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Original Article

Comparison of the Effect of Dialectical Behavior Therapy and Adolescent-centered Mindfulness Therapy on Impulsivity and Depression in Adolescents with Disruptive Mood Dysregulation Disorder

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Abstract

Background and Objective: This study aimed to compare the effect of dialectical behavior therapy (DBT) and adolescent-centered mindfulness therapy (ACMT) on impulsivity and depression in adolescents with disruptive mood dysregulation disorder (DMDD).

Materials and Methods: This quasi-experimental study was conducted based on a pretest-posttest design with a two-month follow-up. The statistical population included all adolescents aged 15-18 years in Najafabad, Iran, during the academic year 2023-2024. The participants included 60 cases who were selected via the purposive sampling method based on the inclusion criteria specified in the study, and randomly assigned to three groups (20 subjects in each group). The research instruments included the Laporte Disruptive Mood Disorder Diagnostic Scale (2019), DSM-5-based diagnostic interview, Barratt Impulsiveness Scale (2004), and Kutcher Adolescents Depression Scale (2002). During research, after completing the questionnaires in the pre-test stage, each experimental group underwent interventions in 60-minute weekly sessions, while the control group did not receive any intervention. After the end of the interventions, the questionnaire was completed by the three groups in post-test and follow-up stages two months later. The data were analyzed in SPSS software (version 26) using the repeated measures analysis of variance and Bonferroni post-test.

Results: Based on the obtained results, both DBT and ACMT exhibited significant effectiveness in the mitigation of impulsivity and depression in adolescents with disruptive mood disorder symptoms, and the effects persisted in the follow-up stage ($P<0.05$).

Conclusion: The comparison of the two intervention methods revealed that in both post-test and follow-up stages, DBT proved to be more effective than ACMT in the mitigation of impulsivity and depression.

Keywords: Adolescent-centered mindfulness, Depression, Dialectical behavior therapy, Disruptive mood dysregulation disorder, Impulsivity

Background

Adolescence is a critical developmental stage likened to a period of turmoil and heightened emotions. This stage requires considerable attention as it is arguably the most sensitive phase of human life, and neglecting it may lead to irreversible consequences [1]. During the interval between physical and psychological maturation, the body tends to develop more rapidly than the mind, resulting in a temporary dominance of physical aspects over the psychological ones. Accordingly, psychologists often describe adolescence as a period of crisis. While most adolescents experience certain conflicts and challenges in their relationship with the surrounding world, in some cases, these difficulties exceed normal limits and become concerning, requiring proper diagnosis and treatment by psychologists and psychiatrists [2]. Understanding neurodevelopmental changes during this period provides valuable insight into adolescents' cognitive and behavioral processes. Research findings suggest that disturbances in the prefrontal cortex during adolescence may contribute to the emergence of disorders, such as attention-deficit/hyperactivity disorder, oppositional defiant disorder, and disruptive mood dysregulation disorder (DMDD) [3].

At present, one of the most common reasons for referring children and adolescents to mental health providers is the pattern of mood and behavioral dysregulation characterized by severe irritability, temper outbursts, and aggressive behavior [4]. Despite the prevalence and severity of these symptoms, mental health professionals have differing opinions on how to conceptualize and accurately diagnose children and adolescents with such symptom patterns [5]. Over the years, chronic irritability and mood dysregulation have been

conceptualized as features associated with externalizing disorders [6], developmental variations, early-onset bipolar disorder [7], and as central characteristics of an experimental research phenotype.

In 2013, the American Psychiatric Association introduced a new diagnostic category, termed Disruptive Mood Dysregulation Disorder (DMDD), in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) to capture chronic and severe irritability in children and adolescents within the depressive disorders chapter [8]. The primary purpose of this addition was to prevent the overdiagnosis of pediatric bipolar disorder in youths with non-episodic irritability and recurrent temper outbursts.

