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Effectiveness of behavioral activation therapy and acceptance and commitment therapy on depression and rumination as a tool for health promotion on mothers with cerebral palsy children

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Abstract:

BACKGROUND: Since in most families, mothers are more responsible for taking care of children and they have more responsibility than fathers for monitoring the child; taking care of a disabled child can have a more negative effect on the psychological state of mothers. The purpose of the present study is to investigate the effectiveness of behavioral activation therapy (BAT) and acceptance and commitment therapy (ACT) on depression and rumination on mothers with children with cerebral palsy in the city of Ilam.

MATERIALS AND METHODS: The design of this research was pretest and post-test quasi-experimental with a control group. The research sample was 60 mothers who referred to occupational therapy centers in the city of Ilam in 2022, who were randomly divided into two experimental groups (N = 40 for each) and a control group (N = 20). One of the experimental groups, received behavioral activation group therapy method; and the other received the group therapy method based on acceptance and commitment for eight sessions lasted for 90 minutes in week. Data were collected using the Beck depression questionnaire (BDI-II) and the rumination questionnaire in two stages before the intervention and after the intervention. In this research, covariance analysis was used for data analysis.

RESULTS: The results of covariance analysis showed that behavioral activation therapy and acceptance and commitment-based therapy reduced depression ($P < 0.01$) and rumination ($P < 0.01$), and the two experimental groups were compared with the control group in the post-test phase.

CONCLUSION: It seems that behavioral activation therapy and acceptance and commitment therapy are effective in reducing depression and rumination in the subjects of the present study. Therefore, these treatments are suggested as complementary treatments along with drug treatments to improve psychological symptoms.

Keywords:

Acceptance and commitment therapy, behavioral activation, cerebral palsy, depression, rumination

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Introduction

Cerebral palsy, which is caused by a wide range of factors such as congenital and genetic problems, inflammation, lack of

oxygen, traumatic events, poisonings, and metabolic disorders,^[1] is one of the most common motor disabilities in children, the prevalence of which is 2 to 2.5 per

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1000 live births.^[2] In Iran, the number of children with cerebral palsy is at least 7000.^[3] Children with cerebral palsy have certain limitations in daily activities such as eating, dressing, bathing, and moving.^[4] Taking care of these children at home creates a lot of tension and has a negative effect on the mental and physical health of the caregivers, which in turn can hinder the rehabilitation of people with cerebral palsy.^[5] Also, the birth of a child with cerebral palsy, as a crisis, can have adverse effects on mothers and put them under physical, psychological, and social stress.^[6] Since in most families, mothers are more responsible for child care and they have more responsibility than fathers for monitoring the child; taking care of a disabled child can have a more negative effect on the psychological state of mothers.^[7] Although some mothers can cope well with problems, in general, mothers with disabled children have more physical disorders, depression, anxiety, tension, and nervous pressure and less self-confidence than the others. These mothers also feel lonely and have problems in their communication with the people around them.^[8] Research results show that the prevalence of depression in mothers of children with developmental disorders is higher than in mothers of healthy children. Also, the unpredictable future in the case of a child with cerebral palsy leads to fatigue and tension in parents^[7]; because the mother is the first person who directly communicates with the child, feelings such as guilt, fault, inadequacy, and deprivation caused by the child's abnormality is endangering the mother's mental health and psychological helplessness.^[9] Psychological helplessness manifests itself as rumination, depression, and anxiety. Rumination includes repeated and recurrent thoughts about negative emotions or life events; depression includes symptoms such as apathy, sadness, and suicidal thoughts; and finally, anxiety is related to feelings of fear, anger, panic, and disquiet.^[10] Other components related to depression include rumination, which reflects the meaning that a person gives to a certain situation and is closely related to the emotional and behavioral response to that situation. In addition, rumination plays an important role in the treatment process and is used as a preferred passage to access the cognitive system and helps to understand the fundamental believes as the basis of some psychological disorders,^[11] and therefore, since this variable is associated with people's negative evaluation of themselves, the world, and the future, it can play a role in the emergence of uncompromising behaviors.^[12] Researches have shown the important role of people's believes in illness, so changing their believes and perceptions can lead to a better and more balanced life.^[13] Since the 1970s, education and counseling with parents of children with special needs has received special attention due to its essential role in the development of any intervention program and its direct effect on the emotional-cognitive development of the child.^[14] On

