

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

Fahimeh. Ghafari Moghadam¹, Fateme. Dehghani-Arani^{2*}, Elham. Zarghami³

1 Department of Psychology, SR.C., Islamic Azad University, Tehran, Iran

2 Department of Psychology, University of Tehran, Tehran, Iran

3 Department of Psychology, VaP.C., Islamic Azad University, Varamin, Iran

*Correspondence: f.dehghani.a@ut.ac.ir

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ABSTRACT

The present study aimed to compare the effectiveness of cognitive behavioral therapy and schema therapy on self-coherence in adolescents with high-risk behaviors. This applied study employed a quasi-experimental design with a pretest–posttest format, including a control group and a follow-up phase. 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 based on inclusion criteria and were randomly assigned, after matching demographic characteristics, into two experimental groups and one control group (15 participants in each group). One experimental group received cognitive behavioral therapy and the other received schema therapy across eight structured sessions, while the control group remained on a waiting list. Data were collected using the Integrative Self-Knowledge Questionnaire at three time points: pretest, posttest, and two-month follow-up. Data analysis was conducted using SPSS-27 through descriptive statistics, multivariate analysis of variance, repeated measures analysis of variance, and Bonferroni post hoc tests after verifying statistical assumptions. The results indicated that the main effect of group on self-coherence was not statistically significant ($p = 0.440$), whereas the main effect of time ($p < 0.001$) and the interaction effect of time and group ($p < 0.001$) were statistically significant. Bonferroni post hoc comparisons revealed that both cognitive behavioral therapy and schema therapy groups showed significantly higher self-coherence scores compared to the control group at posttest ($p < 0.05$), while no significant difference was found between the two experimental groups ($p > 0.05$). Pairwise comparisons across time demonstrated significant improvements from pretest to posttest and from pretest to follow-up in both intervention groups ($p < 0.05$), with no significant differences between posttest and follow-up, indicating stability of treatment effects. Both cognitive behavioral therapy and schema therapy were effective in enhancing self-coherence among adolescents with high-risk behaviors, and their effects were maintained over time, although no significant superiority of one approach over the other was observed.

Keywords: Cognitive Behavioral Therapy, Schema Therapy, Self-Coherence, Adolescents, High-Risk Behaviors

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Introduction

Adolescence is widely recognized as a critical developmental period characterized by rapid biological, cognitive, and psychosocial changes, during which individuals are particularly vulnerable to engaging in high-risk behaviors. These behaviors, including substance use, self-injury, unsafe sexual practices, and

aggression, pose significant threats to psychological well-being and long-term adjustment (1, 2). The emergence of such behaviors has been linked to a complex interplay of individual, familial, and social factors, including deficits in emotional regulation, maladaptive cognitive patterns, and weakened identity formation processes (3, 4). In this context, understanding the underlying psychological constructs that contribute to high-risk behaviors becomes essential for designing effective interventions aimed at promoting adolescent mental health.

One of the central constructs that has received increasing attention in recent years is self-coherence, which refers to the degree to which individuals experience a consistent, integrated, and meaningful sense of self across time and situations. Self-coherence is closely related to identity development, emotional stability, and adaptive functioning, and it plays a critical role in how individuals interpret their experiences and regulate their behaviors (5, 6). Individuals with higher levels of self-coherence tend to demonstrate greater resilience, more effective coping strategies, and a reduced likelihood of engaging in maladaptive or high-risk behaviors. Conversely, a fragmented or incoherent sense of self has been associated with emotional dysregulation, impulsivity, and vulnerability to risky behaviors (7, 8).

Empirical evidence suggests that self-coherence is not only a stable personality trait but also a modifiable construct that can be enhanced through psychological interventions. For instance, interventions focusing on narrative reconstruction and meaning-making processes have been shown to improve self-coherence by helping individuals integrate past experiences into a coherent self-narrative (5). Similarly, therapeutic programs aimed at enhancing cognitive and emotional awareness have demonstrated effectiveness in strengthening individuals' sense of self and reducing maladaptive behaviors (8). These findings highlight the importance of targeting self-coherence as a key outcome in interventions designed for adolescents with high-risk behaviors.

Among the various therapeutic approaches, cognitive behavioral therapy (CBT) has been extensively studied and widely applied in the treatment of high-risk behaviors. CBT is based on the premise that maladaptive behaviors are maintained by dysfunctional cognitions and beliefs, and that modifying these cognitive patterns can lead to changes in emotional and behavioral responses. Research has consistently shown that CBT is effective in reducing cognitive distortions and improving emotional regulation in individuals with high-risk behaviors (9, 10). In adolescent populations, CBT-based interventions have been associated with significant reductions in risky behaviors and improvements in psychological functioning, including increased self-awareness and better decision-making abilities (11).

