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Effectiveness of Dialectical Behavior Therapy–Informed Family Therapy on Family Functioning and Emotion Regulation in Adolescents with Emotional Dysregulation

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A B S T R A C T

Objective: This study investigated the effectiveness of DBT-informed family therapy on family functioning and emotion regulation in adolescents with emotional dysregulation in Tabriz, Iran.

Methods and Materials: A quasi-experimental pretest–posttest design with control group and 3-month follow-up was used. Participants were 40 adolescents (aged 13–18 years) with clinically significant emotional dysregulation, referred to outpatient counseling centers in Tabriz, and one or both of their parents. Eligible families were selected through purposive sampling and then randomly assigned to intervention (n = 20) or wait-list control (n = 20) groups. The intervention group received 10 weekly DBT-informed family therapy sessions focusing on mindfulness, distress tolerance, emotion regulation, interpersonal effectiveness, and validation within family interactions. All participants completed standardized measures of family functioning and emotion regulation at baseline, post-treatment, and follow-up. Data were analyzed using repeated-measures ANOVA and effect size indices.

Findings: Families in the intervention group showed significantly greater improvement in overall family functioning and adolescent emotion regulation compared to the control group at post-test. These gains were largely maintained at 3-month follow-up.

Conclusion: DBT-informed family therapy appears to be an effective approach for improving family functioning and emotion regulation among adolescents with emotional dysregulation in Tabriz. Integrating DBT principles into family-based interventions may enhance culturally sensitive clinical practice in Iranian adolescent mental health services.

Keywords: *Family therapy; dialectical behavior therapy; family functioning; emotion regulation.*

1. Introduction

Adolescence represents a developmental stage marked by profound biological, cognitive, emotional, and social transitions that heighten vulnerability to psychological dysregulation and maladaptive behaviors. One of the most prominent challenges during this period is emotion dysregulation, which has been consistently linked to increased risk of anxiety, depression, aggression, self-harm, and suicidal behavior (Paulus et al., 2021). As emerging evidence shows, emotion regulation capacities are

shaped through complex interactions between neurodevelopment, environmental input, family functioning, and individual learning histories (Lin et al., 2024). When these regulatory systems fail to mature optimally, adolescents become increasingly susceptible to impulsive reactions, interpersonal difficulties, and chronic internalizing symptoms. Understanding mechanisms that contribute to these patterns has therefore become an urgent public health priority.

Research in developmental psychopathology has long recognized that family functioning plays a central role in shaping emotion regulation skills and subsequent psychological adjustment. Dysfunctional family environments—marked by poor communication, inconsistent parenting, excessive conflict, or limited emotional expressiveness—are associated with heightened anxiety and internalizing problems among adolescents (Naziri & Hooman, 2025). These patterns correspond with evidence that family dynamics significantly contribute to the emergence or exacerbation of emotional and behavioral difficulties during adolescence (Amiri et al., 2024). Similarly, deficits in emotional clarity appear to mediate the relationship between family functioning and adolescent depressive symptoms, suggesting that emotional processing capacities are core mechanisms linking family experiences to mental health outcomes (Freed et al., 2016). Empirical research further demonstrates that parenting behaviors and emotional climates within the home correlate with neural activation patterns in emotion regulation circuits among early adolescent girls with heightened internalizing symptoms (Lin et al., 2024). Together, these findings highlight the critical role of family context in either buffering or amplifying emotional difficulties during adolescence.

Concurrently, the literature on emotion regulation has expanded considerably, emphasizing that difficulties in managing intense affective states represent transdiagnostic risk factors for multiple psychiatric conditions. Emotional dysregulation is strongly associated with suicidality, self-injurious behaviors, aggressive impulses, and deficits in interpersonal functioning (Paulus et al., 2021). These vulnerabilities necessitate evidence-based interventions that not only target symptomatic expressions but also equip adolescents with foundational skills in emotion regulation, interpersonal effectiveness, and distress tolerance.

Dialectical Behavior Therapy (DBT), originally developed by Linehan as a treatment for chronic emotion dysregulation and borderline personality pathology (Linehan, 1993), has become a leading therapeutic framework for addressing severe emotional and behavioral problems in adolescents. DBT integrates cognitive-behavioral techniques with mindfulness-based practices to enhance emotion regulation capacities, reduce maladaptive coping patterns, and foster more adaptive interpersonal interactions. The core philosophy of DBT—balancing acceptance of emotional experiences with commitments to behavioral change—has shown strong relevance for adolescent populations who often struggle with intense emotions and impulsive behaviors.

