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# Effectiveness of Acceptance and Commitment Therapy on Cognitive Bias and Dysfunctional Attitudes in Adolescents with Obsessive Beliefs

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## ABSTRACT

**Objective:** This study aimed to evaluate the effectiveness of Acceptance and Commitment Therapy (ACT) in reducing cognitive bias and dysfunctional attitudes among adolescent girls with obsessive beliefs.

**Methods and Materials:** A quasi-experimental, pretest–posttest control group design was employed. From a population of 500 female secondary school students in Tehran during the 2023–2024 academic year, 30 students with high scores on the Obsessive Beliefs Questionnaire (OBQ-44) were selected via multistage cluster sampling and randomly assigned to either an ACT intervention group ( $n = 15$ ) or a waitlist control group ( $n = 15$ ). The intervention group received ten 90-minute ACT sessions based on Hayes et al.'s protocol. Outcome measures included the OBQ-44, the Cognitive Bias Questionnaire (CBQ), and the Dysfunctional Attitudes Scale (DAS-26). ANCOVA was used to analyze data following assumption testing.

**Findings:** The results indicated statistically significant reductions in both cognitive bias ( $F = 44.32, p < .001, \eta^2 = 0.541$ ) and dysfunctional attitudes ( $F = 83.91, p < .001, \eta^2 = 0.763$ ) in the ACT group compared to the control group. All statistical assumptions, including normality, homogeneity of variances, and regression slope equality, were satisfied. Post-test mean scores of the ACT group were significantly lower in both outcome measures.

**Conclusion:** ACT significantly reduced maladaptive cognitive patterns and dysfunctional attitudes in adolescents with obsessive beliefs. Its integration in school-based mental health programs may offer an effective strategy for enhancing psychological flexibility and resilience in youth.

**Keywords:** Acceptance and Commitment Therapy, Cognitive Bias, Dysfunctional Attitudes, Obsessive Beliefs, Adolescents.

## Introduction

Adolescence is a developmental stage characterized by profound physical, cognitive, socio-emotional, and environmental changes. It is a dynamic and emotionally charged period marked by increased cognitive abilities,

the onset of puberty, and shifts in relationships with family, friends, school, and society. During this stage, adolescents face evolving expectations from peers, families, and communities, navigate new family roles and

responsibilities, seek emotional and social identity, manage life tasks with reduced dependence on others, and begin to envision their future as independent and productive adults (Rahmanian et al., 2018). It is a formative period when attitudes toward the self, others, and the world are established, contributing significantly to identity formation and the development of core beliefs and perspectives (Godwin et al., 2020).

Obsessive beliefs in adolescents refer to dysfunctional thoughts, attitudes, and mental representations often accompanied by anxiety. These beliefs are largely rooted in the individual's cognitive schemas and belief systems. Obsessive beliefs can manifest in various forms and significantly affect adolescents' daily lives (Krause et al., 2020). Six major domains of obsessive beliefs include: inflated sense of responsibility, overestimation of threat likelihood and severity, beliefs about the over-importance of the consequences of thoughts, excessive concern about the need to control thoughts, intolerance of uncertainty, and perfectionism (Boger et al., 2020). For instance, overemphasis on the consequences of thoughts is the belief that merely having a thought signifies its importance. While intrusive thoughts can occur in anyone, it is the catastrophic interpretation of these thoughts that leads to obsessions. In the case of concerns about thought control, the individual overestimates the need to control intrusive thoughts, impulses, and images, believing that one must have full control over their thoughts (Piras et al., 2022).

Another issue closely associated with obsessive beliefs is maladaptive attitudes. Early cognitive theories, particularly Beck's cognitive model, attribute the formation of obsessive beliefs to irrational interpretations and dysfunctional thinking patterns (Mahmoudi & Alilou, 2020). Kelly, (2003) posited that beliefs and attitudes function as personal constructs through which individuals interpret their experiences (Liu et al., 2022). Similarly, (Dallos, 1991) argued that beliefs and attitudes comprise perceived truths that guide individuals in reacting to life events in specific ways. Every person holds a set of core beliefs, often semi-conscious, that shape their responses to life. When a triggering event occurs, the individual's conscious thought is largely influenced by these underlying beliefs and attitudes (Baumeister et al., 2011).