the other hand, receiving various treatments such as medicine, surgery, and frequent rehabilitation programs for parents creates physical and social problems in addition to financial pressures. Families constantly complain about going to the clinic and attending medical centers, that most of the time, mothers take these treatments and maybe this factor leads to fatigue and more problems in mothers.^[7] One of the treatments that has recently attracted the attention of researchers is the Acceptance and Commitment Therapy (ACT).^[15] Among the psychological approaches of the third wave, this treatment has a good ability to control the attitudes and perceptions of a person against stressful events in life.^[13] As a result, one of these interesting methods, which is the third wave of cognitive-behavioral approaches, is ACT, which has brought with itself the field of extensive research and has obtained favorable experimental support. In the past treatment methods, by changing the client's behavior, we seek to change the feedback and dysfunctional thinking of the patient; however, in the ACT, efforts are made to reduce the sufferings of the patient and to get it out of the mind and enter into one's own life.^[1] ACT has six main processes that lead to psychological flexibility. These six main processes are: acceptance, rupture, connection with the present, values, self as context, and committed action. This treatment considers the avoidance of pain and tension as the main problem of people, which leads to disability and reduces life satisfaction. According to this theory, avoidance occurs when negative thoughts and emotions have an excessive and inappropriate effect on behavior; therefore, the main method of ACT is to expose the patient to situations that are mostly avoided.^[16]

A review of the researches showed that the ACT on parenting tension, psychological helplessness, and rumination of parents of children with autism spectrum disorder,^[17] on depression and anxiety of mothers with hyperactive children,^[18] on the relationships of families with children with cerebral palsy,^[19] on improving the performance of children, increasing the quality of life and regulating the relationship between parents of families with children with cerebral palsy,^[19] on improving the mental health of parents with children with autism spectrum,^[20] and finally in being effective in reducing the feeling of psychological despair and negative thoughts of parents of children with autism spectrum disorder^[21]; however, not much research has been done on the effect of this method on mothers with children with cerebral palsy, and since cerebral palsy is the third most common diagnosis among developmental disabilities after mental retardation and autism,^[22] it is very important to be addressed. Also, in order to remove the limitations of individual psychotherapy such as the high cost and amount of required time and taking into account the advantages of group psychotherapy such as

group dynamics and facilitating emotional discharge, the need for therapeutic intervention of ACT for mothers with children with cerebral palsy is doubled.^[1]

Another cognitive therapy that has been used for various psychiatric disorders is behavioral activation therapy (BAT). This treatment is a structured process that increases a person's contact with environmental connections and leads to the improvement of her mood, thinking, and quality of life.^[23]

So far, this method of treatment has been used in the treatment of disorders such as depressive disorders in children and adults,^[24] substance abuse disorders,^[25] and the coexistence of anxiety disorders and depression,^[26] which has brought positive effects. Considering the necessity of the study it is believed that third-wave treatments were based on the hypothesis that psychological problems are caused because people do not want to experience emotions, feelings, unpleasant thoughts and physical pain. For this reason, they may use a variety of escape and avoidance strategies. The continuation of the damage happens because people try to prevent the creation of such conditions in advance, which is called avoidance in psychology, in order not to have unpleasant internal experiences. Avoiding situations that cause unpleasant feelings and thoughts will limit a person's life and prevent her from doing what is important and valuable to her or him. Also, when people want not to have unpleasant feelings and thoughts, which are usually unwanted and not under the will of the person, they start criticizing themselves. This type of self-blame increases unpleasant internal experiences such as depression and rumination. Considering the newness of these treatment methods, it seems necessary to investigate their effectiveness on various mental disorders and it can create a revolution in the psychotherapy of mental disorders. Thus, the present study was conducted with the aim of determining the effectiveness of ACT and BAT on depression and rumination of mothers with children with cerebral palsy.

