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Latent Profiles of Nonsuicidal Self-Injury Functions and Severity Among Korean Adolescents: Associations With Social Exposure and Cognitive Functioning

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Research Article

Keywords: nonsuicidal self-injury, adolescents, latent profile analysis, social exposure, cognitive functioning

Posted Date: September 30th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10988180/v1

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Additional Declarations: No competing interests reported.

Abstract

Nonsuicidal self-injury (NSSI) is common during adolescence, yet adolescents who engage in NSSI may differ substantially in its functions and severity. This study identified latent profiles of NSSI and examined their associations with social exposure and cognitive functioning among 384 Korean adolescents with past-year NSSI. Latent profile analysis identified four profiles: low function–low severity, intrapersonal–high severity, moderate mixed-function, and socially oriented mixed-function. Greater media exposure was associated with membership in all three other profiles relative to the low function–low severity profile, whereas interpersonal exposure differentiated specific profiles. Profiles also differed in positive and negative automatic thoughts and social problem-solving characteristics, with the intrapersonal–high severity profile generally demonstrating greater cognitive vulnerability. Findings highlight clinically meaningful heterogeneity in adolescent NSSI and support assessment approaches that consider NSSI functions, severity, social exposure, and cognitive characteristics.

Introduction

Nonsuicidal self-injury (NSSI), defined as the deliberate and direct destruction of one's body tissue without suicidal intent and for purposes not socially sanctioned, represents a significant mental health concern during adolescence (Klonsky, 2007; Nock, 2010). NSSI encompasses behaviors such as cutting, burning, scratching, and hitting oneself and is associated with depression, anxiety, trauma-related symptoms, and broader psychosocial impairment (Nock et al., 2006; Nock, 2010). Although NSSI is conceptually distinct from suicidal behavior, repeated and severe NSSI is associated with heightened risk for subsequent suicidal thoughts and behaviors (Whitlock et al., 2013). Identifying clinically meaningful differences among adolescents who engage in NSSI is therefore important for improving risk assessment and informing targeted prevention and intervention efforts.

Adolescence may represent a particularly vulnerable developmental period for NSSI. Heightened emotional reactivity, ongoing maturation of cognitive control systems, identity development, and the increasing salience of peer relationships may contribute to difficulties regulating distress and increase vulnerability to maladaptive coping behaviors (Nock, 2010; Steinberg, 2014). Developmental models suggest that heightened sensitivity of socioemotional systems relative to still-maturing cognitive control capacities may contribute to increased risk-taking and vulnerability to dysregulated behavior during adolescence (Casey et al., 2008; Steinberg, 2008). These developmental characteristics underscore the importance of considering both intrapersonal and interpersonal processes when examining adolescent NSSI.

NSSI is relatively common during adolescence, with meta-analytic estimates suggesting a lifetime prevalence of approximately 17%–18% in community samples (Muehlenkamp et al., 2012; Swannell et al., 2014). NSSI commonly emerges during early to mid-adolescence and may serve diverse psychological functions, including regulating distress and communicating interpersonal needs (Klonsky, 2007; Nock & Prinstein, 2004). Cross-national evidence further indicates that NSSI occurs across diverse cultural contexts, although its prevalence and correlates may vary across populations (Farkas et al., 2024; Muehlenkamp et al., 2012). Such variation raises an important question beyond prevalence alone: whether adolescents who engage in NSSI comprise distinct subgroups characterized by different functions and levels of severity.

Functional models conceptualize NSSI as a behavior maintained through reinforcement processes that serve distinct psychological purposes. These functions are broadly categorized as intrapersonal functions, such as affect regulation, self-punishment, and anti-dissociation, and interpersonal functions, such as communicating distress or influencing others (Klonsky, 2007; Nock, 2010). Empirical evidence supports the central role of intrapersonal functions, particularly emotion regulation, with the reduction of negative affect among the most frequently endorsed reasons for engaging in NSSI (Taylor et al., 2018). Interpersonal functions remain clinically meaningful, however, particularly during adolescence when peer relationships and social belonging become increasingly salient (Prinstein et al., 2010). Thus, adolescents may differ meaningfully in the extent to which NSSI is maintained by intrapersonal versus interpersonal processes.

