IJBMC
International Journal of Body, Mind and Culture

Volume 12, Issue 8, pp 92-102
DOI: 10.61838/ijbmc.v12i8.1022

Article type:
Original Research

Problematic Behaviors and Self-Injurious Behavior in Adolescents: Testing Procrastination as a Mediator in a Clinical Sample

Leila. Zare Nadiki[1], Faezeh. Moinfar[2], Sahar. Mostaed[3], Zahra. Kardi[4], Faezeh. Khaki[5*]

1 Department of Clinical Psychology, Islamic Azad University, Garmsar Branch, Garmsar, Iran.
2 Department of Psychology, Roudehen Branch, Islamic Azad University, Roudehen, Iran.
3 Department of Clinical Psychology, Faculty of Medicine, Qom Medical Sciences, Islamic Azad University, Qom, Iran.
4 Department of Psychology, Science and Arts University, Yazd, Iran.
5 Department of Educational Sciences and Psychology, Faculty of Humanities, Shahid Rajaee University of Education, Tehran, Iran.

Corresponding author email address:
faezeh.khaki96@gmail.com

Article history:

Received 10 Jul 2025
Revised 25 Aug 2025
Accepted 28 Sep 2025
Published online 01 Nov 2025

How to cite this article:
Zare Nadiki, L., Moinfar, F., Mostaed, S., Kardi, Z., & Khaki, F. (2025). Problematic Behaviors and Self-Injurious Behavior in Adolescents: Testing Procrastination as a Mediator in a Clinical Sample. International Journal of Body, Mind and Culture, 12(8), 92-102.

ABSTRACT

Objective: This study examined associations between internalizing and externalizing problem behaviors and self-injurious behavior in adolescents, and tested whether procrastination mediates these relationships.

Methods and Materials: In this descriptive-correlational, cross-sectional study, 137 adolescents aged 14–17 years with a documented history of self-harm were recruited purposively from counseling and psychology clinics in Tehran between September and November 2024. Self-injurious behavior was assessed with the Deliberate Self-Harm Inventory, problem behaviors with the Teacher's Report Form of the Achenbach System (anxiety/depression, withdrawal/depression, somatic complaints, social problems, thought problems, attention problems, rule-breaking behavior, aggressive behavior), and procrastination with the Tuckman Procrastination Scale. Data were analyzed using SPSS 27 for descriptive statistics and Pearson correlations, and SmartPLS 4 for structural equation modeling with bootstrapped direct and indirect effects; statistical significance was set at $p \leq 0.05$.

Findings: Anxiety/depression, aggressive behavior, somatic complaints, and thought problems showed positive and significant direct effects on self-harm, whereas attention problems, rule-breaking behavior, social problems, and withdrawal/depression did not. Aggressive behavior, social problems, and withdrawal/depression had significant positive direct effects on procrastination. The path from procrastination to self-harm was not significant, and none of the indirect paths from problem behaviors to self-harm through procrastination reached significance.

Conclusion: Specific internalizing dimensions and aggression are associated with higher levels of self-injurious behavior in treatment-seeking adolescents, but procrastination did not emerge as a significant mediator or proximal risk factor. Prevention and intervention efforts should prioritize assessment and treatment of emotional difficulties and aggression, while considering procrastination as a secondary target.

Keywords: Problematic behaviors, self-injurious behavior, procrastination, adolescents.

Introduction

Self-injurious behavior, encompassing actions like cutting, burning, head-hitting, and substance ingestion, is a prevalent issue among adolescents, typically beginning between ages 12 and 15. Its annual prevalence among Iranian adolescents exceeds 40% (Karani et al., 2025). While often non-suicidal, self-injurious behavior is linked to decreased psychological well-being, quality of life, and life satisfaction, and is a significant risk factor for suicide attempts (Asadolahi & Gholamipour, 2023; de Boer et al., 2025). Genetic, biological, environmental, psychological, gender, emotional, and lifestyle factors all influence self-injurious behavior in adolescents, with loneliness and impulsivity linked to girls and higher alcohol use to boys (Da Silva et al., 2024).

Among adolescents with depression, self-injurious behavior frequently arises from maladaptive responses to interpersonal conflicts, defiance, aggression, and social rejection. These behaviors undermine healthy coping mechanisms, thereby increasing the likelihood of self-injury (Shao et al., 2021). Problematic behaviors in adolescence are commonly classified as externalizing behaviors (e.g., aggression, rule-breaking, substance use) and internalizing behaviors (e.g., anxiety, depression, social withdrawal) (Jang et al., 2025). According to Problem Behavior Theory, externalizing behaviors such as aggression and rule-breaking result from the dynamic interaction of personal, behavioral, and environmental factors, and often serve as maladaptive coping strategies during adolescence (Jessor, 1992). Furthermore, Goñi-Sarriés et al. (2025) reported that smoking, alcohol consumption, early cannabis use, and low physical activity significantly increase the risk of self-injurious behavior (Goñi-Sarriés et al., 2025). Therefore, identifying adolescents exhibiting problematic behaviors is crucial for preventing self-injury (Hosseinimotlaqh & Rahimi, 2024; Lan et al., 2022).

Experiencing self-injurious thoughts and mental health difficulties often involves intense emotions such as depression, guilt, and anxiety, which can be exacerbated by procrastination and delaying responsibilities. Procrastination contributes to psychological distress by causing sleep problems, stress, remorse, cognitive confusion, and feelings of disconnection—issues rooted in poor time management and unfinished tasks (Zhang et al., 2025). Unlike direct risk factors such as aggression or depression, procrastination is a cognitive-behavioral process that mediates the impact of emotional distress on self-injurious behavior by disrupting effective coping strategies. Within self-regulation theory, procrastination is conceptualized as a failure of emotion regulation and impulse control, whereby individuals delay tasks to temporarily avoid negative feelings despite long-term consequences (Sirois, 2023). This theoretical perspective elucidates how procrastination undermines adaptive functioning. Research consistently links procrastination to anxiety, emotional distress, poor time management, and lack of self-control, among other factors (Unda-Lopez et al., 2022).

