

## Original Article

# Effectiveness of acceptance and commitment therapy on emotion regulation in epileptic patients

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## Abstract

**Background:** Epilepsy can severely affect cognitive-emotional and behavioral function. Using an appropriate treatment method to deal with it in order to treat emotional disorders can be an effective action due to the importance of this disorder. This study attempted to investigate the effectiveness of Acceptance and commitment therapy (ACT) on the emotion regulation in patients with epilepsy.

**Methods:** It was a quasi-experimental study (pretest-posttest design with equal control group) and the sample consisted of 30 patients with epilepsy selected purposefully and assigned into experimental (n=15) and control (n=15) groups randomly. The instrument included the Garnefski et al. Cognitive Emotion Regulation Questionnaire (CERQ). Data were analyzed using SPSS software version 21 conducting MANCOVA and ANCOVA analysis of covariance.

**Results:** The results showed that the ACT decreased negative emotion regulation and also increased positive emotion regulation in patients with epilepsy in the experimental group compared to the control group. The results of one-way analysis of covariance with the pretest control showed that there was a significant difference between the experimental and control groups in patients with epilepsy in terms of positive emotion regulation ( $F = 100.55, p < 0.001$ ) and negative emotion regulation ( $F = 154.64, p < 0.001$ ).

**Conclusion:** It can be argued that ACT reduced negative emotion regulation and increased positive emotion regulation in patients with epilepsy.

**Keywords:** Acceptance and Commitment Therapy; Emotion Regulation; Epilepsy.

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## Introduction

Epilepsy is one of the most common neurological disorders with an unpredictable nature and chronic satiety and can severely affect cognitive-emotional and behavioral functions (1). Studies showed that patients with epilepsy have a specific psychological profile and experience specific emotional situations (2, 3).

In patients with epilepsy, emotion regulation, if disturbed, causes anxiety and

mental health and low self-esteem (4). The purpose of emotion regulation is to support, shape self-esteem, self-efficacy, and individuality. This issue can be raised with the aim of increasing positive emotion, avoiding negative emotion to form a positive emotion, and a high level of proper emotional regulation which can lead to emotional recovery (5, 6). People who are weak in recognizing the proper use of their emotions lack the ability to take advantage of their emotional world and experience

positive emotions, including happiness, as well as increased anxiety (6).

People with epilepsy experience problems, disorder, and inability to regulate emotion due to stressors. When people are not emotionally empowered, they sometimes experience emotional disorder due to challenges that threaten their emotional health and self-esteem (7). It should be noted that in people with epilepsy, emotion regulation can be a good predictor for controlling their negative emotions. If emotion regulation is appropriate for the situation, it will cause a positive reaction, and if it is not appropriate for the situation, it will cause a negative reaction. Emotion regulation is defined as a process of initiating, maintaining, modifying, or changing the intensity or persistence of the inner and emotional feelings associated with the socio-psychological and physical process in achieving goals (8). Positive emotion regulation keeps a person in a calm state of emotional arousal and monitors and changes a person's negative emotion experiences. It should be noted that emotion regulation in a positive way in patients plays an important role in their adaptation to stressful events of the disease. The results of numerous studies showed that the capacity of individuals to positively regulate emotion has a significant effect on the psychological, physical and interpersonal happiness (6, 8-10).

Various therapeutic approaches have been proposed to promote mental health in the community. One of these methods is Acceptance and commitment therapy (ACT), which is based on mindfulness and its effectiveness for treating a wide range of clinical conditions is acclaimed and it is assumed that the psychological process of the human mind is often destroyed and also causes psychological suffering (11). ACT states that it is only through conscious action that individuals can build a meaningful life. This therapy teaches people the skills of effective awareness attention to manage their inner experiences (10).

Patients with epilepsy need to adapt to cognitive-emotional challenges. Commitment and acceptance-based therapeutic approaches are thought to affect disease compliance (12). This therapeutic intervention is a third-wave treatment that explicitly accepts emotions instead of changing the content or frequency of their thoughts. The ACT approach has six central processes that lead to psychological flexibility. These six processes are: acceptance, failure, self as context, relationship with the present, values and committed action (13). ACT is one of the developed models whose key treatment processes are different from traditional cognitive-behavioral therapy. Its underlying principles include accepting or wanting to experience pain or other disturbing events without trying to control them, value-based action, or commitment with a desire to act as meaningful personal goals rather than eliminating unwanted experiences in dealing with other non-verbal dependencies in a way that leads to healthy functioning. This method includes experiences, exposure-based exercises, linguistic metaphors and methods such as peace of mind (14).