The DMDD can be understood as exceeding a certain threshold on the irritability continuum, necessitating clinical intervention [10]. It is also known as clinical irritability and is derived from the broader syndrome of severe mood dysregulation [11]. The core features of DMDD are persistent and severe irritability manifested in two ways: (1) frequent temper outbursts that are disproportionate to the situation, typically triggered by frustration, and expressed verbally or behaviorally (e.g., aggression toward self or others, or destruction of property). These outbursts must occur at least three times per week, persist for at least 12 months, and be present in at least two of the three settings (at home, in the classroom, or with peers), while also being inconsistent with the individual's developmental level; and (2) between outbursts when individual exhibits persistent irritability or anger that is noticeable to others for the majority of the day, almosty every day [12].

One of the major difficulties observed in individuals with DMDD is impulsivity [13]. From a psychological perspective, impulsivity has been conceptualized around three central factors: diminished sensitivity to the negative consequences of behavior, rapid and unplanned responses to stimuli without adequate information processing, and disregard for long-term outcomes of actions. The importance of this construct lies in its strong association with a wide range of psychological and social difficulties, including aggression, antisocial behaviors, delinquency, and related maladaptive patterns.

Impulsive behaviors encompass a broad spectrum of actions that are not well-considered, exhibit immaturity, and happen abruptly without appropriate planning or prolonged focus, often accompanied by high levels of risk-taking [15]. Impulsivity can also be described as a preference for immediate rewards, a tendency toward sensation-seeking and adventurous behaviors, low persistence in goal-directed tasks, and a general predisposition to unreasoned, hasty reactions. Typically, problems with impulsivity become evident as children enter school and are faced with the demands of structured learning and social interaction. Such behaviors lead to higher rates of inappropriate responses, highlighting the need for improved attention and organizational skills. Moreover, impulsivity is strongly linked to severe developmental difficulties across childhood, adolescence, and adulthood, including personality disorders, substance use, mood disorders, depression, and even suicidality. Given its significance, impulsivity has been selected as a primary variable in the present research [16].

Persistent depressive behavior throughout the course of this disorder provides compelling justification for its classification among mood disorders in the DSM-5 [17]. Depression in children and adolescents requires serious clinical attention due to its detrimental impact on multiple domains of functioning—social, academic, and occupational. It is generally characterized by pervasive low mood, feelings of worthlessness, diminished energy, anhedonia, and interpersonal difficulties, all of which contribute to academic decline, psychosomatic complaints, behavioral problems, and adverse long-term outcomes [18]. Given prior research on DMDD and its clinical correlates, along with the observation that numerous adolescents do not adequately respond to traditional therapeutic approaches—or may require adjunctive interventions—there is a critical need to explore and compare the effectiveness of novel, evidence-based interventions.

The first approach of interest is Dialectical Behavior Therapy (DBT), which has gained increasing attention as a treatment modality for mood dysregulation in adolescents [19]. The DBT is grounded in the biosocial model of emotional dysregulation, which conceptualizes pervasive difficulties in emotion regulation as the result of the interplay between a biological predisposition toward emotional vulnerability and exposure to an invalidating or harmful environment. Biologically, some adolescents may have neurodevelopmental differences that heighten their sensitivity to emotional experiences and impair their ability to regulate affect effectively. Environmentally, many experience neglect, invalidation, or maltreatment from parents, caregivers, siblings, or peers, fostering the perception that their emotions are irrelevant, wrong, or unworthy of recognition. Consequently, these adolescents fail to develop adaptive strategies for regulating emotions, resulting in pervasive dysregulation that can escalate into self-injurious behaviors and suicidal ideation [19, 20].

The DBT aims to address these challenges by equipping adolescents with core therapeutic skills in mindfulness, distress tolerance, emotion regulation, and interpersonal effectiveness. It has been effectively applied to enhance problem-solving in emotional contexts, improve stress management, reduce aggression, and foster better emotional regulation. Such findings underscore DBT as a promising intervention for alleviating the symptoms of DMDD [21, 22].

