



# Effectiveness of Acceptance and Commitment Therapy on Psychological Flexibility, Emotional Self-Regulation, and Stress Coping Styles in Mothers of Children with Specific Learning Disorders

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## ABSTRACT

**Objective:** This research aimed to investigate the effectiveness of Acceptance and Commitment Therapy (ACT) on psychological flexibility, emotional self-regulation, and stress coping styles in mothers of children with specific learning disorders.

**Materials and Methods:** This quasi-experimental study employed a pre-test, post-test, and a three-month follow-up design. The study population included all mothers of children with specific learning disorders enrolled in the fifth grade of primary schools in District 17 of Tehran during the 2021-2022 academic year, from whom 40 participants meeting the inclusion criteria were selected through purposive sampling and randomly assigned into two groups of 20. Data collection was conducted using the Cognitive Flexibility Inventory (Dennis & Vander Wal, 2010), the Emotional Self-Regulation Questionnaire (Larsen & Prizmic-Larsen, 2004), and the Coping with Stressful Situations Questionnaire (Parker & Endler, 1994). Data analysis was performed using mixed ANOVA with SPSS version 25.

**Findings:** Results indicated that Acceptance and Commitment Therapy is effective in improving scores of psychological flexibility, emotional self-regulation, and stress coping styles ( $P < 0.001$ ).

**Conclusion:** Given the effectiveness of Acceptance and Commitment Therapy in mothers of children with specific learning disorders, psychologists and counselors working in this field are advised to utilize these educational and therapeutic methods to enhance psychological flexibility, emotional self-regulation, and stress coping styles in this population.

**Keywords:** Acceptance and Commitment Therapy, Emotional Self-Regulation, Stress Coping, Mothers, Specific Learning Disorders

## 1. Introduction

Learning disorders are, in fact, impairments in one or more basic psychological processes leading to difficulties in understanding spoken and written language. This disorder can manifest as a complete inability to listen, think, speak, write, spell, or do mathematical calculations. The disorder is heterogeneous in nature. This heterogeneity is reflected in academic patterns, strengths and weaknesses in information processing, and also as specific academic disorders in particular areas (reading and writing) (Mammarella et al., 2021). Considering the poor performance, repeated failures, negative self-concept, society's biased attitudes, and communication problems of children with learning disabilities, one of the factors that can play a significant role in their behavioral and cognitive performances is the quality of parent-child interactions in the family (Ugwuanyi et al., 2021).

Cognitive flexibility encompasses a wide range of human abilities, from recognizing and adapting to environmental demands to changing behavioral strategies when these strategies jeopardize the individual's personal and social functioning. Cognitive flexibility maintains a balance between different life domains and makes a person aware of their environment and committed to behaviors aligned with their personal values. Mothers possessing cognitive flexibility are more inclined and capable of accepting their children's failures, individual differences, and appropriately confronting difficult situations in life (Wu et al., 2021).

Researchers believe that possessing self-regulation abilities is influential in many areas, including decision-making, problem-solving, and emotion management. One type of self-regulation is emotional self-regulation. Emotions can be positive or negative. Positive affect is a dynamic yet transient feeling or emotional state of pleasure. Emotional self-regulation refers to an individual's efforts to manage their emotional states, i.e., enhancing positive emotions and reducing negative ones (Martín et al., 2021).

Furthermore, a review of study evidence indicates that there is a close relationship between coping styles in various populations and mental health. Coping is defined as a psychological process involving cognitive and behavioral efforts by individuals to resolve stressful situations. Coping involves actions, both action-oriented and intrapsychic, to manage and regulate environmental, internal demands, and conflicts between them and has two important functions: regulating distressing emotions and taking action to change and improve the situation causing discomfort. There are two

types of coping styles in response to stress: problem-focused coping and emotion-focused coping (Xiao et al., 2022).

A look at the statistics shows that in many recent studies, Acceptance and Commitment Therapy (ACT) has had a substantial scientific and empirical support in improving the emotional and behavioral status of various groups. Acceptance and Commitment Therapy is a behavioral treatment with six core processes, including acceptance, defusion, self as context, present moment, values, and committed action. This treatment is a contextual approach that challenges clients to accept their feelings and thoughts and commit to necessary changes (Thompson et al., 2021).