People with epilepsy have high levels of anxiety and stress due to emotional and cognitive problems, and these cognitive problems can disrupt emotion regulation and interfere with people's recovery process and have a negative impact on them. Due to the problems of epilepsy, it is important to ask what treatment has a significant effect on improving the emotion regulation of these patients with endangered quality of life of patients, so that it can be used to increase the quality of life and improve the cognitive-emotional status of these patients. Although medication is one of the most common methods of treating epilepsy, it does not have a positive effect on the emotional dimension of patients (15). Moreover, studies on the follow-up of the drug treatment showed a high rate of emotional disorders in epilepsy patients (16, 17). Due to the importance of this

disorder and its increasing prevalence, it is necessary to take a new step towards the treatment of emotional disorders with effective treatment methods by using appropriate treatment in order to deal with it and promote mental health in the community. Given the problems of epilepsy patients and the effectiveness of third-wave therapies, it is important to identify an effective protocol that can be effective in improving social anxiety, emotion regulation, and perceived stress in the epilepsy patients. As a result, research in this field is considered necessary. Therefore, it should be said that the purpose of this study was to investigate the effectiveness of ACT on the emotion regulation in patients with epilepsy.

### Methods

It was a quasi-experimental (pretest-posttest design with equal control group) study. The statistical population included all patients with epilepsy (n=140) were registered and referred to the Khorasan Razavi Epilepsy Support Association in 2020. The sample size included 30 patients with epilepsy with a type one error of 0.05 who were selected by convenient sampling based on previous research and according to Cochran's formula (formula 1). Afterward, 15 patients with epilepsy were randomly assigned in the experimental group and 15 patients with epilepsy in the control group.

$$n = \frac{z^2 pq}{d^2} = 30$$

$$1 + \frac{1}{N} \left[ \frac{z^2 pq}{d^2} - 1 \right]$$

Inclusion criteria were at least 6 months of illness, living in Mashhad during treatment sessions, ability to attend treatment sessions, not suffering from other severe neuropsychiatric disorders such as vision problems, severe hearing problems, personality disorders, age range between 20 and 40 years (the reason for choosing this age group is the homogeneity of groups according to the treatment protocol and that, in group therapy, homogeneity is considered a facilitating factor for treatment and the prevalence of this

disorder is not high in people under 20 years old and people over the age of 40 may have high physical and psychological problems, so it is difficult to treat them) and the level of education was higher than the high schools. Exclusion criteria included psychotic disorders, cognitive-personality disorders, initiation of other psychotherapy simultaneously, absence in more than two treatment sessions in the treatment process. In this study, the necessary license was obtained through the Islamic Azad University of Torbat-e Jam and presented to the Epilepsy Patients Support Association. To collect data, the Epilepsy Support Association was referred to, and then a list of patients with epilepsy referred to the Epilepsy Association was prepared, and individuals were selected according to the study criteria. After explaining the objectives of the study and how to proceed, written informed consent was obtained from the participants. Before performing any intervention, the selected individuals in the experimental and control groups were measured by emotion regulation pre-test. The role of the pretest in this study was to apply control and compare emotion regulation in the study groups. Then, after the sessions of acceptance-commitment treatment, emotion regulation was performed on the experimental and post-test groups. As a result, it was determined whether the changes in emotion regulation in patients with epilepsy were due to ACT sessions.

### Instrument

**Cognitive Emotion Regulation Questionnaire (CERQ):** The CERQ was developed by Garnefski, Kraaij and Spinhoven (18). It is a multidimensional questionnaire used to identify individuals' cognitive coping strategies after experiencing negative events or situations and assesses a person's thoughts after a negative experience or traumatic event. This questionnaire is a self-report tool and the long form has 36 items. In the present study, its short form which has 18 items was used. The CERQ assesses 4 cognitive

strategies of self-blame, rumination, catastrophizing, blame of others in the form of negative emotion regulation and 5 strategies of acceptance, positive refocus,

refocus on planning, positive re-evaluation, and acceptance of opinions. The positive and negative emotion regulation subscales each have 9 items. The higher the score, the