In addition to DBT, Adolescent-Centered Mindfulness Therapy (ACMT) has also been employed to address the symptoms of DMDD. Mindfulness-based interventions, originally rooted in Eastern contemplative traditions, are now recognized as third-wave cognitive-behavioral approaches. Mindfulness is defined as a nonjudgmental, present-centered awareness that contrasts with the ruminative focus on the past often observed in depression and the anticipatory focus on the future characteristic of anxiety disorders. Mindfulness training cultivates a stance of acceptance, allowing adolescents to approach emotions, thoughts, and bodily sensations without avoidance, thereby alleviating negative mood states. It has also been demonstrated to enhance relational functioning, improve psychological well-being, strengthen stress-coping skills, and promote relaxation and self-confidence [23, 24].

Accumulating evidence demonstrates the effectiveness of mindfulness-based interventions in the mitigation of depression [25, 26] and impulsivity [27, 28]. In a similar vein, DBT has been shown to exert significant effects on the reduction of depression [29, 30]. Nonetheless, few studies have directly compared the relative effectiveness of DBT and mindfulness-based interventions in adolescents with the symptoms of DMDD.

Objectives

In light of the aforementioned issues, the present study aimed to address this gap by investigating whether DBT and ACMT differ in their effects on impulsivity and depression among adolescents with DMDD symptoms.

Materials and Methods

This quasi-experimental study was conducted based on a pretest-posttest control group design with a two-month follow-up. The independent variables were DBT and CMT, while the dependent variables included impulsivity and depression. The statistical population comprised all adolescents aged 15-18 years in Najafabad, Iran, during the 2024-2025 academic year. Initially, four secondary schools were selected through simple random sampling. Subsequently, based on reports from school counselors and other school authorities, students exhibiting emotional and behavioral difficulties were identified. These students were administered the Laporte Disruptive Mood Dysregulation Screening Scale [31] and a clinical interview based on DSM-5 diagnostic criteria.

Inclusion and Exclusion Criteria

From this initial pool, 60 adolescents who met the inclusion criteria were selected via the purposive sampling method and randomly assigned to three groups: two experimental groups and one control group, each comprising 20 participants. The inclusion criteria entailed an age range of 15-18 years, a positive screening for DMDD according to the Laporte et al. scale (31), meeting clinical diagnostic criteria for DMDD based on DSM-5, and not receiving any concurrent psychiatric or psychological treatment. Participants were excluded if they failed to cooperate or were unwilling to continue attending sessions, missed more than two treatment sessions, failed to complete assigned therapeutic tasks, or received other concurrent psychiatric or psychological interventions.

Procedure

After selecting the sample through purposive sampling and randomly assigning them to the three research groups, a pre-test was administered using the study questionnaires. The first experimental group then received ten 60-minute weekly sessions of DBT, while the second experimental group received ten 60-minute weekly sessions of ACMT. The control group did not receive any intervention. Following the completion of the treatment sessions and a two-month follow-up, all three groups were reassessed.

Dialectical Behavior Therapy Protocol

The DBT sessions were based on Linehan's therapeutic manual, which has been adapted in previous national studies [32] (Table 1).

Adolescent-centered Mindfulness Therapy

The ACMT sessions followed the Burdick mindfulness protocol, adapted and validated for Iranian adolescents by Azad et al. [33](Table 2).

Table 1. Summary of dialectical behavior therapy sessions [32]

Session	Skill Focus	Techniques	Description
1	Mindfulness	Core strategies	Introduction to the program, importance of mindfulness, training in observing, describing, and participating skills
2	Mindfulness	Advanced strategies	Enhancing the "wise mind," fundamental acceptance, practicing mindfulness in daily life, and overcoming obstacles
3	Distress tolerance	Acceptance strategies	Basic acceptance techniques, breathing observation, awareness training, and gentle smiling exercise
4	Distress tolerance	Change strategies	Techniques for distraction, self-soothing, and positive imagery
5	Distress tolerance	Change strategies	Teaching relaxation techniques, present-moment awareness, cost-benefit analysis, and coping strategies
6	Emotion regulation	Understanding emotions Teaching	Components of emotions, emotion classification, functions of emotions, and emotional analysis
7	Emotion regulation	Core strategies	Identifying emotions in the moment, reducing physical and cognitive vulnerability, and increasing positive emotional experiences
8	Emotion regulation	Advanced strategies	Training in nonjudgmental emotional awareness, emotional exposure, acting opposite to emotional urges, and problem-solving
9	Interpersonal effectiveness	Core strategies	Identifying behavior styles, recognizing unhealthy emotional habits, difficulty identifying needs, dysfunctional relationships, and false beliefs
10	Interpersonal effectiveness	Advanced strategies	Teaching assertive communication skills: describing, requesting, listening, saying no, negotiating, resolving conflicts; final review and post-test administration