Cognitive bias is another key concept that may contribute to the development of obsessive beliefs. It

refers to the tendency to misinterpret ambiguous or neutral situations as negative or threatening (Liu et al., 2022). In essence, cognitive biases are systematic errors in thinking that occur when individuals are processing and interpreting information. These biases serve as mental shortcuts that can impair judgment accuracy. Cognitive biases are common across all individuals and are shaped by their prior beliefs and experiences. Essentially, individuals tend to perceive only what they expect to see (Piras et al., 2022).

Given that individuals with obsessive beliefs often also exhibit maladaptive attitudes and cognitive biases, it is necessary to implement interventions that can effectively target these variables. Third-wave therapies, particularly Acceptance and Commitment Therapy (ACT), have shown promise in addressing these issues. Rather than focusing on altering cognitions, ACT seeks to change the individual's relationship with their thoughts and emotions (Pleger et al., 2018). ACT incorporates six core processes aimed at fostering psychological flexibility: acceptance, cognitive defusion, self-as-context, contact with the present moment, values clarification, and committed action (Twohig et al., 2018).

ACT encourages individuals to increase psychological acceptance of internal experiences while reducing ineffective control strategies. Clients learn that attempts to avoid or suppress unwanted thoughts and feelings are not only ineffective but may also exacerbate them. Instead, individuals are taught to accept these experiences without inner or outer resistance. The second step involves cultivating present-moment awareness of thoughts, emotions, and behaviors. In the third step, individuals learn to cognitively distance themselves from mental experiences, allowing for action independent of these experiences. The fourth step involves reducing excessive focus on self-concepts or personal narratives. In the fifth step, individuals identify and clarify core personal values and translate them into actionable goals. Finally, committed action refers to engaging in value-consistent behavior while accepting unpleasant internal experiences such as depressive, obsessive, or fear-related thoughts (Ong et al., 2018).

Previous studies by Safari et al., (2021) and Rajabi et al., (2019) demonstrated the efficacy of ACT in reducing obsessive-compulsive symptoms. Zamani Froshani et al., (2023) found that women who participated in ACT-based training scored significantly lower on measures of

dysfunctional attitudes and psychological distress in the post-test compared to both their pre-test scores and a non-participating control group. Similarly, (Berry & Greenwood, 2018; Kimk & Odaci, 2020), and Noroozi & Gholami, (2019) reported that ACT is effective in reducing dysfunctional attitudes and alexithymia in women with depression.

Given the importance of adolescence as a critical period in identity formation, and the detrimental impact of obsessive beliefs on adolescent well-being, it is essential to prioritize interventions tailored to their specific needs. The present study was therefore designed and conducted to examine the effectiveness of Acceptance and Commitment Therapy in reducing cognitive biases and dysfunctional attitudes in adolescents with obsessive beliefs.

## Methods and Materials

This study employed a quasi-experimental research design with a pre-test–post-test control group format. The statistical population consisted of all female lower secondary school students with obsessive beliefs in schools across Tonekabon during the 2023–2024 academic year. Using a multistage cluster sampling method, 500 students were initially selected to identify those with obsessive beliefs. All 500 completed the Obsessive Beliefs Questionnaire (OBQ-44). From those scoring high on obsessive beliefs, 30 students were randomly selected and assigned to two groups: experimental ( $n = 15$ ) and control ( $n = 15$ ).

### Instruments

1. Obsessive Beliefs Questionnaire (OBQ-44): This instrument contains 44 items designed to assess various dimensions of obsessive beliefs, including the general factor, perfectionism and certainty, responsibility and threat estimation, importance and control of thoughts, and completeness of actions. Items are rated on a 7-point Likert scale: Strongly disagree = -3, Moderately disagree = -2, Slightly disagree = -1, Neutral = 0, Slightly agree = +1, Moderately agree = +2, Strongly agree = +3. The total score is obtained by summing all item scores, with

subscale scores computed likewise. Higher scores indicate more severe obsessive-compulsive tendencies. Shams et al., (2004) reported high internal consistency and good test–retest reliability for the overall scale and its subscales. The Cronbach's alpha coefficient for this questionnaire was 0.91, indicating excellent reliability.

2. Cognitive Bias Questionnaire: This 20-item scale, developed by Quinn, (2012), assesses cognitive biases in children and adolescents aged 11–19. It evaluates 10 types of thinking errors, including all-or-nothing thinking, mental filtering, mind reading, fortune-telling, emotional reasoning, labeling, overgeneralization, personalization, “should” statements, and discounting the positive. The total score ranges from 20 to 140, with higher scores indicating stronger cognitive biases. The original developers reported a Cronbach's alpha of 0.85 and concurrent validity with the Depression, Anxiety, and Stress Scales (DASS) ranging from 0.12 to 0.40. Convergent validity with the Young, Schema Questionnaire (1998) was 0.53. (Zeinali et al., 2020) translated the scale into Persian and back-translated it with expert review by four psychologists, confirming satisfactory content validity. Internal consistency in the Persian version was reported as 0.97 (Cronbach's alpha) and 0.94 (split-half method).