This study applies General Strain Theory (Agnew, 1992) to explain how stressful experiences, such as behavioral problems, generate negative emotions that, when healthy coping mechanisms are lacking, may lead to self-injurious behavior (Agnew, 1992). Procrastination can temporarily alleviate these feelings but often exacerbates them, increasing the risk of self-injury. It is also associated with poorer academic performance, guilt, reduced self-esteem, and a higher risk of suicide (Castro Castro, 2025). Given the severe mental and physical health consequences of adolescent self-injury, this research investigates the complex relationship between problematic behaviors and self-injurious behavior, specifically examining the mediating role of procrastination. While self-injury and procrastination have been studied extensively, the pathway linking problematic behaviors to self-injurious behavior via procrastination remains underexplored. This study aims to fill this gap by evaluating the relationship between problematic behaviors and the likelihood of self-injurious behavior in adolescents, with procrastination as a mediating factor. Clarifying these mechanisms may contribute to more effective prevention and intervention efforts.

Methods and Materials

This descriptive-correlational, cross-sectional study used structural equation modeling with path analysis and bootstrapping to examine the mediating role of procrastination in the relationship between problematic behaviors (independent variable) and self-injurious behaviors (dependent variable) among adolescents. The study population comprised all adolescents with a history of self-injurious behavior in Tehran who sought treatment at psychological clinics and had counseling files between September and November 2024, with their self-injurious behaviors confirmed by clinic specialists.

Purposive sampling yielded a sample of 150 adolescents. Sample size adequacy was determined using Cohen's (2013) formula for SEM, considering 10 latent and 146 observed variables, an anticipated effect size of 0.35, a desired power of 0.8, and a probability level of 0.05 (Cohen, 2013). Despite a population size of 130, 150 participants were recruited to mitigate potential attrition. Participants were purposefully selected from a list of individuals with self-injury cases at the studied clinics. The selection was based on pre-defined inclusion and exclusion criteria. Inclusion criteria included documented self-injury, adolescent and parental consent, and sufficient cognitive ability to complete the questionnaires. Exclusion criteria were being over 17 years old, having a physical or mental disorder that impaired responding, and failing to answer more than five questionnaire items (resulting in study withdrawal).

The research method involved obtaining university permits and selecting three counseling and psychology clinics based on accessibility and the potential for collaboration to reach adolescents with self-injurious behaviors (clinic names were kept confidential). After coordinating with clinic management, they sent information about the research to families with children who have a history of self-injurious behavior and a counseling file at the participating clinics, inviting them to participate. More detailed information was subsequently sent via WhatsApp or email. The research information outlined objectives, permissions, and ethical compliance. Families were guaranteed anonymity and the right to withdraw. Due to limited parental cooperation, online data collection took two months. Of 150 completed questionnaires, 137 were usable; 13 were excluded due to incompleteness or errors. The online self-report questionnaires measured problematic, self-injurious, and procrastinatory behaviors. The parents of the subjects completed the Achenbach Child Behavior Questionnaire, and the adolescents themselves completed other questionnaires in a self-reported manner.

Instruments

Deliberate Self-Harm (DSH): The Deliberate Self-Harm questionnaire (Gratz, 2001) is a 17-item scale that measures a lifetime history and desire for intentional self-harm. It assesses the frequency, duration, and types of self-harm behaviors (e.g., cutting, burning, tattooing, and bone breaking) using a binary (yes/no) Likert scale. Total scores range from 0 to 17, with higher scores indicating a greater history of self-harm. The original validation demonstrated strong reliability (Cronbach's $\alpha = 0.82$; test-retest reliability = 0.92) and significant correlations with other self-harm measures, as well as adequate construct, convergent, and divergent validity in student and patient samples. In Iran, previous research reported a Cronbach's alpha of 0.65 (Khanjani et al., 2020); in the present study, the Cronbach's alpha was 0.780.

Achenbach Behavioral Problems Questionnaire (TRF): The Achenbach Behavioral Problems Questionnaire (ABPQ; Achenbach et al., 1991), a parallel form of the Achenbach ASEBA, assesses behavioral problems in children and adolescents aged 6-18 (Achenbach et al., 1991). The questionnaire uses a 3-point Likert scale (0 = never, 1 = sometimes, 2 = often/always) to evaluate 113 items across eight factors: Anxiety/Depression (AD; items 12, 14, 29, 30, 31, 32, 33, 35, 45, 50, 52, 71, 91, 112), Withdrawal/Depression (WD; items 5, 42, 65, 69, 75, 102, 103, 111), Somatic Complaints (SC; items 47, 49, 51, 54, a56, b56, c56, d56, e56, f56, g56, h56), Social Problems (SP; items 11, 12, 25, 27, 34, 36, 38, 48, 62, 64, 79), Thought Problems (TP; items 9, 18, 40, 46, 58, 59, 60, 66, 70, 76, 80, 83, 84, 85, 92, 100), Attention Problems (AP; items 1, 4, 8, 10, 13, 17, 41, 61, 78, 80), Rule-Breaking Behavior (RB; items 2, 26, 28, 39, 43, 63, 67, 72, 73, 81, 82, 90, 96, 99, 101, 105, 106), and Aggressive Behavior (AG; items 3, 16, 19, 20, 21, 22, 23, 27, 37, 57, 68, 86, 87, 88, 89, 94, 95, 97, 104). The Achenbach Child Behavior Questionnaire measures the emotional-behavioral problems of children aged 6-18 from the perspective of parents and was completed by

the parents in this study. Reported reliability coefficients (Cronbach's alpha) for the Achenbach scale forms were 0.97 and 0.94 (test-retest reliability) (Minaee, 2006). In the present study, Cronbach's alpha values were: AD (0.781), WD (0.821), SC (0.814), SP (0.886), TP (0.841), AP (0.859), RB (0.811), and AG (0.884).