Table 2. Summary of adolescent-centered mindfulness therapy sessions [33]

Session	Topics Covered
1	Building rapport, involving parents, and introducing mindfulness Introduction to mindfulness and explanation of the course purpose, planning daily mindfulness practice, engaging parents through daily logs, teaching mindfulness postures (e.g., seated, lying down, lotus position), and assigning homework
2	Gaining awareness of mindful breathing Sharing participants' experiences, teaching abdominal breathing, using the glitter jar exercise to contrast a busy vs. calm mind, and assigning homework
3	Teaching body scan technique Reviewing previous practices, teaching mindful breathing, and introducing the body scan technique with follow-up homework
4	Awareness of the present moment Reinforcing breathing exercises, introducing present-moment awareness through the water cup activity, practicing mindful movements, and assigning homework
5	Awareness of the five senses Teaching mindful eating, listening, touching, smelling, and seeing, reinforcing mindful breathing, and assigning sensory-based mindfulness homework
6	Emotional awareness Introducing mindful breathing for relaxation, practicing emotion-focused mindfulness, journaling about emotional experiences, applying the "Helpful vs. Unhelpful Inner Inspector" scenario, and assigning homework
7	Review of breathing techniques Reviewing breathing and body scan practices, practicing the "Flowing River Meditation" for thoughts, and assigning homework
8	Awareness of muscle tension Reviewing relaxation breathing and teaching progressive muscle relaxation,; playing the "Change the Channel" game, and assigning homework
9	Awareness of body movements Practicing foundational breathing, mindful body movements, and revisiting the "Helpful vs. Unhelpful Inner Inspector" scenario, and assigning homework
10	Applying mindfulness in daily life Reviewing previous practices and teaching mindfulness in everyday activities, ending with the "Loving-Kindness Meditation", and assigning final homework

Disruptive Mood Dysregulation Disorder Questionnaire

This questionnaire assesses the diagnostic criteria of DMDD among adolescents. It contains two levels of assessment. In the first level, participants rate their responses on a three-point Likert scale: 0 (not at all), 1 (sometimes), and 3 (often). The scale includes three subscales: irritability, frequent temper outbursts, and impairments caused by the disorder—each assessed with three items. The second level provides a more detailed assessment: irritability (8 items), temper outbursts (14 items), and contexts of occurrence (with peers, in the classroom, and at home). Higher scores are indicative of greater severity. The internal consistency (Cronbach's alpha) for the total scale ranged from 0.76-0.84 in the original study [31]. In Iran, Pashangian et al. [34] standardized the questionnaire and reported internal consistency coefficients of 0.85 for the overall scale, and 0.77, 0.80, and 0.74 for the respective subscales.

Clinical Interview

A semi-structured diagnostic interview based on DSM-IV criteria was used for the accurate selection of participants. The interview comprised two main sections: personal history and mental status examination.

Barratt Impulsiveness Scale (BIS-11)