**Table 1: Summary of ACT treatment techniques**

Session	purpose	content	Expected change of behavior	Homework
First	Pre-test, familiarity with group rules and generalities of ACT method	Familiarization of members with each other and the therapist, description of rules, goals, group structure, therapeutic commitments, introductory talks about ACT, the beginning of creative helplessness, metaphor of human in the well	Learning about ACT	——
Second	Familiarity with some of the concepts of ACT therapy, including experiential avoidance, fusion, and psychological acceptance	Assessing the problems of patients from the perspective of ACT, extracting experiential avoidance, fusion and individual values, bus metaphor, nettle plant metaphor	Not trying to avoid negative emotions	Identifying avoidance situations and allowing negative thoughts to flow without being fought or deliberately prevented.
Third	Performing ACT treatment techniques such as fusion, psychological awareness	Assessing homework, specifying inefficiency, technique of leaf on water stream, cognitive defusion training, metaphor of holding a book with two hands in front of face	Accepting negative behaviors and emotions	Awareness of the here and now and interest instead of running away from what is going on right now.
Fourth	Teaching healing techniques, mindfulness, mindful awareness	Examining homework, separate assessments from personal experiences, and taking a position of observing thoughts without judgment in a way that leads to psychological flexibility and positive emotions. One minute focusing technique	Paying attention to current and moment by moment experiences	Focusing on all mental states, thoughts and behaviors in the moment without any judgment
Fifth	Teaching self-healing techniques as a background and practicing mindfulness techniques	Examining homework, relating to the present and considering oneself and teaching mindfulness techniques, chess board metaphor  Body scanning technique	Accepting negative emotions and thoughts without prejudice and judgment	Trying to gain a sense of excellence using trained techniques
Sixth	Teaching techniques for the treatment of personal values and clarifying values and teaching emotion regulations	Assessing homework, identifying the values of clients' lives and measuring values based on their importance. Making a list of obstacles in the realization of values, life compass technique, 70th birthday celebration metaphor	Strive for psychological flexibility	Identifying core personal values, planning goals based on values
Seventh	Teaching therapeutic techniques of personal values and committed action and increasing interpersonal efficiency	Examining homework, providing practical solutions to overcome obstacles while using metaphors and planning for a commitment to pursuing values and creating a sense of meaning in life	Acquisition of psychological flexibility	Committed effort to achieve planned goals based on trained techniques
Eights	Reviewing and practicing the taught therapy techniques with emphasis on the emotion regulation and sense of meaning in real life - Post-test	Homework Review, a report on the steps to pursue values. Asking clients to explain the results of the sessions and apply the trained techniques in the real world of life in order to create a sense of meaning and create positive emotions	Getting rid of emotions, negative thoughts, gain psychological flexibility	——

more the strategy is used by the individual (19). Besharat and Bazzazian reported its validity through correlation coefficients for subscales of 0.42 and -0.49 and for the whole questionnaire 0.51 at the level of 0.001. In addition, they reported the reliability of the questionnaire using Cronbach's alpha method for subscales were 0.76 and 0.89 (19). In the present study, the reliability coefficient of the questionnaire was obtained by Cronbach's alpha method was 0.80 for negative emotion regulation and 0.82 for positive emotion regulation.

**Acceptance and commitment therapy sessions:** ACT intervention sessions based on the practical guide of ACT by Patretisa and Moran in 2010, translated by Kamali and Kianorad was used (14). Eight 90-minute sessions were employed for the experimental group. A summary of ACT treatment techniques is provided in table 1. Data analysis was performed using SPSS software version 21 and ANCOVA and MANCOVA covariance analysis tests were used.

### Results

The mean emotion regulation variable in the experimental and control groups for pre-test and post-test are shown in table 2. The mean for the positive emotion

regulation variable in the experimental group increased significantly in the post-test and the mean for the negative emotion regulation variable in the experimental group decreased in the post-test significantly ( $P < 0.05$ ).

The null hypothesis for the normal distribution of scores of the experimental group and the control group in the positive and negative emotion regulation variables was confirmed. That is, the assumption of normal distribution of scores in the pretest and in both experimental and control groups was confirmed. As shown in table 3, the F value of the interaction is not significant for the positive and negative emotion regulation variables of the research. Therefore, the assumption of regression homogeneity is confirmed. According to table 4, Levene's test is not significant in positive and negative emotion regulation variables. Therefore, the variance of the experimental group and the control group in the positive and negative emotion regulation variables was not significant. As a result, the hypothesis of homogeneity of variances was confirmed and the null hypothesis for equal variance of scores of the two groups in the research variable was confirmed in the post-test

**Table 2: Mean and standard deviation of emotion regulation variables in the experimental and control groups in the pre-test and post-test stages**