Tuckman Procrastination Scale (TPS): The Tuckman Procrastination Scale (1991) is a 16-item self-report questionnaire using a 4-point Likert scale (1=disagree to 4=strongly agree) that assesses procrastination tendencies in adolescents and young adults (Tuckman, 1991). Scores range from 16 to 64; those above 30 indicate procrastination. The scale demonstrated high reliability in Iran (Cronbach's alpha = 0.97), Pakmehr & Lardi (2023), and a Cronbach's alpha of 0.721 was obtained in the present study.

Statistical analysis

SPSS 27 was used for descriptive statistics and Pearson correlation. SmartPLS 4 analyzed variable relationships because the Shapiro-Wilk test indicated non-normal distributions in the research variables. The researcher also examined the VIF index to examine collinearity diagnostics. Given that the VIF values for the predictor variables were less than 5, the model was run with all variables. A significance level of 0.05 was adopted.

Findings and Results

The researcher first analyzed descriptive statistics of the study's demographic variables. Age groups were 14-15 (21.9%), 15-16 (25.5%), and 16-17 (52.6%). Gender distribution was 60.6% boys and 39.4% girls. Types of self-harm reported included cutting, burning skin, hitting or biting, plucking hair, engaging in dangerous behaviors, punching (self or objects), and other reasons (Table 1).

Table 1

Description of the demographic variables

variables	Groups	Frequency	Percent	Sample size	Mode
Gender	Boy	83	60.6	137	3
	Girl	54	39.4		
Age	14 to 15	30	21.9	137	1
	15 to 16	35	25.5		
	16 to 17	72	52.6		
Type of self-harm	Self-harm by cutting	19	13.9	137	3
	Burning skin	18	13.1		
	Hitting or biting	35	25.5		
	Plucking hair	15	10.9		
	Deliberately engaging in physically dangerous behaviors	10	7.3		
	Punching yourself or a wall	15	10.9		
	Other reasons	25	18.2		

Table 2 presents the means and standard deviations of the research variables.

Table 2

Description of the main research variables

Variable	Mean	SD	Skewness	Kurtosis	Shapiro-Wilk	P-value	Min	Max
Self-Harm	10.02	1.67	0.586	-0.350	0.918	< .001	7	14
Tendency to procrastinate	27.21	6.09	0.658	-0.971	0.862	< .001	20	38
Anxiety/Depression (AD)	10.53	3.82	0.481	-0.596	0.951	< .001	5	20
Withdrawal/Depression (WD)	6.81	2.09	0.387	-0.644	0.941	< .001	2	11
Somatic Complaints (SC)	8.17	1.68	-0.668	-0.703	0.863	< .001	5	10
Social Problems (SP)	8.62	2.85	0.348	-0.353	0.899	< .001	5	16
Thought Problems (TP)	18.42	4.51	0.549	-0.865	0.920	< .001	12	28
Attention Problems (AP)	7.06	2.30	0.532	-1.081	0.873	< .001	4	11
Rule-Breaking Behavior (Achenbach et al.)	18.95	3.78	1.449	1.343	0.796	< .001	14	29
Aggressive Behavior (AG)	18.42	5.48	0.992	-0.202	0.850	< .001	12	30

Table 3 presents the correlations among the research variables using Pearson's correlation coefficient.

Table 3

Pearson's Correlations

Variable	1	2	3	4	5	6	7	8	9	10
1. Self-Harm	1									
2. Tendency to procrastinate	0.608**	1								
3. AD	0.628**	0.521**	1							
4. WD	0.592**	0.641**	0.611**	1						
5. SC	0.221**	0.181*	0.131	0.072	1					
6. SP	0.560**	0.592**	0.524**	0.480**	0.187*	1				
7. TP	0.685**	0.617**	0.704**	0.739**	0.068	0.515**	1			
8. AP	0.235**	0.308**	0.275**	0.259**	0.109	0.305**	0.388**	1		
9. RB	0.666**	0.647**	0.585**	0.569**	0.237*	0.623**	0.613**	0.308**	1	
10. AG	0.705**	0.653**	0.514**	0.525**	0.163*	0.622**	0.660**	0.344**	0.753**	1

Table 3 shows that self-harm is positively and significantly associated with procrastination, AD, WD, SC, SP, TP, AP, RB, and AG ($p < 0.01$).