The Barratt Impulsiveness Scale, 11th edition (BIS-11), developed by Barratt et al., is a widely used self-report instrument for the assessment of impulsivity. The scale demonstrates good correlation with the Eysenck Impulsivity Questionnaire, and its items capture key dimensions of hasty decision-making and lack of foresight. The BIS-11 consists of 30 items, which are rated on a four-point Likert scale ranging from 1 (never/rarely) to 4 (almost always/always). Moreover, 11items (1, 7, 8, 9, 10, 12, 13, 15, 20, 29, 30) are reverse-scored. Total scores range from 30-120, with control groups typically scoring between 50 and 60. The scale assesses three dimensions of impulsivity: cognitive/attentional impulsivity (making quick decisions), motor impulsivity (acting without thinking), and non-planning impulsivity (lack of foresight or immediate orientation). Barratt et al. reported Cronbach's alpha and test-retest reliability (after one month) of 0.87 and 0.79, respectively [35]. In Iran, Akhtari et al. translated and validated the BIS-11 among healthy individuals and opioid users, reporting construct validity and reliability of 0.75 and 0.83, which indicate acceptable psychometric properties of the Persian version. Javid et al. also reported satisfactory reliability and validity, with Cronbach's alpha coefficients of 0.80 for non-planning impulsivity, 0.67 for motor impulsivity, 0.70 for cognitive impulsivity, and 0.81 for the total scale. Test-retest reliability was 0.79 for non-planning, 0.73 for motor, 0.49 for cognitive, and 0.79 for the total scale.

Kutcher Adolescent Depression Scale

The Kutcher Adolescent Depression Scale (KADS) was developed by Kutcher based on a sample of 17,712 middle and high school students in 2002. In a study conducted on 550 Nigerian adolescents, Cronbach's alpha and split-half reliability coefficients for the total scale were reported as 0.90 and 0.87, respectively. Other studies reported an overall reliability of 0.88, with subscale internal consistency of 0.79 for depression and 0.88 for suicidal ideation [36]. In a psychometric evaluation of 300 high school students in Tehran, the scale demonstrated a reliability of 0.87 and validity of 0.58. The KADS is a self-report instrument comprising 11 items. Respondents rate each item based on the degree to which it reflects their mood states using a four-point Likert scale. Scores range from 0-3 for each item, with total scores ranging from 0-33. Higher scores indicate greater levels of depression, whereas lower scores suggest minimal or no depression (0–5: no depression, 5-15: normal, 16-21: depression, above 21: severe depression).

Data Analysis

In the descriptive phase, statistical indices, such as mean and standard deviation, were used. In the inferential phase, prior to conducting the main analysis, the statistical assumptions for repeated measures ANOVA were tested: Normality of distribution was examined using the Shapiro-Wilk test; Homogeneity of error variances was evaluated through Levene's test; Equality of covariance matrices was assessed via Box's M test; Homogeneity of regression slopes was checked through the interaction between group membership and the pre-test variable.

Following the confirmation of statistical assumptions, the main analysis was performed using repeated measures ANOVA, followed by Bonferroni post hoc tests for pairwise group comparisons. All analyses were conducted using SPSS software (version 26). The level of statistical significance was set at $P<0.05$, with a more stringent threshold of $P<0.001$ being applied for highly significant results.

Results

Demographic Characteristics

The three research groups were compared based on demographic variables, including age, parental education and occupation, and number of siblings, using the chi-square test. The results exhibited no significant differences between groups in these variables, confirming demographic equivalence.

Descriptive Statistics

Table 3 presents the means and standard deviations of included impulsivity and depression scores across the three groups during the pre-test, post-test, and follow-up phases.

Table 3. Means and standard deviations of study variables by group at three measurement points

Variable	Group	Pretest M ± SD	Posttest M ± SD	Follow-up M ± SD
Impulsivity	DBT	6.856±8.11	4.806±5.29	5.451±7.31
	ACMT	6.058±8.78	5.703±8.29	5.906±8.27
	Control	6.658±10.19	6.209±10.17	6.459±10.25
Depression	DBT	1.609±2.98	1.951±3.05	1.502±2.60
	ACMT	2.150±3.70	1.654±2.88	1.854±3.11
	Control	1.408±4.93	1.458±5.22	1.708±5.72

ACMT: Adolescent-centered mindfulness therapy, DBT: Dialectical behavior therapy

Based on the results presented in Table 3, it can be observed that the mean scores of impulsivity and depression decreased in both experimental groups at the post-test and follow-up stages. On the contrary, no notable changes were observed in these variables across the pre-test, post-test, and follow-up stages in the control group. Nevertheless, to confirm that the interventions were responsible for improvements in these variables, inferential statistical analyses were required.