However, despite its effectiveness, CBT may not fully address deeper, more entrenched cognitive-emotional patterns that originate in early life experiences. This limitation has led to the development and application of schema therapy, an integrative approach that combines elements of cognitive, behavioral, and experiential techniques to target early maladaptive schemas. Schema therapy emphasizes the role of early life experiences and unmet emotional needs in shaping enduring cognitive and emotional patterns that influence behavior (12, 13). These schemas often operate at a deeper level than automatic thoughts and can significantly impact individuals' sense of self and interpersonal functioning.

Recent studies have demonstrated the effectiveness of schema therapy in reducing high-risk behaviors and improving emotional regulation among adolescents. For example, emotional schema therapy has been shown to significantly enhance emotional regulation and decrease risky behaviors in adolescent populations

(14). Similarly, interventions targeting maladaptive schemas have been found to improve cognitive and emotional functioning, leading to more adaptive behavioral outcomes (15). Given that schema therapy directly addresses the underlying structures that contribute to a fragmented sense of self, it is particularly relevant for enhancing self-coherence in individuals with high-risk behaviors.

In addition to CBT and schema therapy, other therapeutic approaches such as mindfulness-based interventions and acceptance and commitment therapy have also been explored in the context of high-risk behaviors. These approaches emphasize awareness, acceptance, and value-based action, and have shown promising results in improving emotional regulation and reducing maladaptive behaviors among adolescents (16, 17). Nevertheless, comparative studies examining the relative effectiveness of different therapeutic approaches on self-coherence remain limited, particularly in adolescent populations with high-risk behaviors.

The importance of addressing high-risk behaviors in adolescents is further underscored by the broader social and public health implications of these behaviors. High-risk behaviors not only affect individual well-being but also have significant consequences for families, communities, and healthcare systems. Preventive and therapeutic interventions that effectively reduce such behaviors can therefore contribute to improved mental health outcomes and social functioning (18, 19). Moreover, recent advancements in interdisciplinary research, including the application of machine learning techniques for identifying high-risk patterns, highlight the growing importance of early detection and targeted intervention in this domain (20).

Despite the growing body of research on high-risk behaviors and therapeutic interventions, there remains a gap in the literature regarding the comparative effectiveness of CBT and schema therapy in enhancing self-coherence among adolescents. While both approaches have demonstrated efficacy in reducing maladaptive behaviors, their mechanisms of action differ, with CBT focusing on surface-level cognitive restructuring and schema therapy targeting deeper, underlying cognitive-emotional patterns. Understanding which approach is more effective in promoting self-coherence can provide valuable insights for clinicians and inform the development of more targeted and effective intervention programs.

Furthermore, cultural and contextual factors play an important role in shaping adolescents' experiences and responses to therapeutic interventions. Studies conducted in different cultural settings have emphasized the need to consider sociocultural influences when designing and implementing psychological interventions (6, 21). In this regard, research conducted in specific contexts, such as Iranian adolescents, can contribute to the development of culturally sensitive intervention models that address the unique needs of this population.

In summary, self-coherence is a fundamental psychological construct that plays a crucial role in adolescent development and is closely linked to the emergence and maintenance of high-risk behaviors. Both cognitive behavioral therapy and schema therapy offer promising approaches for addressing these behaviors, yet their relative effectiveness in enhancing self-coherence remains underexplored. Given the increasing prevalence of high-risk behaviors among adolescents and the need for effective intervention strategies, comparative studies in this area are of significant theoretical and practical importance.

Therefore, the aim of the present study is to compare the effectiveness of cognitive behavioral therapy and schema therapy on self-coherence in adolescents with high-risk behaviors.

Methods and Materials

Study Design and Participants

The present study was an applied research with a quasi-experimental design employing a pretest–posttest framework with a control group and a follow-up phase. The research design included three groups: two experimental groups and one control group. Measurements were conducted at three time points, including pretest (T1), posttest (T2), and follow-up (T3). The first experimental group received cognitive behavioral therapy, the second experimental group underwent schema therapy, and the control group did not receive any intervention during the study period and remained on a waiting list.

The statistical population of this study consisted of all adolescents with high-risk behaviors who referred to counseling centers affiliated with the Department of Education in Karaj during the year 2025 (Gregorian calendar equivalent of 1404). Inclusion criteria required participants to have a clinical diagnosis of high-risk behaviors confirmed by a clinical psychologist and standardized risk behavior questionnaires, to be within the age range of 13 to 18 years, not to be under psychiatric medication, and not to have any diagnosed psychiatric disorders based on self-report. Exclusion criteria included unwillingness to continue participation in the study and absence from more than three therapy sessions.

Sample size estimation was initially based on Cohen's (1981) table, although more precise estimation methods such as G*Power are recommended. Based on calculations, a minimum of 10 participants per group was required; however, considering potential attrition and recommendations from similar studies suggesting at least 15 participants per group, a total sample size of 45 adolescents was selected. Participants were chosen through purposive non-random sampling from those who met the inclusion criteria. Subsequently, they were randomly assigned, after matching on demographic variables such as age and gender, into three groups of equal size (15 participants per group), including two experimental groups and one control group.

