

Comparing the Effectiveness of Cognitive Behavioral Therapy and Schema Therapy on Externalizing Behaviors in Adolescents with High-Risk Behaviors

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ABSTRACT

Purpose: The present study aimed to compare the effectiveness of cognitive behavioral therapy and schema therapy on reducing externalizing behaviors in adolescents with high-risk behaviors.

Methods and Materials: This applied study employed a quasi-experimental design with a pretest-posttest control group and a two-month follow-up. The statistical population consisted of adolescents with high-risk behaviors referred to counseling centers of the Department of Education in Karaj in 2025. A total of 45 participants were selected through purposive sampling and randomly assigned into two experimental groups (cognitive behavioral therapy and schema therapy) and one control group, each comprising 15 participants. The experimental groups received eight sessions of group-based interventions, while the control group remained on a waiting list without intervention. Data were collected using the Achenbach-based Externalizing Behavior Questionnaire. Data analysis was conducted using SPSS version 26 at both descriptive and inferential levels, including repeated measures ANOVA and Bonferroni post hoc tests after verifying statistical assumptions.

Findings: The results indicated that the main effect of group was not statistically significant ($p > 0.05$), whereas the main effect of time was significant ($p < 0.001$), demonstrating changes in externalizing behaviors across measurement stages. Furthermore, the interaction effect of time and group was statistically significant ($p < 0.001$), indicating differential changes among the groups over time. Bonferroni post hoc comparisons revealed that both cognitive behavioral therapy and schema therapy significantly reduced externalizing behaviors compared to the control group at posttest ($p < 0.001$), while no significant difference was observed between the two intervention groups ($p > 0.05$). Pairwise comparisons also showed that improvements were maintained at follow-up in both experimental groups.

Conclusion: Both cognitive behavioral therapy and schema therapy were effective in reducing externalizing behaviors in adolescents with high-risk behaviors, with comparable levels of effectiveness and sustained outcomes over time.

Keywords: Cognitive Behavioral Therapy, Schema Therapy, Externalizing Behaviors, High-Risk Adolescents, Adolescence, Psychological Interventions

1. Introduction

Adolescence represents a critical developmental period characterized by rapid biological, psychological, and social changes, during which individuals are particularly vulnerable to engaging in high-risk behaviors. These behaviors, which include aggression, delinquency, substance use, and rule-breaking tendencies, are often conceptualized within the broader domain of externalizing behaviors and are associated with significant negative outcomes for both individuals and society (Joharifard et al., 2021; Sefidrood & Hobbi, 2023). Externalizing behaviors in adolescents have been linked to maladaptive developmental trajectories, including academic failure, interpersonal difficulties, and increased likelihood of psychiatric disorders in adulthood, thereby highlighting the importance of early identification and intervention (Mohammadi Hosseini Asl et al., 2022; Stepanyan et al., 2020).

From a theoretical perspective, high-risk and externalizing behaviors are understood as multifactorial phenomena influenced by cognitive, emotional, familial, and social determinants. Cognitive-emotional processes, particularly maladaptive emotion regulation strategies and dysfunctional beliefs, play a central role in the emergence and maintenance of such behaviors (Samsami & Mohammadkhani, 2022; Zarea et al., 2020). Adolescents with poor cognitive emotion regulation skills and maladaptive metacognitive beliefs are more likely to engage in impulsive and risky behaviors as a means of coping with internal distress (Joharifard et al., 2021; Sefidrood & Hobbi, 2023). Furthermore, attachment styles and family dynamics have been identified as significant predictors of high-risk behaviors, with insecure attachment and low family cohesion contributing to behavioral dysregulation and externalizing tendencies (Penner et al., 2022; Yousefi, 2025).

In addition to environmental influences, individual cognitive structures such as early maladaptive schemas have received considerable attention in recent years. Schema theory posits that deeply ingrained cognitive and emotional patterns, formed during early childhood experiences, shape individuals' perceptions, emotional responses, and behaviors throughout life (Sobhani et al., 2021; Van Wijk-Herbrink et al., 2018). These maladaptive schemas are often activated in stressful situations and can lead to dysfunctional coping strategies, including externalizing behaviors such as aggression and rule-breaking (Mirzaalian Dastjerdi, 2022). Empirical studies have demonstrated that early maladaptive

schemas are strong predictors of both internalizing and externalizing problems in adolescents, mediated by coping responses and schema modes (Sobhani et al., 2021; Van Wijk-Herbrink et al., 2018).

