

## ***The Effectiveness of Acceptance-commitment Therapy and Emotion Regulation Training on Impulsivity and Distress Tolerance in People with a History of Drug Addiction***

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### **Abstract**

**Background:** Substance abuse and addiction have created numerous social and psychological problems around the world, encouraging researchers to employ different psychological approaches.

**Objectives:** The aim of this study was to determine the effectiveness of acceptance-commitment therapy and emotion regulation training on impulsivity and distress tolerance in people with a history of drug addiction.

**Methods:** This was a multi-group experimental research with a pre-test/post-test design, conducted in a two-month follow-up period. The statistical population included men with substance abuse, who referred to private addiction rehabilitation clinics in Tehran in 2019. Two centers were selected by accessible sampling, and 63 people were purposefully chosen and randomly divided into two experimental groups and one control group after obtaining informed consent. Addiction drugs included opium, heroin, and tramadol. During the study period, all subjects were on methadone therapy. Assessment tools included Barratt Impulsivity Scale (BIS) and Distress Tolerance Scale (DTS). Data were analyzed using repeated-measures analysis of variance in SPSS software version 22.

**Results:** The results showed that there was no significant difference between the two experimental groups comparing post-test and follow-up impulsivity and distress tolerance ( $P \geq 0.05$ ). There was a significant difference in impulsivity comparing pre-test vs. post-test and post-test vs. follow-up in the two experimental groups ( $P \leq 0.05$ ). There was no significant difference comparing post-test and follow-up impulsivity in the two experimental groups ( $P \geq 0.05$ ). There was a significant difference among the three stages of the study comparing distress tolerance in the acceptance-commitment therapy group ( $P \leq 0.05$ ). There was a significant difference in distress tolerance comparing pretest vs. post-test and post-test vs. follow-up in the emotion regulation training group ( $P \leq 0.05$ ). There was no significant difference comparing distress tolerance between post-test and follow-up in the emotion regulation training group ( $P \geq 0.05$ ).

**Conclusion:** According to these results, addiction therapists can use acceptance-commitment therapy to control impulsivity and employ emotion regulation training to control distress tolerance in people with a history of addiction.

**Keywords:** *impulsivity, distress tolerance, emotion regulation, acceptance-commitment based therapy, addiction*

### **Introduction**

In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, substance use disorder (SUD) has been defined based on

cognitive, behavioral, and psychological parameters, indicating that a person, despite experiencing remarkable substance-related problems, continues to consume drugs [1]

Substance abuse and addiction have created numerous familial, social, and psychological problems around the world, including Iran. Studies indicate that temptation and mental health are important players in relapse [2]. Drug addiction, as one of the most important health-related issues, has been associated with reduced quality of life, increased mortality, as well as a fall in social and moral values, and a rise in criminal behaviors [3].

Impulsivity is a major axis for the diagnosis of a variety of clinical disorders such as substance dependence [4]. This concept is defined as the basis of unplanned and prompt reactions to internal or external stimuli regardless of the negative consequences that may befall the person himself or others [5]. Recent research shows that the best existing definition of impulsivity is a multidimensional structure consisting of four dimensions: urgency (tendency to act impulsively when experiencing a negative emotion), insufficiency (failure), and lack of perseverance (inability to focus on or pursue hard and exhaustive duties), and searching for emotions (tendency to enjoy and pursue exciting and new activities and experiences) [6]. Studies suggest that extreme impulsivity is a dominant phenomenon among the consumers of the drugs commonly subjected to abuse, such as alcohol, cocaine, and amphetamines [7].

Distress tolerance is a common structure for studying emotional disorders. This concept refers to the ability to experience and tolerate negative psychological situations. Distress may result from physical and cognitive processes, but it represents an emotional state that is often characterized by a desire to escape the emotional experience [8]. When a person is disturbed due to a particular negative event, he seeks to suppress and reduce the resulting distress [9]. For addicts, the most significant distress alleviating behavior is substance use, which helps the person to avoid the disturbing situation. Therefore, people who can tolerate distress better are also more capable of handling negative emotions and uncomfortable situations. So, these people are less likely to be engaged in destructive behaviors such as alcohol or substance abuse [9].