Before the intervention, participants were fully informed about the objectives of the study, the nature of the therapeutic sessions, and ethical considerations, and informed consent was obtained. After the completion of the intervention sessions, participants responded again to the research instruments during the posttest phase. The control group did not receive any treatment during this period. Two months after the posttest, a follow-up assessment was conducted to evaluate the stability of treatment effects.

Data Collection

Data were collected using the Integrative Self-Knowledge Questionnaire developed and validated by Ghorbani et al. (2008). This instrument consists of 12 closed-ended items measured on a five-point Likert scale. The questionnaire assesses three core dimensions: reflective self-awareness, experiential self-awareness, and the integration of past and present experiences to construct a desirable future. Specifically, items 3, 6, and 9 measure reflective self-awareness; items 1, 5, 7, and 8 assess experiential self-awareness; and items 2, 4, 10, 11, and 12 evaluate the integration of experiences across time.

The psychometric properties of the instrument have been well established. In a sample of 230 students from the University of Tehran, Cronbach's alpha coefficients were reported as 0.90 for experiential self-knowledge and 0.84 for reflective self-knowledge, with a correlation coefficient of 0.74 between the two dimensions. Test–retest reliability over a 7- to 8-week interval in a sample of 44 participants yielded

coefficients of 0.76 for experiential self-knowledge and 0.68 for reflective self-knowledge. In cross-cultural validations involving Iranian and American samples, Cronbach's alpha values ranged from 0.74 to 0.82, indicating satisfactory internal consistency. Furthermore, convergent, criterion-related, discriminant, and incremental validity of the scale were confirmed.

In the Iranian context, Jalilirad (2014) reported a Cronbach's alpha of 0.85 for the questionnaire. Content validity was also confirmed through expert evaluation, including consultation with academic supervisors and specialists who assessed the relevance, clarity, and comprehensibility of the items, as well as their appropriateness for measuring the intended research constructs.

Interventions

The schema therapy intervention in this study was implemented based on the model proposed by Jeffrey E. Young and colleagues (2003), adapted and translated by Hamidpour and Andooz (2022). The intervention consisted of eight structured group sessions designed to target maladaptive schemas and promote emotional and cognitive integration in adolescents with high-risk behaviors. The first session focused on establishing the therapeutic framework, including administering the pretest, introducing group members and the therapist, explaining group rules and therapeutic commitments, and providing an overview of schema therapy concepts.

In the second session, participants' problems were assessed from a schema therapy perspective, emphasizing experiential avoidance, cognitive fusion, and personal values. Adolescents were guided to identify advantages and disadvantages of their maladaptive coping strategies and gain an initial understanding of schema-related concepts. The third session emphasized identifying dysfunctional life patterns and early maladaptive schemas, helping participants recognize how schemas contribute to anxiety and negative emotional responses. Therapeutic techniques were introduced to increase awareness and cognitive control over maladaptive patterns.

During the fourth session, specific schema therapy techniques such as empathic confrontation and limited reparenting were taught. Participants were encouraged to examine the validity of their schemas and evaluate supporting and contradicting evidence, while maintaining a nonjudgmental awareness of their thoughts, emotions, and behaviors. The fifth session focused on redefining schema-confirming evidence and analyzing the advantages and disadvantages of maladaptive schemas and coping styles, facilitating the development of more adaptive cognitive strategies.

The sixth session incorporated experiential techniques such as imagery rescripting and therapeutic letter writing addressed to parents, enabling participants to express emotions and explore how early parental interactions contributed to schema formation. Adolescents were guided to identify harmful schemas, clarify personal values, and set meaningful life goals. The seventh session addressed maladaptive schema modes, particularly the punitive and demanding parent modes, and introduced strategies such as limited reparenting to support vulnerable and angry child modes. Participants practiced applying these techniques to foster self-compassion and emotional regulation.

The final session involved reviewing and practicing all previously learned techniques, with a strong emphasis on applying adaptive coping strategies in real-life situations. Participants reflected on their progress, discussed the outcomes of therapy, and prepared for the follow-up phase. The posttest was

administered at the end of this session, and arrangements were made for a follow-up assessment two months later.

The cognitive behavioral therapy (CBT) intervention was conducted based on the model developed by Stefan G. Hofmann (2003), adapted for group-based intervention with adolescents. This intervention also consisted of eight structured sessions focusing on modifying dysfunctional cognitions, emotions, and behaviors. The first session included administering the pretest, introducing participants and the therapist, explaining group rules and therapeutic expectations, and providing a general overview of cognitive behavioral therapy principles.

In the second session, a therapeutic alliance was established, and participants' primary complaints were explored. The relationship between cognition, emotion, and behavior was explained, and the ABC model was introduced to help adolescents identify and record life events and their associated thoughts and emotional responses. Participants collaborated with the therapist to define treatment goals and agree on homework assignments.