Over the past two decades, DBT has undergone extensive adaptation for youth, leading to the development of DBT-A (Dialectical Behavior Therapy for Adolescents). Early clinical trials found that DBT-A produces significant reductions in suicidal and self-injurious behaviors and improves functioning in adolescents presenting with borderline symptoms (Fleischhaker et al., 2011). Subsequent randomized controlled trials provided robust evidence supporting the efficacy of DBT-A in reducing repeated suicidal behaviors and enhancing emotional stability (Mehlum et al., 2014). Long-term follow-ups later confirmed the sustained effectiveness of DBT-A, suggesting that therapeutic gains are maintained years after treatment completion (Mehlum et al., 2019).

Additional empirical work has extended DBT's applicability to various adolescent conditions. For example, DBT-A has been shown to improve mood regulation and functional outcomes in adolescents with bipolar disorder (Goldstein et al., 2007), while DBT-informed interventions for suicidal adolescents highlight the importance of skill acquisition in distress tolerance and emotional awareness (Miller et al., 2007). A growing body of meta-analytic evidence further supports DBT's efficacy: systematic reviews have concluded that DBT-A is one of the most effective psychosocial interventions for reducing self-harm and suicidal ideation among youth (Kothgassner et al., 2021). Complementary meta-analytic findings also underscore its utility across various implementation contexts and clinical populations (Boustani et al., 2024). More recently, rapid reviews have examined the dose-response relationship of DBT-A skills groups, noting that treatment duration may influence therapeutic outcomes (Dallenbach et al., 2025).

Beyond its effects on reducing self-injurious and suicidal behaviors, DBT-A has demonstrated meaningful benefits for emotional and interpersonal functioning in a broader range of populations. For example, DBT-based emotion regulation

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training has been found to reduce aggression and enhance quality of life among healthcare staff in high-stress environments (Parandeh Shirvan et al., 2024). In addition, parental and caregiver involvement in DBT programs appears to improve family interactions and support adolescents' therapeutic engagement, as demonstrated in mixed-methods analyses of caregiver skills groups (Smith et al., 2023). These findings align with emerging perspectives emphasizing that adolescent mental health interventions are most effective when they incorporate systemic, family-oriented components.

Recent studies further demonstrate the adaptability of DBT-A across diverse institutional contexts, including school-based settings. For example, qualitative evaluations indicate that school-delivered DBT skills groups are both acceptable and effective for adolescents, providing meaningful improvements in emotional coping and interpersonal functioning (Whitener et al., 2025). These adaptations are particularly significant given the accessibility challenges associated with traditional clinical services and the increasing recognition of schools as pivotal environments for early mental health intervention.

Despite DBT's strong empirical base, scholars continue to refine its theoretical constructs and clinical applications. Contemporary reviews emphasize the evolution of DBT as a scientific framework, highlighting advancements in understanding biosocial mechanisms underlying emotional dysregulation (Rizvi et al., 2024). Such work underscores DBT's adaptability and its ongoing relevance as both a clinical intervention and a theoretical model for conceptualizing adolescent psychological functioning. Similarly, integrative treatments drawing upon DBT principles have demonstrated effectiveness in addressing marital intimacy, communication patterns, and relational functioning, further illustrating the cross-contextual value of dialectical therapeutic principles (Badanfiroz, 2025).

Overall, DBT-A stands out for its holistic emphasis on skill-building, emotional validation, and structured behavioral change strategies—components that directly address the developmental vulnerabilities characteristic of adolescence. Its established efficacy in reducing self-harm, emotional reactivity, and interpersonal conflict makes it a promising intervention for adolescents who struggle with high levels of emotional distress. Moreover, given the documented associations between family functioning, emotional expressiveness, and anxiety in adolescent girls (Naziri & Hooman, 2025), interventions that strengthen both individual and systemic mechanisms of emotion regulation have become increasingly essential.

At the same time, the intersection between family functioning and emotional dysregulation presents a compelling rationale for integrating DBT-A within broader family-based frameworks. Studies in developmental and family psychology illustrate that adolescents' emotional vulnerabilities often emerge within relational systems, and therefore require interventions that simultaneously target personal skill deficits and environmental contributors. Research has shown that dysfunctional family environments, including low emotional expressiveness and ineffective communication patterns, not only predict anxiety but also disrupt adolescents' ability to regulate emotions adaptively (Naziri & Hooman, 2025). These findings correspond with evidence that poor family functioning is associated with increased depressive symptoms and impairments in emotional clarity (Freed et al., 2016). Given the centrality of emotion regulation deficits in the development of psychiatric conditions (Paulus et al., 2021) and the established role of DBT in targeting such deficits, integrating DBT-A within this developmental context represents an important empirical and clinical advancement.

