research is IR.IAU.CHALUS.REC.1401.025.

Data were gathered using the following tools.

Barratt Impulsiveness Scale (BIS-11)

The Barratt Impulsivity Scale (BIS-11) is a widely used self-report measure of impulsivity, originally developed in the 1990s by Dr. Barratt and the International Society for Impulsivity Research. It is one of the most commonly used self-report scales for assessing impulsivity in research and clinical settings. Although the BIS-11 was originally developed in the United States, it has been widely used worldwide and translated into many languages. The questionnaire consists of 30 questions across 3 subscales: cognitive impulsivity, motor impulsivity, and disorganization. Responses to the questions are on a four-point Likert scale ranging from rarely (score 1) to always (score 4), with the lowest and highest scores being 30 and 120, respectively. The higher the score, the greater the impulsivity (Barratt et al, 1997). Patton et al. (1995) reported internal reliability (.79-.83) for the total score of this questionnaire. In Iran, Ekhtiari et al. (2008) administered this questionnaire to two groups of healthy individuals and substance abusers. In the healthy group, Cronbach's alpha coefficients were .48, .63, .79, and .83 for the disorganization, motor impulsivity, cognitive impulsivity, and total score subscales, respectively. In the

present study, the questionnaire's overall reliability (.890) was estimated using Cronbach's alpha.

Emotional Self-Regulatory Questionnaire (ERQ)

This scale, developed by Hoffmann and Kashdan (2010), has 3 dimensions (concealment, compromise, and tolerance) and 20 items, and the responses are based on a 5-point Likert scale (from very untrue of me (score 1) to very true of me (score 5). The validity of this scale has been confirmed by its developer (23). In the study by Karsheki (2013), the validity and reliability indices of this questionnaire were reported to be satisfactory, with Cronbach's alphas of .70, .75, and .50 for the concealment, compromise, and tolerance subscales, respectively, and a total reliability of .81. In the present study, the overall reliability of this scale, as measured by Cronbach's alpha, was .84.

Treatment protocol

In this study, the protocols of acceptance and commitment therapy were taught based on Hayes approach (2004), and emotion-focused therapy was taught based on the Greenberg approach (2008), to the experimental groups during eight 90’ sessions, one session per week, along with the assigned homework.

Table 1
A Summary of ACT Sessions

Sessions	Contents
1st session	Introducing members to each other and establishing a therapeutic relationship, introducing acceptance and commitment therapy, determining the treatment method and its goals, introducing exercises and planning sessions, examining the physical and psychological consequences of obesity
2nd	Examining the costs of suppressing emotions and avoiding

session	them, explaining the lack of need to reduce unpleasant emotions or avoid negative emotions, discovering avoided situations during social interactions and contacting them through accepting them
3rd session	Introducing the concept of acceptance, teaching contacting physical-social anxiety and emotional discomfort without trying to block or control them, encouraging clients to participate in social interactions and activities without trying to avoid them, teaching psychological flexibility and self-compassion, using the bus metaphor, practicing acceptance: observation, conscious breathing and openness
4rd session	Teaching how to recognize the different components of the mind and creating the capacity to actively engage with some activities and put others aside, introducing mindfulness and providing techniques for staying in the present moment and observing internal emotions without drowning, avoiding, suppressing or acting on them and developing a self-observer through doing a series of skills such as breathing exercises, body scans, and mindfulness practice on eating behavior
5rd session	Becoming aware of the relationship between emotions and behaviors, learning to distance and separate oneself from painful thoughts and emotions such as physical and social anxiety, reducing the effects of emotional content on behavior, enabling to observe emotions with no regard to their content and nature, using the metaphor of the bus driver and the metaphor of clouds in the sky
6rd session	Helping clients identify meaningful values in life in order to find behaviors inconsistent with values (e.g., overeating, excessive inactivity), reappraising situations as opportunities to live by values and practicing new behaviors, practice clarifying values by writing about the meaning and importance of different areas of life, using metaphors (such as birthday party metaphor)
7rd session	Reviewing obstacles in achieving values and employing strategies to overcome them, helping clients set goals based on personal values and strive to achieve them despite the possibility of failure, creating sense of commitment to pursuing valuable actions in life such as increasing family interactions or sticking to proper diets and doing exercises to improve physical health
8rd session	Giving answers to subjects' questions, summarizing sessions, and conducting post-tests