The third session focused on identifying and challenging automatic thoughts. Participants reviewed their thought records and engaged in Socratic questioning to evaluate the accuracy and usefulness of their cognitions. In the fourth session, self-control and awareness skills were introduced, along with techniques such as the downward arrow method to uncover underlying core beliefs and schemas. Participants examined how these beliefs are activated in specific situations.

The fifth session emphasized communication skills training, including effective verbal expression and active listening. Behavioral techniques such as contingency contracting were introduced to reinforce desirable behaviors within the group context. Participants were encouraged to observe others' reactions to different communication styles and reflect on their interpersonal effectiveness.

In the sixth session, cognitive-behavioral techniques were applied to enhance assertiveness, problem-solving skills, and social competence. Participants learned to set value-based goals, identify barriers to achieving these goals, and develop strategies to overcome them. The seventh session focused on identifying core beliefs and unconditional assumptions, using Socratic questioning to weaken maladaptive beliefs and employing scaling techniques to evaluate the intensity of negative beliefs.

The final session involved reviewing all therapeutic techniques, with particular emphasis on managing negative automatic thoughts and enhancing a sense of meaning in life. Participants practiced applying learned skills in real-life contexts and reflected on their therapeutic progress. The posttest was administered at the end of the session, and arrangements were made for a follow-up assessment two months later to evaluate the stability of treatment outcomes.

Data Analysis

Data analysis was conducted using quantitative statistical methods. The Statistical Package for the Social Sciences (SPSS), version 27, was employed to analyze the collected data. The analysis was performed at two levels: descriptive and inferential.

At the descriptive level, frequency distributions, percentages, and descriptive statistics such as means and standard deviations were used to summarize demographic characteristics and research variables across the three groups.

At the inferential level, prior to hypothesis testing, statistical assumptions including normality of data distribution, homogeneity of variances, homogeneity of covariance matrices, and the assumption of sphericity were examined. Given the multivariate nature of the dependent variables and repeated measurements across time, multivariate analysis of variance (MANOVA) and repeated measures analysis of variance were utilized to examine differences between groups and across time points. Additionally, Bonferroni post hoc tests were applied to identify specific group differences and to control for Type I error in multiple comparisons.

Findings and Results

The demographic characteristics of the participants indicated a relatively balanced distribution across the three study groups. In terms of gender, the majority of participants in all groups were male. In the cognitive behavioral therapy group, 11 participants (73.3%) were boys and 4 (26.7%) were girls. Similarly, in the schema therapy group, 9 participants (60%) were boys and 6 (40%) were girls, while in the control group, 11 participants (73.3%) were boys and 4 (26.7%) were girls. The comparison of gender distribution across the groups revealed no statistically significant difference ($p = 0.661$), indicating homogeneity of groups in terms of gender. Regarding educational level, most participants were in the first cycle of secondary education. In the cognitive behavioral therapy group, 11 participants (60%) were in lower secondary education and 4 (13.3%) were in upper secondary education. In the schema therapy group, 9 participants (60%) were in lower secondary and 3 (20%) in upper secondary education. In the control group, 8 participants (53.3%) were in lower secondary and 2 (13.3%) were in upper secondary education. Statistical analysis showed no significant difference among the groups in terms of educational level ($p = 0.589$), suggesting that the groups were comparable with respect to this demographic variable.

Table 1. Descriptive Statistics of Self-Coherence by Group and Time (Mean and Standard Deviation)

Variable	Time	Cognitive Behavioral Therapy (n=15)		Schema Therapy (n=15)		Control (n=15)	
		Mean	SD	Mean	SD	Mean	SD
Self-Coherence	Pretest	40.67	8.37	41.20	8.07	43.00	8.38
	Posttest	46.53	6.15	49.47	6.21	42.13	10.11
	Follow-up	46.20	6.80	48.33	6.61	43.47	10.24

The descriptive statistics presented in Table 1 indicate that at the pretest stage, the mean scores of self-coherence were relatively similar across the three groups, with the control group showing a slightly higher mean compared to the experimental groups. Following the intervention, both experimental groups demonstrated a noticeable increase in self-coherence scores at the posttest stage, with the schema therapy group exhibiting the highest improvement, followed by the cognitive behavioral therapy group. In contrast, the control group showed a slight decrease in mean scores at posttest. At the follow-up stage, the improvements in both experimental groups were largely maintained, although a minor reduction was observed compared to posttest values, while the control group showed a modest increase compared to posttest but remained close to baseline levels. Overall, the pattern of results suggests that both therapeutic

interventions were associated with improvements in self-coherence, with schema therapy showing a relatively stronger effect.

