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Comparing Sense of Coherence, Self-Efficacy, and Character Strengths among Adolescents with ADHD and Non-Suicidal Self-Injury

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ABSTRACT

Objective: This study compared sense of coherence, self-efficacy, and character strengths among adolescents with attention-deficit/hyperactivity disorder (ADHD), adolescents engaging in non-suicidal self-injury (NSSI), and a control group.

Methods and Materials: In this cross-sectional, causal-comparative study, 72 adolescents aged 13–18 years (24 ADHD, 22 NSSI, 26 controls) were recruited through purposive sampling from counseling and psychology clinics in Tehran, Iran. Participants completed the Sense of Coherence Scale (SOC-29), the General Self-Efficacy Scale (GSE-17), and the short form of the Values in Action Inventory of Strengths (VIA-IS). Data were analyzed in SPSS-27 using basic descriptive statistics and multivariate analysis of variance with post hoc tests; the significance level was set at $p \leq 0.05$.

Findings: MANOVA indicated a significant multivariate effect of group. Univariate tests showed significant group differences in SOC and self-efficacy (both $p<0.001$), but not in character strengths (p 0.081). Post hoc comparisons revealed that SOC was lowest in the ADHD group, intermediate in the NSSI group, and highest in controls. Self-efficacy was lowest in the NSSI group and highest in the control group. At the same time, adolescents with ADHD reported higher self-efficacy than those with NSSI and did not differ significantly from controls.

Conclusion: Adolescents with ADHD and those who engage in NSSI show vulnerabilities in sense of coherence and self-efficacy, whereas overall character strengths appear similar across groups. Interventions that enhance coherence and self-efficacy and use strength-based approaches may support resilience and guide therapeutic programs for these adolescents.

Keywords: Sense of Coherence, self-efficacy, character Strengths, adolescents, ADHD, Self-injury.

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a common neurodevelopmental disorder in children and adolescents, affecting 3 to 10% of the population. It manifests as symptoms of inattention, hyperactivity, and impulsivity, which significantly impair social, emotional, and academic functioning (Herrera-Gutiérrez et al., 2021; Yari et al., 2024). Individuals with ADHD often show comorbid conditions including impulse control disorders (e.g., oppositional defiant, borderline, antisocial personality), mood disorders (e.g., depression, bipolar, cyclothymic), anxiety disorders (e.g., generalized anxiety, agoraphobia, PTSD, social anxiety), phobias, substance use issues, learning disabilities, and sleep disturbances (Asadolahi & Gholamipour, 2023; Khare & Acharya, 2023). Research indicates that family environment and parenting practices can affect ADHD symptom severity (Claussen et al., 2024). Moreover, individuals with ADHD, particularly those with pronounced attention deficits, are more likely to engage in non-suicidal self-injury (NSSI), with girls showing a higher risk of comorbidity and symptom onset than boys (Cheng et al., 2024). Compared to peers without ADHD, affected individuals are about 3.5 times more likely to experience suicidal ideation, 4.5 times more likely to plan suicide, more than twice as likely to attempt it, and over six times more likely to die by suicide. Additionally, ADHD symptom severity has been linked to increased NSSI (Alimjon et al., 2023; Thornton et al., 2025).

NSSI typically emerges during adolescence and is considered a maladaptive coping strategy for managing overwhelming negative emotions, often reflecting broader difficulties in emotion regulation (Ashrafi et al., 2021). This behavior involves deliberately inflicting harm upon one's own body without suicidal intent and is regarded as a serious mental health concern. The prevalence of NSSI is reported to be over 40% in clinical populations and around 18% in non-clinical samples (Zetterqvist et al., 2020). Empirical studies have revealed associations between childhood impulsivity and later suicidal behaviors, as well as between childhood neglect and engagement in NSSI (Ojala et al., 2022). Moreover, ADHD has been found to contribute both directly and indirectly to suicidal behaviors and NSSI (Brown et al., 2022). Adolescents with ADHD who engage in NSSI tend to exhibit high levels of emotional distress, impulsivity, antisocial behavior, and substance abuse. However, the presence of psychological protective factors may mitigate these risks (Yari et al., 2024; Dayan et al., 2022).