Materials and Methods

Study design and setting

The present research design was a pretest–post-test quasi-experimental with two experimental groups and one control group, which is done in the city of Ilam, a province in the west of Iran.

Study participants and sampling

The statistical population of the research included all 237 mothers with children with cerebral palsy who referred to the occupational therapy centers in the city of Ilam, Iran. First, a preliminary screening for depression and rumination was performed among all

the mothers. By observing the ethical principles and receiving oral consent from the subjects to participate in the research, among those who were screened, the 60 individuals who had a high mean score of depression and rumination were included in the study. They were randomly assigned in two experimental and one control group with 20 individuals in each. The Beck depression test (BDI-II) and the rumination questionnaire were performed on the entire sample as a pre-test. Then, one of the experimental groups received BAT group method, and the other received the group therapy method ACT for eight sessions of 90 minutes in the form of one session and group session per week. The control group did not receive any program during this period.

Data collection tool and technique

Immediately after the treatment period, the Beck Depression and Rumination Questionnaire was administered individually for all the three groups. Research data were analyzed using SPSS software version 24 (IBM Corp., Armonk, NY, USA) with multivariate analysis of variance (MANCOVA) statistical model. The criteria for entering the research were as follows: receiving a high score in the depression and rumination questionnaire, not taking medication, not participating in any type of therapeutic intervention at the same time as participating in the research program, and expressing the desire to participate in the program in oral form. The exclusion criteria were as follows: absence of more than one session in treatment sessions, diagnosis of personality disorders, presence of mood problems caused by drug use or biological problems, and lack of consent to participate in the research. Ethical considerations of this research included informed consent to participate in the research and emphasis on confidentiality of information. The following tools were used to collect the data.

Beck depression questionnaire (BDI-II)

This questionnaire is a revised form of the Beck depression questionnaire which was developed to measure depression and has 21 items, the range of scores of which is from 0 to 63 and the way of scoring is in a continuum from zero to 3 for each subject. Scores between 0-13 indicate partial depression, 14-19 mild depression, 20-28 moderate depression, and 29-63 severe depression.^[27] Beck, Epstein, Brown, and Steer^[28] reported the internal consistency of this instrument to be 0.73 to 0.92 with an average of 0.86 and the alpha coefficient for the sick and healthy groups, respectively, 0.86 and 0.81. Dobson and Mohammadkhani^[29] reported the reliability of the questionnaire using Cronbach's alpha method as 0.92 for outpatients and 0.93 for students. Also, in their research, the validity of the questionnaire was reported to be 0.73 in a two-week interval. In her research, Kaviani^[30] reported the reliability coefficient of this questionnaire

as 0.77, its validity as 0.70, and its internal consistency as 0.91. In the present study, the reliability coefficient of this questionnaire was obtained by Cronbach’s alpha method equal to 0.79.

Rumination questionnaire

Nalen-Hooksema and Maro (1991) developed a self-test questionnaire that assessed four different styles of reaction to negative mood. The response styles questionnaire consists of two scales of ruminating responses and a scale of distracting responses. The rumination response scale has 22 items and the scoring method of this questionnaire is based on the four-option Likert scale, the options of which are scored from one (never) to four (always). The range of scores for this questionnaire is between 22 and 88. The score of 33 is the cut-off point of the questionnaire, and scores below 33 indicate low rumination and scores higher than that indicate high rumination, which predicts primary depression. Based on empirical evidence, the scale of rumination responses has high internal reliability. Cronbach’s alpha coefficient is in the range of 0.88 to 0.92. Various studies show that the test-retest correlation for rumination responses is 0.67.^[31] In the research conducted by Mansouri and her colleagues (2013), Cronbach’s alpha was 0.90 in the Iranian sample. The predictive validity of the Rumination Response Scale has been tested in a large number of studies. The results of many studies show that the scale of rumination responses predicts the severity of depression in follow-up periods in clinical and nonclinical samples by controlling variables such as the initial level of depression or stressful factors.^[32] In the present study, the reliability coefficient of this

questionnaire was obtained by Cronbach’s alpha method equal to 0.71.