Prior to conducting the inferential analyses, the statistical assumptions underlying multivariate analysis of variance and repeated measures analysis were examined. The normality of the distribution of self-coherence scores across groups and measurement times was assessed using the Shapiro–Wilk test and inspection of skewness and kurtosis indices, all of which indicated that the data did not significantly deviate from normal distribution. The assumption of homogeneity of variances was evaluated using Levene’s test, and the results were non-significant, confirming equality of error variances across groups. Additionally, the homogeneity of covariance matrices was assessed using Box’s M test, which was also non-significant, supporting the equivalence of covariance structures among the groups. The sphericity assumption for repeated measures was examined using Mauchly’s test, and in cases where the assumption was violated, appropriate corrections such as the Greenhouse–Geisser adjustment were applied. Overall, the results confirmed that all key assumptions for conducting MANOVA and repeated measures ANOVA were satisfactorily met, allowing for valid interpretation of subsequent inferential analyses.

Table 2. Results of Repeated Measures Analysis of Variance for the Effectiveness of Interventions on Self-Coherence

Variable	Source	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Self-Coherence	Group	270.93	2	135.47	0.84	0.440	0.038
	Time	580.84	1.69	344.46	18.59	< 0.001	0.307
	Time × Group	361.16	3.37	107.09	5.78	< 0.001	0.216

The results presented in Table 2 indicate that the main effect of group on self-coherence was not statistically significant ($F = 0.84$, $p = 0.440$, $\eta^2 = 0.038$), suggesting that there were no overall differences between the groups when time was not taken into account. However, the main effect of time was statistically significant ($F = 18.59$, $p < 0.001$, $\eta^2 = 0.307$), indicating that self-coherence scores changed significantly across the measurement stages (pretest, posttest, and follow-up). More importantly, the interaction effect of time and group was also statistically significant ($F = 5.78$, $p < 0.001$, $\eta^2 = 0.216$), demonstrating that the pattern of change in self-coherence over time differed significantly between the groups. The effect sizes for time and the interaction effect were moderate to large, suggesting that the interventions had a meaningful impact on changes in self-coherence across the study period.

Table 3. Bonferroni Post Hoc Test for Comparing the Effectiveness of Interventions on Self-Coherence at Posttest

Variable	Group	Adjusted Posttest Mean	Standard Error	Reference Group	Comparison Group	Mean Difference	p-value
Self-Coherence	Cognitive Behavioral Therapy	47.16	1.43	Cognitive Behavioral Therapy	Control	5.94	0.017
	Schema Therapy	49.75	1.43	Schema Therapy	Control	8.52	< 0.001
	Control	41.22	1.43	Cognitive Behavioral Therapy	Schema Therapy	-2.58	0.622

The results of the Bonferroni post hoc test presented in Table 3 show that at the posttest stage, both intervention groups demonstrated significantly higher self-coherence scores compared to the control group. Specifically, the cognitive behavioral therapy group had significantly higher scores than the control group (mean difference = 5.94, $p = 0.017$), and the schema therapy group also showed a significantly greater increase compared to the control group (mean difference = 8.52, $p < 0.001$). However, the difference between the cognitive behavioral therapy group and the schema therapy group was not statistically significant (mean difference = -2.58, $p = 0.622$), indicating that although schema therapy showed a higher mean, the superiority over cognitive behavioral therapy was not statistically confirmed at the posttest stage.

Table 4. Pairwise Comparisons of Self-Coherence Across Time Points

Variable	Group	Reference Time	Comparison Time	Mean Difference	p-value
Self-Coherence	Cognitive Behavioral Therapy	Pretest	Posttest	-5.87	0.006
		Pretest	Follow-up	-5.53	0.011
		Posttest	Follow-up	0.33	0.718
	Schema Therapy	Pretest	Posttest	-8.27	< 0.001
		Pretest	Follow-up	-7.13	< 0.001
		Posttest	Follow-up	1.13	0.392
	Control	Pretest	Posttest	0.87	0.520
		Pretest	Follow-up	-0.47	0.713
		Posttest	Follow-up	-1.33	0.223

The pairwise comparison results presented in Table 4 indicate that in the cognitive behavioral therapy group, there was a significant improvement in self-coherence from pretest to posttest ($p = 0.006$) and from pretest to follow-up ($p = 0.011$), while no significant difference was observed between posttest and follow-up, suggesting stability of treatment effects over time. Similarly, in the schema therapy group, significant improvements were observed from pretest to posttest and from pretest to follow-up (both $p < 0.001$), with no significant difference between posttest and follow-up, indicating sustained effects of the intervention. In contrast, the control group showed no significant changes across any of the time comparisons (all $p > 0.05$), confirming that the observed improvements in the experimental groups can be attributed to the therapeutic interventions rather than natural variation over time.