One of the key protective factors identified in the literature is Sense of Coherence (SOC), a concept derived from Antonovsky's salutogenic model. SOC reflects a person's overall view of life as structured, predictable, and manageable, consisting of three components: comprehensibility (perceiving life as coherent and understandable), manageability (believing one has sufficient resources to meet demands), and meaningfulness (finding life emotionally significant and worthwhile) (Dayan et al., 2022). Higher levels of SOC have been associated with reduced engagement in risky behaviors and improved health-related outcomes, even among adolescents with ADHD (da-Silva-Domingues et al., 2022). Additionally, another study found a positive relationship between SOC and self-efficacy, underscoring SOC's importance for mental health and overall well-being (Kösler et al., 2024).

Repeated exposure to negative feedback, often experienced by adolescents with ADHD or those engaging in NSSI, can diminish their self-efficacy and increase maladaptive behaviors (Liu et al., 2020). Self-efficacy refers to an individual's belief in their ability to successfully perform actions necessary to achieve specific goals or manage challenges (Kösler et al., 2024). Research has shown that low self-efficacy in resisting self-injury is associated with higher NSSI frequency (Zhou & Luo, 2025). In contrast, improved self-efficacy is associated with better coping, better mental health, and reduced ADHD symptoms (Wüstner et al., 2019).

Various studies have shown that individuals with high levels of protective factors-including Sense of Coherence, self-efficacy, and character strengths-are less vulnerable to risks and less likely to experience suicidal ideation, with character strengths serving as a crucial protective shield (Ohlan & Gera, 2022). Character strengths serve as key psychological mechanisms that embody core virtues. According to the Values in Action framework, these strengths fall into six categories: wisdom (e.g., creativity, curiosity), courage (e.g., bravery, persistence), humanity (e.g., love, kindness), justice (e.g., fairness, leadership), temperance (e.g., forgiveness, self-regulation), and transcendence (e.g., gratitude, hope) (Casali et al., 2021). Numerous studies have demonstrated that adolescents with high levels of character strengths, particularly hope

and gratitude, report lower levels of depression and suicidal ideation (Ohlan & Gera, 2022). These findings highlight the protective nature of character strengths in fostering emotional resilience and adaptive functioning among youth with psychological vulnerabilities. Emphasizing character strengths in adolescents with ADHD can also shift the educational and clinical focus from deficit-based perspectives toward strength-based approaches that support positive development and well-being (Boeckmans, 2021).

Adolescents with ADHD and those engaging in NSSI both face emotional and behavioral challenges, including poor emotion regulation, impulsivity, and comorbid psychiatric symptoms (Cheng et al., 2024). Drawing on Antonovsky's salutogenic theory and positive psychology, this study integrates Sense of Coherence (SOC), self-efficacy, and character strengths as interconnected protective factors that foster resilience (Schwartz & Sendor, 1999). SOC reflects a global life orientation emphasizing comprehensibility, manageability, and meaningfulness; self-efficacy denotes confidence in handling challenges; and character strengths represent core virtues that support adaptive functioning and reinforce SOC and self-efficacy. Together, these constructs offer a framework for understanding resilience and coping mechanisms among these adolescents. This study explores differences between adolescents with ADHD and those with NSSI in these protective factors, how these factors interrelate within each group, and their moderating role on mental health outcomes. Comparing these groups is justified by their shared emotional and behavioral difficulties despite distinct diagnoses. The findings aim to inform a conceptual model of how psychological resources influence mental health in these populations.

Methods and Materials

The study was conducted as part of cross-sectional research with a practical purpose and utilized a causal-comparative research design regarding method and duration. The dependent variables examined in the study were a sense of coherence, self-efficacy, and character strength. The study's statistical population consisted of adolescents aged 13 to 18 years, both boys and girls, who exhibited hyperactivity or engaged in self-injurious behaviors and sought counseling and psychological services in Tehran from July to September 2023. The research used a purposive sampling method, with a sample of 90 individuals (30 per group). The sample size was determined using G-Power software, with parameters set at significance level (α) = 0.05, effect size = 0.15, power = 0.95, and number of groups = 3 (Kang, 2021) (Figure 1). Initially, the estimated sample size was 75 individuals, but to account for potential dropouts, the researcher decided on 90 individuals, resulting in 30 per group.