3. Dysfunctional Attitudes Scale (DAS-26): Developed by Beck et al., (1991), this 26-item scale measures dysfunctional attitudes across four subscales: achievement–perfectionism, need for approval, need to please others, and vulnerability–performance evaluation. Responses are rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Beck et al. reported a content validity index of 0.88 and Cronbach's alpha values above 0.70 for all components. In Iran, Ebrahimi et al., (2013) validated the scale, reporting a content validity of 0.75 and overall reliability of 0.73 in an Iranian sample.

### Intervention

The intervention package was adapted from the Acceptance and Commitment Therapy (ACT) manual developed by (Hayes et al., 2006). The structure of the intervention is outlined below in Table 1.

**Table 1**

*Summary of ACT-Based Intervention Sessions*  
(Hayes et al., 2004; adapted by Asli Azad et al., 2019)

Session	Content Description
Session 1	Introduction, rapport building, psychoeducation, overview of ACT, explanation of key components and study objectives
Sessions 2-3	Discussion and evaluation of experiences, use of creative hopelessness metaphor (farm/toolbox), confronting the change agenda, assigning homework
Session 4	Exploring control as a problem, introducing internal experiences (emotions, memories, physical sensations) using the “uninvited guest” metaphor, assigning homework
Sessions 5-6	Application of cognitive defusion techniques, weakening the fusion of self with thoughts and emotions, mindfulness walk practice, assigning homework
Session 7	Observing the self as context, weakening conceptualized self using “bus and passengers” metaphor, assigning homework
Session 8	Cognitive distancing, modeling thought defusion using “trains under the bridge” metaphor, assigning homework
Session 9	Introduction to values, exploring the risks of outcome-focused behavior, discovering core life values using the “mind compass” metaphor, assigning homework
Session 10	Application of learned skills to real life, reflection, and lifelong commitment tasks

## Findings and Results

Demographic analysis revealed that the mean age of participants in the intervention group was 14.27 years with a standard deviation of 2.06, and in the control

group, the mean age was 14.05 years with a standard deviation of 1.93. There was no significant difference in age between the two groups. Descriptive statistics (means and standard deviations) for the research variables—cognitive bias and dysfunctional attitudes—by group and test phase are presented in Table 2.

**Table 2**

*Mean and Standard Deviation of Cognitive Bias and Dysfunctional Attitudes (n = 30)*

Variable	ACT Group		Control Group	
	Pre-test M (SD)	Post-test M (SD)	Pre-test M (SD)	Post-test M (SD)
Cognitive Bias	83.33 (1.45)	74.53 (1.30)	83.00 (1.07)	82.00 (1.06)
Dysfunctional Attitudes	96.47 (1.50)	89.87 (2.32)	96.93 (1.27)	95.93 (1.28)

Prior to conducting ANCOVA, the assumption of homogeneity of regression slopes was tested using the F-test for interaction effects. Results indicated that this assumption was met for both variables: cognitive bias ( $F = 1.427, p > 0.05$ ) and dysfunctional attitudes ( $F = 2.195, p > 0.05$ ). In addition, Levene’s test for equality of variances confirmed that the assumption of homogeneity

of variances was also satisfied for both variables: cognitive bias ( $F = 1.585, p > 0.05$ ), and dysfunctional attitudes ( $F = 1.628, p > 0.05$ ). The Kolmogorov–Smirnov test showed that the data were normally distributed ( $p > 0.05$ ). As all statistical assumptions for ANCOVA were met, a univariate analysis of covariance was performed to assess the effectiveness of the intervention.