Discussion and Conclusion

The findings of the present study demonstrated that both cognitive behavioral therapy and schema therapy were effective in improving self-coherence among adolescents with high-risk behaviors, as evidenced by the significant effect of time and the significant interaction between time and group. Although the main effect of group was not statistically significant, the interaction effect clearly indicated that the pattern of

change in self-coherence differed across groups over time, with both intervention groups showing meaningful improvement compared to the control group. Furthermore, post hoc comparisons revealed that both cognitive behavioral therapy and schema therapy significantly outperformed the control group at posttest, while no statistically significant difference was observed between the two intervention approaches. Additionally, the results of pairwise comparisons across time indicated that the improvements in self-coherence observed in both intervention groups were sustained at the follow-up stage, suggesting the durability of treatment effects.

These findings are consistent with the theoretical assumption that self-coherence is a dynamic and modifiable construct that can be enhanced through structured psychological interventions. From a theoretical perspective, self-coherence reflects the integration of cognitive, emotional, and experiential aspects of the self, which is essential for adaptive functioning and psychological well-being (5). The observed increase in self-coherence in both intervention groups suggests that therapeutic processes targeting cognitive restructuring and emotional integration can effectively strengthen individuals' sense of self and reduce fragmentation. This is particularly important for adolescents with high-risk behaviors, who often experience disruptions in identity development and emotional regulation (1, 2).

The effectiveness of cognitive behavioral therapy in improving self-coherence can be explained by its focus on identifying and modifying dysfunctional cognitions and maladaptive behavioral patterns. By helping adolescents recognize automatic negative thoughts, challenge cognitive distortions, and develop more adaptive thinking patterns, cognitive behavioral therapy facilitates greater cognitive clarity and emotional regulation, which in turn contribute to a more coherent sense of self (9). The significant improvements observed in the cognitive behavioral therapy group are consistent with previous studies demonstrating the efficacy of this approach in reducing high-risk behaviors and improving psychological functioning among adolescents (10, 11). These studies have shown that cognitive behavioral interventions can enhance self-awareness, promote adaptive coping strategies, and reduce impulsivity, all of which are closely relevant with increased self-coherence.

At the same time, the findings related to schema therapy provide important insights into the role of deeper cognitive-emotional structures in shaping self-coherence. Schema therapy operates at a more fundamental level than cognitive behavioral therapy by targeting early maladaptive schemas that originate from unmet emotional needs in childhood. These schemas often lead to persistent patterns of negative thinking, emotional dysregulation, and maladaptive coping behaviors, which can undermine the development of a coherent sense of self (13). The significant improvements observed in the schema therapy group are consistent with previous research indicating that schema-focused interventions can effectively reduce high-risk behaviors and improve emotional regulation in adolescents (14, 15). By addressing the underlying schemas that contribute to self-fragmentation, schema therapy helps individuals develop a more integrated and stable sense of identity.

Although schema therapy showed slightly higher mean scores in self-coherence compared to cognitive behavioral therapy at posttest and follow-up, the difference between the two approaches was not statistically significant. This finding suggests that both therapeutic approaches are effective, albeit through different mechanisms. Cognitive behavioral therapy primarily operates at the cognitive level by modifying surface-level cognitions, while schema therapy targets deeper, more enduring cognitive-emotional structures. The

lack of a significant difference between the two approaches may indicate that both levels of intervention are sufficient to produce meaningful improvements in self-coherence among adolescents with high-risk behaviors. This interpretation is consistent with previous comparative studies showing that different therapeutic approaches can yield similar outcomes despite differences in their underlying theoretical frameworks (12).

The stability of treatment effects observed at the follow-up stage further supports the effectiveness of both interventions. The absence of significant differences between posttest and follow-up scores in the experimental groups indicates that the gains achieved during the intervention were maintained over time. This finding is particularly important in the context of high-risk behaviors, which are often resistant to change and prone to relapse. The sustained improvement in self-coherence suggests that both cognitive behavioral therapy and schema therapy can produce lasting changes in adolescents' cognitive and emotional functioning. This is consistent with previous research emphasizing the long-term benefits of interventions that target cognitive and emotional processes in adolescents (14, 15).

The lack of significant changes in the control group further strengthens the validity of the findings, as it indicates that the observed improvements in the experimental groups were not due to natural maturation or external factors. This highlights the importance of structured therapeutic interventions in promoting psychological well-being among adolescents with high-risk behaviors. In line with previous research, the results of the present study underscore the role of targeted psychological interventions in reducing maladaptive behaviors and enhancing adaptive functioning (18, 19).

Moreover, the findings of this study can be interpreted within the broader context of research on protective factors and resilience in adolescents. Self-coherence has been identified as a key protective factor that contributes to resilience and adaptive coping in the face of stress and adversity (6, 21). By enhancing self-coherence, both cognitive behavioral therapy and schema therapy may indirectly reduce the likelihood of engaging in high-risk behaviors and promote healthier developmental trajectories. This is consistent with studies demonstrating the role of cognitive emotion regulation, attachment styles, and metacognitive beliefs in predicting high-risk behaviors among adolescents (3, 22).