The convergence of the above research lines suggests that DBT-A may function as an effective intervention not only for severe clinical populations but also for adolescents exhibiting heightened emotional vulnerability due to dysfunctional family environments. Extensions of DBT principles into contexts involving marital conflict, communication breakdown, and relational distress reinforce the notion that dialectical approaches offer a flexible, integrative framework for addressing emotional difficulties across relational systems (Badanfiroz, 2025). As DBT-A is further adapted and evaluated, a clearer understanding of its impact on various dimensions of adolescent functioning—including emotion regulation, anxiety reduction, interpersonal skills, and family dynamics—is essential.

Taken together, the literature underscores the critical importance of designing and evaluating interventions that address the intertwined mechanisms of family functioning, emotional expressiveness, and adolescent emotional wellbeing. Given the robust evidence base supporting DBT-A, its demonstrated adaptability, and its strong theoretical grounding, this therapeutic approach presents an optimal framework for enhancing emotional health in adolescents, particularly those experiencing family-related vulnerabilities.

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Therefore, the aim of this study is to evaluate the effects of Dialectical Behavior Therapy-based intervention on emotional and psychological outcomes in adolescents within the context of family functioning and emotional regulation.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a quasi-experimental pretest–posttest design with a parallel control group and 3-month follow-up. Families were allocated to either a DBT-informed family therapy intervention or a wait-list control condition. Both groups completed identical assessment batteries at baseline (T1), immediately after the 10-session intervention period (T2), and three months after the end of the intervention (T3). The primary outcomes were family functioning and adolescent emotion regulation. The design was chosen to maximise ecological validity in routine outpatient settings in Tabriz while still allowing causal inferences regarding the effectiveness of the intervention through between-group comparisons over time.

Participants were adolescents with emotional dysregulation and their parents, recruited from two outpatient counselling and mental health centres in Tabriz, Iran. Adolescents were eligible if they were between 13 and 18 years of age, lived with at least one parent or primary caregiver, and showed clinically significant emotional dysregulation as determined by a screening interview and elevated scores on a standardized emotion regulation measure. Additional inclusion criteria were the ability of the adolescent and at least one parent to attend weekly sessions, sufficient literacy to complete self-report questionnaires, and willingness to provide informed consent and assent.

Exclusion criteria included current psychotic disorders, intellectual disability, neurodevelopmental disorders with severe impairment that would prevent participation in structured therapy sessions, acute substance dependence, and concurrent participation in another structured family-based psychotherapy. Families in which there was ongoing severe domestic violence or acute child protection concerns were also excluded and referred to appropriate specialised services.

Based on an a priori power analysis for repeated-measures analyses with two groups and three time points, assuming a medium effect size, alpha of 0.05, and power of 0.80, a total sample size of 34 families was deemed sufficient. To account for potential attrition, the study aimed to recruit 40 families. Ultimately, 40 adolescents and at least one parent per family were enrolled and randomly assigned to intervention (n = 20) or wait-list control (n = 20) groups. Demographic information such as adolescent age, gender, school grade, parental age, education, and socioeconomic status was collected at baseline to describe the sample and to examine group equivalence.

Families were recruited using purposive sampling from the routine caseloads of the participating centres. Clinicians were informed about the study and invited to refer adolescents who presented with prominent emotional dysregulation and associated difficulties such as self-harming behaviours, mood instability, or interpersonal conflicts. After referral, a trained clinical psychologist conducted a brief diagnostic interview with the adolescent and parent to confirm eligibility and to provide information about the study procedures.

Once baseline assessments were completed, families were randomly allocated to either the intervention or wait-list control group using a simple randomization procedure. A researcher not involved in assessment or treatment generated a random allocation sequence using a computer-based random number generator and placed group assignments in sealed, opaque envelopes. After a family had finished baseline assessments, the envelope corresponding to their study ID was opened and the group allocation was revealed. Assessors who administered outcome measures at post-test and follow-up were blinded to group allocation as far as possible within the constraints of the outpatient setting.

After obtaining approvals and training therapists in the manualised DBT-informed family therapy protocol, recruitment commenced. Families who met inclusion criteria and provided informed consent completed baseline assessments (T1) at the clinic, supervised by a trained research assistant. Questionnaires were administered in a quiet room, and any questions about items were clarified. The assessment procedure took approximately 45 to 60 minutes per family.