Summary of behavioral activation treatment program and commitment and acceptance therapy are shown in Table 1.

Ethical consideration

The satisfaction of all the individuals who have participated in the study was obtained orally.

Results

The results of the present study are the result of 60 mothers with cerebral palsy children with an average age of 34.13 years; with diploma to master’s education, in two experimental groups and one control group. Before performing data analysis with multivariate covariance analysis, its presuppositions were checked. The results of the Kolmogorov–Smirnov test were not significant for any of the variables in the pretest and post-test phases, which indicates that the assumption of normality is valid. Therefore, there are conditions for using multivariate covariance analysis. In Table 2, the number, mean, and standard deviation of depression and rumination of the groups in the pretest and post-test phases are presented.

In Table 2, the mean results and standard deviation of the ACT group, the BAT group, and the control group can be seen in different evaluation stages. Based on that, the post-test mean of depression and rumination in both experimental groups has decreased more compared to the control group. To investigate the

Table 1: Summary of treatment sessions

Sessions	Content of behavioral activation therapy sessions	Content of acceptance and commitment therapy sessions
First session	introducing the members to each other, introducing the course and its rules and objectives.	introducing the members, stating the rules of the group, goals and introducing the course.
Second session	focusing on behavioral activation and on the interaction between the person and the environment, identifying and changing obvious behaviors.	Familiarity with some concepts of ACT therapy, including the experience of avoidance, integration and acceptance of the psyche.
Third session	psychological training of group healing processes with four topics: explanations about the general background of the disease, choosing appropriate treatment methods, the individual’s condition, and motivational topics.	implementation of therapeutic techniques (ACT) such as cognitive separation, psychological awareness, self-image.
Fourth session	focusing on aspects of depression and changing moods and mental states through the use of metaphors.	Teaching therapeutic techniques of emotional awareness and wise awareness (self-victim metaphor).
Fifth session	focusing on aspects of depression and changing moods and mental states through the use of metaphors.	Teaching self-healing techniques as a context and practicing mindfulness techniques and teaching distress tolerance.
Sixth session	focusing on behavioral states (Essentials to get rid of anxiety and depression) and cognitive judgments and their control (ability to solve problems and get rid of stress and how to use emotion-oriented coping).	Teaching personal values therapy techniques and clarifying values and teaching emotion regulation (bad cup metaphor).
Seventh session	Teaching therapeutic techniques of personal values and committed action and increasing interpersonal efficiency (chess scene metaphor).	Teaching therapeutic techniques of personal values and committed action and increasing interpersonal efficiency (chess scene metaphor).
Eighth session	presenting a short summary of the treatment and follow-up solutions and asking group members’ opinions.	Reviewing and practicing the taught therapeutic techniques with an emphasis on regulating emotions and a sense of meaning in life in the real world.

effect of the independent variable on the dependent variables of depression and rumination, the results of the multivariate test presented in Table 3 were used.

According to the results of Table 3, the significant level of the F test in all four tests is less than 0.01. That is, the independent variables (ACT and BAT) have a positive and significant effect on the dependent variables (depression and rumination of mothers with cerebral palsy children). Considering the significance of the results of the multivariate test and to check which of the dependent variables had a significant effect on the ACT and the BAT, the results of multivariate analysis of covariance were used with the control of the pretest effect, the results of which are presented in Table 4.