Many studies have shown a relationship between emotion regulation and substance abuse [10]. One of the accepted models of emotion regulation is

the Gross model [11], according to which, emotion regulation refers to the emotion by which a person is affected, when he or she has that emotion, and how he or she experiences and expresses it. Research shows that poor emotion regulation due to the inability to effectively cope with and manage emotions plays a role in the onset of substance use [12]. Substance users perceive negative emotions as unbearable so that they cannot manage these emotional states without consuming drugs. So, they use the physical and psychological features arisen by drugs to nail emotional stability [13]. Azami *et al.* [14] have shown that due to the fact that drug addicts are more exposed to negative emotions, they are likely to act unplanned and impulsively in such situations. Therefore, emotion regulation training (ERT) to these people can boost their control over such situations.

Acceptance-commitment therapy (ACT) is a combination of acceptance, mindfulness, and principal values aiming to create psychological flexibility, including taking a step back and consciously looking at intrinsic experiences (e.g., thoughts, emotions, and bodily senses) during the treatment process [15]. In addition, due to its extra-diagnostic nature, this treatment can affect other psychological problems commonly associated with substance abuse, such as depression and anxiety [15].

Research shows that psychological inflexibility can predict a wide range of psychological problems, including substance abuse [16]. Morrison *et al.* [16] have examined the extra-diagnostic effects of ACT on impulsive decision making and shown that this approach can be used as a meta-diagnostic treatment for impulsive behaviors. Amirian *et al.* [17] examined the effects of ACT on emotion regulation and distress tolerance in substance abusers and showed that this treatment significantly reduced the difficulty in emotion regulation and increased distress tolerance in these people. Different therapeutic approaches have been effective in treating substance abuse; however, this disorder is still among hard-to-treat conditions. A review of recent treatment approaches has shown that only 30 to 50% of treated addicts maintain substance abstinence [15]. Regarding the importance of addiction, this study aimed to investigate the effects of ERT and ACT on impulsivity and

distress tolerance in people with a history of addiction.

### Methods

This was a multi-group experimental study with a pretest/post-test design and a two-month follow-up period, aiming to compare the efficiency of two treatment models (i.e., ERT and ACT) with a routine treatment (methadone therapy) in improving impulsivity and distress tolerance in substance abusers.

The sample population was selected through the accessible sampling method from all the people referring to addiction rehabilitation centers. Among these, 63 eligible (based on inclusion and exclusion criteria) people referred to Mehrgostar and Khorshid clinics (two private addiction rehabilitation centers in District 2 of Tehran) who were willing to participate and gave informed consent were selected.

To calculate the sample size, G-Power software was used, rendering 21 participants per group for one-sided hypotheses [18]. Finally, considering 95% confidence interval (type 1 error (alpha) of 0.05) and a power of ( $\beta-1$ ) of 90%, the sample size was determined 61 subjects per group.

For each patient, a clinical interview was independently performed, and they were requested to fill out the demographic information questionnaire, the Barratt Impulsivity Scale (BIS), and Distress Tolerance Scale (DTS) at the baseline (i.e., pre-test). The subjects were then allocated to either experimental (ACT and ERT) or control (methadone) groups by simple randomization using the Sampling software.

Inclusion criteria were the age range of 20 to 45 years, giving informed consent, meeting drug dependency criteria (based on DSM-V items), having at least intermediate education, not using stimulants and hallucinogenic substances, not having mental disorders and psychotic symptoms (based on clinical interviews by a psychologist), and being under pharmaceutical treatment with agonists. Exclusion criteria were missing two or more therapy sessions and developing a positive urine test during treatment. The substances used by the participants included opium, heroin, and tramadol. All the subjects were on methadone treatment during the study. Treatment protocols were performed according to the Gross model

(2007) for the ERT group and the Hayes's protocol (1999) for the ACT group.

Emotion regulation training 2-hour sessions were held every day of the week using the same content in each session. So, the subjects could rotate, and in case of missing a session, they could compensate on another day. Acceptance-commitment therapy also included 90-minute sessions held every day of the week with the same manner of the ERT group. On the last day of intervention, the BIS and DTS instruments were filled again by the participants of all groups (i.e., post-test). The control group received no psychological intervention and continued treatment according to their routine programs. After two months, the same tools were completed by the participants (i.e., follow-up). Repeated measures ANOVA and the Bonferroni post hoc test were used to analyze the data.

**Data Collection Tools:** A demographic questionnaire proposed by the rehabilitation center was used to gather information such as age, education, marital status, history of substance use, usage severity, previous treatment attempts, the history of high-risk behaviors, clinical and psychological status, and familial and social conditions.