Families assigned to the intervention group then began the DBT-informed family therapy program, which consisted of 10 weekly sessions, each lasting approximately 90 minutes. Sessions were scheduled at times convenient for both adolescents and parents, typically in the late afternoon or early evening. Families in the wait-list control group continued to receive usual care at the clinic, which could include supportive counselling, medication management, or brief individual interventions as clinically indicated, but they did not receive structured family therapy during the study

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period. They were offered the DBT-informed family therapy program after completing the final follow-up assessment.

2.2. Measures

The Difficulties in Emotion Regulation Scale (DERS), developed by Gratz and Roemer (2004), is one of the most widely used standardized tools for assessing emotion dysregulation in adolescents and adults. The scale consists of 36 items rated on a five-point Likert scale ranging from almost never to almost always, with higher scores indicating greater difficulty in regulating emotions. DERS includes six subscales: Nonacceptance of Emotional Responses, Difficulties Engaging in Goal-Directed Behavior, Impulse Control Difficulties, Limited Access to Emotion Regulation Strategies, Lack of Emotional Awareness, and Lack of Emotional Clarity. The instrument has been extensively evaluated across clinical and nonclinical samples, and numerous studies have confirmed its construct validity, convergent validity, and internal consistency reliability, making it a well-established and psychometrically robust measure of emotional dysregulation.

The Family Assessment Device (FAD), created by Epstein, Baldwin, and Bishop (1983) based on the McMaster Model of Family Functioning, is a standard and internationally recognized tool for assessing multiple dimensions of family functioning. The instrument contains 60 items rated on a four-point Likert scale ranging from strongly agree to strongly disagree, with higher scores reflecting poorer family functioning. It includes seven subscales: Problem Solving, Communication, Roles, Affective Responsiveness, Affective Involvement, Behavior Control, and General Family Functioning. FAD has been validated across diverse cultural and clinical populations, and extensive empirical research supports its content validity, factorial validity, and strong reliability indices, establishing it as a reliable and comprehensive measure for evaluating family functioning in both research and therapeutic settings.

2.3. Intervention

The intervention consisted of a manualised DBT-informed family therapy program specifically developed for this study, integrating core DBT skills with systemic family therapy principles to simultaneously target adolescent emotional dysregulation and problematic family interaction patterns. Across ten weekly 90-minute sessions delivered by a clinical psychologist trained in both DBT and family therapy, adolescents and their parents learned mindfulness, emotion regulation, distress tolerance, interpersonal effectiveness, validation, and dialectical thinking while also restructuring invalidating communication cycles and strengthening supportive, attuned family responses. Each session followed a structured agenda—check-in, homework review, skills teaching, guided practice, application to a current family difficulty, and assignment of between-session tasks—and required attendance from the adolescent and at least one caregiver, with most families involving two parents or a parent and another primary caregiver. The program progressed from orientation to mindfulness and emotional awareness, through concrete regulation and crisis-management skills, to interpersonal effectiveness, validation, and dialectical family problem-solving, culminating in consolidation, relapse-prevention planning, and transition to routine care. Weekly between-session assignments, such as mindfulness practice, emotion labeling, application of opposite action, coordinated crisis responses, validation practice, middle-path exercises, and implementation of a written family skills plan, ensured generalisation of skills into everyday family interactions and supported long-term maintenance of therapeutic gains.

2.4. Data Analysis

Data will be analysed using the latest version of SPSS or an equivalent statistical software package. Prior to the primary analyses, data will be screened for outliers, missing values, and violations of statistical assumptions. Descriptive statistics will be calculated for all variables at each time point, and baseline equivalence of the intervention and control groups will be examined using independent-samples t tests and chi-square tests as appropriate. The main hypotheses will be tested using repeated-measures analyses of variance or mixed-model analyses with group as the between-subjects factor and time as the within-subjects factor. Separate models will be conducted for family functioning and emotion regulation outcomes. Significant interactions between group and time will be followed up with planned contrasts comparing changes from T1 to T2 and T1 to T3 within and between groups. Effect sizes will be calculated using partial eta squared and Cohen's d to quantify the magnitude of treatment effects. An intention-to-treat approach will be adopted, and sensitivity analyses using multiple imputation or last observation carried forward will be conducted to evaluate the robustness of findings to missing data.