According to the results of Table 4, the effect of the pretest stage of the “depression” variable on the posttest stage of this variable is significant ($P = 0.002$; $F = 10.45$; $\mu = 0.16$), because of the value of the significance level which is smaller than 0.01 ($P < 0.01$). In simple words, the level of depression of mothers in all three studied groups (ACT, BAT and control) are different in both stages and their level of depression is not similar.

The effect of the pretest stage of the “rumination” variable on the post-test is also significant ($P = 0.000$; $F = 30.62$; $\mu = 0.35$), because the level of significance is less than 1% error ($P < 0.01$). More precisely, the amount of rumination in mothers in all three studied groups (ACT, BAT and control) is different in both

pretest and post-test stages, and the amount of rumination is not similar.

The variable amount of depression and rumination in the post-test stage is different among the three studied groups. Because the significance level of both mentioned variables is equal to zero ($P < 0.01$).

Discussion

The present study was conducted with the aim of investigating the effectiveness of BAT and ACT on depression and rumination of mothers with cerebral palsy children. The results of this research showed BAT and ACT reduced depression and rumination among the research participants. The results of the present research on the effectiveness of BAT in reducing depression and rumination were in line with the results of previous researches. For example, Chu *et al.*^[33] reported in a research in which BAT reduced youth depression. In another study, Karimpour *et al.*^[34] reported that BAT significantly reduced depression and rumination in the post-test and two-month follow-up stages. Also, Soleimani *et al.*^[35] in a research concluded that group BAT significantly reduced depression and its dimensions. In explaining the effectiveness of BAT on depression, it can be said that the behavioral theory of depression states that this therapy is effective because it provides the opportunity to receive an increase in positive reinforcement. The goal of behavioral activation is to increase behaviors that are likely to lead to receiving reinforcement from the patient, which are internal (such as pleasure or a sense of success) or external (such as social attention), and these increases help to improve the patient’s health and finally, they reduce his depressed mood.^[36] Another explanation is that BAT teaches people to change their lifestyle and establish new rules in their lives and follow them. For example, people learn to become more active and try to solve problems instead of being silent when they feel sad. Also, this method teaches the strategy of breaking difficult tasks into

Table 2: The mean and standard deviation of the scores of the groups in the variables of depression and rumination in the pretest and post-test stages

Test type	Variable	ACT group		BAT group		Control group	
		Mean	S.D	Mean	S.D	Mean	S.D
pre-test	Depression	38.6	5.12	36.25	3.53	35.6	5.92
	Rumination	57.4	6.91	47.85	5.06	49.25	5.66
Post-test	Depression	15.15	6.3	18.6	7.73	35.55	4.31
	Rumination	31.35	3.87	33.2	2.62	46.00	4.44

Table 3: The results of the multivariate test to investigate the effectiveness of treatment in depression and rumination variables

Effect	Value	F	df	Distribution error	P	μ
Pillai trace	0.903	22.62	4	110	0.000	0.45
Wilks Lambda	0.099	58.87	4	108	0.000	0.68
Hotelling’s trace	9.1	120.57	4	106	0.000	0.82
Roy’s Largest Root	9.09	250.19	2	55	0.000	0.901

Table 4: Multivariate analysis of covariance test on the mean scores of the groups in depression and rumination

Source	Dependent variable	SS	df	MS	F	P	μ
Depression pre-test	Depression post-test	327.17	1	327.17	10.45	0.002	0.16
Rumination pre-test	Rumination post-test	282.54	1	282.54	30.62	0.000	0.35
Group membership	Depression post-test	5068.17	2	254.08	80.94	0.000	0.74
	Rumination post-test	2754.19	2	1377.09	149.28	0.000	0.84

several simple ones. Therefore, by implementing these strategies, depressed people can achieve success in a progressive manner which facilitates the achievement of positive reinforcement. Also, this therapeutic approach encourages depressed patients to become more active despite feeling tired and sad, or to try to perform behavioral tasks related to the treatment process, even if they have no motivation to do so. Over time, such processes may lead to an increase in environmental reinforcement and subsequently improve the mood of depressed people and reduce rumination.^[37]