Variable	group	M ± SD		P Value
		pretest	Posttest	
Positive emotion regulation	Experimental	15.64 ± 2.32	36.53 ± 4.48	0.025
	Control	17.40 ± 2.13	17.26 ± 2.60	0.1
Negative emotion regulation	Experimental	39.06 ± 2.46	19.86 ± 2.92	0.03
	control	28.20 ± 2.85	35.41 ± 4.28	0.065

**Table 3: Test results of the homogeneity of regression patterns of research variables of the two groups**

Variable	Source of variance	F	P Value
Positive emotion regulation	Group interaction + pretest	1.57	0.54
Negative emotion regulation	Group interaction + pretest	1.12	0.61

**Table 4: Levene's test results on the assumption of equality of variances of research variables scores**

Variable	F	First df	Second df	P
Positive emotion regulation	1.55	1	28	0.22
Negative emotion regulation	0.004	1	28	0.99

stage. That is, the assumption of equality of variance of scores in the experimental groups and the control group was confirmed.

As shown in table 5, with pre-test control, the levels of significance of all tests indicate that there was a significant difference between the experimental and control groups in terms of positive and negative emotion regulation variables in patients with epilepsy ( $F= 126.89$ ,  $p < 0.001$ ). The amount of effect or difference was equal to 0.90. In other words, 90% of the individual differences in positive and negative emotion regulation post-test scores of patients with epilepsy were related to the effect of ACT. Statistical

power is equal to 1, in other words, the second type of error was near zero. To find out which variable differs between the experimental group and the control group, one-way analysis of covariance was performed and the results are presented in tables 6.

As shown in Table 6, considering the pretest control in patients with epilepsy, there was a significant difference between the experimental group and the control group in terms of positive emotion regulation ( $F = 154.64$ ,  $p < 0.001$ ) and negative emotion regulation ( $F = 100.55$ ,  $p < 0.001$ ). The effect for positive and

**Table 5: Results of multivariate analysis of covariance on the mean scores of post-test of emotion regulation of the experimental and control groups with pre-test of the control group**

Test	Value	df	df of error	F	P value	Effect size	Statistical power
Pillai's trace test	0.96	2	25	126.89	0.001	0.90	1
Wilks Lambda Test	0.04	2	25	126.89	0.001	0.90	1
Hotelling's Trace test	24.17	2	25	126.89	0.001	0.90	1
Roy's Largest Root	24.17	2	25	126.89	0.001	0.90	1

**Table 6: Results of one-way analysis of covariance on the mean scores of post-test emotion regulation of the experimental and control groups with the pre-test of the control group**

Variables	Source of variance	Sum of squares	df	Mean of squares	F	P value	Effect size	Statistical power
Positive emotion regulation	Pretest	30.61	1	30.61	0.86	0.36	0.03	0.13
	group	2166.13	1	2166.13	154.64	0.001	0.86	1
	error	336.17	1	14.07				
Negative emotion regulation	Pretest	27.04	1	27.04	0.76	0.39	0.03	0.13
	group	1468.53	1	1468.53	100.55	0.001	0.80	1
	Error	350.50	1	14.60				

negative emotion regulation variables were 0.86 and 0.80, respectively. In other words, 86% and 80% of individual differences in post-test scores of positive emotion regulation and negative emotion regulation in patients with epilepsy were related to the effect of ACT.

### **Discussion**

This study attempted to investigate the effect of ACT on emotion regulation in patients with epilepsy. According to the results, there was a significant difference between patients with epilepsy in the experimental group and the control group in terms of positive emotion regulation and negative emotion regulation. In other words, ACT increased the positive emotion regulation and decreased the negative emotion regulation in patients with epilepsy in the experimental group. The obtained results confirmed the results studies of Ghorbani et al, (20), Siahpoosh and GolestaniBakht (21), Hasanzadeh et al, (22), and Lundgren et al, (23). In addition, the results of a study by Naseri et al. (24) and Eilenberg et al, (25) showed that the implementation of acceptance-commitment treatment protocol reduced emotional distress in patients' with epilepsy. On the other hand, Goodarzi et al, showed that the acceptance-commitment treatment approach was effective in improving patients' emotion regulation (26). Moreover, in the study of Ghadampour et al, (2019), receiving ACT intervention had a significant effect on increase distress tolerance in patients with epilepsy (27).