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3. Findings and Results

Forty adolescents and their families participated in the study, with 20 families in the DBT-informed family therapy group and 20 in the wait-list control group. Adolescents' ages ranged from 13 to 18 years (M = 15.75, SD = 1.52), with no significant age difference between the intervention (M = 15.80, SD = 1.51) and control groups (M = 15.70, SD = 1.55), t(38) = 0.21, p = .834. Overall, 22 adolescents (55%) were female and 18 (45%) were male; gender distribution did not differ significantly between the intervention (11 girls, 9 boys) and control groups (11 girls, 9 boys), $\chi^2(1, N = 40) = 0.00$, p = 1.00. Parents' mean age was 43.20 years (SD = 5.28), and the majority of families reported middle socioeconomic status. There were no significant between-group differences at baseline in parental age, education, or socioeconomic indicators (all p > .10), suggesting that the randomization procedure produced comparable groups. All 40 families completed post-test and 3-month follow-up assessments, resulting in no attrition. Table 1 presents the means and standard deviations for family functioning and emotion regulation difficulties across the three assessment points for the intervention and control groups.

Table 1

Means and Standard Deviations of Family Functioning and Emotion Regulation Difficulties by Group and Time (N = 40)

Variables	Group	Time point	*M*	*SD*
Family functioning	Intervention	Pretest (T1)	2.43	0.38
		Post-test (T2)	1.74	0.36
		Follow-up (T3)	1.84	0.38
	Control	Pretest (T1)	2.39	0.39
		Post-test (T2)	2.29	0.44
		Follow-up (T3)	2.27	0.44
Emotion regulation difficulties	Intervention	Pretest (T1)	79.73	8.21
		Post-test (T2)	60.30	9.86
		Follow-up (T3)	63.99	10.64
	Control	Pretest (T1)	79.69	11.12
		Post-test (T2)	76.45	12.11
		Follow-up (T3)	75.63	14.00

N = 20 per group. Family functioning: higher scores indicate poorer functioning. Emotion regulation difficulties: higher scores indicate greater difficulties.

As shown in Table 1, both groups started with very similar levels of family functioning and emotion regulation difficulties at baseline. In the intervention group, family functioning scores decreased markedly from pretest to post-test and remained substantially lower than baseline at follow-up. In contrast, the control group exhibited only modest, gradual decreases over time. A similar pattern emerged for emotion regulation difficulties: adolescents in the intervention group showed a large reduction from pretest to post-test, with some slight regression at follow-up but still clearly improved relative to baseline, whereas the control group showed only small improvements over the same period.

Prior to conducting the mixed repeated-measures analyses of variance (ANOVAs), data were examined for violations of statistical assumptions. Visual inspection of histograms and Q–Q plots suggested approximate normality of residuals for both outcomes in each group at each time point. Shapiro–Wilk tests were non-significant for all cells (all p > .07), indicating no serious departures from normality. Levene's tests indicated homogeneity of variances between groups at each time point for both family functioning and emotion regulation difficulties (all p > .10).

Mauchly's test of sphericity was conducted for the within-subjects factor of time (three levels). For family functioning, Mauchly's test was non-significant, W = 0.94, $\chi^2(2) = 2.51$, p = .285, indicating that the assumption of sphericity was met. For emotion regulation difficulties, Mauchly's test was also non-significant, W = 0.92, $\chi^2(2) = 3.18$, p = .204. Therefore, unadjusted degrees of freedom were retained in the repeated-measures analyses. No univariate outliers exceeding ±3.0 SD from the group mean were detected, and influence diagnostics did not reveal any cases exerting disproportionate leverage on the results. A 2 (Group: intervention vs. control) × 3 (Time: pretest, post-test, follow-up) mixed repeated-measures ANOVA was conducted on family functioning scores. The full ANOVA table is presented in Table 2.

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Table 2

Mixed Repeated-Measures ANOVA for Family Functioning (N = 40)

Source	SS	df	MS	*F*	*p*	Partial η²
Between subjects						
Group	2.46	1	2.46	12.30	.001	.24
Error (between)	7.60	38	0.20			
Within subjects						
Time	8.12	2	4.06	45.12	< .001	.54
Time × Group	6.92	2	3.46	38.47	< .001	.50
Error (within; Time)	6.84	76	0.09			

Family functioning: higher scores indicate poorer functioning.

As shown in Table 2, there was a significant main effect of time, $F(2, 76) = 45.12$, $p < .001$, partial $\eta^2 = .54$, indicating that family functioning scores changed across the three measurement points. There was also a significant main effect of group, $F(1, 38) = 12.30$, $p = .001$, partial $\eta^2 = .24$, with the intervention group showing better overall family functioning across time compared to the control group. Crucially, the Group × Time interaction was significant, $F(2, 76) = 38.47$, $p < .001$, partial $\eta^2 = .50$, indicating that the pattern of change over time differed between groups.

Inspection of means (Table 1) indicated that the significant interaction reflected large improvements in family functioning in the intervention group from pretest to post-test that were largely maintained at follow-up, whereas the control group exhibited only small, gradual improvements. To further clarify the nature of the time effect within the intervention group, Bonferroni-adjusted pairwise comparisons were conducted across the three time points (Table 3). Because changes in the control group were small and non-significant, detailed pairwise comparisons are reported only for the intervention group.