**Table 3**

*Univariate ANCOVA Results for Cognitive Bias and Dysfunctional Attitudes*

Source of Variation	SS	df	MS	F	p-value	Effect Size ( $\eta^2$ )
Group Effect (Cognitive Bias)	423.878	1	423.878	44.322	0.0005	0.541
Error	29.760	26	1.145			
Group Effect (Dysfunctional Attitudes)	236.537	1	236.537	83.910	0.0005	0.763
Error	73.293	26	2.819			

The results of the univariate ANCOVA for cognitive bias and dysfunctional attitudes are displayed in Table 3. In this analysis, pre-test scores were statistically controlled, meaning the influence of pre-test differences was removed, and the comparison was based on the residual variance. The analysis revealed a significant difference between the ACT group and the control group in cognitive bias scores ( $F(1,26) = 44.322, p < 0.01$ ). As

shown in Table 2, the post-test mean score for cognitive bias was significantly lower in the ACT group ( $M = 74.53$ ) than in the control group ( $M = 82.00$ ). This indicates that Acceptance and Commitment Therapy significantly reduced cognitive bias among adolescents with obsessive beliefs.

Similarly, a significant difference was observed in dysfunctional attitudes scores between the ACT group

and the control group ( $F(1,26) = 83.910, p < 0.01$ ). As shown in Table 2, the ACT group had a significantly lower post-test mean score ( $M = 89.87$ ) compared to the

## Discussion and Conclusion

The present study aimed to investigate the effectiveness of Acceptance and Commitment Therapy (ACT) on cognitive bias and dysfunctional attitudes in adolescents with obsessive beliefs. The findings revealed that ACT significantly reduced cognitive biases and dysfunctional attitudes among these adolescents. These results are consistent with previous studies by [Zamani Froshani et al., \(2023\)](#), and [\(Noroozi & Gholami, 2019; Hosseini et al., 2023; Zakirovna et al., 2024\)](#).

The first cognitive theory on obsessive beliefs was introduced by [McFall & Wollersheim, \(1979\)](#). According to this theory, obsessions arise through a two-stage process: first, a primary threat appraisal, in which the individual overestimates the likelihood and severity of negative consequences, followed by a secondary appraisal, in which the individual underestimates their ability to cope with the perceived threat. This leads to a cyclical pattern of obsessive beliefs, contributing to cognitive biases and dysfunctional thinking in adolescents [\(Piras et al., 2022\)](#).

Cognitive bias refers to a preferential tendency to process threatening or negative information—either through increased attention allocation or through threat-related interpretations of ambiguous stimuli. Research suggests that individuals with obsessive beliefs preferentially direct their attention toward threatening information and interpret ambiguity negatively. Interpretation bias occurs when multiple competing evaluations are possible, and the threat-relevant interpretation becomes dominant, using more processing resources [\(Krause et al., 2020\)](#).

The effectiveness of ACT can be explained by the use of techniques such as cognitive defusion and acceptance, which help adolescents experience less distress when confronted with obsessive thoughts. While ACT does not attempt to directly challenge thoughts, it uses metaphors and experiential exercises to reduce the emotional intensity of unpleasant experiences, indirectly weakening obsessive thought patterns [\(Safari et al., 2021\)](#). This approach encourages individuals to accept obsessive beliefs rather than deny or avoid them,

control group ( $M = 95.93$ ), suggesting that ACT was also effective in reducing dysfunctional attitudes in the post-test phase.

viewing them as a part of life. Through metaphorical language and practical exercises, adolescents develop greater awareness of the nature of their thoughts, thereby reducing their susceptibility to cognitive distortions.

Moreover, ACT incorporates value clarification and goal setting, which foster a more positive outlook toward the self, others, and the world. Techniques such as verbalizing negative thoughts and expressing associated emotions enable individuals with dysfunctional attitudes to engage in emotional processing and cognitive restructuring [\(Berry & Greenwood, 2018\)](#). In the present study, goal- and value-based interventions helped reduce maladaptive evaluations and dysfunctional self-appraisals among students.

Another explanation lies in ACT's emphasis on committed action, which helps replace maladaptive behavioral patterns that create psychological barriers. The continuous application of ACT protocols—featuring observable behavioral strategies—supports both cognitive and behavioral changes in adolescents with obsessive beliefs and dysfunctional attitudes.

In summary, ACT facilitates psychological flexibility through six core processes: acceptance, cognitive defusion, self-as-context, contact with the present moment, values, and committed action. The first four are mindfulness-based processes, while the last two focus on behavior change. This combination helps reduce the influence of negative thoughts and obsessive beliefs, enhancing the adolescent's ability to remain flexible in high-pressure and triggering situations. As psychological flexibility increases, cognitive bias and dysfunctional attitudes are likely to decrease.

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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. Ethical considerations in this study were that participation was entirely optional.

## 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.

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## Authors' Contributions

All authors equally contribute to this study.

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