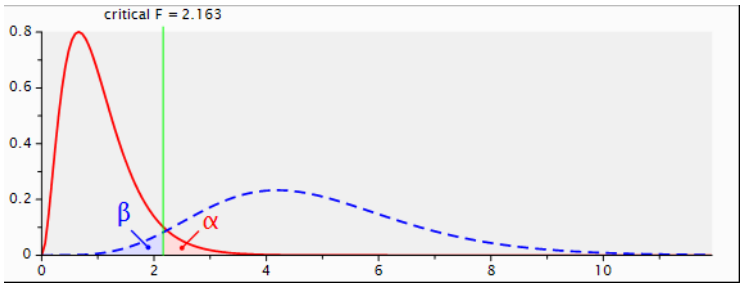

Figure 1

Sample size calculation with G-Power software

Criteria for entry into the study included being at least 13 years old and willing to participate; possessing adequate literacy and understanding to answer questions; experiencing hyperactivity for the first group; and exhibiting self-injurious behaviors in the past year for the second group, as well as visiting local clinics and having a consultation file. Exclusion criteria included not completing the questionnaire with more than 10 questions, having a physical or mental disorder that hindered participation, and declining to take part. After obtaining the required permits and university approval, the researchers were first connected with three

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psychology clinics by their professors. They then collaborated with the clinics and spoke with parents of children with hyperactivity or self-injurious behaviors before reaching out to willing participants, ensuring participants could withdraw from the study. The research process, including in-person questionnaire administration, lasted three months due to limited participant cooperation. The participants were divided into three groups with 30 individuals each: a hyperactive experimental group, a self-injurious behavior experimental group, and a control group. The control group consisted of adolescent clinic clients without self-injurious or hyperactive behaviors. The study excluded 18 participants for providing incomplete or deliberately incorrect answers to the questionnaire. A number of these individuals also withdrew from the study. Given the missing data, the researcher continued the study after eliminating cases, assuming the sample size remained sufficient based on the sample size calculation method. The number of participants varied across the three groups: 24 in the Hyperactive group, 22 in the Self-injury group, and 26 in the Control group. To ensure ethical guidelines were followed, individuals were provided with a consent document before completing the surveys, highlighting the voluntary nature of participation and the right to withdraw at any time. They were also made aware that the survey responses would remain anonymous.

Instruments

Sense of Coherence 29-item scale (SOC-29): This questionnaire consists of three components: comprehensibility, manageability, and meaningfulness. It includes 29 questions measuring sense of coherence on a seven-point Likert scale. Higher scores indicate a stronger sense of coherence, while lower scores indicate a weaker one (Antonovsky, 1993). The total points should fall between 29 and 203 to determine an individual's sense of coherence. To use the SOC-29 questionnaire in the Iranian cultural context, a careful cultural adaptation and translation process was carried out. This process included translation into Persian, back-translation into English by independent translators, and a content validity review by experts in psychology and health to ensure the conceptual compatibility of the items with the local culture. A study in Iran aimed to evaluate the psychometric properties of the Sense of Cohesion Questionnaire (29 items) in university students. Factor analysis showed that this questionnaire has only one factor, which explains 76.5% of the variance, and all items loaded on this factor; therefore, the internal consistency of the SOC questionnaire was α=0.969. This indicates the questionnaire's good reliability (Alipour & Sharif, 2012). The scale's reliability, as measured by Cronbach's alpha in Iran, was 0.969 (Alipour & Sharif, 2012). In the current research, the Cronbach's alpha for this questionnaire was 0.71.