Table 4

Indirect and Direct effects

		Estimate	STDEV	t-value	p	95% Confidence Interval	
						2.5%	97.5%
Direct effects	AD -> Self-Harm	0.179	0.083	2.157	0.031	0.015	0.337
	AD -> Tendency to procrastinate	-0.015	0.073	0.199	0.842	-0.167	0.122
	AG -> Self-Harm	0.329	0.093	3.521	0.000	0.133	0.500
	AG -> Tendency to procrastinate	0.223	0.087	2.574	0.010	0.046	0.387
	AP -> Self-Harm	-0.094	0.064	1.470	0.142	-0.215	0.032
	AP -> Tendency to procrastinate	0.030	0.073	0.411	0.681	-0.112	0.178
	RB -> Self-Harm	0.105	0.093	1.138	0.255	-0.053	0.316
	RB -> Tendency to procrastinate	0.148	0.095	1.560	0.119	-0.029	0.342
	SC -> Self-Harm	0.098	0.049	1.988	0.047	0.000	0.195
	SC -> Tendency to procrastinate	0.049	0.067	0.734	0.463	-0.081	0.181
	SP -> Self-Harm	0.054	0.066	0.818	0.413	-0.078	0.185
	SP -> Tendency to procrastinate	0.172	0.072	2.378	0.017	0.034	0.315
	TP -> Self-Harm	0.224	0.089	2.501	0.012	0.047	0.397
	TP -> Tendency to procrastinate	0.052	0.095	0.547	0.584	-0.137	0.230
	Tendency to procrastinate -> Self-Harm	0.059	0.086	0.688	0.491	-0.109	0.230
	WD -> Self-Harm	0.076	0.074	1.029	0.303	-0.065	0.220
	WD -> Tendency to procrastinate	0.317	0.082	3.861	0.000	0.159	0.484
Indirect effects	SP -> Tendency to procrastinate -> Self-Harm	0.010	0.016	0.620	0.535	-0.017	0.048
	WD -> Tendency to procrastinate -> Self-Harm	0.019	0.028	0.671	0.502	-0.035	0.075
	TP -> Tendency to procrastinate -> Self-Harm	0.003	0.011	0.280	0.779	-0.017	0.030

Ijbmc.org
E-ISSN: 2345-5802

AG -> Tendency to procrastinate -> Self-Harm	0.013	0.022	0.595	0.552	-0.024	0.066
SC -> Tendency to procrastinate -> Self-Harm	0.003	0.009	0.316	0.752	-0.006	0.030
RB -> Tendency to procrastinate -> Self-Harm	0.009	0.017	0.517	0.605	-0.020	0.049
AP -> Tendency to procrastinate -> Self-Harm	0.002	0.008	0.218	0.827	-0.022	0.013
AD -> Tendency to procrastinate -> Self-Harm	-0.001	0.007	0.114	0.909	-0.019	0.014

Table 4 and Figure 1 show that AD (β= 0.179, p =0.031), AG (β= 0.329, p <0.001), SC (β= 0.098, p = 0.047), and TP (β= 0.224, p = 0.012) had positive and significant direct effects on Self-Harm. AG (β = 0.223, p = 0.010), SP (β = 0.172, p = 0.017), and WD (β = 0.317, p < 0.001) had positive and significant direct effects on Tendency to Procrastinate. Conversely, AD (β= -0.015, p = 0.842), AP (β= -0.094, p = 0.142), RB (β= 0.105, p = 0.255), SP (β= 0.054, p = 0.413), TP (β= 0.052, p = 0.584), WD (β= 0.076, p = 0.303), AP (β= 0.030, p = 0.681), RB (β= 0.148, p = 0.119), SC (β= 0.049, p = 0.463), and Tendency to procrastinate (β= 0.059, p = 0.491) did not have significant direct effects on Self-Harm. Similarly, AD, AP, RB, SC, and TP did not have a significant direct impact on the Tendency to procrastinate. Furthermore, AD, WD, SC, SP, TP, AP, RB, and AG did not have significant indirect effects on Self-Harm through Tendency to Procrastinate (p>0.05). Also, based on the results, the obtained mediation coefficients were very weak.

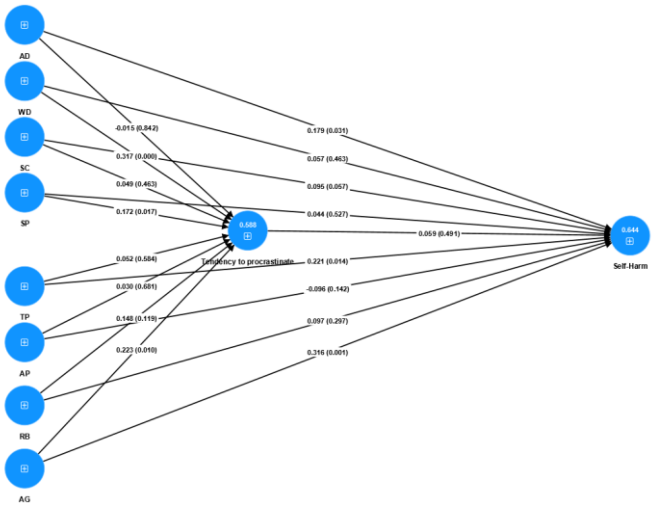

Figure 1

Statistical Diagram

Table 5

Reliability and validity of the model

Variables	Cronbach's Alpha	Composite Reliability	AVE
Self-Harm	0.780	0.785	0.514
Tendency to procrastinate	0.721	0.725	0.523
Anxiety/Depression (AD)	0.781	0.786	0.582
Withdrawal/Depression (WD)	0.821	0.836	0.687
Somatic Complaints (SC)	0.814	0.828	0.642
Social Problems (SP)	0.886	0.809	0.592
Thought Problems (TP)	0.841	0.852	0.739
Attention Problems (AP)	0.859	0.892	0.544
Rule-Breaking Behavior (Achenbach et al.)	0.811	0.869	0.571
Aggressive Behavior (AG)	0.884	0.810	0.502