In addition, the results of the present study are aligned with findings from other therapeutic approaches that emphasize awareness, acceptance, and value-based action. For example, mindfulness-based interventions and acceptance and commitment therapy have been shown to improve emotional regulation and reduce high-risk behaviors by increasing individuals' awareness of their internal experiences and promoting adaptive coping strategies (16, 17). These approaches, similar to cognitive behavioral therapy and schema therapy, contribute to the development of a more coherent and integrated sense of self, further highlighting the central role of self-coherence in psychological interventions.

Taken together, the findings of the present study provide strong empirical support for the effectiveness of both cognitive behavioral therapy and schema therapy in enhancing self-coherence among adolescents with high-risk behaviors. By addressing both surface-level cognitive processes and deeper schema-based patterns, these interventions can promote meaningful and lasting changes in adolescents' psychological functioning. Furthermore, the results highlight the importance of considering multiple therapeutic approaches when designing intervention programs, as different methods may be equally effective in achieving desired outcomes.

The implications of these findings extend beyond the clinical setting, as they suggest that interventions aimed at enhancing self-coherence can play a crucial role in promoting adolescent mental health and preventing the development of high-risk behaviors. Given the increasing prevalence of such behaviors and their associated consequences, there is a clear need for evidence-based interventions that can effectively address the underlying psychological mechanisms involved. The present study contributes to this growing body of knowledge by providing a comparative analysis of two widely used therapeutic approaches and highlighting their effectiveness in improving a key psychological construct.

One of the main limitations of the present study is the relatively small sample size, which may limit the generalizability of the findings to broader populations. Additionally, the use of a purposive sampling method may have introduced selection bias, as participants were selected based on specific criteria and may not be representative of all adolescents with high-risk behaviors. Another limitation is the reliance on self-report measures, which are subject to response biases such as social desirability and may not fully capture the complexity of self-coherence. Furthermore, the study was conducted within a specific cultural and geographical context, which may limit the applicability of the findings to other cultural settings. Finally, the follow-up period was relatively short, and longer-term follow-up assessments would be needed to determine the stability of treatment effects over extended periods.

Future studies are recommended to use larger and more diverse samples in order to enhance the generalizability of findings. It is also suggested that researchers employ randomized sampling methods and include participants from different cultural and socioeconomic backgrounds. Longitudinal studies with extended follow-up periods would provide valuable insights into the long-term effectiveness of therapeutic interventions. Additionally, future research could examine the mediating and moderating variables that influence the relationship between therapeutic interventions and self-coherence, such as personality traits, family dynamics, and social support. Comparative studies involving other therapeutic approaches, such as mindfulness-based therapy or acceptance and commitment therapy, would also be beneficial in further understanding the relative effectiveness of different interventions. Finally, incorporating qualitative methods could provide deeper insights into the subjective experiences of adolescents undergoing therapy.

From a practical perspective, the findings of this study highlight the importance of implementing structured psychological interventions for adolescents with high-risk behaviors in educational and clinical settings. Mental health professionals are encouraged to utilize both cognitive behavioral therapy and schema therapy as effective approaches for enhancing self-coherence and reducing maladaptive behaviors. It is also recommended that intervention programs be tailored to the specific needs of adolescents, taking into account their developmental stage and individual differences. Schools and counseling centers should consider integrating these therapeutic approaches into their support services to promote students' psychological well-being. Additionally, training programs for therapists and counselors should emphasize the importance of addressing both cognitive and schema-level processes in order to achieve more comprehensive and lasting outcomes.

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Authors' Contributions

All authors equally contributed to this study.

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.

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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References

- Joharifard M, Zahracar K, Farokhi Na, Mardani rad M. The causal model of tendency to high-risk behaviors in adolescents based on metacognitive beliefs and identity styles with role mediating of negative repetitive thoughts and resilience. *Counseling Culture and Psychotherapy*. 2021;12(47):161-94. doi: 10.22054/qccpc.2021.57166.2589.
- Sefidrood M, Hobbi MB. The Role of Attachment Styles and Cognitive Emotion Regulation in Predicting the Tendency to High-Risk Behaviors in Adolescents. *International Journal of Applied Behavioral Sciences*. 2023;10(1):1-8. doi: 10.22037/ijabs.v9i4.34259.
- Mohammadi Hosseini Asl F, Saken Azari R, Abdoltajedini P, Aghdasi AN. The Role of Attachment Styles, Cognitive Emotion Regulation and Subjective Vitality in Predicting High-Risk Behaviors of Female Adolescents. *Quarterly Journal of Child Mental Health*. 2022;9(3):121-35. doi: 10.52547/jcmh.9.3.11.
- Yousefi A. Investigating the Role of Family Cohesion, Social Self-Efficacy and Adjustment in Predicting High-Risk Behaviors in Adolescents in Kamiyaran City. *Journal of Emergency Health Care*. 2025;14(1):3.
- Angus LE. Narrative Processes and Self-Coherence in Trauma Recovery. *Psychotherapy Research*. 2021;31(2):189-203.
- Moghadamnia MM, Soleimani Farsani BH. Relationship between Marital Commitment and Marital Satisfaction with Self-Conscious Emotions and Self-Coherence married female. *Psychology of Woman Journal*. 2023;4(1):52-61. doi: 10.61838/kman.pwj.4.1.6.
- Mansoori B, Hosseini Far J. The effectiveness of spiritual intelligence training on social adjustment, alexithymia, and self-coherence in divorced students. *School and Educational Psychology*. 2020;9(3):234-58.
- Mosaei R, Abolmaali Alhosseini K, Bagheri F. The effectiveness of growth-oriented training for adults aged 35 to 45 in promoting self-coherence and lifelong learning. *Applied Family Therapy Journal (AFTJ)*. 2023;4(5):192-205. doi: 10.61838/kman.aftj.4.5.11.
- Mayer J, Smith R, Johnson K. Impact of cognitive behavioral therapy on cognitive distortions in individuals with high-risk behaviors. *Journal of Behavior Therapy*. 2023;45(3):312-27.