General Self-Efficacy Scale (GSE-17): In 1982, Sherer et al. & Maddux developed this survey (Sherer et al., 1982). The GSE-17 survey assesses individuals' overall self-efficacy. It consists of 17 questions, each answered on a four-point Likert scale ranging from strongly disagree to agree. The scale evaluates three aspects of behavior: the inclination to initiate, the perseverance to see it through, and the ability to overcome obstacles—scores range from 17 to 68. To use the GSE-17 General Self-Efficacy Scale in the Iranian cultural context, the translation and cultural adaptation process has been carefully carried out. The Persian version of this scale has been used in several studies in Iran and has shown appropriate convergent validity and reliability. In a study titled Psychometric Properties of the Persian Version of the General Self-Efficacy Scale, 261 subjects (47 women and 214 men) were selected from substance abusers attending a training and treatment center through convenience sampling, and the subjects completed the GSE scale and the AWARE questionnaire. The findings confirmed the single-factor structure of the GSE scale among substance abusers. This factor accounted for 0.67% of the total variance in the GSE scale. The Cronbach's alpha coefficient was 0.94. The results showed that the correlation between the GSE scale and the AWARE questionnaire was -0.51 and was significant at $p<0.01$ (Farnia et al., 2020). A study in Iran found the survey's internal consistency to be 0.83 (Ahmadi Deh Ghotbaddini, 2022). The researchers also calculated Cronbach's alpha as 0.766. Furthermore, the questionnaire's convergent validity was 0.77.

Values in Action- Inventory of Strengths (VIA-IS): In 2004, Peterson and Seligman developed a questionnaire to assess individuals' personality traits (Ruch et al., 2010). The questionnaire aims to evaluate six universal virtues: wisdom, humanity, courage, justice, temperance, and transcendence, which are commonly found in various religions. It consists of 240 statements, with each

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virtue represented by 10 statements. Respondents indicate their level of agreement or disagreement with each statement on a 5-point Likert scale. To deal with the questionnaire's length, a concise 24-item version was developed. To use the VIA-IS questionnaire in the Iranian cultural context, the translation and cultural adaptation process has been carefully carried out. In a study in Iran aimed at investigating the psychometric properties of the Values Strengths in Action Questionnaire for adolescents, 417 students (213 girls and 204 boys) were selected. The results of the confirmatory factor analysis showed that CMIN/DF ≥ 3, CFI = 0.90, PCFI = 0.60, and RMSEA = 0.08 confirm the proposed scale structure using data from a sample of Iranian adolescents. The significant correlations of personality strengths with happiness and self-efficacy (r = 0.28 - 0.56, p < 0.001) confirmed the scale's convergent validity, and the correlations with behavioral and general self-handicapping (r = 0.12 - 0.61; p < 0.001) confirmed the scale's divergent validity. Cronbach's alpha coefficients for the virtues ranged from 0.79 to 0.97, and their reliability over 15 days ranged from 0.76 to 0.94 (Khosrojerdi et al., 2020). Previous research reported a Cronbach's alpha value of 0.80 for this scale (Khodabakhash et al., 2015), but the present study discovered a Cronbach's alpha of 0.81.

Statistical analysis

The data collected in the study were analyzed using MANOVA, Kruskal-Wallis, Games-Howell, and Bonferroni post hoc tests to compare the scores of the three groups. Before starting the analysis, the required assumptions were verified. No anomalies were detected during data examination. Additionally, the three groups were confirmed to be independent of each other. The Shapiro-Wilk test indicated that the distribution was normal. As a result, the researcher used parametric methods in this study. Levene's Test showed that the error variances of the variables were equal across groups. The study used SPSS 27 to analyze descriptive statistics at the 0.05 significance level.

Findings and Results

In this study, 72 adolescents participated: 24 in the Hyperactive group, 22 in the self-injury group, and 26 in the control group. Initially, the researcher examined the descriptive statistics of the study's variables. The adolescents were categorized into four age groups: 13 to 14 years, 14 to 15 years, 15 to 16 years, and 16 years and above. The participants were further divided into male and female groups. The researcher also compared the demographic variables across the three groups. According to the Kruskal-Wallis test, there were no significant differences among the variables across the three groups (P>0.05) (Table 1).

Table 1

Demographic characteristics in the groups

Variables	Demographic information	Hyperactive	%	Self-Injury	%	Control Group	%	Kruskal Wallis	P value
Age	13-14	7	29.2%	8	36.4%	8	30.8%	0.357	0.837
	14-15	6	25.0%	5	22.7%	5	19.2%		
	15-16	7	29.2%	5	22.7%	7	26.9%		
	16-18	4	16.7%	4	18.2%	6	23.1%		
	Total	24	100.0%	22	100.0%	26	100.0%		
	Girl	17	70.8%	13	59.1%	16	61.5%	0.773	0.680
Gender	Boy	7	29.2%	9	40.9%	10	38.5%		
	Total	24	100.0%	22	100.0%	26	100.0%		

Table 2 presents the descriptive statistics for the research variables within the different groups.