**Barratt Impulsivity Scale:** The original version of this scale was developed by Ernest Barratt in 1950 and has been revised several times since. This scale has 30 items scored on a 4-point Likert scale, measuring the multidimensional nature of impulsivity. The tool has three subscales: 1. cognitive impulsivity, including immediate cognitive-based decision making (items 5, 6, 9, 11, 20, 24, 26, and 28); 2. motor impulsivity, including actions without thinking (items 2, 3, 4, 16, 17, 19, 21, 22, 23, 25, and 30); and 3. unplanned impulsivity (items 1, 7, 8, 10, 12, 13, 14, 15, 18, 27, and 29). In addition to the score of each subscale, a total impulsivity score is also calculated for the entire scale. In order to avoid subjects' style-based responses, the items have been organized in a way that reliably detect the lack of impulsivity. Some items were reversely scored (i.e., 1, 7, 8, 9, 10, 12, 13, 15, 20, 29,30). Scores between 52 and 71 referred normal impulsivity, scores above 71 indicated severe impulsivity, and scores below 52 indicated poor impulsivity [19]. Somia et al. [20] in their study reported the Cronbach's alpha coefficients of the

three subscales and the scale ranging from 0.60 to 0.79; the retest validity coefficient after four months was between 0.71 and 0.84. Javid et al. [21] reported a Cronbach's alpha coefficient of 0.81 for the total score while the Cronbach's alpha coefficients of the cognitive, motor, and unplanned impulsivity subscales were reported 0.70, 0.67, and 0.80, respectively. In the recent report, the retest coefficient of the total score was reported 0.77. In the present study, the Cronbach's alpha coefficients of the cognitive, motor, and unplanned impulsivity subscales were obtained 0.69, 0.68, and 0.71, respectively, and the Cronbach's alpha coefficient of the total score was 0.75.

**Distress Tolerance Scale:** The DTS is a self-report index developed by Simons and Gaher [8] to measure distress tolerance. This scale has 15 items, measuring distress tolerance based on a person's ability to tolerate emotional distress, mental assessment of distress, the level of attention to encountered negative emotions, and

regulatory measures to alleviate distress. The tool is scored based on a 5-point Likert scale (1; strongly agree and 7; strongly disagree). The item number 7 was inversely scored. In this scale, the maximum and minimum scores were 80 and 15, respectively, with a higher score indicating a higher distress tolerance. Simons and Gaher [8] reported the alpha coefficients of 0.72, 0.82, 0.78, and 0.70 for the subscales and a coefficient of 0.82 for the whole scale. Intra-class correlation coefficient was 0.61 after six months [8]. Azizi et al. [22] also reported a Cronbach's alpha coefficient of 0.67 and a retest validity of 0.79 for this scale. In the present study, the Cronbach's alpha coefficient of the whole scale was obtained 0.75 while the coefficients were 0.69, 0.71, 0.68, and 0.70 for the tolerance, assessment, assimilation, and regulation subscales, respectively. As shown in Table 1, the ERT protocol has been presented based on the Gross model. As shown in Table 2, the ACT has been presented using the Hayes's protocol.

**Table 1: The Therapeutic Protocol of Emotion Regulation Training Based on the Gross model (12)**

Session	Content
1	Acquainting group members with each other, explaining the logic and stages of the intervention, the framework and rules of participation
2	Explaining emotion and stimulating situations by teaching the different functions of emotions, teaching different dimensions of emotion and short- and long-term effects of emotions
3	Assessing members' vulnerabilities and emotional skills
4	Changing emotion-provoking situations and teaching interpersonal skills (dialogue, assertiveness, and conflict resolution)
5	Changing attention and stopping rumination and worry
6	Changing cognitive evaluation and teaching the marketing strategy
7	Changing the behavioral and physiological consequences of emotion
8	Re-evaluation and resolving usage barriers

**Table 2: The Hayes's therapeutic Protocol of Acceptance-Commitment Therapy(23)**

Session	Content
1	Acquainting group members with each other, explaining the logic and stages of the intervention, the framework and rules of participation, talking about how to recognize thoughts, feelings, physical symptoms, desires, and memories
2	Recognizing the measures employed by the participants to alleviate or avoid intrinsic events and anxiety and assessing their effectiveness (creative helplessness); Using the falling into a hole metaphor
3	Introducing control as a problem; using the baby metaphor
4	Discussing acceptance/willingness to experience; replacing control with tendency
5	Explaining fault and distancing from thoughts and emotions; using the chess metaphor
6	Teaching mindfulness and being in the present; using the beggar metaphor
7	Recognizing and differentiating members' values and the goals and actions that direct them towards these values
8	Reviewing the contents and metaphors discussed in previous sessions

## Results

Participants in this study included 63 people aged 20 to 45 years old with a history of drug abuse. The participants were randomly divided into two

experimental groups (ACT and ERT) and one control group (methadone maintenance therapy). Demographic information of participants in the

experimental groups and the control group has been shown in Table 3.