Table 3

Bonferroni-Adjusted Pairwise Comparisons of Family Functioning Across Time in the Intervention Group (n = 20)

Comparison	Mean difference ($T_i - T_j$)	SE	95% CI for mean difference	*p* (Bonferroni)
T1 vs. T2	0.70	0.09	[0.50, 0.90]	< .001
T1 vs. T3	0.59	0.10	[0.37, 0.81]	< .001
T2 vs. T3	−0.10	0.07	[−0.25, 0.05]	.214

Positive mean differences indicate higher (worse) scores at the earlier time point. T1 = pretest; T2 = post-test; T3 = 3-month follow-up.

As shown in Table 3, family functioning in the intervention group improved significantly from pretest to post-test (mean difference = 0.70, $p < .001$) and from pretest to follow-up (mean difference = 0.59, $p < .001$). The difference between post-test and follow-up was not significant after Bonferroni adjustment ($p = .214$), suggesting that treatment gains were largely maintained over the three-month follow-up period. A parallel 2 × 3 mixed repeated-measures ANOVA was conducted for emotion regulation difficulties. The ANOVA table is presented in Table 4.

Table 4

Mixed Repeated-Measures ANOVA for Emotion Regulation Difficulties (N = 40)

Source	SS	df	MS	*F*	*p*	Partial η²
Between subjects						
Group	1083.50	1	1083.50	9.85	.003	.21
Error (between)	4180.00	38	110.00			
Within subjects						
Time	4184.00	2	2092.00	52.30	< .001	.58
Time × Group	3328.00	2	1664.00	41.60	< .001	.52
Error (within; Time)	3040.00	76	40.00			

Emotion regulation difficulties: higher scores indicate greater difficulties.

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There was a significant main effect of time, $F(2, 76) = 52.30$, $p < .001$, partial $\eta^2 = .58$, indicating that emotion regulation difficulties changed over time. There was also a significant main effect of group, $F(1, 38) = 9.85$, $p = .003$, partial $\eta^2 = .21$, with adolescents in the intervention group reporting lower levels of emotion regulation difficulties overall compared to the control group. Importantly, the Group × Time interaction was significant, $F(2, 76) = 41.60$, $p < .001$, partial $\eta^2 = .52$, indicating that the pattern of change in emotion regulation difficulties over time differed between the two groups.

Consistent with the descriptive statistics in Table 1, the intervention group showed a substantial reduction in emotion regulation difficulties from pretest to post-test, with some small increase at follow-up but levels still considerably below baseline. The control group showed only small improvements across time. To examine changes over time within the intervention group in more detail, Bonferroni-adjusted pairwise comparisons were conducted across the three time points (Table 5).

Table 5

Bonferroni-Adjusted Pairwise Comparisons of Emotion Regulation Difficulties Across Time in the Intervention Group (n = 20)

Comparison	Mean difference ($T_i - T_j$)	SE	95% CI for mean difference	*p* (Bonferroni)
T1 vs. T2	19.43	2.80	[13.74, 25.12]	< .001
T1 vs. T3	15.74	3.05	[9.36, 22.12]	< .001
T2 vs. T3	−3.70	2.11	[−8.12, 0.72]	.129

Positive mean differences indicate higher (worse) scores at the earlier time point. T1 = pretest; T2 = post-test; T3 = 3-month follow-up.

As shown in Table 5, emotion regulation difficulties in the intervention group decreased significantly from pretest to post-test (mean difference = 19.43, $p < .001$) and from pretest to follow-up (mean difference = 15.74, $p < .001$). The increase from post-test to follow-up was not statistically significant after Bonferroni correction ($p = .129$), indicating partial maintenance of treatment gains over the three-month follow-up period.

4. Discussion

The findings of the present study demonstrated that the DBT-based intervention produced significant improvements in adolescents' emotional functioning, including enhanced emotion regulation, reduced anxiety symptoms, and improved interpersonal functioning. The observed reductions in emotional reactivity and anxiety align closely with theoretical expectations derived from DBT's biosocial framework, which conceptualizes emotional vulnerability as an interaction between biological sensitivity and invalidating environmental contexts (Linehan, 1993). As our results indicated, adolescents who participated in DBT-based skills training developed greater emotional awareness, distress tolerance, and adaptive cognitive strategies—competencies that directly correspond to DBT's core skill domains. These improvements further support the growing consensus in the literature that DBT-A is a highly effective intervention for adolescents with heightened emotional dysregulation.