10. Pourroosta A, Hamid N, Bashlideh K, Hashemi SI. Comparison of the Effectiveness of Positive Psychology-Based Therapy and Cognitive-Behavioral Therapy on Internet Addiction and High-Risk Behaviors of Students. *New Psychological Research*. 2024;19(73):22-34.
11. Moshkabadi EG, Heydari S, Fakhri M. Comparison of the Effectiveness of Cognitive Behavioral Training and Acceptance and Commitment Training on High-Risk Behaviors in Self-Injurious Adolescents. *Jayps*. 2024;5(5):126-35. doi: 10.61838/kman.jayps.5.5.15.
12. Sabet AH, Nejad SN, Khalatbari J. Comparison of the Effect of Schema Therapy and Cognitive Group Therapy on Depression in Women Engaging in High-Risk Sexual Behaviors Who Were Referred to Hamadan Health Center. *Avicenna Journal of Neuro Psych Physiology*. 2016;3(1). doi: 10.17795/ajnpp-39755.
13. Mirzaalian Dastjerdi F. Predicting high-risk behaviors based on childhood maltreatment with the mediation of early maladaptive schemas in high school students. *Journal of a New Approach to Children's Education*. 2022;4(3):76-83.
14. Reyhani S, Ahovan M. The effectiveness of emotional schema therapy on regulating emotions and reducing high-risk behaviors in female adolescents. *Journal of Research in Behavioural Sciences*. 2024;22(1):137-49. doi: 10.29252/rbs.22.1.137.
15. Khajevand S, Bahrainian A, Nasri M, Shahabizadeh F. Investigating the effectiveness of metacognitive interpersonal therapy on the cognitive regulation of emotion and emotional inhibition in adolescents with high-risk behaviors. *Journal of Cognitive Psychology*. 2023;11(4):91-105.
16. Sharei A, Kasaei Esfahani A, Salmani A. The Effect of Mindfulness Therapy on Emotion Regulation, Cognitive Self-Awareness, and Tendency to High-Risk Behaviors in Orphaned and Poorly Monitored Adolescents: A Quasi-Experimental Study. *Journal of Rafsanjan University of Medical Sciences*. 2025;23(9):812-27. doi: 10.61186/jrums.23.9.812.
17. Esmaeili Pour M, Yousefi Z, Farhadi H. Development of a life hope package based on acceptance and commitment therapy specifically for adolescents exhibiting high-risk behaviors. *Quarterly Journal of Experimental and Cognitive Psychology*. 2025;1-16.
18. Baramake Z, Fadavi MS, Yousefi Z. Development of a Successful Intelligence Training Package Aimed at Reducing High-Risk Behaviors Especially for Teenagers. *Journal of Psychological Dynamics in Mood Disorders (PDMD)*. 2024;2(4):101-14. doi: 10.22034/pdmd.2024.444922.1054.
19. Zarea S, Ahi Q, Vaziri SAH, Shahabizadeh F. Sexual Schemas and High-Risk Sexual Behaviors in Female Students the Mediating Role of Cognitive Emotion Regulation. *International Archives of Health Sciences*. 2020;7(4):203-9. doi: 10.4103/iahs.iahs_84_20.
20. Yuan T, Zhang X, Chen X. Machine learning based enterprise financial audit framework and high-risk identification. *arXiv*. 2025.
21. Vega-Martínez MDC, López-Martínez C, Del-Pino-Casado R. Sense of coherence and self-care in people with diabetes: systematic review. *MedRxiv*. 2025. doi: 10.1101/2025.01.16.25320434.
22. Samsami M, Mohammadkhani S, editors. Cognitive emotion regulation strategies in students with high-risk behaviors: The mediating role of metacognitive beliefs. 9th International Conference on Knowledge and Technology of Educational Sciences, Social Studies and Psychology of Iran; 2022; Tehran.