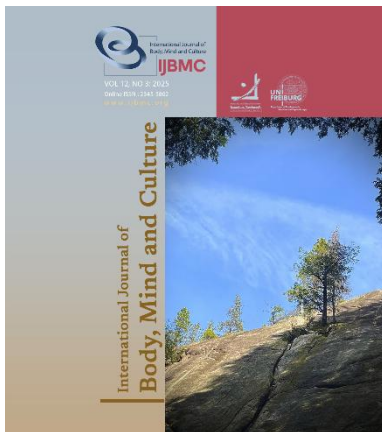


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- 1 Professor, Department of Psychology, Faculty of Literature and Humanities, Urmia University, Urmia, Iran
- 2 PhD Student, Department of Psychology, Faculty of Literature and Humanities, Urmia University, Urmia, Iran

Corresponding author email address:
sepehrianazar@urmia.ac.ir



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Introduction

Adolescence is a period of rapid physical, emotional, and cognitive change that significantly impacts emotional regulation (Brown & Larson, 2009; Casey et al., 2010). The heightened emotional responses common in this stage, such as anger, frustration, and anxiety, are often challenging for adolescents themselves as well as

Effectiveness of a Family-Centered Emotion Regulation Intervention on Adolescent Anger, Psychological Resilience, and Family Intimacy

Firouzeh. Sepehrianazar^{1*}, Mahdi. Chitsaz²

ABSTRACT

Objective: This study examines the effectiveness of a family-centered emotion regulation intervention in reducing adolescent anger, enhancing psychological resilience, and improving family intimacy.

Methods and Materials: A quasi-experimental pretest-posttest design with a three-month follow-up was conducted on 80 adolescents (aged 12–18 years), randomly assigned to an intervention group (n= 40) or a control group (n= 40). The intervention, conducted over 12 weeks, integrated Cognitive Behavioral Therapy (CBT), Emotion-Focused Therapy (EFT), and Parent-Child Interaction Therapy (PCIT) to improve emotional regulation skills in adolescents and enhance parental support. The State-Trait Anger Expression Inventory (STAXI-2), Connor-Davidson Resilience Scale (CD-RISC), and Family Intimacy Questionnaire (FIQ) were used to measure outcomes. Data were analyzed using repeated measures ANOVA and Bonferroni post-hoc tests.

Findings: The intervention group showed significant improvements in Anger, Resilience and Family intimacy compared to the control group ($p < 0.001$). These effects were sustained at follow-up, confirming the long-term benefits of the intervention.

Conclusion: A family-centered approach to emotion regulation significantly enhances adolescent psychological resilience, reduces anger, and strengthens family relationships. Integrating such interventions into school-based and community programs may provide sustainable support for adolescent mental health.

Keywords: Adolescent, anger, emotion regulation, resilience, family therapy, psychological well-being.

their families. Effective emotional regulation is crucial during adolescence as it influences not only individual well-being but also family dynamics (Hastings, 2018). As such, the role of family-based interventions in supporting adolescents through these challenges is increasingly recognized as essential for fostering resilience and promoting positive mental health (Luthar & Cichetti, 2019).

A major difficulty adolescents face is regulating intense emotions, particularly anger. This is mainly due to the developmental immaturity of the brain, especially the prefrontal cortex, which is crucial for impulse control and emotional regulation (Casey et al., 2010; Suardi Wekke et al., 2022). This neurobiological delay often results in heightened emotional reactivity, with anger frequently manifesting as a prominent issue. Research has shown that unregulated anger during adolescence is linked to interpersonal conflict, aggression, and mental health issues such as depression and anxiety (Zeman, 2020). Furthermore, emotion regulation difficulties often persist into adulthood if not addressed early, underlining the importance of timely interventions (Gross, 2019).