Assumption Testing

To examine the assumption of homogeneity of variances, Levene's test was conducted. The results revealed that for impulsivity, the p-values and F-values were 0.279 and 1.3 at pre-test, 0.288 and 1.2 at post-test, and 0.06 and 2.95 at follow-up, respectively. For depression, the p-values and F-values were 0.053 and 3.17 at pre-test, 0.063 and 2.92 at post-test, and 0.061 and 3.03 at follow-up, respectively. These results collectively confirm that the assumption of homogeneity of variances was satisfied for both variables across all three stages.

Mauchly's test was employed to assess the sphericity of the covariance matrices across groups. The results for impulsivity were Mauchly's W=0.624, χ^2=26.44, P=0.001, and for depression, Mauchly's W=0.665, χ^2=22.85, P=0.001, indicating that the assumption of sphericity was violated for both variables.

Repeated Measures ANOVA Analysis

Therefore, in the repeated measures ANOVA, the conservative Greenhouse–Geisser correction was applied. The results of between-subjects and within-subjects comparisons for the research variables are presented in Table 4.

Table 4. Results of between-subjects and within-subjects effects on research variables

Variable	Effect	Source	Sum of Squares	df	Mean Square	F	Significance	Effect Size (η^2)	Power
Impulsivity	Between-subjects	Group	6189.478	2	3094.739	16.29	0.001	0.364	0.999
		Error	10828.85	57	189.98				
	Within-subjects	Time effect	4165.4	1.45	2866.513	119.95	0.001	0.678	1.000
		Time×Group	2516.289	2.9	865.79	36.22	0.001	0.56	1.000
		Error	1979.5	82.83	23.89				
Depression	Between-subjects	Group	440.933	2	220.467	5.27	0.008	0.156	0.816
		Error	2382.817	27	41.804				
	Within-subjects	Time effect	708.933	1.49	354.467	134.907	0.001	0.703	1.000
		Time × Group	136.696	2.99	136.69	38.96	0.001	0.578	1.000
		Error	299.533	85.38	85.38				

As illustrated in Table 4, the between-subjects analysis revealed significant differences in the mean scores of impulsivity (F=16.29, P<0.001, η^2=0.364) and depression (F=5.27, P=0.01, η^2=0.156) among the experimental groups (DBT and ACMT) and the control group. The within-subjects analyses also indicated a significant main effect of time, suggesting that there were overall significant changes in the mean scores of impulsivity (F=119.95, P<0.001, η^2=0.678) and depression (F=134.907, P<0.001, η^2=0.703) across the different stages of the study.

Furthermore, the interaction effect of time×group was significant for both impulsivity (F=36.22, P<0.001, η^2=0.56) and depression (F=38.96, P<0.001, η^2=0.578), indicating that the changes observed across the pre-test, post-test, and follow-up stages were significant within each group. The results of post-hoc tests comparing the experimental and control groups for research variables at each stage of the study are demonstrated in Table 5.

As displayed in Table 5, during the pre-test stage, significant differences were observed neither between the DBT and the ACMT groups nor between each of these groups and the control group in terms of impulsivity and depression (P>0.05). However, the results suggested that in the post-test stage, the DBT group showed significantly lower scores in impulsivity (MD=-22.4, P<0.001) and depression (MD=-6.5, P<0.001) compared to the control group. In a similar vein, at the follow-up stage, the DBT group continued to demonstrate significantly lower impulsivity (MD=-18.00, P<0.001) and depression scores (MD=-6.2, P<0.001) relative to the control group. In addition, the

ACMT group also exhibited significantly lower impulsivity (MD=-15.5, P<0.001) and depression scores (MD=-3.8, P=0.01) than the control group at the post-test stage. At the follow-up stage, the ACMT group maintained significantly lower scores in impulsivity (MD=-12.55, P<0.001) and depression (MD=-3.85, P=0.01) compared to the control group.