NSSI also varies substantially in behavioral severity, including its frequency, repetition, and diversity of methods (Nock et al., 2006; Whitlock et al., 2013; Victor & Klonsky, 2014). Importantly, function and severity may be interrelated rather than independent dimensions of NSSI. Intrapersonal functions, particularly those involving relief from negative affect, may reinforce repeated NSSI because the behavior can provide immediate reduction in emotional distress (Klonsky, 2007; Nock, 2010). Consistent with this perspective, negative affect has been shown to precede NSSI and decrease following self-injury, and stronger endorsement of

intrapersonal motives has been associated with more frequent or severe NSSI (Franklin et al., 2013; Houben et al., 2017; Taylor et al., 2018; Turner et al., 2012). However, examining functions or severity separately may obscure clinically meaningful combinations of these characteristics. A person-centered approach that considers both dimensions simultaneously may therefore provide a more clinically informative characterization of heterogeneity among adolescents who engage in NSSI.

Person-centered research provides further evidence that individuals who engage in NSSI are heterogeneous in their behavioral characteristics, functions, and associated vulnerabilities. Case et al. (2020) identified four latent classes among late adolescents with a history of NSSI using behavioral characteristics, including frequency, number of methods, scarring, and pain—together with NSSI functions, with classes ranging from relatively mild or experimental NSSI to more severe and multifunctional patterns. Yan et al. (2024) identified distinct functional profiles among Chinese adolescents based on emotional regulation, attention-seeking, and social avoidance functions of NSSI. Person-centered approaches have also been applied among Korean adolescents. Kim and Lee (2023), for example, identified latent profiles based on psychological characteristics among Korean high school students and examined differences in self-injury across the resulting profiles. These studies demonstrate the utility of person-centered approaches for characterizing heterogeneity in NSSI. However, further research is needed to clarify how functional motives and behavioral severity jointly characterize NSSI profiles during adolescence and how these profiles correspond to social exposure and cognitive functioning.

Social exposure may be particularly relevant for differentiating patterns of adolescent NSSI. Social learning and contagion perspectives suggest that exposure to self-injury through peers or media may increase the salience or perceived acceptability of NSSI as a coping strategy (Jarvi et al., 2013). Longitudinal research indicates that adolescents exposed to peers who engage in NSSI are more likely to subsequently engage in or escalate self-injury (Heilbron & Prinstein, 2010; Prinstein et al., 2010), and peer norms may further reinforce these behaviors within friendship networks (Giletta et al., 2013). Digital environments represent another increasingly relevant source of exposure, as NSSI-related content is readily accessible through social media and other online platforms (Lewis et al., 2011, 2012; Marchant et al., 2017). Examining media and interpersonal exposure separately may therefore help clarify whether different forms of social exposure are associated with distinct functional and severity-based NSSI profiles.

Cognitive and problem-solving characteristics may provide additional information about the clinical significance of NSSI profiles. Adolescents who engage in NSSI have been found to report more negative cognitions and difficulties in social problem solving, which may limit their ability to generate adaptive responses to distress (Nock & Mendes, 2008). Experimental research similarly suggests lower distress tolerance and poorer problem solving among individuals who self-injure (Franklin et al., 2010; Nock & Mendes, 2008). Examining whether NSSI profiles differ in positive and negative automatic thoughts and social problem-solving characteristics may therefore help determine whether function- and severity-based profiles correspond to broader patterns of psychological vulnerability.

Cultural context is also important when considering adolescent NSSI. Research in South Korea has documented NSSI among adolescents and has identified associations with a range of psychological and interpersonal difficulties (Jeong et al., 2021; Lee et al., 2021; Moon et al., 2024). Emerging person-centered research further suggests heterogeneity in psychological characteristics associated with self-injury among Korean adolescents (Kim & Lee, 2023). Nevertheless, much of the broader theoretical and empirical literature on NSSI has been developed in Western populations. Examining NSSI among Korean adolescents therefore provides an opportunity to evaluate whether patterns of functional and behavioral heterogeneity identified in prior research are also evident in a distinct cultural context and to examine how these patterns correspond to social and cognitive characteristics.