Table 2

Descriptive statistics of the variables

Variables	Groups	N	Mean ± SD	Min	Max	Skewness	Kurtosis	Shapiro-Wilk	P-value
SOC	Hyperactive	24	84.333±4.761	76	95	0.312	-0.286	0.976	0.821
	Self-Injury	22	91.727±4.733	83	100	-0.497	-0.916	0.871	0.008
	Control Group	26	96.538±6.008	82	103	-0.944	0.293	0.883	0.007
Self-Efficacy	Hyperactive	24	42.667±2.959	37	48	-0.139	-0.867	0.956	0.370
	Self-Injury	22	37.091±1.743	34	40	-0.390	-0.329	0.915	0.061
	Control Group	26	44.692±3.750	36	50	-0.735	-0.028	0.933	0.093
Character Strength	Hyperactive	24	65.042±3.113	60	70	0.043	-1.481	0.918	0.054
	Self-Injury	22	63.818±3.948	57	70	0.154	-1.051	0.940	0.201
	Control Group	26	62.615±4.109	57	69	0.134	-1.342	0.917	0.037

The mean scores for the Sense of Coherence variable were 84.333 for the Hyperactive group, 91.727 for the self-injury group, and 96.538 for the control group. The mean of the Sense of Coherence variable in the Hyperactive group was lower than the mean scores in the control group. Similarly, the mean scores in the Self-Efficacy variable were 42.667 for Hyperactive, 37.091 for self-injury, and 44.692 for the control group. The mean Self-Efficacy score in the adolescent's self-injury group was lower than in the control group. Additionally, the mean scores in the Character strength variable were 65.042 for Hyperactive, 63.818 for self-injury, and 62.615 for the control group. There was no significant difference between the groups. The researcher conducted a MANOVA test to assess the significance of the differences. Before the analysis, the necessary assumptions were reviewed, including checking for outliers; none were found. The Shapiro-Wilk test indicated that the distribution of scores was normal. When the distribution was abnormal, the researcher used the Kruskal-Wallis test, which yielded results similar to those of the MANOVA test.

Table 3

Levene's Test of Equality of Error Variances

	Levene Statistic	df1	df2	P-value
SOC	1.243	2	69	0.295
Self-Efficacy	5.309	2	69	0.007
Character Strength	1.113	2	69	0.334

In addition, the equality of variance among the groups was examined in Table 3, and Levene's Test of Equality of Error Variance did not show any significance. The Self-Efficacy variable was the only one rejected in this hypothesis, leading the researcher to use Welch's analysis of variance to examine group differences in this variable.

Table 4

Multivariate Tests

	Value	F	Hypothesis df	Error df	P-value	η2p*
Pillai's trace	1.064	25.762	6	136	p < 0.001	0.532
Wilks' lambda	0.217	25.659	6	134	p < 0.001	0.535
Hotelling's trace	2.323	25.548	6	132	p < 0.001	0.537
Roy's largest root	1.392	31.561	3	68	p < 0.001	0.582

Tests of Between-Subjects Effects

Source	Dependent Variable	SS	df	MS	F	P-value

Group	SOC	1875.841	2	937.921	34.166	p < 0.001
	Self-Efficacy (Welch)	722.588	2	361.294	58.749	p < 0.001
	Character Strength	73.490	2	36.745	2.607	0.081

** η2p = Eta Squared Effect Size*

Based on the findings in Table 4, there was a significant difference in the mean scores for the SOC and self-efficacy variables among the three groups ($p < 0.001$). However, the mean scores for the Character Strength variable did not differ significantly among the three groups ($p = 0.081$). Based on the effect size obtained in the MANOVA test, the eta squared value was 0.532. Based on this value, the difference between the groups is moderate. Additionally, the post hoc Games-Howell and Bonferroni tests were conducted in the next step to analyze the differences and make pairwise comparisons between the groups, with the results displayed in Table 5.