Fornell-Larcker criterion discriminant validity										
Self-Harm	**0.716**									
Tendency to procrastinate	0.608	**0.723**								
Anxiety/Depression (AD)	0.628	0.521	**0.763**							
Withdrawal/Depression (WD)	0.592	0.641	0.611	**0.829**						
Somatic Complaints (SC)	0.221	0.181	0.131	0.072	**0.801**					
Social Problems (SP)	0.560	0.592	0.524	0.480	0.187	**0.769**				
Thought Problems (TP)	0.685	0.617	0.704	0.739	0.068	0.515	**0.859**			
Attention Problems (AP)	0.235	0.308	0.275	0.259	0.109	0.305	0.388	**0.737**		
Rule-Breaking Behavior (Achenbach et al.)	0.666	0.647	0.585	0.569	0.237	0.623	0.613	0.308	**0.756**	
Aggressive Behavior (AG)	0.705	0.653	0.514	0.525	0.163	0.622	0.660	0.344	0.753	**0.708**

Ijbmc.org
E-ISSN: 2345-5802

Table 5 demonstrates the model's reliability and validity. Cronbach's alpha exceeded 0.6, and composite reliability surpassed 0.7 for all variables. Furthermore, Average Variance Extracted (AVE) values exceeding 0.5 confirmed the model's validity. The Fornell-Larcker test was used to examine the divergent validity. As shown in Table 5, the Fornell-Larcker test values for the research variables on the diagonal were lower than those below the diagonal, indicating confirmation of divergent validity. The coefficient of determination for endogenous variables was also examined.

Table 6

Coefficient of determination of the model

Variables	R-square	R-square adjusted
Self-Harm	0.644	0.619
Tendency to procrastinate	0.588	0.563

Table 6 shows the model's ability to explain and predict the variance of the dependent variable. The Self-Harm variable accounted for 61.9 percent of the explained variance. The Tendency to procrastinate variable also accounted for 56.3 percent of the explained variance. Blindfolding was used to assess the model's predictive reliability. Q^2 values above zero suggest accurate data reconstruction and reliable prediction.

Table 7

Predictive communication Q^2

Variable	SSO	SSE	Q^2 (=1-SSE/SSO)
Self-Harm	137.000	53.307	0.611
Tendency to procrastinate	137.000	63.562	0.536

The researcher also examined the model fit. All the model fit indices were confirmed. If the SRMR index is less than 0.8, it indicates a good model fit. The SRMR value for the model was 0.154. Similarly, the NFI was 0.695. Table 7 confirmed the model's fit.

Discussion and Conclusion

This study examined the relationship between problem behaviors and self-injurious behavior (SIB) in adolescents, specifically testing procrastination as a mediator. Results indicated that anxiety and depression (AD), somatic complaints (SC), and thinking problems (TP) increased SIB but not procrastination. Aggression (AG) increased both SIB and procrastination, while hyperactivity (AP) and rule-breaking (Achenbach et al.) did not affect either. Social problems (SP) and withdrawal/depression (WD) increased procrastination only. Notably, procrastination did not directly affect SIB, and none of the behavioral variables mediated SIB through procrastination.

The finding that AD, SC, and TP increase SIB aligns with previous research (Alizadehfard, 2021; Campos et al., 2025; Pratile et al., 2025; Wallace et al., 2023), such as studies linking depression and mood Alizadehfard (2021), somatization Campos et al. (2025), and mental health issues Pratile et al. (2025) to SIB. Additionally, prior research supports the link between aggression and SIB (Wallace et al., 2023). However, the lack of association between AD and procrastination contradicts earlier findings suggesting a direct relationship between depression and procrastination (Kınık & Odacı, 2020). This discrepancy may stem from differences in the conceptualization and measurement of procrastination. For example, Kınık & Odacı (2020) focused on academic procrastination in students. In contrast, the present study examined behavioral procrastination in adolescents with a history of self-injurious behavior, whose emotional and motivational profiles may differ considerably (Kınık & Odacı, 2020). While a general link between procrastination and mental health is supported, direct evidence linking SC and TP to procrastination is limited (Jochmann et al., 2024). Somatic and cognitive

Ijbmc.org
E-ISSN: 2345-5802

symptoms may influence emotional dysregulation without necessarily affecting executive functioning patterns, such as procrastination. The non-significant mediation of procrastination between problem behaviors and SIB may suggest that, while procrastination co-occurs with emotional difficulties, it does not constitute a proximal risk factor for self-injurious behavior (Gatta et al., 2022; Pratile et al., 2025). Nonetheless, small or indirect effects-though statistically nonsignificant-may still have practical relevance and warrant further investigation using larger samples or alternative models.

The finding that aggression increases both procrastination and self-injurious behavior aligns with previous research (Luo et al., 2024; Michielsen et al., 2024). Luo et al. (2024) showed that violent online games increase aggression and procrastination, particularly among adolescents with emotion regulation difficulties (Luo et al., 2024). Similarly, Michielsen et al. (2024) linked outward aggression to indirect self-injurious behaviors (Michielsen et al., 2024). Adolescents who frequently resort to aggression as a coping strategy often experience impaired emotion regulation, which can lead to negative emotions such as anxiety and hopelessness. These emotional states, in turn, may contribute to procrastination as an avoidant behavior and self-injurious behavior as an impulsive means of emotional relief (Chen et al., 2023). Collectively, these findings suggest that adolescents prone to aggression may engage in both avoidance-based procrastination and impulsive self-injurious behavior as maladaptive coping mechanisms. Thus, aggression, as an uncontrolled emotional response, may serve as a common underlying factor contributing to both procrastination and self-injurious behavior (de Boer et al., 2025).