Given the complex etiology of high-risk behaviors, psychological interventions that target cognitive and emotional processes have been widely developed and applied. Among these, cognitive behavioral therapy (CBT) has been recognized as one of the most effective evidence-based approaches for reducing maladaptive behaviors and cognitive distortions. CBT operates on the premise that dysfunctional thoughts influence emotions and behaviors, and that modifying these cognitions can lead to behavioral change (Mayer et al., 2023). Research has consistently shown that CBT is effective in reducing high-risk behaviors and associated cognitive distortions in adolescents, particularly when it incorporates skill-building components such as problem-solving, emotional regulation, and social skills training (Moshkabadi et al., 2024; Pourroosta et al., 2024).

Despite the effectiveness of CBT, some researchers have argued that it may not sufficiently address deeper, more ingrained cognitive structures such as schemas, which are often resistant to change through traditional cognitive restructuring techniques. This limitation has led to the development of schema therapy, an integrative therapeutic approach that combines elements of cognitive behavioral, attachment, and experiential therapies to target early maladaptive schemas and their associated emotional and behavioral patterns (Bernstein et al., 2022). Schema therapy emphasizes the role of unmet emotional needs in childhood and aims to modify maladaptive schemas through techniques such as limited reparenting, experiential exercises, and cognitive restructuring (Heilemann et al., 2011).

Empirical evidence suggests that schema therapy is particularly effective in treating individuals with complex and chronic behavioral problems, including externalizing behaviors. For instance, schema therapy has been shown to reduce high-risk behaviors and improve emotional regulation in adolescents by addressing the underlying cognitive-emotional structures that drive maladaptive behavior (Reyhani & Ahovan, 2024). Similarly, comparative studies have indicated that schema therapy may have advantages over traditional cognitive approaches in producing more durable changes in behavior due to its focus on deep-seated schemas and coping modes (Sabet et al., 2016).

In recent years, there has been increasing interest in comparing the effectiveness of different therapeutic approaches in addressing adolescent high-risk behaviors. Studies have examined various interventions, including mindfulness-based therapy, acceptance and commitment therapy, and metacognitive therapy, all of which have demonstrated effectiveness in reducing high-risk behaviors and improving psychological functioning (Esmacili Pour et al., 2025; Khajevand et al., 2023; Sharei et al., 2025). These findings highlight the importance of targeting cognitive, emotional, and behavioral processes simultaneously. However, despite the growing body of research, there remains a need for direct comparative studies examining the relative effectiveness of CBT and schema therapy, particularly in the context of externalizing behaviors in adolescents.

Moreover, recent developments in psychological research have emphasized the role of contextual and systemic factors, such as peer influence, educational environment, and technological changes, in shaping adolescent behavior. For example, exposure to delinquent peers has been identified as a mediating factor in the relationship between early developmental changes and externalizing behaviors (Stepanyan et al., 2020). Additionally, advances in data-driven approaches, such as machine learning models for identifying high-risk patterns, underscore the growing importance of early detection and intervention in preventing the escalation of risky behaviors (Yuan et al., 2025). These perspectives further reinforce the need for effective, evidence-based interventions that can address both individual and contextual determinants of behavior.

In the Iranian context, several studies have highlighted the increasing prevalence of high-risk behaviors among adolescents and the urgent need for culturally adapted interventions. Research has demonstrated that factors such as cognitive distortions, maladaptive schemas, and emotional dysregulation play a significant role in the development of high-risk behaviors among Iranian youth (Khajevand et al., 2023; Sefidrood & Hobbi, 2023). Interventions aimed at enhancing psychological resilience, emotional regulation, and adaptive coping strategies have shown promising results in reducing these behaviors (Baramake et al., 2024). Nevertheless, there is still limited research comparing different therapeutic modalities within this population, particularly with respect to their long-term effectiveness and sustainability of outcomes.