Table 5

Post hoc test to compare the means of groups

Variables	Group 1	Group 2	Mean difference	95% CI for MD		SE	t	Cohen's d	P-value
				Lower	Upper				
SOC	Hyperactive	Self-Injury	-7.394	-11.189	-3.599	1.546	-4.781	-1.411	< .001
		Control Group	-12.205	-15.844	-8.566	1.483	-8.229	-2.329	< .001
	Self-Injury	Control Group	-4.811	-8.535	-1.087	1.518	-3.170	-0.918	0.007
Self-Efficacy	Hyperactive	Self-Injury	5.576	3.411	7.741	0.882	6.319	1.865	< .001
		Control Group	-2.026	-4.102	0.051	0.846	-2.394	-0.678	0.058
	Self-Injury	Control Group	-7.601	-9.726	-5.476	0.866	-8.777	-2.543	< .001
Character	Hyperactive	Self-Injury	1.223	-1.495	3.942	1.108	1.104	0.326	0.820
Strength		Control Group	2.426	-0.181	5.034	1.063	2.283	0.646	0.076
	Self-Injury	Control Group	1.203	-1.466	3.871	1.087	1.106	0.320	0.818

According to Table 5, the comparison between the groups revealed significant differences in the SOC variable ($p < 0.01$), with the Hyperactive group showing lower levels than the other groups. The self-injury group also had lower levels compared to the control group. Additionally, there was a significant difference in Self-Efficacy between the Hyperactive and self-injury groups ($p < 0.001$), with the Hyperactive group showing higher levels. However, self-injury levels were lower than those of the control group, and this difference was also significant ($p < 0.001$). There was no significant difference between the Hyperactive and the control group ($p = 0.058$). In addition, there were no notable differences in the Character strength variable across groups ($p > 0.05$).

Discussion and Conclusion

This study aimed to examine and compare levels of Sense of Coherence (SOC), self-efficacy in coping with challenges, and character strengths among adolescents with ADHD and those engaging in non-suicidal self-injury (NSSI). The results indicated that adolescents with ADHD exhibited lower SOC compared to other groups, and adolescents who engage in NSSI also showed reduced SOC relative to their non-self-injuring peers. Although there is no direct prior research specifically addressing this comparison, these findings align with earlier studies (da-Silva-Domingues et al., 2022; Kingsbury et al., 2020; Kösler et al., 2024). Previous research has demonstrated that higher SOC is associated with improved health behaviors and reduced engagement in risky behaviors among adolescents, including those with ADHD (da-Silva-Domingues et al., 2022). Additionally, a positive relationship between SOC and self-efficacy has been reported, underscoring SOC's importance for mental health and overall well-being (Kösler et al., 2024). Moreover, elevated SOC has been linked to lower incidences of stressful events such as suicidal ideation, depression, anxiety, behavioral disorders, and criminal behaviors (Kingsbury et al., 2020).

SOC encompasses the capacity to comprehend, manage, and find meaning in life's difficulties, serving as a key psychological and social resource for coping with life stressors. Adolescents with ADHD exhibited lower SOC compared to adolescents who self-injure, which may reflect distinct characteristics inherent to these groups. Adolescents with ADHD often struggle with concentration, impulse control, and social skills, which may impede their ability to establish mental coherence and a sense of connectedness, leaving them feeling overwhelmed and detached from their surroundings (Dayan et al., 2022). Conversely, adolescents who self-injure, despite experiencing severe psychological difficulties, often possess a clearer understanding of the motives behind their behaviors. Although their SOC remains lower than that of typical adolescents, they may show greater emotional awareness (da-Silva-Domingues et al., 2022). Overall, lower SOC in self-injuring adolescents may result from psychological strain, social stress, and difficulties in emotion regulation, potentially contributing to increased self-injurious behaviors during times of stress. Reduced SOC is associated with elevated stress levels and adverse health outcomes, and adolescents with lower SOC may be more vulnerable to psychological problems and risky behaviors due to ineffective stress management (Dayan et al., 2022).