Furthermore, comparisons between the DBT and ACMT groups revealed significant differences in both impulsivity (MD=6.9, P=0.01) and depression (MD=2.7, P=0.05) at the post-test stage, as well as in impulsivity (MD=5.45, P=0.05) and depression (MD=2.35, P=0.05) at the follow-up stage, demonstrating that DBT was more effective than ACMT in the mitigation of these variables.

Table 5. Bonferroni Post Hoc comparison of variable scores

Variable	Stage	Groups Compared	Mean Difference (MD)	Standard Error (SE)	Significance (p)
Impulsivity	Pre-test	DBT vs Control	-1.8	2.86	0.533
		ACMT vs Control	-0.6	2.86	0.835
		DBT vs ACMT	1.2	2.86	0.628
	Post-test	DBT vs Control	-22.4	2.58	<0.001
		ACMT vs Control	-15.5	2.58	<0.001
		DBT vs ACMT	6.9	2.58	0.01
	Follow-up	DBT vs Control	-18.0	2.75	<0.001
		ACMT vs Control	-12.55	2.75	<0.001
		DBT vs ACMT	5.45	2.75	0.04
Depression	Pre-test	DBT vs Control	1.2	1.25	0.342
		ACMT vs Control	1.75	1.25	0.167
		DBT vs ACMT	0.55	1.25	0.662
	Post-test	DBT vs Control	-6.5	1.22	<0.001
		ACMT vs Control	-3.8	1.22	0.003
		DBT vs ACMT	2.7	1.22	0.02
	Follow-up	DBT vs Control	-6.2	1.28	<0.001
		ACMT vs Control	-3.85	1.28	0.004
		DBT vs ACMT	2.35	1.28	0.042

ACMT: Adolescent-centered mindfulness therapy
DBT: Dialectical behavior therapy

Discussion

The present study sought to assess and compare the effectiveness of DBT and ACMT in the reduction of impulsivity and depression among adolescents exhibiting the symptoms of DMDD. The results pinpointed that both interventions—DBT and ACMT—were effective in the reduction of impulsivity and depressive symptoms. Nonetheless, when comparing the two interventions, DBT demonstrated greater effectiveness at both post-test and follow-up stages.

These findings are consistent with those reported in previous research, suggesting the effectiveness of DBT in the mitigation of impulsivity among adolescents [19-22]. The observed effects can be explained by the fact that DBT is an evidence-based therapeutic approach specifically designed for individuals with severe emotional fluctuations and impulsive behaviors. This approach focuses on four core components—mindfulness, emotional regulation, interpersonal effectiveness, and distress tolerance—to strengthen patients' emotional and social functioning [32]. One of the key techniques in DBT is mindfulness, which helps individuals attend to moment-to-moment experiences and respond constructively and non-critically to their emotions. This technique teaches adolescents to adopt adaptive strategies rather than impulsive responses when faced with intense emotions or stressful stimuli [30]. The findings of the present research are in line with the results of previous studies, which highlighted the effectiveness of adolescent-centered mindfulness

training in reducing impulsivity among adolescents [23-28]. These outcomes can be explained by the role of mindfulness as a validated therapeutic technique that produces significant positive effects, particularly in managing psychological issues among adolescents. Adolescents exhibiting DMDD symptoms often struggle with poor anger control, impulsivity, and antisocial behaviors, which negatively affect both their personal functioning and social/familial relationships. Engagement in mindfulness exercises enables these adolescents to develop greater awareness and regulation of their emotions, thereby gaining better control over impulsive behaviors and negative thoughts.

In explaining the greater effectiveness of DBT compared to ADCT in the reduction of impulsivity, it can be noted that DBT, which is specifically designed to treat emotional and behavioral disorders, emphasizes balancing acceptance and helps adolescents strengthen their social, emotional, and cognitive skills. This therapy includes four key components: self-awareness skills, emotion regulation skills, effective interpersonal communication skills, and distress tolerance skills. On the contrary, ADCT primarily focuses on helping adolescents increase awareness of their emotions and cultivate present-moment thinking. This approach typically involves breathing exercises and meditation practices to reduce stress and enhance positive affect. While this method assists adolescents in recognizing and managing emotions, it may not be sufficient on its own to address deeper behavioral challenges. These findings suggest that combining different approaches, or selecting a method that incorporates practical skills training and cognitive strategies, may yield better outcomes compared to the mere use of a single therapeutic approach. This is particularly relevant for adolescents exhibiting symptoms of DMDD, who require comprehensive and specialized interventions.