**Table 3: The Demographic Features of Participants in the Experimental and Control groups**

Variables		Acceptance-commitment	Emotion regulation	Routine treatment
Education	Diploma	11 (52.4)	11 (52.4)	15 (71.4)
	Associate of Science	5 (23.8)	4 (19.0)	2 (9.5)
	Bachelor's degree	5 (23.8)	6 (28.6)	4 (19.0)
Marital status	Single	11 (52.4)	8 (38.1)	10 (47.6)
	Married	8 (38.1)	10 (47.6)	10 (47.6)
	Divorced	2 (9.5)	1 (4.8)	1 (4.8)

As shown in Table 4, there were no significant differences comparing the assessed variables between the study groups at pre-test ( $P > 0.05$ ).

**Table 4: The Results of One-way Analysis of Variance to Examine Pre-test Differences**

Variables		Sum of squares	Degree of freedom	Mean of squares	F	P value
Age	Between-group	40.222	2	20.111	0.461	0.663
	Within-group	2620.190	60	43.670		
	Total	2660.413	62			
Education	Between-group	0.984	2	0.492	0.681	0.510
	Within-group	43.333	60	0.722		
	Total	44.317	62			
marital state	Between-group	0.508	2	0.254	0.584	0.561
	Within-group	26.095	60	0.435		
	Total	26.603	62			
impulsivity tolerance	Between-group	0.222	2	0.111	0.001	0.999
	Within-group	4714.762	60	78.579		
	Total	4714.984	62			
distress tolerance	Between-group	64.889	2	32.444	0.169	0.845
	Within-group	11492.095	60	191.535		
	Total	11556.984	62			

The mean scores of impulsivity and distress tolerance in the studied groups have been presented in Table 5.

**Table 5: Mean Impulsivity and Distress Tolerance Scores in the Experimental and Control Groups**

Variables		Acceptance-commitment		Emotion regulation		Control	
		Mean	SD	Mean	SD	Mean	SD
distress tolerance	Pre-test	38.19	13.94	37.14	13.63	35.71	13.93
	Post-test	49.85	9.16	48.90	9.66	38.04	13.27
	Follow-up	47.47	8.41	47.66	8.10	38.19	13.36
Impulsivity	Pre-test	71.09	8.91	70.95	8.65	71.00	9.02
	Post-test	54.95	5.50	66.95	8.60	71.90	8.85
	Follow-up	56.28	5.00	67.47	9.51	72.19	8.45

According to the Shapiro-wilk test, the distribution of the education and commitment variables was not significantly deviated from normal ( $p > 0.05$ ), indicating normal data distribution in the studied groups. Also, the assumption of the homogeneity of covariance matrices was met in both variables. The Leven's test index was statistically significant for none of

the impulsivity and distress tolerance variables in neither of assessment phases ( $p > 0.05$ ), indicating homogenous error variances. The assumption of the equality of covariance at different stages was not met for the impulsivity and distress tolerance variables (i.e., Machley statistic rendering a P value of  $< 0.05$ ). So, we here used the Greenhouse Greezer method.

Table 6 shows the results of repeated measures analysis of variance for examining the main effects of the group, time, and the time-group interaction on the impulsivity variable, considering adjustments for the degree of freedom. According to this table, the main effects of time ( $P < 0.001$ ), the time-group interaction ( $P < 0.001$ ), and group ( $P < 0.001$ ) were statistically significant. The effect of time showed that there was a significant difference between pre-test,

post-test, and follow-up. The effect size on the group main effect showed that 87% of changes in impulsivity were explained by group membership. Also, the effect size on the time main effect showed that 52% of changes in impulsivity were due to time variations. Finally, the effect size on the time-group interaction main effect revealed that 59% of changes in impulsivity were related to time variations in at least one of the two groups.