Table 2
A Summary of EFT Sessions

Sessions	Contents
1st session	Introducing members to each other and establishing a therapeutic relationship, introducing emotion-focused therapy, explaining the treatment method and its goals, planning sessions, examining the physical and psychological consequences of obesity
2nd session	Explaining the nature and function of emotions, primary and secondary emotions, and teaching how to differentiate them, observing and discovering the client's emotional processing style, representing and regulating the main adaptive-maladaptive emotions
3rd session	Dealing with different indicators at various levels of the client's processing process, highlighting the role of clients in creating emotional experiences, discovering and overcoming interruptions and obstacles to expressing emotions, achieving acceptance, tolerance, regulation and experience of emotions
4rd session	Identifying rejected needs and denied and blamed aspects of the self, examining the impact of anxiety and defense mechanisms on cognitive and emotional processes, strengthening acceptance of denied aspects of the self
5rd session	Identifying the anxious and blaming self, identifying the split of the critical self, making two-chair dialogues for making a conversation between the anxious self and the safe self
6rd session	Providing a definition of emotional schemas, helping clients discover and activate initial maladaptive emotional urges and schemas to change the main maladaptive emotions by evoking the stopped emotions, using the two-chair dialogue technique
7rd session	Processing emotions and changing emotional schemas, creating new emotional self-regulation strategies to change the main maladaptive schemas, giving meaning to experience, emotional regulation capacity, training the ability to reflect on experiences and create a new narrative of them
8rd session	Giving answering to the subjects' questions, summarizing the sessions, and conducting the post-test

Results

The mean and standard deviation were used at the descriptive level, and a repeated-measures analysis of variance and Bonferroni post hoc test were used at the inferential level. The mean and standard deviation of Impulsive Behaviors and Emotional Self-Regulation for the research groups in the three stages of the study indicated that in two groups of acceptance and commitment therapy and emotion-focused therapy, significant effect changes occurred in Impulsive Behaviors and Emotional Self-Regulation from pre- test to post-test and follow-up stages than the control group (Table 3). Before performing a repeated measures analysis of variance, the normality of the data distribution was checked using the Kolmogorov-Smirnov test, the homogeneity of variances was checked using the Levene test, and the sphericity assumption was checked using Mauchly's test (Table 4). As well as the significance levels of all four multivariate statistics, including Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root, are significant at the level of .001 ($P < .01$), indicating that the intervention had a general effect on the dependent variables(Table 5).

Table 3
Mean and Standard Deviation of Impulsive Behaviors and Emotional Self-Regulation in Research Groups

Variable	Group	Stage	Mean	standard deviation
Impulsive Behaviors	Acceptance and commitment therapy	Pre-test	89.88	10.42
		Post- test	57.88	5.21
		Follow- up	57.38	4.28
	Emotion-focused	Pre-test	90	10.73
		Post- test	50.66	4.81

	therapy	Follow- up	50.61	5.38
	Control	Pre-test	90.24	10.42
		Post- test	89.83	10.6
		Follow- up	88.87	10.2
	Acceptance	Pre-test	57.22	6.01
	and	Post- test	82.38	2.37
	commitment	Follow- up	81.34	17.57
Emotional	therapy			
Self-	Emotion-	Pre-test	56.88	6.04
Regulation	focused	Post- test	89.11	4.52
	therapy	Follow- up	88.53	4.52
	Control	Pre-test	56.92	6.05
		Post- test	56.55	5.4
		Follow- up	57.18	5.14

Table 4
Results of Kolmogorov-Smirnov, Levene and Mauchly Tests

Variable	Group Stage	Emotion-focused Therapy		Acceptance and Commitment Therapy		Levene Test		Mauchly Test	
		K-S	Sig.	K-S	Sig.	Statistical	Sig.	Statistical	Sig.
Impulsive Behaviors	Pre-test	.683	.739	.577	.893	2.57	.33	.097	.14
	Post-test	1.08	.194	.686	.734	1.12	.57		
	Follow-up	.599	.855	.761	.609	1.27	.29		
Emotional Self-Regulation	Pre-test	.778	.32	.566	.821	.24	.79	.62	.65
	Post-test	.741	.11	.632	.714	1.6	.34	.097	.14
	Follow-up	.841	.871	.741	.569	1.08	.34		

Table 5
Results of Pillai's Trace Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root