Taken together, the existing literature suggests that both cognitive behavioral therapy and schema therapy offer

valuable frameworks for understanding and treating high-risk and externalizing behaviors in adolescents. CBT provides structured, skill-based interventions that target maladaptive thoughts and behaviors, while schema therapy offers a deeper, integrative approach that addresses underlying cognitive-emotional patterns. However, the relative effectiveness of these approaches, particularly in comparison to each other and in the context of externalizing behaviors, remains insufficiently explored. Therefore, the present study aims to compare the effectiveness of cognitive behavioral therapy and schema therapy on externalizing behaviors in adolescents with high-risk behaviors.

2. Methods and Materials

2.1. Study Design and Participants

The present study was an applied research with a quasi-experimental design based on a pretest–posttest format including a control group and a follow-up phase. The research design consisted of three groups: two experimental groups and one control group. The first experimental group received Cognitive Behavioral Therapy, the second experimental group received Schema Therapy, and the control group did not receive any intervention during the study period. Measurements were conducted at three time points, including pretest (T1), posttest (T2), and follow-up (T3), while the interventions were denoted as X. The statistical population of this study included all adolescents exhibiting high-risk behaviors who were referred to counseling centers affiliated with the Department of Education in Karaj during the year 2025.

The inclusion criteria for participants consisted of having a clinical diagnosis of high-risk behaviors confirmed by a clinical psychologist and the relevant questionnaire, being between 13 and 18 years of age, not currently using psychiatric medications, and not having any diagnosed psychiatric disorders based on self-report. The exclusion criteria included unwillingness to continue participation in the study and absence from more than three therapy sessions.

The sample size was initially determined using Cohen's table (1981), although G*Power is recommended for more precise calculation. Based on these calculations, a minimum of 10 participants per group was required. However, considering possible attrition and recommendations from similar studies, a total of 45 participants were selected. These participants were chosen through purposive non-random sampling from individuals who met the inclusion criteria. After selection, they were randomly assigned into

three groups of 15 participants each (two experimental groups and one control group), following matching in terms of age, gender, and other demographic variables. Prior to the intervention, participants were provided with detailed explanations regarding the study objectives, treatment procedures, and ethical considerations. The control group remained on a waiting list without receiving any intervention during the study. After the completion of the treatment sessions, all participants completed the research questionnaires again, and a follow-up assessment was conducted two months after the posttest phase.

2.2. Measures

The primary instrument used in this study was the Externalizing Behavior Questionnaire derived from the Achenbach System of Empirically Based Assessment, specifically the Adult Behavior Checklist (ABCL). This instrument is designed to assess behavioral and emotional problems, as well as social and academic competencies in adolescents and adults aged 15 to 59 years. The questionnaire can be administered either as a self-report or through an interview format and typically requires approximately 25 to 30 minutes to complete. It is widely used to evaluate behavioral changes over time or as a result of therapeutic interventions.

The first section of the instrument consists of five items that assess competencies, impairments, and health conditions, as well as the respondent's major concerns and perceptions of the individual's strengths. The second section includes 126 items measuring a wide range of behavioral patterns. Responses are scored on a three-point Likert scale ranging from 0 (not true) to 2 (very true or often true).

This instrument evaluates multiple domains, including adaptive functioning and competencies, syndrome scales based on empirical findings, DSM-5-oriented scales, and additional scales introduced in the 2014 revision. The adaptive functioning scale assesses social relationships, family interactions, and personal strengths. The syndrome scales include anxiety/depression, withdrawal, somatic complaints, thought problems, attention problems, aggressive behavior, rule-breaking behavior, and intrusive thoughts. Additionally, composite indices such as internalizing problems, externalizing problems, and total problems are calculated. The DSM-5-oriented scales include depressive problems, anxiety problems, somatic problems, avoidant personality problems, attention-deficit/hyperactivity problems, and antisocial personality

problems. The 2014 scales further assess sluggish cognitive tempo and obsessive-compulsive problems.

Interpretation of scores is based on standardized T-scores. In competency scales, T-scores above 40 are considered normal, scores between 37 and 40 are borderline, and scores below 37 are clinical. In syndrome and DSM-oriented scales, T-scores below 67 are normal, scores between 67 and 70 are borderline, and scores above 70 are clinical. For internalizing, externalizing, and total problem scales, T-scores below 60 are normal, scores between 60 and 63 are borderline, and scores above 63 are clinical. Reliability of the instrument has been reported with Cronbach's alpha coefficients around 0.97 and test-retest reliability of approximately 0.94. Validity has been confirmed through content, criterion, and construct validation methods. The instrument was translated and standardized in Iran, and previous studies have reported acceptable levels of internal consistency, temporal stability, and inter-rater agreement, indicating that it is a reliable and valid tool for assessing emotional and behavioral problems in adolescents.