**Table 6: The Results of Repeated Measures Analysis of Variance for Determining the Main and Interactive Effects of Impulsivity**

Sources of variations	Mean of squares	F	Degree of freedom	P	Effect size	Test power
<b>Group effect</b>	1982.053	11.088	2	0.001	0.87	1.00
<b>Time effect</b>	1277.021	67.363	2	0.001	0.52	1.00
<b>Time-group interaction</b>	833.062	43.944	2	0.001	0.59	1.00

To evaluate differences in mean impulsivity scores between each two phases of assessment,

the Bonferroni post hoc test was used (Table 7).

**Table 7: The Results of the Bonferroni Test for the Impulsivity Variable**

Group	Baseline (mean)	Comparison phase (mean)	Mean difference	Standard error	P
<b>Acceptance-commitment therapy</b>	Pre-test (71.095)	Post-test (54.952)	16.143	2.122	<0.001
		Follow-up (56.286)	14.810	2.034	<0.002
	Post-test (54.952)	Follow-up (56.286)	-1.333	0.553	0.077
<b>Emotion regulation training</b>	Pre-test (70.952)	Post-test (66.952)	4.000	0.218	<0.001
		Follow-up (67.476)	3.476	0.519	<0.001
	Post-test (66.952)	Follow-up (67.746)	-0.524	0.445	0.759
<b>Control</b>	Pre-test (71.0)	Post-test (71.905)	-0.905	0.248	0.5
		Follow-up (72.190)	-1.190	0.476	1.064
	Post-test (71.905)	Follow-up (72.190)	-0.286	0.391	1.000

As shown in Table 7, there were significant differences comparing pre-test vs. post-test and post-test vs. follow-up mean impulsivity scores in the ACT and ERT groups ( $P < 0.001$ ). However, there was no significant difference between the pretest and follow-up phases in the ACT and ERT groups ( $P > 0.05$ ). There was no significant

difference between the three assessment phases in the control group ( $p > 0.05$ ).

There was no significant difference comparing mean impulsivity scores between the ACT and ERT groups at neither the post-test nor follow-up phases (Table 8).

**Table 8: Between-group Differences in Impulsivity**

Variable	Phase	Group	Mean	T	P
Impulsivity	Pre-test	Emotion regulation	66.95	-5.382	0.07
		Acceptance-commitment therapy	54.95		
	Follow-up	Emotion regulation	67.47	-4.770	0.12
		Acceptance-commitment therapy	56.28		

Table 9 shows the results of repeated measures analysis of variance for examining the main effects of the group, time, and the time-group interaction on the distress tolerance variable, considering adjustments for the degree of freedom. According to this table, the main effects of time ( $P < 0.001$ ), and group ( $P < 0.001$ ), but not that of the time-group interaction ( $P = 0.88$ ), were

statistically significant. The effect of time showed that there was a significant difference between pre-test, post-test, and follow-up. The effect size on the group main effect showed that 94% of changes in distress tolerance were explained by group membership. Also, the effect size on the time main effect showed that 33% of changes in distress tolerance were related to time variations.

**Table 9: The Results of Repeated Measures Analysis of Variance for Determining the Main and Interactive Effects of Distress Tolerance**

Sources of variations	Mean of squares	F	Degree of freedom	P	Effect size	Test power
Group effect	1204.545	1051.991	2	0.001	0.946	1.00
Time effect	2443.813	29.667	2	0.001	0.331	1.00
Time-group interaction	310.859	3.778	2	0.024	0.112	0.880

To evaluate differences in mean distress tolerance scores between each two phases of assessment, the Bonferroni post hoc test was used (Table 10). As shown in Table 10, there were significant differences comparing mean distress tolerance scores between the three assessment phases in the ACT and ERT groups ( $P < 0.05$ ). There was a

significant difference between the pretest and post-test phases ( $P < 0.05$ ), but not between the post-test and follow-up ( $P = 0.637$ ) in the ERT group. There was no significant difference between the three assessment phases in the control group ( $P > 0.05$ ).

**Table 10: The Results of the Bonferroni Test for the Distress Tolerance Variable**

Group	Baseline (mean)	Comparison phase (mean)	Mean difference	Standard error	P
Acceptance-commitment therapy	Pre-test (38.19)	Post-test (49.85)	-11.66	2.233	<0.001
		Follow-up (47.47)	-9.286	2.283	<0.002
	Post-test (49.85)	Follow-up (47.47)	21.381	0.600	0.002
Emotion regulation training	Pre-test (37.14)	Post-test (48.90)	-11.762	2.013	<0.001
		Follow-up (47.66)	-10.524	2.533	<0.001
	Post-test (48.90)	Follow-up (47.66)	1.238	0.961	0.637
Control	Pre-test (35.71)	Post-test (38.04)	-2.333	2.862	1.000
		Follow-up (38.19)	-2.476	2.995	1.000
	Post-test (38.04)	Follow-up (38.19)	-0.143	0.607	1.000

There was no significant difference comparing mean distress tolerance scores between the ACT

and ERT groups at neither the post-test nor follow-up phases (Table 11).