There are few studies available on the effectiveness of the aforementioned treatment on psychological characteristics and reducing symptoms of pain in mothers of children with specific learning disorders, indicating the need for research in this area. If the effectiveness of the mentioned therapeutic methods is confirmed after investigation in the current study, therapists will have more options for improving the mental health status of these individuals. Paying attention to the above psychological-behavioral outcomes in this group of mothers is among the research priorities in society. Based on the mentioned content, the main goal of the present research is to assess the effectiveness of Acceptance and Commitment Therapy on psychological flexibility, emotional self-regulation, and stress coping styles in mothers of children with specific learning disorders.

## 2. Methods and Materials

### 2.1. Study Design and Participants

This study is an applied research employing a semi-experimental method with a pre-test, post-test with control group, and a three-month follow-up. The study population included all mothers of children with specific learning disorders enrolled in the fifth grade of primary schools in District 17 of Tehran during the 2021-2022 academic year, from whom 40 individuals meeting the inclusion criteria were selected and randomly assigned into two equal groups, each consisting of 20 participants (one intervention group and one control group).

### 2.2. Measures

#### 2.2.1. Cognitive Flexibility

Cognitive Flexibility Inventory (Dennis & Vander Wal, 2010) consists of 20 questions with 3 subscales including the willingness to perceive difficult situations as controllable

situations (perception of controllability), the ability to perceive multiple alternative explanations for life events and human behaviors (perception of behavior justification), and the ability to generate multiple alternative solutions for difficult situations (perception of different options). The questions are scored on a 7-point Likert scale (strongly disagree=1 to strongly agree=7). The range of scores obtained on the cognitive flexibility scale is between 20 to 140, where higher scores indicate greater cognitive flexibility and lower scores indicate less cognitive flexibility. The scale's creators reported Cronbach's alpha coefficient for the entire instrument and its subscales in the range of 0.84 to 0.91. In Iran, several studies have also confirmed the psychometric properties of this scale (Jenabadi & Jafarpour, 2019). They reported Cronbach's alpha coefficient for the entire instrument and its subscales in the range of 0.64 to 0.93, and Jafari (2020) reported the Cronbach's alpha coefficient for the entire instrument as 0.88. In the present study, Cronbach's alpha coefficient for the entire instrument was calculated as 0.83, and for the subscales, perception of controllability was 0.71, perception of behavior justification was 0.68, and perception of different options was 0.72 (Shiralinia et al., 2018).

### 2.2.2. Emotional Self-Regulation

Emotional Self-Regulation Questionnaire consists of 44 questions with 6 subscales including cognitive dimensions, behavioral, situation modification, emotion modification, reduction of negative mood, and enhancement of positive mood. The questionnaire is scored on a 7-point Likert scale (never to always). Salehi Morkani (2006) reported the reliability of this questionnaire using the split-half method as 0.75 and using Cronbach's alpha coefficient as 0.80. Also, Ghadampour and colleagues (2019) reported the validity of the Emotional Self-Regulation Questionnaire for each of the subscales between 0.63 to 0.70, indicating the high validity of this questionnaire in the Iranian culture (cited from Moradi, Babaei & Karami, 2020). In the research of Moradi and colleagues (2020), Cronbach's alpha coefficient for the aforementioned questionnaire was estimated as 0.85. In the present study, Cronbach's alpha coefficient for the entire instrument was calculated as 0.74, and for the subscales, it ranged between 0.62 to 0.74.

### 2.2.3. Coping with Stressful Situations

Coping with Stressful Situations Questionnaire (Parker & Endler, 1994) consists of 48 questions measuring three

coping styles with stress: problem-focused coping, emotion-focused coping, and avoidance coping. Each question is rated using a 5-point Likert scale (from never to very much), and each category includes 16 questions. That is, 16 questions measure problem-focused behaviors (abbreviated as T); 16 questions measure emotion-focused behaviors (abbreviated as E); and 16 questions measure avoidance behaviors (abbreviated as A). The creators of this questionnaire reported its validity and reliability for both adult and adolescent scales at a very high level. In Iran, Shojaei (2016) reported Cronbach's alpha for the entire scale as 0.83, and for the problem-focused, emotion-focused, and avoidance coping subscales, respectively, as 0.86, 0.81, and 0.79. In the present study, Cronbach's alpha coefficient for problem-focused coping was calculated as 0.77, emotion-focused coping as 0.69, and avoidance coping as 0.75 (Ghadampour et al., 2019).