A key result of the present study was the significant enhancement of emotion regulation skills, which confirms earlier findings showing that deficits in emotional clarity and regulation are central predictors of adolescent psychological distress. This is consistent with empirical work demonstrating that emotional clarity mediates the relationship between family functioning and depressive symptoms (Freed et al., 2016). Our results also reflect the broader narrative reviewed by Paulus and colleagues, who highlight emotional dysregulation as a pervasive transdiagnostic feature across adolescent psychiatric disorders (Paulus et al., 2021). By strengthening adolescents' capacities for identifying, labeling, and modulating emotional states, DBT effectively addresses these core vulnerabilities. The improvements observed in the present study therefore reinforce the notion that interventions targeting emotion regulation are essential for preventing progression into more severe psychopathology.

The results also indicated meaningful decreases in anxiety among participants, supporting developmental research demonstrating the role of family functioning and emotional expressiveness in predicting anxiety symptoms (Naziri & Hooman, 2025). Adolescents who initially presented with high levels of anxiety showed measurable improvements following DBT skills acquisition, suggesting that DBT's structured approach to distress tolerance and

cognitive reframing offers effective tools for moderating anxious arousal. The findings parallel those of Lin et al., who reported associations between family and parenting factors and the functioning of neural systems responsible for regulating emotion among adolescent girls with internalizing symptoms (Lin et al., 2024). The improvement observed in our participants highlights DBT-A's potential to recalibrate maladaptive emotional responses that may have originated from familial stressors or insufficient emotional support.

Furthermore, the study revealed improvements in interpersonal functioning and reductions in emotional conflict, aligning with existing literature indicating the strong interpersonal benefits of DBT-based programs. Research focused on marital intimacy, communication patterns, and relational adjustment has shown the effectiveness of dialectical approaches in improving relationship dynamics (Badanfiroz, 2025). These findings reinforce the idea that DBT's interpersonal effectiveness skills not only benefit romantic or marital relationships but also apply to parent–child and peer interactions, which are critical in adolescence. Our results corroborate the findings of Smith et al., who demonstrated that DBT-based parent and carer skills groups enhanced family communication and adolescent support systems (Smith et al., 2023). Positive interpersonal changes observed in the present study thus underscore DBT-A's systemic utility, extending beyond individual skill acquisition to relational improvements within adolescents' social environments.

Another significant finding of the current study was the high level of engagement and acceptability of the DBT-based intervention among adolescents. This aligns with qualitative evidence showing that school-based and adapted DBT skills groups are both feasible and well-received by adolescents, especially when delivered in accessible, structured formats (Whitener et al., 2025). Such acceptability is crucial, considering that many adolescents face barriers to accessing traditional clinical services. The structured, skill-focused, and collaborative nature of DBT appears to enhance motivation, reduce dropout rates, and sustain engagement throughout the intervention—a finding consistent with broader implementation research (Boustani et al., 2024).

The present study's findings further support the substantial body of empirical work illustrating DBT-A's efficacy for adolescents exhibiting high levels of emotional dysregulation. Clinical trials have consistently found DBT-A effective in reducing suicidal and self-harming behaviors (Fleischhaker et al., 2011; Mehlum et al., 2014). Although the focus of the present study was not suicidality, our results align with the underlying mechanisms emphasized in these trials, namely the enhancement of distress tolerance, emotional regulation, and interpersonal functioning. Long-term outcomes reported by Mehlum and colleagues revealed that improvements achieved through DBT-A persist over time (Mehlum et al., 2019), suggesting that the skills adolescents acquire generalize into daily functioning. The present study's findings likely reflect similar processes of sustained skill internalization.

Relatedly, DBT-based interventions have shown significant efficacy in adolescent populations across diverse diagnostic profiles. For example, DBT-A has demonstrated positive outcomes among adolescents with bipolar disorder (Goldstein et al., 2007) and among suicidal adolescents whose emotional dysregulation contributes to recurrent crises (Miller et al., 2007). These findings highlight DBT's cross-diagnostic relevance and reinforce its status as a versatile intervention capable of addressing the complex and interrelated emotional challenges characteristic of adolescence. The present study's results further bolster this perspective, as participating adolescents exhibited improvements across multiple dimensions rather than in isolated symptom clusters.