This study also found that adolescents who self-injure reported lower self-efficacy than controls. In comparison, adolescents with ADHD exhibited higher self-efficacy than self-injuring adolescents but lower than nonclinical peers. It is essential to clarify that while "self-efficacy in dealing with trauma" was referenced in prior literature, this specific construct was not directly measured in the present study. Instead, self-efficacy was assessed more broadly as individuals' beliefs in their ability to manage challenges. Previous studies have linked low self-efficacy in resisting self-injury with increased frequency of NSSI behaviors (Zhou & Luo, 2025). Moreover, higher self-efficacy has been associated with better coping strategies, enhanced psychological well-being, and reductions in ADHD symptoms (Wüstner et al., 2019). Positive psychosocial factors such as self-efficacy and self-esteem have also been identified as necessary buffers against stress in adolescents (Mikkelsen et al., 2020).

Interpreting these findings, self-efficacy reflects one's belief in their capacity to perform tasks and overcome difficulties, and it plays a critical role in managing daily stressors. Adolescents engaging in self-injury typically exhibit low self-efficacy, often stemming from negative emotional states like depression and anxiety that diminish their confidence in handling life's challenges. Consequently, self-injury may function as an unhealthy coping mechanism to alleviate psychological distress, underscoring their struggles with adaptive emotion regulation and contributing to reduced self-efficacy (Ashrafi et al., 2021; Liu et al., 2020). In contrast, adolescents with ADHD, despite difficulties in attention and impulse control, often demonstrate higher energy levels and determination to achieve goals, which can bolster their confidence and self-efficacy. Their ongoing efforts to regulate impulsive behavior and focus on tasks may help sustain greater self-efficacy compared to self-injuring adolescents (Khare & Acharya, 2023; Sholeh et al., 2021).

Finally, the lack of significant differences in character strengths across groups warrants consideration. This finding may suggest that character strengths represent relatively stable traits that are less susceptible to short-term fluctuations in clinical status. Alternatively, the measurement tool used may not have been sensitive enough to detect group differences, or contextual factors such as family environment and social support may exert stronger influences on character strengths. These possibilities highlight the need for future research to explore further the role and variability of character strengths among adolescents with diverse psychological profiles.

Several limitations should be considered when interpreting the findings. The study faced constraints, including potential bias from self-report measures, especially since some adolescents with ADHD or those engaging in self-injury experienced anxiety and concentration difficulties while completing questionnaires. Despite efforts to mitigate bias through clear instructions and ample time, self-report remains a possible limitation. Additionally, impulsivity and attention deficits in participants with ADHD may have affected data quality. Cultural, social, ideological, and religious factors influencing self-injury were challenging to control, resulting in some adolescents declining participation, which might have affected sample representativeness. The clinic-based sampling method may limit the generalizability of the findings to the

broader adolescent population, suggesting that future studies should use population-based samples to improve external validity. The cross-sectional design limits causal inference and temporal understanding of relationships among variables, underscoring the need for longitudinal research.

A further limitation is the absence of control for common psychiatric comorbidities such as depression and anxiety, which often co-occur with ADHD and self-injury and may confound results. Future research should address these comorbidities for clearer insights. Practical constraints, including limited time for data collection and challenges working with hyperactive and self-injuring adolescents, may have influenced the findings. The critical role of parental involvement and education was also identified as an important consideration for future studies.

The findings of this study indicate that adolescents with ADHD and those engaging in non-suicidal self-injury face unique psychological challenges related to sense of coherence (SOC) and self-efficacy. Adolescents with ADHD showed significantly lower SOC compared to controls, while those who self-injure exhibited lower SOC and self-efficacy than their non-self-injuring peers; however, some group differences were not statistically significant and should be interpreted with caution. These variations in SOC and self-efficacy may affect their social interactions, family and peer relationships, and ability to cope with daily stressors. Based on these findings, interventions aiming to enhance SOC and self-efficacy could be valuable components of treatment for adolescents with ADHD and those who self-injure. Strength-based approaches that build on existing character strengths may also be beneficial, particularly in preventing self-injury behaviors. Educational and counseling programs in schools and healthcare settings should incorporate training in social-emotional skills, such as emotion regulation, conflict resolution, and effective communication, to help adolescents build stronger connections and resilience. Future clinical practice and policy should emphasize psychological and social support tailored to these vulnerable groups to improve their overall well-being and quality of life.

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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 included the fact 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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