2.3. Interventions

The schema therapy intervention was implemented in eight group sessions based on the schema therapy framework developed by Young, Klosko, and Weishaar (2003), using the Persian translation attributed in the study guide to Hamidpour and Andouz (2022). The first session was devoted to administration of the pretest, introduction of the adolescents to one another and to the therapist, explanation of group rules, presentation of the treatment goals and structure, clarification of therapeutic commitments, and provision of introductory information about schema therapy. The second session focused on assessment of the participants' difficulties from a schema therapy perspective, identification of experiential avoidance, cognitive fusion, and personal values, and preparation of a list of perceived advantages, disadvantages, and control strategies related to their problems. In the third session, the therapist emphasized the maladaptive nature of dysfunctional patterns, helped participants identify harmful life patterns, and trained them to recognize early maladaptive schemas and their role in the development and maintenance of distress and problematic behavior. The fourth session introduced core therapeutic techniques, including empathic confrontation, limited reparenting within boundaries, schema testing, and evidence examination. The purpose of this stage was to help adolescents attend to their current psychological states,

thoughts, and behaviors without harsh self-judgment and to promote modification of maladaptive schemas. The fifth session centered on redefining the evidence that appears to confirm schemas, examining the advantages and disadvantages of early maladaptive schemas and coping styles, and increasing awareness of ineffective coping responses. The sixth session involved experiential techniques such as imagery and letter writing to parents, encouraging the adolescents to recall emotionally significant memories, identify related feelings, and reflect on how parental behaviors may have contributed to schema formation. The seventh session focused on confronting punitive and demanding parent modes and applying limited reparenting techniques to vulnerable and angry child modes. The eighth and final session reviewed and rehearsed the therapeutic techniques taught throughout treatment, with emphasis on coping styles and transferring newly acquired skills into everyday life; the posttest was then administered, and arrangements were made for the follow-up assessment two months later. Across sessions, the instructional methods included lecture, question-and-answer, role play, and group discussion, and the training materials included presentation slides and audiovisual aids.

The cognitive behavioral therapy intervention was conducted in eight group sessions based on the Hofmann model introduced in the study guide as a 2003 protocol. In the first session, the pretest was administered, participants and therapist were introduced, group rules and expectations were explained, treatment goals and session structure were clarified, and preliminary information about cognitive behavioral therapy was provided. The second session emphasized the establishment of a therapeutic relationship, exploration of the adolescents' main complaints, brief introduction to the treatment model, collaborative formulation of therapeutic goals, explanation of the relationship among cognition, emotion, and behavior, agreement on treatment targets and homework assignments, and recording of life events using the ABC model. The third session continued work on automatic thoughts by reviewing dysfunctional thought records and challenging maladaptive cognitions through Socratic questioning. The fourth session focused on training in self-control and awareness skills, identification of underlying beliefs, examination of the conditions under which such beliefs become activated, application of the downward arrow technique, and analysis of several target problems experienced by the participants. The fifth session addressed communication skills training through discussion and complementary exercises; the

adolescents were taught effective verbal responding styles and active listening skills and were encouraged to observe the reactions of others to these new communication patterns. In addition, a behavioral dependency contract was introduced as a group-based reinforcement strategy for encouraging desirable behaviors. The sixth session applied cognitive-behavioral techniques to assertiveness training, problem solving, and social skills development. The seventh session focused on further identification of unconditional assumptions and core beliefs, weakening maladaptive beliefs through Socratic examination, and rating the strength of negative beliefs on a scale from 0 to 100. The eighth session reviewed and practiced all previously taught cognitive-behavioral techniques, with particular emphasis on negative automatic thoughts and the application of treatment gains to real-life situations; the posttest was then administered and coordination was made for the follow-up session two months later. The teaching methods used across sessions included lecture, role play, question-and-answer, and group discussion, while the instructional materials consisted of presentation slides and audiovisual tools.