Another result of the present research is that there is a significant difference between the post-test mean scores of depression and rumination in the two experimental and control groups after teaching the ACT of mothers with children with cerebral palsy, so it can be concluded that this treatment is effective on the depression and rumination of the sample. The results of the present study are in line with the results of other studies^[38] in the field of the effectiveness of ACT. Also, the obtained results are in line with the results of Heidari, Sajjadian and Heidarian's study^[17] in the field of the effect of the program ACT on depression and rumination of parents of children with autism spectrum disorder; Whittingham, Sheffield and Boyd's research^[38] on the effect of education ACT on significant improvement in parent-child relationships in families with a child with cerebral palsy; also with the results of Kowalkowski's research^[39] on the effect of ACT in significant reducing of the depression of parents of children with autism spectrum disorder. Heidari *et al.*^[40] in a research reached the conclusion that the treatment method ACT is effective in reducing rumination. Mohammadi *et al.*^[41] also conducted a study with the aim of investigating the effectiveness of ACT on the cognitive regulation of emotion in addicted men treated with methadone. The results of the research showed that the therapeutic method ACT had a positive and significant effect on reducing rumination.

In explaining the effectiveness of ACT on depression and rumination, it can be said that the goal of ACT is to help clients to create a rich, complete, and meaningful life while accepting the suffering that life inevitably brings with it.^[42] The metaphors and exercises of this therapy are used to intertwine psychological processes in order to focus on psychological flexibility as a whole. Regarding the rumination variable, it should be mentioned that ACT, which involves solving the cognitive-behavioral problem, moment-to-moment awareness of emotions (mindfulness) and unconditional acceptance of the problem (disorder), makes people have the skills to strengthen themselves to solve problems. Since depressed people, as well as those with high rumination, have many cognitive distortions and dysfunctional thoughts, the activation of these thoughts causes a

person to focus on himself - devaluing and despairing of the future, and as a result, reducing mood and feeling sad it also has an important effect on the aggravation of symptoms. Teaching different methods of challenging irrational thoughts and choosing a correct approach to the problem that is called cognitive fault in the teaching of ACT by influencing these aspects can ultimately affect the ineffective thoughts and rumination of women with children with cerebral palsy.^[43] In this regard, Wells^[44] stated that the use of this training is due to the mechanism hidden in it, such as acceptance, increasing awareness, desensitizing, being in the moment, observing without judgment, confronting, and letting go in combination with traditional cognitive behavioral therapy techniques can reduce rumination symptoms in people. In other words, this training works on gradually reducing rumination and trying to replace incompatible thinking patterns.^[45] It can also be said that the training ACT in a group way help people to experience their disturbing thoughts only as a thought at first and to become aware of the ineffective nature of their activity plan instead of responding to it, do what is important to themselves in life and in line with their values, and accept their thoughts and master unwanted thoughts and feelings. By providing appropriate mental exercises, this training increase the control over the mental system and mothers with children with cerebral palsy showed less rumination, depression, and repetitive thoughts.

Limitation and recommendation

The results of the current research should be interpreted and generalized in the context of its limitations. First, the sample size was limited. Second, because of executional limitations, it was not possible to have follow-up procedure. For this reason, its generalization to the whole society should be done with caution. It is suggested that similar research be conducted on samples with larger samples. It is recommended that acceptance and commitment therapy and behavioral activation on other variables of mothers such as quality of life and obsessive thoughts should be examined. These treatments should be used to implement preventive programs for parents who are about to have children, and finally, a training package for acceptance and commitment therapy and behavioral activation for parents and their children for education and prevention based on local culture should be prepared and compiled.

Conclusion

The results of the present research in order to support the effectiveness of treatments based on acceptance and commitment and behavioral activation on reducing the symptoms of depression and mental rumination can be an important step in the field of treating psychiatric disorders such as depression and mental rumination.

Authors' contributions

All authors contributed in preparing this article.

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Conflicts of interest

There are no conflicts of interest.

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