Conversely, the lack of a direct relationship between procrastination and self-injurious behavior appears inconsistent with some previous studies (Unda-Lopez et al., 2022), which linked procrastination to emotional distress, impaired self-regulation, and increased suicide risk. However, these earlier studies often emphasized academic or generalized procrastination, whereas this study focused on behavioral procrastination in a clinical-risk group, which may explain the difference. Although this study reported demographic variables such as gender and age, their moderating effects on the relationship between procrastination and self-injurious behavior were not deeply analyzed. Additionally, the cultural context was not examined. Future research should further investigate how these factors might influence the observed associations. The finding that SP and WD are associated with increased procrastination aligns with research suggesting that psychosocial difficulties are related to avoidant coping styles (Hajek et al., 2025; Shi et al., 2019). For example, Hajek et al. (2025) found that social withdrawal and isolation predict procrastination (Hajek et al., 2025). Adolescents facing social challenges may procrastinate to avoid social judgment or emotional discomfort (Sirois, 2023), whereas SIB typically arises from acute emotional distress requiring immediate relief (Karani et al., 2025).

Thus, social withdrawal may reflect internal avoidance but may not generate the urgency or emotional intensity typically associated with self-injurious behavior. Adolescents with social difficulties or depressive symptoms often experience reduced motivation, feelings of worthlessness, and avoidance tendencies, which contribute to procrastination as a passive coping mechanism to evade negative evaluation or failure (Sirois, 2023). In contrast, self-injurious behavior is an active response often driven by internalized anger, frustration, rejection, and an urgent need for emotional relief (Karani et al., 2025). Therefore, the gradual isolation linked to social problems or mild depression may not reach the threshold required to provoke self-injurious behavior, instead manifesting as a slow process of psychological erosion (Hajek et al., 2025).

However, the finding that Attention Problems (AP) and Rule-Breaking (Achenbach et al.) did not affect procrastination or SIB is less consistent with previous literature (Lin et al., 2024; Youngstrom et al., 2023). Lin et al., (2024) linked early hyperactivity to increased self-injurious behavior and suicidal ideation Lin et al., (2024), and others associated impulsive aggression with both law-breaking and self-injurious behavior (Youngstrom et al., 2023).

These inconsistencies may reflect differences in sampling and methodology. For example, this study assessed behavioral tendencies using self-report tools rather than clinical diagnoses such as ADHD. It focused on a specific high-risk group of adolescents with self-injurious behavior histories. Additionally, variations in

age, gender composition, or cultural norms could account for divergent findings, as impulsivity-related behaviors may manifest differently across subgroups (LaMont-George, 2024). Furthermore, although hyperactivity and rule-breaking are often viewed as externalizing behaviors, self-injurious behavior is generally considered an internalizing response to psychological distress. Adolescents who display rule-breaking may externalize their conflict, whereas those who engage in self-injurious behavior may internalize their pain. This distinction highlights the need to examine co-occurring emotional and behavioral traits rather than assuming uniform effects across problem behaviors (Da Silva et al., 2024; Li et al., 2022).

While this study offers valuable insights, several limitations warrant consideration. The reliance on self-report data introduces potential cognitive and social biases; future research should employ mixed methods or clinical observations to enhance data accuracy and validity. The cross-sectional design of this study limits the ability to infer causal relationships between variables. Additionally, potential response bias may exist in adolescents with psychological histories, which could affect the reliability of the findings. The limited geographical sampling and lack of participant diversity constrain the generalizability of results, so future studies should broaden the sampling scope to encompass greater cultural, social, and economic diversity. Furthermore, the study did not include longitudinal follow-up or clinical validation of self-injurious behavior diagnoses, which would strengthen the robustness of the findings. The influence of cultural, religious, and familial values on self-injurious behaviors and procrastination was not thoroughly examined; subsequent research should incorporate these cultural variables as moderating factors in analytical models. The generalizability of the study is limited to adolescents with self-injury experience, so future research should compare adolescents with and without such experience to enhance applicability. Questionnaire-based diagnosis of self-injurious behavior posed challenges in capturing detail and severity, highlighting the need to supplement self-reports with standardized clinical interviews. Subject attrition, likely due to the sensitive nature of the topic, suggests that shorter, more engaging questionnaires and appropriate incentives may improve participation rates. Resistance from parents and educators hindered cooperation, pointing to the importance of educational programs and briefing sessions to emphasize the significance of scientific research in prevention and treatment. To reduce superficial responses caused by fatigue or boredom, online questionnaires with appealing designs are recommended. Finally, this study lacked direct investigation of the underlying causes of self-injury, such as perfectionism or emotional avoidance; future research should include these variables to provide a more comprehensive understanding.

This study found that internalizing disorders, particularly aggression, are associated with increased self-injurious behaviors in adolescents, while procrastination did not show a statistically significant direct effect. However, minor or indirect effects of procrastination may still be practically relevant and warrant further investigation. Aggression was the only factor linked to both self-harm and procrastination, suggesting it may serve as a common underlying mechanism influencing maladaptive coping behaviors. Social isolation and withdrawal were associated with increased procrastination but not directly with self-harm. Procrastination did not emerge as a clear mediator in the relationship between problem behaviors and self-harm, highlighting the need for more nuanced analyses in future studies. These findings emphasize the importance of addressing aggression and emotional difficulties in prevention efforts. They can inform educational, psychological, and mental health policies by enabling school counselors and educators to better identify at-risk students. Additionally, results support the development of comprehensive self-harm prevention programs tailored to schools and adolescent care centers. Educating parents about differentiating between behaviors of concern (e.g., aggression, anxiety, depression) and those less directly related (e.g., procrastination) is also critical. Future research should explore these relationships using diverse adolescent samples and consider longitudinal designs to clarify causal pathways, as well as examine other potential mediators and moderators influencing self-injurious behavior.