2.4. Data Analysis

Data analysis in this study was conducted using quantitative statistical methods. The collected data were analyzed using SPSS software version 26 at both descriptive and inferential levels. At the descriptive level, frequency distributions, percentages, and descriptive statistics were used to summarize demographic characteristics and examine the research variables across groups and time points.

At the inferential level, prior to hypothesis testing, the assumptions of statistical analyses were examined, including normality of data distribution, homogeneity of variances, homogeneity of covariance matrices, and the assumption of sphericity. Based on the nature of the data and research design, multivariate analysis of variance (MANOVA) and repeated measures analysis of variance were employed to assess differences between groups across measurement stages. Furthermore, Bonferroni post hoc tests were applied to identify specific group differences and to test the research hypotheses with greater precision.

3. Findings and Results

The demographic characteristics of the participants indicated that the distribution of gender across the three groups was relatively comparable, with no statistically significant difference observed ($p = 0.661$). In the cognitive

behavioral therapy group, 11 participants (73.3%) were male and 4 participants (26.7%) were female. In the schema therapy group, 9 participants (60%) were male and 6 participants (40%) were female. Similarly, in the control group, 11 participants (73.3%) were male and 4 participants (26.7%) were female. Regarding educational level, the distribution across groups was also homogeneous and showed no significant difference ($p = 0.589$). In the cognitive behavioral therapy group, 11 participants (60%)

were in lower secondary education and 4 participants (13.3%) were in upper secondary education. In the schema therapy group, 9 participants (60%) were in lower secondary education and 3 participants (20%) were in upper secondary education. In the control group, 8 participants (53.3%) were in lower secondary education and 2 participants (13.3%) were in upper secondary education. Overall, the findings suggest that the groups were well-matched in terms of demographic variables prior to the intervention.

Table 1

Descriptive Statistics of Externalizing Behaviors by Group and Time

Variable	Time	Cognitive Behavioral Therapy (Mean)	Cognitive Behavioral Therapy (SD)	Schema Therapy (Mean)	Schema Therapy (SD)	Control (Mean)	Control (SD)
Externalizing Behaviors	Pretest	85.00	21.16	83.40	23.55	88.47	26.30
	Posttest	78.67	16.81	75.07	20.17	89.80	25.70
	Follow-up	77.27	16.49	75.73	19.84	90.47	25.37

The descriptive statistics indicate that the mean scores of externalizing behaviors decreased over time in both the cognitive behavioral therapy and schema therapy groups, while the control group showed a slight increasing trend. At the pretest stage, the three groups had relatively similar mean scores, suggesting baseline comparability. At posttest, both intervention groups exhibited a noticeable reduction in mean scores, with the schema therapy group showing a slightly greater decrease compared to the cognitive behavioral therapy group. This downward trend was maintained at the follow-up stage, indicating stability of treatment effects over time. In contrast, the control group demonstrated a marginal increase in mean scores from pretest to follow-up, suggesting no improvement in externalizing behaviors without intervention. The standard deviations across groups remained relatively consistent, indicating a stable dispersion of scores within each group over time.

Prior to conducting the main inferential analyses, the statistical assumptions underlying multivariate analysis of variance and repeated measures analysis of variance were

examined. The normality of the data distribution for externalizing behaviors across groups and measurement stages was assessed using the Shapiro–Wilk test and inspection of skewness and kurtosis indices, which indicated that the data were approximately normally distributed. The assumption of homogeneity of variances was evaluated using Levene’s test, and the results were non-significant, confirming equality of variances across groups. Additionally, the homogeneity of covariance matrices was examined using Box’s M test, which was not statistically significant, supporting the assumption of equal covariance matrices. The sphericity assumption required for repeated measures analysis was assessed using Mauchly’s test; in cases where this assumption was violated, the Greenhouse–Geisser correction was applied to adjust the degrees of freedom. Overall, the results confirmed that all necessary assumptions for conducting MANOVA and repeated measures ANOVA were adequately met, allowing for valid interpretation of the inferential analyses.