## 2.3. Interventions

### 2.3.1. ACT

The intervention protocol in this study revolves around the principles of Acceptance and Commitment Therapy (ACT), designed to enhance participants' psychological flexibility, emotional self-regulation, and stress coping styles. This structured intervention is spread over eight sessions, each crafted to incrementally guide participants through a journey of self-discovery, value clarification, mindfulness, acceptance, and committed action towards their values. The sessions employ a mix of didactic content, experiential exercises, and homework assignments to foster skills critical for dealing with psychological distress and promoting mental well-being. The aim is to empower mothers of children with specific learning disorders to better manage their emotional responses and engage in behaviors that are congruent with their personal values, thereby improving their quality of life (Magnacca et al., 2021; Sarhaddi & Dargahi, 2018).

Session 1 provides an opportunity for participants to introduce and get to know each other, outlines the main rules of therapy including timely completion of exercises, offers an overview of the treatment and the goals of the therapeutic program, discusses potential values, and reviews past treatments used.

Session 2 focuses on behavior change and mindfulness, prioritizing homework review. It includes mindfulness exercises such as body scan and attention to breathing and

body parts, explores the relationship between pain, mood, and performance, and assigns homework.

In Session 3, homework is reviewed, values are clarified, and metaphors such as the funeral ceremony and the long journey are introduced to help participants discover their life values, followed by a homework assignment.

Session 4 reviews homework, practices mindfulness (floating leaves on water exercise), examines ranked values and the obstacles to achieving them, and discusses goals for reaching values (values are like signs that bring us closer to our values).

Session 5 includes a homework review, progress reporting: checking, planning, and taking necessary action to reach values (reviewing participants' actions), mindfulness exercise (imagine your thoughts are like items on a display screen coming and going), committed action to achieve values, and homework assignment.

Session 6 covers homework review, making movement uniform, disengagement from language threats, exercises on what numbers are and mental polarity practice with the bus full of passengers, general mindfulness, starting committed action-related tasks, allowing obstacles to emerge and identifying them, and guidance on becoming mindful of actions and their consequences.

In Session 7, homework is reviewed, participants' willingness to move towards their values is examined (using metaphors), obstacles and actions each participant has for

overcoming them are discussed, along with jumping exercise, mindfulness, and self-observation practice.

Session 8 is about commitment, farewell, addressing negative outcomes and prevention of non-commitment, and follow-up on treatment, identifying progress and movement towards values, and recognizing risky life situations.

#### 2.4. Data analysis

For data analysis, demographic characteristics of participants were first examined along with descriptive statistics, then parametric statistical assumptions were reviewed, and in the next step, mixed ANOVA was used for statistical hypothesis testing. To examine the effect of intervention, the Bonferroni post-hoc test was used. SPSS version 25 was utilized.

### 3. Findings and Results

The Table 1 present descriptive statistics of the research variables at two stages of implementation across three groups separately. Results from Table 2 indicate that there was a significant change from pre-test to post-test and follow-up in the mean scores of psychological flexibility, emotional self-regulation, and stress coping strategies in the experimental group (Acceptance-based treatment), whereas the mean scores of these variables in the control group did not show a significant change from the pre-test stage to the post-test and follow-up stages.

**Table 1**

*Descriptive Statistics Indices of the Research Variables*

Dependent Variable	Group	Pre-test Mean (SD)	Post-test Mean (SD)	Follow-up Mean (SD)
Perception of Controllability	ACT	16.35 (3.84)	19.10 (3.33)	19.35 (3.21)
	Control	16.70 (3.24)	16.45 (3.11)	16.35 (2.81)
Perception of Behavior Justification	ACT	5.35 (2.36)	8.20 (2.66)	8.75 (2.35)
	Control	7.05 (2.28)	6.65 (2.23)	6.55 (2.21)
Perception of Different Options	ACT	23.90 (5.92)	26.10 (4.50)	27.25 (3.69)
	Control	19.90 (5.02)	19.35 (4.61)	19.20 (4.62)
Psychological Flexibility	ACT	45.60 (12.12)	53.40 (10.49)	55.35 (9.25)
	Control	43.65 (10.54)	42.45 (9.95)	42.10 (9.64)
Emotional Self-Regulation	ACT	73.70 (6.42)	76.15 (7.02)	76.40 (6.73)
	Control	71.45 (5.87)	69.80 (5.41)	69.95 (5.29)
Problem-focused Coping	ACT	32.70 (6.09)	36.90 (4.55)	37.20 (4.87)
	Control	29.65 (4.85)	29.10 (5.58)	29.15 (5.39)
Emotion-focused Coping	ACT	44.90 (9.84)	41.70 (8.22)	41.40 (7.86)
	Control	38.10 (6.45)	37.80 (5.22)	37.65 (5.18)
Avoidance Coping	ACT	37.50 (8.40)	33.55 (6.27)	32.80 (5.24)
	Control	36.20 (5.75)	37.05 (5.71)	37.05 (5.71)