In other words, DBT is particularly effective for these adolescents as it provides specific strategies for behavior change and emotion management, whereas ACMT and emotion-focused therapy offer fewer structured approaches for behavioral and emotional change. Therefore, the advantages of DBT in providing clear strategies for reducing impulsive behaviors justify its superiority over the other two approaches.

The present findings are consistent with previous research, which demonstrated the effectiveness of DBT in reducing depressive symptoms [21]. The obtained results can be explained on the grounds that this disorder, which is often accompanied by severe mood fluctuations and unstable behaviors, requires approaches that specifically target emotion regulation and interpersonal skills. The DBT, by providing a structured therapeutic framework, helps adolescents acquire such skills as emotion regulation, stress tolerance, and interpersonal effectiveness, ultimately leading to a reduction in depressive symptoms and improvement in their quality of life. One of the core techniques of DBT is behavioral skills training, which includes assertiveness, problem-solving, and anger management skills. These skills enable adolescents to cope more effectively with unpleasant emotions and refrain from destructive behaviors. Furthermore, mindfulness exercises within DBT not only enhance self-awareness and acceptance of emotions but also teach adolescents to live in the present moment and reduce everyday stress.

Mindfulness, as a contemporary therapeutic approach, has gained considerable attention in recent years, particularly in the field of adolescent mental health. The ACMT, as a psychological intervention, can effectively reduce depressive symptoms and mood dysregulation in adolescents. Research has evidenced that mindfulness practices improve emotion regulation and reduce psychological stress. This approach helps adolescents develop greater self-awareness of their emotions and thoughts, thereby enhancing their ability to manage stress and regulate their mood. Adolescent depression, especially among those exhibiting the symptoms of DMDD, has become a significant concern. DMDD is characterized by unstable patterns and unpredictable mood changes, which can lead to depressive episodes [10]. Effective mindfulness techniques include breathing exercises, meditation, and present-moment focus, which can teach adolescents to control emotions, reduce stress, and consequently improve depressive symptoms.

Conclusion

The findings of the present study demonstrate that both Dialectical Behavior Therapy and Adolescent-Centered Mindfulness Therapy are effective in reducing impulsivity and depressive symptoms among adolescents exhibiting features of disruptive mood dysregulation disorder. However, the superior and more stable improvements observed in the DBT group across both post-test and follow-up assessments indicate that DBT provides a more robust therapeutic framework for addressing emotional dysregulation and associated behavioral difficulties in this population. Given the chronic and impairing nature of DMDD, these results underscore the necessity of implementing structured, skill-based interventions that target emotion regulation, distress tolerance, and interpersonal functioning.

Despite the strengths of the study, the findings should be interpreted in light of certain limitations,

including the reliance on self-report measures, the limited sample size, and the absence of long-term follow-up beyond two months. Future research would benefit from incorporating larger and more diverse samples as well as extended follow-up periods to examine the durability of treatment effects. Overall, this study contributes to the growing evidence base supporting structured psychosocial interventions for DMDD and highlights DBT as a particularly promising approach for improving psychological functioning in affected adolescents.

Ethical Considerations

The present study was approved by the Ethics Committee of Islamic Azad University, Isfahan Branch, Isfahan, Iran, with the code of IR.IAU.NAJAFABAD.REC.1402.373. Moreover, written informed consent was obtained from all participants.

Data Availability Statement

The original contributions presented in the study are included in the article/supplementary material. Further inquiries can be directed to the corresponding author.

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Authors' Contributions

P. Gh., M. BI., and H. T. contributed to the study conception and design, material preparation, data collection, and analysis.

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Conflicts of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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