Changes		value	F	Hypothesis *df*	Error *df*	Sig.
Impulsive behaviors	*Pillai's* trace	.847	138.3	2	50	.000
	Wilk's lambda	.153	138.3	2	50	.000
	Hotelling's trace	5.53	138.3	2	50	.000
	Roy's *greatest root*	5.53	138.3	2	50	.000
Emotion self-regulation	*Pillai's* trace	.908	247.2	2	50	.000
	Wilk's lambda	.092	247.2	2	50	.000
	Hotelling's trace	9.88	247.2	2	50	.000
	Roy's *greatest root*	9.88	247.2	2	50	.000

The results of multivariate analysis of variance with repeated measures showed the significance of, the test factor (F=1.266 P<.001), group (F=9424.4, P<.001) and the test × group interaction (F=62.95 P<.001) in the impulsive behavior variable indicating the fact that there is a significant difference between at least two of the three research groups in the post-test and follow-up stages in the impulsive behavior variable. Also, the results showed that, in emotional self-regulation, the test factor (F=8.127 P<.001), group (F=4451.44, P<.001) and the test × group interaction (F=29.35 P<.001) was significant; thus,

indicating a significant difference between at least two of the three research groups in the post-test and follow-up stages in emotional self-regulation variable (Table 6).

Table 6
Results of Repeated Measures Analysis of Variance

Variable	Source of changes	SS	df	MS	F	Sig.	Eta
Impulsive Behaviors	Test	42502.32	1	42502.32	266.1	.000	.281
	Group	9424.4	1	8513.36	488.2	.000	.387
	Group * test	20107.3	2	10053.6	62.95	.000	.457
Emotional Self-Regulation	Test	22613.55	1	22613.55	127.8	.000	.517
	Group	4451.44	1	4451.33	247.5	.000	.618
	Group * test	12489.03	2	6244.51	35.29	.000	.432

Table 7
Bonferroni Test to Compare Three Groups in Research Variables

Variable	Group	pre-test- post-tes		pre-test- Follow-up		post-tes-Follow- up	
		Average difference	**Sig.**	Average difference	**Sig.**	Average difference	**Sig.**
Impulsive Behaviors	Emotion-focused therapy	39.34	.001	39.39	.001	.05	.001
	Acceptance and commitment therapy	32	.001	32.50	.001	.5	.001
Emotional Self-Regulation	Emotion-focused therapy	-32.23	.001	-31.65	.001	-.58	.001
	Acceptance and commitment therapy	-25.16	.001	-21.11	.001	-1.04	.001

Table 7 shows the results of the Bonferroni post hoc analysis. According to the results, there is a significant difference between the emotion-focused therapy and acceptance and commitment therapy groups on the variables of impulsive behaviors and emotional self-regulation. The emotion-focused therapy group showed greater effectiveness in both the post-test and follow-up stages on the variables of impulsive behaviors and emotional self-regulation.

Discussion

The study aimed to compare the effectiveness of acceptance and commitment therapy and emotion-focused therapy on impulsive behaviors and emotional self-regulation in people with obesity. Although the statistical results showed significant effectiveness for both treatments, emotion-focused therapy was more effective on these variables. This result is consistent with the studies of Azandariani et al., (2021); Jalali Farahani et al., (2021); Babolmorad and Gatezadeh (2021); Fahimi et al., (2020); Smith et al., (2023); Boelens et al., (2022); Torres et al., (2020); and Julien et al., (2019). In explaining the results, it can be said that the reduction in impulsive behaviors and improvement in self-regulation skills can be attributed to the three components of acceptance, attention to the client's values, and mindfulness in acceptance and commitment therapy(Hayes, 2004). As an initial response to negative emotions, acceptance uses emotion regulation to achieve significant goals in a flexible manner, which leads to psychological well-being (Hayes, et al., 2006). In addition, clarifying and reappraising values, which is considered a key factor in acceptance and commitment therapy, reduces impulsive behaviors and improves emotional self-regulation

(Hayes, 2004). As an initial response to negative emotions, acceptance uses emotion regulation to achieve significant goals in a flexible manner, which leads to psychological well-being (Hayes, et al., 2006). If obese individuals understand the value and importance of weight-loss-related behaviors, they will be more willing to stick to a more challenging diet (Hayes & Lillis, 2014). Another component that can be used to reduce impulsive behaviors and improve emotional self-regulation is mindfulness. Empirical studies show that mindfulness skills (adopting a non-reactive, non-judgmental stance toward thoughts and feelings) can reduce food cravings. Observing thoughts and feelings in a nonjudgmental, mindful manner reduces a person's attention to eating, which is itself driven by emotional cues. As a result, people can better control their impulsive behaviors by using emotional self-regulation strategies. Emotional triggers can therefore reduce overeating and unnecessary food consumption, as people can more intelligently distinguish between real hunger cues and emotional cues that lead them to eat without feeling hungry (Lindsay & Creswell, 2017; O'Reilly et al., 2014).