Prior to performing the mixed ANOVA, assumptions of normality, homogeneity of variances, and sphericity were meticulously checked and confirmed, ensuring the validity

of the subsequent analyses. For instance, the Shapiro-Wilk test confirmed normal distribution of residuals for psychological flexibility ( $p = .215$ ), emotional self-

regulation ( $p = .198$ ), and all coping styles, including problem-focused ( $p = .230$ ), emotion-focused ( $p = .250$ ), and avoidance coping ( $p = .265$ ). Levene's test for equality of variances showed no significant deviations, affirming homogeneity across groups for all dependent variables (all  $ps > .05$ ). Lastly, Mauchly's test of sphericity was not violated, indicating that the assumption of sphericity had been met for the repeated measures ( $p > .05$  for all variables), allowing for the interpretation of the F statistics without

adjustments. These preliminary checks were crucial in bolstering the confidence in the reported effects of ACT on enhancing psychological flexibility, emotional self-regulation, and adaptive coping mechanisms, as evidenced by significant within-subject and between-subject effects in Tables 9 and 11, with effect sizes ranging from moderate to large ( $\eta^2 = .118$  to  $.608$ ) and high statistical power ( $> .90$ ) across the key measures.

**Table 2**

*Within-Subject and Between-Subject Results of Mixed ANOVA for Dependent Variables*

Research Variables	Source of Variation	F Statistic	Significance	Effect Size	Statistical Power
Psychological Flexibility	Group	24.910	.000	.396	.998
	Time	31.202	.000	.451	1.000
	Time * Group	58.896	.000	.608	1.000
Emotional Self-Regulation	Group	19.026	.002	.556	.933
	Time	12.158	.003	.430	.898
	Time * Group	27.816	.000	.319	.989
Problem-focused Coping	Group	22.853	.000	.376	.997
	Time	3.201	.001	.478	.994
	Time * Group	5.178	.004	.320	.755
Emotion-focused Coping	Group	5.063	.030	.118	.592
	Time	3.957	.024	.294	.686
	Time * Group	2.502	.019	.262	.781
Avoidance Coping	Group	11.359	.015	.235	.698
	Time	15.196	.022	.120	.660
	Time * Group	17.310	.001	.229	.941

Results from Table 2 demonstrate that Acceptance and Commitment Therapy significantly affects the increase in psychological flexibility, emotional self-regulation, and improvement in stress coping skills. Subsequent pairwise

comparison of adjusted mean scores at testing stages (pre-test, post-test, and follow-up) for the aforementioned dependent variables is presented in Table 3.

**Table 3**

*Results of Bonferroni Post-hoc Test for Dependent Variables*

Research Variables	Stages	Mean Difference	Significance
Psychological Flexibility	Pre-test - Post-test	-3.300*	.000
	Pre-test - Follow-up	-4.100*	.000
	Post-test - Follow-up	-.800	.105
Emotional Self-Regulation	Pre-test - Post-test	-0.400*	.000
	Pre-test - Follow-up	-0.602*	.001
	Post-test - Follow-up	-.217	.275
Problem-focused Coping	Pre-test - Post-test	-1.825*	.000
	Pre-test - Follow-up	-2.000*	.000
	Post-test - Follow-up	.376	.000
Emotion-focused Coping	Pre-test - Post-test	-1.750*	.004
	Pre-test - Follow-up	-1.975*	.037
	Post-test - Follow-up	.708	.000
Avoidance Coping	Pre-test - Post-test	-1.550*	.016
	Pre-test - Follow-up	-1.936*	.019
	Post-test - Follow-up	.375	.621

\* $P < 0.05$

As shown in Table 3, the difference in mean scores between pre-test and post-test (intervention effect) and the difference between pre-test and follow-up (time effect) are more significant than the difference between post-test and follow-up (intervention stability effect). This indicates that Acceptance and Commitment Therapy has had an effect on increasing psychological flexibility, emotional self-regulation, and improving stress coping skills at the post-test stage and that this effect persisted during the follow-up stage. Therefore, the second hypothesis of the research, stating that "Acceptance and Commitment Therapy is effective in improving psychological flexibility, emotional self-regulation, and stress coping styles in mothers of children with specific learning disorders," was confirmed.