Table 2

Results of Repeated Measures Analysis of Variance for Externalizing Behaviors

Variable	Source of Effect	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Externalizing Behaviors	Group	3351.22	2	1675.61	1.17	0.320	0.053
	Time	595.57	1.14	520.25	32.53	<0.001	0.437
	Time × Group	588.25	2.29	256.93	16.07	<0.001	0.433

The results of the repeated measures analysis of variance showed that the main effect of group on externalizing behaviors was not statistically significant ($F = 1.17$, $p = 0.320$, $\eta^2 = 0.053$), indicating that there was no overall difference between the three groups when ignoring the time factor. However, the main effect of time was statistically significant ($F = 32.53$, $p < 0.001$, $\eta^2 = 0.437$), suggesting that externalizing behaviors changed significantly across the measurement stages (pretest, posttest, and follow-up).

Importantly, the interaction effect of time and group was also statistically significant ($F = 16.07$, $p < 0.001$, $\eta^2 = 0.433$), indicating that the pattern of change over time differed significantly between the groups. The relatively large effect sizes for time and the interaction effect suggest that the interventions had a substantial impact on reducing externalizing behaviors over time, with differential effectiveness across the cognitive behavioral therapy, schema therapy, and control groups.

Table 3

Bonferroni Post Hoc Test for Comparing the Effectiveness of Interventions on Externalizing Behaviors at Posttest

Variable	Group	Adjusted Posttest Mean	Standard Error	Reference Group	Comparison Group	Mean Difference	p
Externalizing Behaviors	Cognitive Behavioral Therapy	79.21	1.06	Cognitive Behavioral Therapy	Control	-8.10	<0.001
	Schema Therapy	77.01	1.06	Schema Therapy	Control	-10.29	<0.001
	Control	87.31	1.06	Cognitive Behavioral Therapy	Schema Therapy	2.20	0.452

The results of the Bonferroni post hoc test at the posttest stage indicate that both intervention groups differed significantly from the control group. Specifically, the cognitive behavioral therapy group showed a significantly lower mean of externalizing behaviors compared to the control group (mean difference = -8.10, $p < 0.001$), and the schema therapy group also demonstrated a significantly

lower mean compared to the control group (mean difference = -10.29, $p < 0.001$). However, the difference between the cognitive behavioral therapy and schema therapy groups was not statistically significant (mean difference = 2.20, $p = 0.452$), suggesting that both interventions were similarly effective at the posttest stage in reducing externalizing behaviors.

Table 4

Pairwise Comparison of Externalizing Behaviors Across Time Points

Variable	Group	Reference Time	Comparison Time	Mean Difference	p
Externalizing Behaviors	Cognitive Behavioral Therapy	Pretest	Posttest	6.33	<0.001
		Pretest	Follow-up	7.73	<0.001
		Posttest	Follow-up	1.40	0.031
	Schema Therapy	Pretest	Posttest	8.33	<0.001
		Pretest	Follow-up	7.67	<0.001
		Posttest	Follow-up	-0.67	0.007
	Control	Pretest	Posttest	-1.33	0.002
		Pretest	Follow-up	-2.00	<0.001
		Posttest	Follow-up	-0.67	0.076

The pairwise comparison results across time points revealed that in the cognitive behavioral therapy group, there were significant reductions in externalizing behaviors from pretest to posttest (mean difference = 6.33, $p < 0.001$) and from pretest to follow-up (mean difference = 7.73, $p < 0.001$), while a smaller but still significant difference was observed between posttest and follow-up (mean difference = 1.40, $p = 0.031$), indicating continued improvement over time. In the schema therapy group, significant reductions

were also observed from pretest to posttest (mean difference = 8.33, $p < 0.001$) and from pretest to follow-up (mean difference = 7.67, $p < 0.001$), while a slight but statistically significant change between posttest and follow-up (mean difference = -0.67, $p = 0.007$) suggests stabilization of treatment effects. In contrast, the control group showed small but statistically significant increases in externalizing behaviors from pretest to posttest and follow-up, while the difference between posttest and follow-up was not

significant ($p = 0.076$), indicating a lack of improvement in the absence of intervention.

4. Discussion and Conclusion

The present study aimed to compare the effectiveness of cognitive behavioral therapy and schema therapy on externalizing behaviors in adolescents with high-risk behaviors. The findings demonstrated that both interventions significantly reduced externalizing behaviors over time, as evidenced by the significant main effect of time and the significant interaction effect between time and group. However, the main effect of group was not significant, indicating that when time was not considered, the overall differences between the groups were not statistically meaningful. More importantly, post hoc analyses revealed that both cognitive behavioral therapy and schema therapy were significantly more effective than the control condition at the posttest stage, while no significant difference was observed between the two intervention groups. These findings suggest that both therapeutic approaches are effective in reducing externalizing behaviors, with relatively comparable levels of efficacy.