Despite growing person-centered research on adolescent NSSI, several questions remain. Existing studies have demonstrated heterogeneity based on NSSI behavioral characteristics, functions, and broader intrapersonal and interpersonal risk factors. However, less is known about how functional motives and behavioral severity jointly characterize NSSI profiles among adolescents and whether these profiles are systematically associated with distinct forms of social exposure and cognitive functioning. This question may be particularly relevant during adolescence, when peer relationships and engagement with digital environments become increasingly salient. Moreover, although emerging person-centered research has examined NSSI among East Asian and Korean adolescents, further work is needed to clarify how profiles defined by characteristics of NSSI itself correspond to contextual and psychological vulnerabilities. Latent profile analysis (LPA) provides a useful framework for examining these configurations and

their external correlates (Howard & Hoffman, 2018). Identifying such patterns may contribute to more differentiated assessment and intervention approaches for adolescents who engage in NSSI.

The present study used a person-centered approach to identify latent profiles of NSSI among Korean adolescents with past-year NSSI based on functional motives and behavioral severity. We further examined whether media exposure, interpersonal exposure, and demographic characteristics were associated with profile membership and whether the identified profiles differed in positive and negative automatic thoughts and social problem-solving characteristics. Based on functional models of NSSI and prior empirical research, we expected that (a) multiple distinct profiles would emerge; (b) a profile characterized by stronger intrapersonal motives would demonstrate greater NSSI severity; (c) greater social exposure would be associated with membership in profiles characterized by higher levels of NSSI functions or severity; and (d) profiles characterized by greater NSSI severity would demonstrate more maladaptive cognitive and social problem-solving characteristics.

Method

Data Collection Procedures

Data for the present study were collected over a four-month period, from March to July 2022, through an online survey administered via a widely used anonymous worry-sharing mobile application for adolescents in South Korea. The platform had accumulated approximately 900,000 downloads and around 10,000 daily active users at the time of data collection, and approximately 94% of its users were between 9 and 24 years of age, indicating strong alignment with the target population of this study. The survey required approximately 30 minutes to complete. As compensation, participants received a small amount of in-app points that could be used for online learning content, avatar customization, or gift certificate exchange.

Participants were recruited through a pop-up notice that automatically appeared on the application's main screen upon login. Individuals who clicked the survey link were first provided with information regarding the purpose of the study and the protection of personal information. Because the study involved minors, the survey proceeded only after both adolescent assent and parental consent had been obtained. For parental consent, the survey information was presented to the parent or legal guardian, who then completed an identity verification process by entering their name, resident registration number, and mobile phone number, followed by confirmation of an authentication code sent to the registered phone.

Participants were clearly informed that they could discontinue the survey at any time if they experienced emotional discomfort, without any penalty or disadvantage. All responses were collected anonymously, and the data were encrypted and used solely for research purposes. In consideration of the possibility that some adolescents might experience psychological distress while answering questions, information on relevant mental health and community support resources, including community mental health centers, youth welfare agencies, suicide prevention services, and family support institutions, was provided. Contact information for a 24-hour crisis hotline was also made available for participants requiring immediate assistance. This study was conducted after receiving approval from the Institutional Review Board of the affiliated institution (SKKU-2021-12-012-001) and was carried out as part of the first-wave data collection under the scope of the original approved project.

2.2. Sample selection flowchart

The initial sample for this study was drawn from 963 respondents in the Wave 1 cross-sectional NSSI dataset. Based on the aims of the present study, participants were excluded if they had not engaged in NSSI during the past 12 months (*n* = 240), were outside the adolescent age range of 10 to 19 years (*n* = 63), or reported suicidal intent (*n* = 276). Following these exclusions, the final sample consisted of 384 adolescents who had engaged in NSSI within the previous 12 months (see Fig. 1).