Acknowledgments

The authors express their gratitude and appreciation to all participants.

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.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

Authors' Contributions

All authors equally contribute to this study.

References

Achenbach, T. M., Howell, C. T., Quay, H. C., Conners, C. K., & Bates, J. E. (1991). National survey of problems and competencies among four-to sixteen-year-olds: Parents' reports for normative and clinical samples. *Monographs of the Society for Research in Child Development, I-130*. https://doi.org/10.2307/1166156

Agnew, R. (1992). Foundation for a general strain theory of crime and delinquency. *Criminology*, *30*(1), 47-88. https://doi.org/10.1111/j.1745-9125.1992.tb01093.x

Alizadehfard, S. (2021). Exploring Structural Pattern of the Self-Harm Behaviors Based on Time Perception, Depression, and Self-Forgiveness in Adolescents. https://20.1001.1.20081243.1400.16.1.11.9

Asadolahi, S., & Gholamipour, N. (2023). An Explanation of Impulsivity, Cognitive Flexibility, and Metacognitive Thinking in Non-Suicidal Self-Injury Behaviors. *International Journal of Body, Mind & Culture (2345-5802)*, *10*(4). https://doi.org/10.22122/ijbmc.v10i4.501

Campos, R. C., Marmelo, M., & Holden, R. R. (2025). Body Image and Self-Harming Behaviors in Adolescents: The Mediating Effect of Somatization. *Perceptual and Motor Skills*, *132*(2), 332-352. https://doi.org/10.1177/00315125241306480

Castro Castro, J. A. (2025). PROCRASTINACIÓN ACADÉMICA Y RIESGO DE SUICIDIO EN ESTUDIANTES UNIVERSITARIOS. https://doi.org/10.63957/7125.052061

Chen, H., Hong, L., Tong, S., Li, M., Sun, S., Xu, Y., Liu, J., Feng, T., Li, Y., & Lin, G. (2023). Cognitive impairment and factors influencing depression in adolescents with suicidal and self-injury behaviors: a cross-sectional study. *BMC psychiatry*, *23*(1), 247. https://doi.org/10.1186/s12888-023-04726-8

Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. Routledge. https://doi.org/10.4324/9780203771587

Da Silva, J., Heimer, M., Oliveira, L., & Malheiros, L. (2024). Self-harm among Brazilian teenagers: scoping review. *European Psychiatry*, *67*(S1), S350-S351. https://doi.org/10.1192/j.eurpsy.2024.722

De Boer, K., Hopkins, L., Kehoe, M., Whitehead, R., Nedeljkovic, M., & Meyer, D. (2025). A systematic review of the facilitators and barriers for the implementation of co-designed youth suicide and self-harm interventions. *Children and Youth Services Review*, 108191. https://doi.org/10.1016/j.childyouth.2025.108191

Gatta, M., Angelico, C., Rigoni, F., Raffagnato, A., & Miscioscia, M. (2022). Alexithymia and psychopathological manifestations centered on the body: somatization and self-harm. *Journal of Clinical Medicine*, *11*(8), 2220. https://doi.org/10.3390/jcm11082220

Goñi-Sarriés, A., Gutiérrez-Valencia, M., Morata-Sampaio, L., Saiz-Fernández, L. C., Leache-Alegría, L., & Sánchez-Villegas, A. (2025). Lifestyle Habits, Problem Behaviors and Non-Suicidal Self-Injury in Adolescents: A Systematic Review with Meta-Analysis of Longitudinal Studies. *Adolescent Research Review*, 1-16. https://doi.org/10.1007/s40894-025-00257-3

Gratz, K. L. (2001). Measurement of deliberate self-harm: Preliminary data on the Deliberate Self-Harm Inventory. *Journal of Psychopathology and Behavioral Assessment*, *23*(4), 253-263.

Hajek, A., Gyasi, R. M., Pengpid, S., Kostev, K., Soysal, P., Veronese, N., Smith, L., Jacob, L., König, H.-H., & Peltzer, K. (2025). Associations of procrastination with loneliness, social isolation, and social withdrawal. *Journal of Public Health*, 1-9.

Hosseinimotlaqh, M., & Rahimi, A. (2024). Comparison of Cognitive Fusion, Risk-taking, and Fathers' Communication Style between Adolescents with and without Self-harm. *International Journal of Body, Mind & Culture (2345-5802)*, *11*(3). https://doi.org/10.22122/ijbmc.v11i3.535

Jang, S. H., Song, H., & Kim, J. (2025). Gender-specific problematic behaviors and transnational social ties among multicultural adolescents in South Korea. *Children and Youth Services Review*, *172*, 108265. https://doi.org/10.1016/j.childyouth.2025.108265

Jessor, R. (1992). Risk behavior in adolescence: A psychosocial framework for understanding and action. *Developmental review*, *12*(4), 374-390. https://doi.org/10.1016/0273-2297(92)90014-S

Jochmann, A., Gusy, B., Lesener, T., & Wolter, C. (2024). Procrastination, depression, and anxiety symptoms in university students: a three-wave longitudinal study on the mediating role of perceived stress. *BMC psychology*, *12*(1), 276. https://doi.org/10.1186/s40359-024-01761-2

Karani, R., Jamalpour Biregani, L., Mokarram, M., Fonoodi, N., & Sedaghat, N. (2025). Comparing Theory of Mind, Emotion Recognition, and Suicidal Ideation Among Adolescents With and Without Self-harm. *Journal of Research and Health*, *15*(1), 93-104. https://doi.org/10.32598/JRH.15.1.2414.1

Khanjani, S., Asmari, Y., Mousavi Asl, E., & Ashouri, A. (2020). Relationship of non-suicidal self-injury behaviors with mental pain in soldiers: The Mediating Role of Self-Compassion.