On the contrary, to reduce impulsive behaviors, greater emphasis of interventions related to emotion-focused therapy is put on: (a) increasing emotional awareness and emotion regulation through describing and labeling emotions, (b) recognizing the signs of emotional experiences, (c) learning how to tolerate distress in the moment; and (d) learning alternative tools for coping with negative emotions (Gratz, & Roemer, 2004). In emotion-focused therapy, individuals are first trained to consider and accept negative emotions. This allows for better recognition of the potential consequences of behaviors on the body. In emotion-focused therapy, the therapist aims to increase

clients' access to adaptive emotion regulation strategies, including acceptance of emotions, reappraisal, and reduced reliance on maladaptive suppression-based strategies, all of which are associated with a greater tendency to engage in impulsive behaviors (İnce et al., 2021). Emotion regulation training also provides individuals with more effective strategies for coping with negative emotions rather than escaping them, which, in turn, helps achieve impulse and self-control and allows individuals to gain a deeper understanding of the role of emotion regulation in overeating. Awareness and understanding of emotions, acceptance of emotions, training in controlling behavior when facing negative emotions, and the ability to use emotion self-regulation strategies flexibly and appropriately in the situation can improve self-control, the tendency to resist immediate temptations, and the desire to receive short-term and even the most pleasurable rewards (e.g., eating food). Thus, by considering its long-term consequences, these people try to avoid unwanted responses to immediate and pleasurable stimuli to stick to long-term strategies that grant them more significant benefits (Schag et al., 2021).

In addition, researchers have introduced maladaptive emotional self-regulation strategies as a key cause of obesity and believe that emotions play a significant role in threatening public health by increasing the likelihood of obesity (Kass, Wildes & Coccaro 2019). The experience of negative emotions, which is one of the most accurate predictors of obesity and emergence of binge eating, also shows the importance of exploring psychological treatments that have greater specific emphasis on the role of emotions. According to previous studies, obesity is associated with problems such as

impaired explicit recognition of emotions, reduced emotional awareness, increased emotional alexithymia, and weak automatic processing of emotional information, which rely on emotional unconsciousness (Giel et al., 2021). According to the theory of emotional overeating, negative emotions lead people to eat more. The theory relies mostly on two basic assumptions: a) negative emotions increase the desire to eat, which in turn causes increased eating; b) the phenomenon of binge eating reduces the intensity of negative emotions (Macht & Simons, 2011). People with obesity tend to engage in emotional eating. In other words, increased consumption of highly palatable and high-calorie foods and beverages, which reduces distress caused by negative mood and anxiety, can lead to excessive overeating (Konttinen, 2020). So eating more food seems to suppress unpleasant and aversive emotional experiences (emotional overeating) (Laghi et al., 2015).

Given that acceptance and commitment therapy and emotion-focused therapy can be effective strategies for reducing impulsive behaviors and improving emotional self-regulation in overweight women, and both can have long-term effective effects alongside pharmacological treatments, it is therefore suggested that these therapeutic approaches be used as an adjunct therapy along with pharmacological treatments and therapeutic regimens. Like all other studies, the present study faced limitations, which include:

1. The present study sample only includes obese women in Tehran, aged 20 to 30 years; therefore, it is not possible to generalize the results to other obese women of other age ranges and in other regions.

2. Another limitation of the present study is that the sample group consisted of obese women; therefore, it is not possible to generalize the results to obese men.
3. Given that the present study is cross-sectional, it is not possible to conclude time priorities or causal mechanisms.

Author Contributions:

NSH was responsible for designing the review protocol, writing the protocol and report, conducting the search, screening potentially eligible studies, extracting and analysing data, interpreting results, updating reference lists and creating 'Summary of findings' tables. JSH was responsible for designing the review protocol and screening potentially eligible studies. She contributed to writing the report, extracting and analysing data, interpreting results and creating 'Summary of findings' tables. JA conducted the meta-regression analyses and contributed to the design of the review protocol, writing the report, arbitrating potentially eligible studies, extracting and analysing data and interpreting results. JSH contributed to data extraction and provided feedback on the report. NSH and JSH provided feedback on the report.

Competing interests

The authors declare no conflict of interest.

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