Psychological resilience, the ability to maintain or regain mental health despite adversity, is another critical factor in adolescent development (Mohammadiyas et al., 2023). Resilient adolescents are more likely to manage stress effectively, cope with negative emotions, and engage in adaptive problem-solving (Southwick, 2020). Family support plays a central role in fostering resilience and providing adolescents with a secure emotional foundation (Luthar & Cicchetti, 2019). Family-based interventions that enhance the emotional bonds between parents and children have been shown to buffer the effects of stress and help adolescents develop stronger emotional regulation skills (Kaminski, 2020).

Family intimacy, defined by emotional closeness, trust, and mutual understanding, has been shown to impact adolescent mental health and behavior positively. Adolescents who report higher levels of family intimacy experience fewer behavioral problems and better social relationships (Cohen, 2017; Whiteman, 2019). However, lack of intimacy can lead to emotional distress, alienation, and dysfunctional behavior patterns (Navabinejad et al., 2024; Parsakia et al., 2023). Addressing these issues through family-centered interventions that focus on emotion regulation is particularly important during adolescence, as this period marks a critical phase in the individuation process and the quest for autonomy (Brown & Larson, 2009). Studies have demonstrated that fostering open communication and empathy within the family can enhance intimacy and emotional support, providing a protective buffer against the emotional challenges adolescents face (Kerr, 2020).

Although family-based interventions targeting emotion regulation have shown promise in improving

adolescent emotional functioning, the specific mechanisms by which family involvement enhances emotional regulation and resilience remain underexplored. Research has shown that family-based programs can effectively improve emotional functioning. However, there is still a gap in understanding why family-focused interventions may be more effective than individual approaches in enhancing emotional regulation (Kaminski, 2020). The current study aims to address this gap by exploring the unique contributions of family-based interventions in promoting emotional regulation and resilience, particularly within the context of family intimacy.

This study examines how family-centered interventions can enhance emotional regulation, resilience, and family intimacy in adolescents. It aims to clarify the advantages of family-based approaches over individual interventions and provide insights into strategies that effectively address emotional difficulties in adolescents. By investigating these factors, the study seeks to contribute to the growing body of literature on the role of family support in adolescent emotional development.

Methods and Materials

Study Design and Participants

This study employs a quasi-experimental design with pre- and post-intervention assessments to evaluate the impact of a family-centered emotion regulation intervention on reducing adolescent anger, enhancing psychological resilience, and improving family intimacy. The study focuses on adolescent participants aged 12-18 years who experience difficulties with anger and emotional regulation alongside their primary caregivers (mothers and/or fathers). Participants were randomly assigned to two groups: an intervention group (n = 40) who received the family-centered emotion regulation program and a control group (n = 40) who did not receive the intervention but were placed on a waitlist for future participation.

The study recruited 80 adolescents from local schools and community organizations in both urban and suburban areas to ensure the sample represented a diverse socio-economic background. The inclusion criteria for participants were: adolescents aged between 12 and 18 years, adolescents who reported difficulties

with emotional regulation, particularly anger, as measured by a preliminary screening questionnaire (e.g., State-Trait Anger Expression Inventory), adolescents living in a two-parent or single-parent household where at least one caregiver could participate in the intervention. Exclusion criteria included adolescents with severe psychiatric conditions (e.g., major depressive disorder, bipolar disorder) that could require specialized treatment, adolescents with significant developmental disorders (such as Autism Spectrum Disorder or intellectual disabilities), and families where the adolescent or caregiver had a history of substance abuse or other risk factors that could interfere with participation.

Regarding the socioeconomic and educational background of the parents, the study gathered data on parental education levels and socioeconomic status through a brief survey. This additional information was used to assess any potential influence of parental education or socioeconomic status on the intervention outcomes, as family-based interventions can be influenced by these factors.

Instruments

Data were collected at three key time points: the pre-test (before the intervention), the post-test (immediately after the intervention), and the follow-up (three months after the intervention). Multiple methods of data collection were used to assess changes in adolescent anger, psychological resilience, and family intimacy.