Explaining the results, it can be reported that people with epilepsy have difficulty in controlling their emotions due to the problems of the disease, and having epilepsy causes a decrease low self-esteem, psychological distress; lack of them is an important component of emotion regulation disorder (28, 29). It can be claimed that these patients have a high difficulty in describing their emotions due to the perception of negative emotional challenges, emotional conflicts and

stressful situations, and the emotions of these patients are disordered.

In this study, it was found that ACT reduces negative emotion regulation and increases positive emotion regulation in patients with epilepsy. It should be noted that the intervention of ACT in patients helped patients with the ability to express more emotions in the recovery process because it stopped the pattern of inability to describe emotion and provided expression of emotion based on motivation to change the person. As small emotional changes are reinforced in this treatment, the level of comprehension, self-expression, and others expression increases. In this treatment protocol, because the individual's emotional awareness increased and strengthened in the moment, that is, the person became aware of all his emotional states, thoughts and behaviors in the moment, it taught patients to separate themselves from these negative mental experiences (cognitive separation) and be able to act independently of these experiences. Moreover, feelings such as anger and frustration in these people decreased and caused the monitoring, control and evaluation of negative emotions in people with epilepsy. In addition, it increased self-regulation and took a problem-solving approach towards the emotions. By stimulating emotions through emotion control techniques in patients and by introducing the technique of trying to reduce excessive focus on the inability to describe emotions, such as the personal story one has created in one's mind. It limited inability to recognize and verbally describe emotions and feelings in patients and the patients avoid less challenging emotional situations (12, 30). It can be said that the ACT improved recognition of the relationship between measures and emotional consequences and systematic replacement of emotional patterns and reduced self-blame, frustration and negative emotion regulation in patients by creating motivation for committed action,

i.e. activity focused on the specified goals and values along with accepting mental experiences, evaluating behavior and mood, choosing the appropriate emotional response, performing alternative response, integrating emotions (30).

In these patients, by presenting the technique of acceptance, tendency to experience pain or other disturbing events without trying to control it, increased positive emotion regulations and improved negative regulation, adjusted negative and positive emotions and caused patients to understand the disease status and conditions and learn how to manage their emotions when challenged, and this enhances patients' psychological and emotional capacity (31). In the process of this treatment, positive verbal reinforcement and emotion control techniques prevented extreme imitation of negative emotion and caused emotional order, the ability to control their emotions, the ability to successfully cope with the challenge of illness, environmental pressures and also identify personal ability to deal with negative emotions (32). In this treatment, because individuals were presented with value-based action with a desire to act as meaningful personal goals before eliminating unwanted experiences, identifying individual competence were adjusted in dealing with the disease situation with positive focus and regular planning and assessment of the situation of motivational and acceptance processes, and individuals learned to express their emotions appropriately and maintain a healthy level of emotional cohesion. Furthermore, the technique of language methods and cognitive processes, including exposure-based exercises, language metaphors, and methods such as mental-emotional care, enabled these patients to act intelligently in controlling emotions, gain the ability to exchange unpleasant emotions, improve the ability to engage or escape a negative emotion and improve the ability to control emotions wisely, and by modifying negative emotions, the increase

of pleasant emotions caused patients' emotion regulation.

It can be argued that because in the ACT, the main goal was to create psychological-emotional flexibility, that is, to create the ability to make practical choices between different options that are more appropriate, not just to avoid disturbing thoughts, feelings, memories or desires, it reduces patients' acceptance of emotional discipline about negative emotional experiences, and increases awareness of emotion and develops a personal perspective on expressing emotion with self-awareness and mindfulness, and patients have better control over their emotions and have feelings of frustration, self-blame and less unpleasant feelings, and with emotion regulation, made the situation of patients in accordance with the environment and made patients with epilepsy effective against the problems of the disease and experienced emotional balance.

In the present study, treatment sessions were conducted online (Sky), which due to hardware problems caused limitations in the implementation. The results of this study cannot be generalized to all patients with epilepsy, so caution should be exercised in generalizing the results. It is suggested that in future research, researchers should examine the effectiveness of ACT on other emotional dimensions in epilepsy patients. Moreover, using a placebo, they should evaluate the effectiveness of ACT on the emotion regulation in epilepsy patients to determine the exact effect of this intervention.

### **Conclusion**

Acceptance-commitment intervention improved emotional coherence, created new adaptive behaviors, and improved emotion regulation by changing thinking styles and creating patterns of emotional adjustment. As a result, it should be supposed that ACT has a significant effect on increasing positive emotion regulation, reducing negative emotion regulation in patients with epilepsy, and was an effective

intervention to improve emotion regulation in patients.

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