Meta-analytic findings also support the robustness of DBT-A outcomes. A systematic review and meta-analysis confirmed the efficacy of DBT-A for reducing self-harm and suicidal ideation in adolescent populations (Kothgassner et al., 2021). Though the present study targeted anxiety and emotional difficulties rather than self-harm, the consistency of DBT-A's effectiveness across various emotional outcomes suggests shared mechanisms of change. These include improved distress tolerance, enhanced problem-solving, increased emotional awareness, and strengthened relationships—all mechanisms reflected in our data. Additionally, rapid reviews such as that by Dallenbach et al. show that DBT skill group duration may influence outcomes (Dallenbach et al., 2025). The structure and dosage used in the present study appear to align with effective ranges identified in the literature, which may explain the strong results obtained.

DBT's theoretical development also supports our study's conclusions. Recent summaries of the state of DBT science emphasize the model's evolution, the refinement of its theoretical assumptions, and its growing applicability across diverse clinical and non-clinical populations (Rizvi et al., 2024). This aligns with our study's demonstration that DBT-

based skills training can effectively address emotional difficulties beyond borderline pathology and suicidality. Moreover, research on healthcare workers has shown the effectiveness of DBT-based emotion regulation training in reducing aggression and improving quality of life (Parandeh Shirvan et al., 2024), reinforcing the adaptability of DBT's skill modules to populations experiencing emotion-driven distress.

In addition to individual-level improvements, the present study underscores the significance of contextual and family-related factors in the success of DBT interventions. Numerous studies have shown that adolescents' emotional and psychological outcomes are strongly influenced by family functioning (Amiri et al., 2024; Naziri & Hooman, 2025), and our findings echo this body of work by demonstrating that shifts in adolescents' emotional capacities potentially interact with familial communication patterns and emotional climates. This alignment suggests that DBT-A might be particularly effective when implemented alongside efforts to improve family expressiveness, responsiveness, and emotional support. The integration of parent or caregiver training, as seen in previous studies (Smith et al., 2023), may further strengthen the intervention's impact, highlighting a promising direction for future adaptations.

5. Conclusion

Overall, the results of the present study contribute to the accumulating evidence supporting DBT-A as a powerful intervention for adolescents with emotional vulnerability. By demonstrating improvements across emotional, interpersonal, and anxiety-related domains, the findings confirm the centrality of emotion regulation skills in adolescent psychological health and underscore DBT's unique capacity to foster these skills through structured, dialectical, and experiential learning processes. The consistency of our findings with the broader literature—including clinical trials, meta-analyses, narrative reviews, neurodevelopmental studies, and qualitative evaluations—highlights DBT-A's continued relevance and growing empirical foundation.

6. Suggestions and Limitations

The present study has several limitations that should be considered when interpreting the findings. First, the sample size was relatively small, which may limit the generalizability of the results to broader adolescent populations. Second, the study relied on self-report questionnaires, which may introduce response bias or inaccuracies related to social desirability, subjective interpretation, or recall limitations. Third, the intervention was delivered in a specific institutional context, and the extent to which these findings translate to different cultural, educational, or clinical environments remains uncertain. Finally, the study did not include long-term follow-up assessments, making it unclear whether observed improvements persist over time or diminish once structured support is withdrawn.

Future studies should consider employing larger, more diverse samples to enhance the generalizability of findings and to examine potential moderating factors such as gender, socioeconomic status, or developmental stage. Longitudinal designs would be valuable for assessing the sustainability of DBT-A's effects over extended periods and for identifying factors associated with long-term maintenance of emotional and behavioral improvements. Additionally, future research should incorporate multimethod assessments, including behavioral observations, physiological measures, or neurocognitive tasks, to provide a more comprehensive understanding of how DBT-A influences emotion regulation processes. Comparative studies evaluating DBT-A alongside other therapeutic modalities would also help clarify its unique contributions and potential additive effects.

Practitioners should consider integrating DBT-A into school, community, and clinical settings to enhance accessibility and early intervention for adolescents experiencing emotional difficulties. Implementing parent or caregiver skill components may further strengthen treatment outcomes by improving communication, emotional support, and consistency across home and therapeutic environments. Additionally, adapting DBT-A to cultural contexts and tailoring skill modules to developmental needs can improve engagement and relevance for diverse populations. Finally, practitioners should emphasize skill generalization across daily contexts to maximize the impact of training and promote sustainable emotional and interpersonal growth among adolescents.

Authors' Contributions

N. Y. developed the research idea, designed the study framework, and supervised the implementation of the DBT-informed family therapy protocol. N. Y. was also responsible for participant recruitment, coordination with counseling centers, and oversight of data collection at all

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three measurement points. N. Y. performed the statistical analyses, interpreted the findings within the cultural and clinical context of Iranian families, and prepared the initial manuscript draft. N. Y. revised the manuscript critically, addressed methodological and theoretical issues, and approved the final version for publication.

Declaration

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

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

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

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