*Table 1: Between-group Differences in Distress Tolerance*

Variable	Phase	Group	Mean	t	P
Distress tolerance	Pre-test	Emotion regulation	48.90	0.328	0.74
		Acceptance-commitment therapy	49.85		
	Follow-up	Emotion regulation	47.66	-0.75	0.94
		Acceptance-commitment therapy	47.47		

### Discussion

Regarding the impulsivity variable, our results showed that there were significant differences comparing pre-test vs. posttest and posttest vs. follow-up in the ACT and ERT groups. However, there was no significant difference between the pretest and follow-up phases in neither of the experimental groups. Regarding between-group comparisons, there were no significant differences comparing mean impulsivity scores between the ACT and ERT groups at the post-test and follow-up phases.

Regarding the effects of ACT on impulsivity, our results were in line with those of Morrison et al. [16] and Amirian et al. [17]. On the other hand, regarding the effects of ERT on impulsivity, our observations were in line with the results of Azami et al. [14], Shriber et al. [24]. For explaining these findings, one can note that the aim of ACT therapy is to strengthen acceptance, failure, oneself (as the context), communication with the present, verification of values, and participation in valuable activities, all of which result in psychological flexibility. On the other hand, psychological flexibility can free the person from the trap of ineffective thoughts and temptations that are routes to impulsivity and substance use. Therefore, mindfulness training can free these people from ineffective thoughts and temptations [18] and reduce impulsivity in life by creating flexibility and encouraging people to take action towards achieving personal values [25]. On the other hand, ERT can play an effective role in controlling and inhibiting impulses [4]. Reactivity is one of the most important factors influencing substance abuse through negative emotion regulation strategies. Emotion regulation training via teaching correct emotion regulation strategies can be effective in reducing impulsivity and upgrading reactivity [26].

Regarding distress tolerance, our findings showed that there were significant differences among the three assessment phases of the study in both ACT and ERT groups. Accordingly, there was a significant difference comparing the pre-test and post-test phases, but not between post-test and follow-up, in the ERG group. Regarding between-group comparisons, the mean scores of distress tolerance did not significantly differ between the ACT and ERT groups at the post-test and follow-up phases.

Our observations on the impacts of ACT on distress tolerance were consistent with the results of Ahmadi et al. [27] and Shareh et al. [28]. Also, regarding the effects of ERT on distress tolerance, our findings agreed with those of Parsamanesh et al. [29] and Warden et al. [30]. It can be explained that the lack of an effective emotion regulation strategy is closely related to distress tolerance. In fact, a low distress tolerance forces people to seek a prompt way to get rid of one's negative emotions. In the next step, these people may encounter difficulty in recognizing their emotions and controlling their impulses and be stopped at the emotion development stage. The lack of emotion regulation often leads to a failure in self-control, leading to a variety of problems, including overeating and addiction [31]. Therefore, teaching emotion regulation to people with low distress tolerance can initially strengthen the recognition of emotions and the ability to distinguish emotions from each other. On the other hand, this can provide people with low distress tolerance with more effective strategies to cope with negative emotions instead of getting rid of them, helping in the achievement of impulse-control and self-control [32]. In conclusion, regarding the positive effects of ACT on impulsivity and the satisfactory impacts of ERT on distress tolerance, addiction therapists can use these effective treatments in people with a history of substance abuse.

One of the limitations of this study was that due to executive restrictions, the same therapist performed protocols in both groups. Furthermore, the follow-up period was relatively short, and we used accessible sampling to include eligible patients. Finally, the study was conducted only on men. Accordingly, it is suggested to employ different therapists, consider longer follow-up periods, and include women as well in future studies.

### Conclusion

The results showed that both ACT and ERT approaches were effective on impulsivity and distress tolerance. Nevertheless, at the two-month follow-up period, a significant impact was observed on distress tolerance only in the ERT group. It seems that as long as the subjects participated in the treatment sessions, impulsivity and distress tolerance improved accordingly, but with the discontinuance of treatments, their therapeutic effects disappeared as well.

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### Conflict of interest

There is no conflict of interest.

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