#### 4. Discussion and Conclusion

This study aimed to assess the effectiveness of Acceptance and Commitment Therapy on psychological flexibility, emotional self-regulation, and stress coping styles in mothers of children with specific learning disorders. The findings showed that Acceptance and Commitment Therapy was effective in improving the psychological flexibility scores of the experimental group's subjects at different assessment stages (post-test and follow-up), whereas the psychological flexibility score in the control group did not show significant changes at different assessment stages. Thus, this research hypothesis is confirmed. This finding aligns with the results of previous studies (Ahmadi & Raeisi, 2018; Byrne et al., 2021; Fung et al., 2021; Hayes, 2019; Lillis et al., 2021; Magnacca et al., 2021; Marino et al., 2021; Sarhaddi & Dargahi, 2018; Shiralinia et al., 2018; Thompson et al., 2021).

This finding can be explained by the possibility that Acceptance and Commitment Therapy has improved mothers' well-being through factors such as non-judgmental acceptance, being in the present moment, and dealing with internal experiences without avoidance, suppression, or trying to change them. Mothers of children with learning disorders need strategies to maintain and enhance their adaptive power and coping ability. Another interpretation is that psychological flexibility itself is the process of change in Acceptance and Commitment Therapy. Psychological flexibility includes dimensions of avoidance and cognitive fusion. The function of experiential avoidance, controlling or minimizing the impact of distressing experiences, can create immediate and short-term relief, leading to the maintenance of avoidant behavioral patterns through

negative reinforcement principles (Hayes, 2019; Lillis et al., 2021). This avoidance becomes problematic when it interferes with daily functioning and achieving personal life goals. The effectiveness of Acceptance and Commitment Therapy in this area is explainable given that the variable of inflexibility includes dimensions of avoidance and cognitive fusion (Marino et al., 2021; Shiralinia et al., 2018). Likely, the success of Acceptance and Commitment Therapy is not about changing the content of thoughts but is a behavioral treatment using mindfulness skills, acceptance, and cognitive defusion to increase psychological flexibility. Training in effective, open, and non-defensive communication with the present moment has enabled mothers to pay attention to and observe what is in the environment and their internal experience, and furthermore, they have learned to describe what exists without judgment or values.

The research results also showed that Acceptance and Commitment Therapy was effective in improving the emotional self-regulation score of the experimental group's subjects. This finding is consistent with the results of previous studies (Ahmadi & Raeisi, 2018; Fung et al., 2021; Marino et al., 2021). Many therapists believe that psychological and behavioral disorders are the product of attempts to control or avoid negative thoughts and emotions, avoidance of internal experiences, and not engaging in important and valuable life activities. Therefore, Acceptance and Commitment Therapy focuses on changing individuals' relationships with their internal experiences and avoidances. For this reason, therapeutic sessions use techniques such as psychological acceptance, mindfulness, cognitive defusion, self-as-context, value clarification, committed action to values, emotional awareness, distress tolerance training, and emotion regulation training. In line with this perspective, Hayes (2019) believes that depressed individuals usually have problems regulating their emotions in different life situations, especially in stressful situations, and also have low levels of meaning in life (Hayes, 2019). As a result, they are either unable to engage in social relationships or do not have warm and effective social interactions. This, in turn, leads to long-term despair, poor quality of life, and low psychological well-being in these mothers' lives.

#### 5. Limitations & Suggestions

The limited population to mothers of children with specific learning disorders and the limited number of participants in the study, due to the methodological

limitations of this study, limits the generalizability of the findings. The short duration of the follow-up, while many studies conduct follow-ups ranging from 6 months to a year. Also, one of the main limitations of the current research that could create ambiguity in some of its results was the use of self-report tools for data collection. Future studies are recommended to include both parents and other educational and developmental issues to increase the generalizability of the results. Future research should re-examine these hypotheses and use other methods such as interviews, in addition to questionnaires, to assess research variables. Furthermore, given the effectiveness of Acceptance and Commitment Therapy on psychological flexibility, emotional self-regulation, and stress coping styles in mothers of children with specific learning disorders, it is suggested that centers providing services to this group of individuals in society, as well as welfare organizations, seek assistance from specialists experienced and knowledgeable in this therapeutic approach. Offering exercises and programs derived from this approach can help improve stress coping skills, enhance emotional self-regulation, and promote the psychological functioning of mothers with children suffering from specific learning disorders.

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### Declaration of Interest

The authors of this article declared no conflict of interest.

### Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

### Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

### Declaration

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

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All authors equally contributed in this article.

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