Anger and Emotional Regulation: To measure the adolescent's anger levels and emotional regulation, the State-Trait Anger Expression Inventory (STAXI-2) was administered (Spielberger, 2013). The STAXI-2 includes three primary subscales: State Anger, which assesses how angry the participant feels at the moment; Trait Anger, which measures how prone the participant is to anger; and Anger Expression, which evaluates how the participant expresses their anger (e.g., verbally, physically, or by suppressing it). The STAXI-2 has been validated in both international contexts and in Iran, where it has shown high reliability ($\alpha = 0.90$) in measuring adolescent anger (Mohammadkhani, 2019).

Psychological Resilience: The Resilience Scale for Adolescents (READ) (Hjemdal, 2011) was used to measure psychological resilience. The READ assesses resilience across several domains: personal competence,

social competence, structured style, and family cohesion. Higher resilience scores indicate better emotional adaptation and the ability to cope with challenges, stress, and adversity. This scale has shown high reliability in both Western and Iranian samples ($\alpha = 0.92$) (Shahmohammadi, 2020).

Family Intimacy: Family intimacy was assessed using the Family Environment Scale (FES) (Moos & Moos, 2009). This tool assesses three key aspects of family dynamics: cohesion, communication, and emotional support. The FES provides valuable insights into how adolescents perceive their relationships with their family members, including the level of emotional closeness and understanding within the family unit. The FES has been widely used in diverse cultural contexts and has demonstrated high reliability in Iranian studies ($\alpha = 0.88$) (Moradi, 2021).

Intervention

The family-centered emotion regulation intervention was a 12-week program aimed at improving adolescents' emotional regulation, reducing anger, enhancing psychological resilience, and strengthening family intimacy. The program was based on a combination of evidence-based approaches, including Cognitive-Behavioral Therapy (CBT), Emotion-Focused Therapy (EFT), and Parent-Child Interaction Therapy (PCIT). The program consisted of weekly 90-minute sessions. Each session focused on specific skills related to emotion regulation, communication, and conflict resolution. Caregivers participated alongside adolescents to ensure that the learned skills could be reinforced in the home environment. A group-based format was used, allowing families to share experiences and support each other.

In the intervention, families were explicitly encouraged to practice the skills learned during the sessions at home. Parents were asked to monitor and reinforce their adolescent's emotion regulation skills through daily check-ins, role-playing scenarios, and structured family discussions. They were also provided with weekly activity sheets that helped track progress and identify challenges in applying the new skills in everyday situations. Trained therapists with expertise in family therapy and emotion regulation led the interventions. The therapists were responsible for guiding the families through the sessions, addressing individual challenges, and ensuring that the skills were

being practiced effectively. The Family-Centered Emotion Regulation Intervention spans 12 weeks, each focusing on a specific aspect of emotion regulation for both adolescents and their families. The first session introduces emotion regulation, providing psychoeducation on emotions and how they can be managed effectively. In the second session, adolescents learn to identify and label their emotions, increasing their emotional awareness. The third session focuses on anger management, teaching adolescents healthy ways to cope with anger. Session four aims to improve communication within families, addressing misunderstandings and enhancing effective interaction. Parents are trained in session five to model emotion regulation for their children, reinforcing the skills learned. In session six, both adolescents and caregivers are taught conflict resolution strategies to handle disputes constructively. The seventh session introduces resilience-building techniques to help participants cope with adversity. Strengthening family bonds is the primary goal of session eight, where activities are designed to foster cohesion and intimacy among family members. In session nine, role-playing scenarios provide opportunities for participants to practice their emotion regulation skills in realistic situations. The tenth session is dedicated to relapse prevention, teaching strategies for maintaining progress over time. Session eleven involves reviewing the participants' progress, adjusting strategies as needed, and providing feedback. The final

session reflects on the journey, celebrates achievements, and helps families develop plans for continued growth and emotional regulation beyond the intervention.

At the end of the program, families were encouraged to continue practicing the skills learned and attend follow-up sessions to reinforce and troubleshoot any challenges.

Data Analysis

To determine the intervention's impact on the key outcome measures, repeated-measures analysis of variance (ANOVA) was conducted for each variable (anger, resilience, and family intimacy). Post-hoc comparisons were performed to assess the intervention's specific effects at each time point.