The significant reduction in externalizing behaviors across time in the intervention groups highlights the effectiveness of structured psychological interventions targeting cognitive and emotional processes in adolescents. This finding is consistent with previous research indicating that high-risk behaviors are closely linked to deficits in cognitive emotion regulation and maladaptive coping strategies (Samsami & Mohammadkhani, 2022; Zarea et al., 2020). The observed improvements can be attributed to the focus of both interventions on modifying dysfunctional thought patterns and enhancing emotional awareness, which are key mechanisms underlying behavioral regulation. Cognitive behavioral therapy, in particular, emphasizes the identification and restructuring of maladaptive cognitions, thereby reducing impulsive and aggressive responses associated with externalizing behaviors (Mayer et al., 2023). Similarly, schema therapy targets deeper cognitive-emotional structures, enabling individuals to recognize and modify early maladaptive schemas that contribute to behavioral dysregulation (Sobhani et al., 2021; Van Wijk-Herbrink et al., 2018).

The lack of a significant difference between cognitive behavioral therapy and schema therapy in the posttest comparisons suggests that both interventions may be equally effective in the short term. This finding aligns with studies

comparing different cognitive-based and integrative therapeutic approaches, which have often reported comparable outcomes in reducing high-risk behaviors (Moshkabadi et al., 2024; Pourroosta et al., 2024). However, the slightly greater mean reduction observed in the schema therapy group, although not statistically significant, may indicate a potential advantage of schema therapy in addressing underlying cognitive structures. This interpretation is supported by research suggesting that schema therapy, by targeting early maladaptive schemas and associated coping modes, may lead to more profound and enduring changes in behavior (Bernstein et al., 2022; Heilemann et al., 2011). Furthermore, studies have shown that schema-focused interventions can be particularly effective in populations with complex behavioral problems, including adolescents with high-risk behaviors (Reyhani & Ahovan, 2024).

The results of the pairwise comparisons across time further revealed that both intervention groups experienced significant reductions in externalizing behaviors from pretest to posttest and from pretest to follow-up, indicating that the therapeutic effects were not only immediate but also sustained over time. In contrast, the control group exhibited a slight increase in externalizing behaviors, underscoring the necessity of intervention in preventing the escalation of such behaviors. These findings are consistent with longitudinal research demonstrating that externalizing behaviors tend to persist or worsen in the absence of targeted interventions (Stepanyan et al., 2020). The maintenance of treatment effects at follow-up suggests that both cognitive behavioral therapy and schema therapy equip adolescents with skills that can be generalized to real-life situations, thereby promoting long-term behavioral change.

The effectiveness of cognitive behavioral therapy observed in this study can be explained by its emphasis on skill acquisition, including problem-solving, emotional regulation, and social skills training. These components have been shown to enhance adolescents' ability to manage stress and reduce engagement in high-risk behaviors (Pourroosta et al., 2024). Moreover, CBT interventions often incorporate behavioral techniques such as reinforcement and exposure, which directly target maladaptive behaviors and facilitate behavioral change. Previous studies have demonstrated that CBT is effective in reducing cognitive distortions and improving behavioral outcomes in individuals with high-risk behaviors (Mayer et al., 2023). The present findings corroborate these results, highlighting the utility of CBT as

a structured and evidence-based approach for addressing externalizing behaviors in adolescents.

On the other hand, the effectiveness of schema therapy can be attributed to its integrative nature and its focus on early developmental experiences. Schema therapy posits that unmet emotional needs in childhood lead to the formation of maladaptive schemas, which in turn influence behavior across the lifespan (Sobhani et al., 2021). By addressing these schemas and their associated coping modes, schema therapy facilitates deeper cognitive and emotional change. The use of experiential techniques, such as imagery and role-playing, allows individuals to process unresolved emotional experiences and develop healthier coping strategies. Empirical evidence supports the effectiveness of schema therapy in reducing high-risk behaviors and improving emotional regulation in adolescents (Reyhani & Ahovan, 2024; Sabet et al., 2016). Additionally, research has shown that schema therapy can lead to significant improvements in individuals with externalizing behavior problems by targeting underlying cognitive-emotional mechanisms (Bernstein et al., 2022).