Journal of Military Medicine, *22*(4), 363-372. https://10.30491/JMM.22.4.6

Kınık, Ö., & Odacı, H. (2020). Effects of dysfunctional attitudes and depression on academic procrastination: Does self-esteem have a mediating role? *British Journal of Guidance & Counselling*, *48*(5), 638-649. https://doi.org/10.1080/03069885.2020.1780564

LaMont-George, J. (2024). The Use of Problematic Behaviors as Predictors of Suicidal Ideations and Attempts in Adolescent Psychiatric Inpatients. https://digitalcommons.pcom.edu/psychology_dissertations/629/

Lan, Y.-T., Pan, Y.-C., & Lin, Y.-H. (2022). Association between adolescents' problematic online behaviors and self-harm risk. *Journal of Affective Disorders*, *317*, 46-51. https://doi.org/10.1016/j.jad.2022.08.073

Li, G., Chen, Y., Chaudhary, S., Tang, X., & Li, C.-S. R. (2022). Loss and frontal striatal reactivities characterize alcohol use severity and rule-breaking behavior in young adult drinkers. *Biological psychiatry: cognitive neuroscience and neuroimaging*, *7*(10), 1007-1016. https://doi.org/10.1016/j.bpsc.2022.06.001

Lin, P.-I., Wu, W. T., Azasu, E. K., & Wong, T. Y. (2024). Pathway from attention-deficit/hyperactivity disorder to suicide/self-harm. *Psychiatry research*, *337*(115936), 10.1016. https://doi.org/10.1016/j.psychres.2024.115936

Luo, Y., Ye, C., Zhao, Y., & Zhang, H. (2024). Violent online game contact and academic procrastination: A moderated mediation model. *Psychology in the Schools*, *61*(3), 1144-1160. https://doi.org/10.1002/pits.23103

Michielsen, P. J., Hoogveldt, S., L'oihmi, N., Sneep, S., van Dam, A., Mulder, C. L., Hoogendijk, W. J., & Roza, S. J. (2024). Dual harm: Violent behaviour to others and self-harm behaviour in adults compulsorily admitted to a Dutch psychiatric hospital. *International journal of law and psychiatry*, *94*, 101989. https://doi.org/10.1016/j.ijlp.2024.101989

Minaee, A. (2006). Adaptation and standardization of the Child Behavior Checklist, Youth Self-Report, and Teacher's Report Forms. *Journal of Exceptional Children*, *6*(1), 529-558. https://20.1001.1.16826612.1385.6.1.3.6

Pakmehr, H., & Lardi, R. D. (2023). The Mediating role of academic procrastination in the relationship between early maladaptive schemas and the use of virtual social networks in high school students. *Technology and Scholarship in Education*, *2*(4), 37-48. https://DOI: 10.30473/T-EDU.2023.66798.1068

Pratile, D. C., Orlandi, M., Carpani, A., & Mensi, M. M. (2025). Look at My Body: It Tells of Suffering—Understanding Psychiatric Pathology in Patients Who Suffer from Headaches, Restrictive Eating Disorders, or Non-Suicidal Self-Injuries (NSSIs). *Pediatric Reports*, *17*(1), 21. https://doi.org/10.3390/pediatric17010021

Shao, C., Wang, X., Ma, Q., Zhao, Y., & Yun, X. (2021). Analysis of risk factors of non-suicidal self-harm behavior in adolescents with depression. *Annals of palliative medicine*, *10*(9), 9607613-9609613. https://doi.org/10.21037/apm-21-1951

Shi, X., Wang, S., Liu, S., Zhang, T., Chen, S., & Cai, Y. (2019). Are procrastinators psychologically healthy? Association between psychosocial problems and procrastination among college students in Shanghai, China: a syndemic approach. *Psychology, health & medicine*, *24*(5), 570-577. https://doi.org/10.1080/13548506.2018.1546017

Sirois, F. M. (2023). Procrastination and stress: A conceptual review of why context matters. *International Journal of Environmental Research and Public Health*, *20*(6), 5031. https://doi.org/10.3390/ijerph20065031

Tuckman, B. W. (1991). The development and concurrent validity of the procrastination scale. *Educational and psychological measurement*, *51*(2), 473-480. https://doi.org/10.1177/0013164491512022

Unda-Lopez, A., Osejo-Taco, G., Vinueza-Cabezas, A., Paz, C., & Hidalgo-Andrade, P. (2022). Procrastination during the COVID-19 pandemic: A scoping review. *Behavioral Sciences*, *12*(2), 38. https://doi.org/10.3390/bs12020038

Wallace, L., Adhikari, J., & Fido, D. (2023). Predicting self-harm in survivors and perpetrators of domestic abuse. https://doi.org/10.31234/osf.io/4rukv

Youngstrom, E. A., Young, A. S., Van Eck, K., Stepanova, E., Langfus, J. A., Carlson, G., & Findling, R. L. (2023). Developing empirical latent profiles of impulsive aggression and mood in youths across three outpatient samples. *Journal of Clinical Child & Adolescent Psychology*, *52*(2), 196-211. https://doi.org/10.1080/15374416.2021.1929251

Zhang, D., Mushtaque, I., & Hanif, M. W. (2025). Exploring the role of perfectionism and psychological capital in the relationship between academic procrastination, test anxiety, and suicidal ideation among pre-medical students. *Acta Psychologica*, *252*, 104662. https://doi.org/10.1016/j.actpsy.2024.104662