Findings and Results

The mean age of the adolescents was 15.2 years ($SD = 1.3$), with a range of 12 to 18 years. The age distribution was pretty balanced across both groups. There were 42 male (52.5%) and 38 female (47.5%) adolescents in the study. Both gender groups were equally distributed between the intervention and control groups. The descriptive statistics for the primary outcome variables (anger, psychological resilience, and family intimacy) across the three time points (pre-test, post-test, and follow-up) are presented in [Table 1](#).

Table 1

Mean (SD) of research variables

Variable	Pre-test (M ± SD)	Post-test (M ± SD)	Follow-up (M ± SD)
Anger	25.5 ± 5.2	18.3 ± 4.9	19.1 ± 5.3
Psychological Resilience	55.8 ± 7.4	62.1 ± 6.3	60.7 ± 6.8
Family Intimacy	21.7 ± 3.1	25.3 ± 2.7	24.6 ± 2.9

The distribution of scores for each variable (anger, resilience, and family intimacy) at each time point (pre-test, post-test, follow-up) was assessed using the Shapiro-Wilk test. Results indicated that the data were normally distributed for all variables ($p > 0.05$). The assumption of homogeneity of variance was checked using Levene's test. No significant violations were found ($p > 0.05$), indicating that the variance across groups was similar. The assumption of sphericity for the repeated

measures was tested using Mauchly's test. The assumption was met for all outcome variables ($p > 0.05$).

A MANCOVA was conducted to examine the intervention's effects on the three outcome variables (anger, psychological resilience, and family intimacy), controlling for pre-test scores. The analysis revealed significant main effects for both group (intervention vs. control) and time (pre-test, post-test, and follow-up) ([Table 2](#)).

Table 2*Results of repeated Measure Anova*

Variables	Source	F	df	p-value	Partial η^2
Anger	Group	16.38	3, 74	< 0.001	0.398
	Time	11.42	2, 148	< 0.001	0.134
	Group \times Time	4.67	6, 148	< 0.001	0.160
Resilience	Group	15.92	1, 78	< 0.001	0.671
	Time	14.29	2, 158	< 0.001	0.153
	Group \times Time	5.45	2, 158	< 0.001	0.065
Family intimacy	Group	12.81	1, 78	< 0.001	0.538
	Time	9.91	2, 158	< 0.001	0.111
	Group \times Time	4.21	2, 158	0.016	0.053

The main effect of the group indicates that the intervention group showed significant improvements in all three outcome variables compared to the control group. The main effect of time showed significant changes in anger, resilience, and family intimacy over

time. The group \times time interaction revealed that the intervention group showed more significant improvements across all variables than the control group (Table 2).

Table 3*Pairwise Comparison Results for Pre-test, Post-test, and Follow-up (Difference in Mean Scores)*

Variable	Pre-test vs. Post-test	Post-test vs. Follow-up	Pre-test vs Follow-up
Anger	7.2*	0.8	6.4*
Psychological Resilience	6.3*	-1.4	4.9*
Family Intimacy	3.6*	-0.7	2.9*

*p<0.05

Adolescents in the intervention group showed a significant reduction in anger and increasing in resilience and family intimacy scores from pre-test to post-test, with a slight increase at follow-up. The control group showed minimal changes in anger, resilience and family intimacy levels across all time points. These results suggest that the intervention was effective in reducing anger and increasing resilience and family intimacy among participants (Table 3).

Discussion and Conclusion

The results of this study underscore the effectiveness of a family-centered emotion regulation intervention in reducing adolescent anger, enhancing psychological resilience, and improving family intimacy. The intervention group showed significant improvements across all outcome variables, demonstrating the value of integrating family dynamics into emotion regulation training for adolescents. These findings align with the growing body of research emphasizing the importance of

family involvement in adolescent emotional development (Kaminski, 2020).