The findings of this study also highlight the importance of considering contextual and environmental factors in understanding and addressing externalizing behaviors. Family dynamics, peer relationships, and social influences play a crucial role in shaping adolescent behavior. For instance, low family cohesion and poor parental monitoring have been associated with increased risk of externalizing behaviors (Penner et al., 2022; Yousefi, 2025). Interventions that incorporate family components or address social contexts may therefore enhance treatment outcomes. Additionally, cognitive flexibility and peer influences have been identified as important moderators of externalizing behaviors, suggesting that interventions should be tailored to individual and contextual factors (Stepanyan et al., 2020).

Furthermore, the findings of this study are consistent with research emphasizing the role of cognitive and emotional processes in the development of high-risk behaviors. Studies have shown that maladaptive emotion regulation strategies and negative repetitive thoughts are significant predictors of such behaviors (Joharifard et al., 2021). Interventions that target these processes, such as CBT and schema therapy, are therefore well-suited for addressing externalizing behaviors. Other therapeutic approaches, including mindfulness-based interventions and acceptance and commitment therapy, have also demonstrated effectiveness in reducing high-risk behaviors by enhancing emotional awareness and psychological flexibility (Esmaceli Pour et al., 2025; Sharei

et al., 2025). These findings suggest that a comprehensive approach that integrates multiple therapeutic modalities may be particularly beneficial.

In the context of Iranian adolescents, the present findings contribute to the growing body of literature on culturally adapted interventions for high-risk behaviors. Previous studies have highlighted the need for interventions that are sensitive to cultural and social factors influencing adolescent behavior (Khajevand et al., 2023). The effectiveness of both CBT and schema therapy in this study suggests that these approaches can be successfully adapted and implemented in diverse cultural contexts. Moreover, the development of indigenous intervention programs, such as successful intelligence training, has shown promise in reducing high-risk behaviors among adolescents (Baramake et al., 2024). These findings underscore the importance of integrating evidence-based practices with culturally relevant strategies.

In summary, the results of this study indicate that both cognitive behavioral therapy and schema therapy are effective interventions for reducing externalizing behaviors in adolescents with high-risk behaviors. While no significant difference was observed between the two approaches, both demonstrated substantial improvements over time and maintained their effects at follow-up. These findings highlight the importance of targeting cognitive and emotional processes in the treatment of high-risk behaviors and suggest that both CBT and schema therapy can be valuable tools in clinical and educational settings.

One of the main limitations of this study is the relatively small sample size, which may limit the generalizability of the findings to a broader population. Additionally, the use of self-report measures may introduce bias, as participants may underreport or overreport their behaviors. Another limitation is the lack of long-term follow-up beyond the two-month period, which restricts the ability to assess the durability of treatment effects over extended periods. Furthermore, the study did not control for potential confounding variables such as family environment, socioeconomic status, and peer influences, which may have influenced the outcomes.

Future research should aim to include larger and more diverse samples to enhance the generalizability of findings. Longitudinal studies with extended follow-up periods are recommended to examine the long-term effectiveness and sustainability of interventions. Additionally, future studies could explore the combined or integrative effects of cognitive behavioral therapy and schema therapy to determine whether a hybrid approach yields superior outcomes. Investigating the role of mediating and

moderating variables, such as emotional regulation, resilience, and family dynamics, would also provide deeper insights into the mechanisms underlying treatment effectiveness.

From a practical perspective, the findings of this study suggest that both cognitive behavioral therapy and schema therapy can be effectively implemented in counseling centers and educational settings to address externalizing behaviors in adolescents. Practitioners are encouraged to select interventions based on individual needs and characteristics of adolescents, and to incorporate skill-building components that enhance emotional regulation and cognitive restructuring. Additionally, involving families and creating supportive environments may further improve treatment outcomes. Training programs for therapists and school counselors should also emphasize the application of evidence-based approaches such as CBT and schema therapy to ensure effective intervention delivery.

Authors' Contributions

All authors significantly contributed to this study.

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

In this study, to observe ethical considerations, participants were informed about the goals and importance

of the research before the start of the study and participated in the research with informed consent.

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