Anger Reduction: A key finding of this study was the significant decrease in anger among adolescents in the intervention group. Adolescents in the intervention group showed a substantial reduction in anger scores from the pre-test to the post-test. Although a slight increase was observed at follow-up, their levels of anger remained significantly lower than at baseline. This aligns with prior research indicating that emotion regulation interventions can effectively reduce anger in adolescents (Gross, 2019). Adolescents who struggle with regulating anger often exhibit aggressive behaviors and interpersonal conflicts (Zeman, 2020), making anger management an essential focus of intervention programs.

The intervention's sustained improvement in anger regulation is consistent with findings from similar family-based programs, such as Parent-Child Interaction Therapy (PCIT) and the Incredible Years Program, which have shown long-term benefits in reducing adolescent aggression and improving emotion regulation skills

(Hastings, 2018; Southwick, 2020). The inclusion of family members in these interventions appears to be particularly effective in addressing emotional dysregulation because families provide ongoing support and feedback, reinforcing the skills learned in therapy.

Another significant outcome of the study was the improvement in psychological resilience among adolescents in the intervention group. Adolescents who participated in the emotion regulation program showed significant increases in resilience from the pre-test to the post-test. Although there was a slight decrease at follow-up, the resilience scores remained higher than baseline levels. This finding is consistent with previous studies showing that resilience can be fostered through interventions that target emotion regulation and coping skills (Luthar & Cichetti, 2019; Masten & Barnes, 2021).

Resilience is a key factor in adolescent mental health, as it allows individuals to cope with adversity and stress in adaptive ways. Family-centered interventions provide adolescents with a safe environment to develop these skills, mainly when families are involved in teaching problem-solving and emotional expression (Southwick, 2020). The results of this study suggest that improving emotional regulation through family engagement can significantly enhance adolescents' ability to cope with stress and setbacks, contributing to better psychological outcomes in the long term.

Family Intimacy: The intervention also resulted in improvements in family intimacy, as measured by family cohesion. Adolescents in the intervention group reported stronger emotional bonds with their family members by the post-test, which were maintained at follow-up. This finding is consistent with the research on the importance of family cohesion in adolescent development. Positive family interactions are crucial for fostering emotional well-being, and family-based interventions have been shown to strengthen family intimacy by improving communication and emotional support (Cohen, 2017).

The results of this study are particularly significant because they demonstrate the potential for emotion regulation programs to help adolescents regulate their emotions and improve overall family functioning. By improving communication and emotional understanding within the family, these interventions foster a supportive environment that can buffer against the negative effects

of stress and promote healthy emotional development (Luthar & Cichetti, 2019).

Although the findings of this study are promising, several limitations should be considered. First, the study used a quasi-experimental design with no random assignment, which limits the ability to draw definitive causal conclusions. Future research should aim to replicate these findings with a randomized controlled trial (RCT) design to strengthen the evidence base for the effectiveness of family-centered emotion regulation interventions. Second, the study relied on self-report measures to assess anger, resilience, and family intimacy. While these measures are widely used and valid, they are subject to response biases. Future studies could benefit from incorporating observer-rated or physiological measures of emotional regulation to provide a more comprehensive assessment of the intervention's effects. A limitation of this study is that the follow-up period of 3 months may not be long enough to assess the long-term sustainability of the intervention's effects fully. Future studies should consider extending the follow-up period to evaluate whether the improvements in anger regulation, resilience, and family intimacy are maintained over a more extended period. Finally, while the intervention was effective in the short term, the long-term sustainability of the effects remains unclear. Future research should explore whether the benefits of family-centered emotion regulation interventions are maintained over an extended period and whether booster sessions or ongoing support are necessary to ensure lasting changes in emotional regulation and family dynamics.

This study provides strong evidence for the effectiveness of a family-centered emotion regulation intervention in improving anger regulation, psychological resilience, and family intimacy in adolescents. The intervention was associated with significant improvements in all outcome variables, highlighting the value of involving families in therapeutic programs. These findings contribute to the growing body of research supporting the role of family-centered interventions in adolescent emotional and behavioral development. Given the importance of emotion regulation in adolescent mental health, such interventions hold great promise for reducing emotional distress and improving the overall well-being of adolescents.

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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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