2.3. Participants

The final analytic sample consisted of 384 adolescents. Participants ranged in age from 10 to 19 years, with a mean age of 14.54 years (SD = 1.76). Of the total sample, 21 participants (5.5%) were male and 363 (94.5%) were female. In terms of academic status, 215 participants (56.0%) were attending middle school, 125 (32.6%) were attending high school, and 26 (6.8%) were attending elementary school. Smaller proportions were attending college (n = 7, 1.8%), had discontinued schooling (n = 7, 1.8%), or were homeschooled/other (n = 4, 1.0%). Regarding residential area, 295 participants (76.8%) lived in urban districts (gu/dong), whereas

89 (23.2%) lived in smaller towns or rural areas (eup/myeon/ri). Most participants were living with both parents (n = 284, 74.0%), followed by those living with a single parent (n = 63, 16.4%), grandparents (n = 9, 2.3%), relatives (n = 2, 0.5%), or in other living arrangements (n = 26, 6.8%). In terms of perceived socioeconomic status, 258 participants (67.2%) identified as middle class, 83 (21.6%) as lower-middle class or below, and 43 (11.2%) as upper-middle class or above. Finally, 88 participants (22.9%) reported having a religion, whereas 296 (77.1%) reported no religious affiliation.

Measures

The Functional Assessment of Self-Mutilation (FASM)

Participants' NSSI experience was assessed using the Functional Assessment of Self-Mutilation (FASM; Lloyd et al., 1997), Korean version validated by Kwon and Kwon (2017). The original scale consists of three sections assessing NSSI methods and frequency, characteristics of NSSI behaviors, and functions of NSSI. In the present study, only the 8 items assessing NSSI methods and frequency were used. These items assessed behaviors such as cutting, hitting oneself, hair pulling, wound picking, burning, skin piercing, biting or pinching, and severe scratching. Participants who reported at least one of these behaviors were classified as having a history of NSSI.

Repetitive Non-Suicidal Self-Injury Questionnaire (R-NSSI-Q)

NSSI severity was assessed using an adapted version of the Repetitive Non-Suicidal Self-Injury Questionnaire (R-NSSI-Q; Manca et al., 2014). The scale consists of 15 items assessing the frequency, repetitiveness, and characteristics of NSSI behaviors. Items 1–11 are rated on a 3-point Likert scale ranging from 1 (false) to 3 (true), whereas Items 12–15 are rated on a 2-point Likert scale ranging from 1 (false) to 2 (true). Higher scores indicate greater severity of NSSI. The original study reported an internal consistency of .81, and Cronbach's alpha in the present study ranged from .91 to .94.

Social Exposure to Nonsuicidal Self-Injury Scale (SENS)

Social exposure to NSSI was assessed using the Social Exposure to Nonsuicidal Self-Injury Scale (SENS; Zelkowitz & Cole, 2014). The scale consists of 11 items, including 6 items assessing media exposure and 5 items assessing interpersonal exposure. Each item is rated on a 4-point Likert scale ranging from 1 (never) to 4 (often), with higher scores indicating greater exposure to NSSI. Media exposure reflects exposure to NSSI-related content through sources such as social media, music, films, and television, whereas interpersonal exposure reflects contact with peers or others who engage in NSSI. Previous studies reported internal consistency coefficients ranging from .79 to .85, and Cronbach's alpha in the present study ranged from .83 to .85.

Positive Subscale of the Automatic Thoughts Questionnaire-Revised (ATQ-RP)

Positive automatic thoughts were assessed using the Positive Subscale of the Automatic Thoughts Questionnaire-Revised (ATQ-RP), validated in Korean by Heo and Kim (2020a) based on the original ATQ-R developed by Kendall et al. (1989). The ATQ-RP consists of 10 items, including 7 cognitive items and 3 emotional items. Each item is rated on a 5-point Likert scale ranging from 1 (not at all true) to 5 (very true), with higher scores indicating higher levels of positive automatic thoughts. Heo and Kim (2020a) reported an internal consistency of .93, and Cronbach's alpha in the present study ranged from .91 to .94.

Short Form of the Korean Version of the Automatic Thoughts Questionnaire-Negative (ATQN-SF)

Negative automatic thoughts were assessed using the Short Form of the Korean Version of the Automatic Thoughts Questionnaire-Negative (ATQN-SF), shortened and validated by Heo and Kim (2020b) based on the original ATQ-N developed by Hollon and Kendall (1980). The scale consists of 9 items assessing dissatisfaction with reality and desire for change, negative self-image and expectations, and helplessness/loss of motivation. Each item is rated on a 5-point Likert scale ranging from 1 (never) to 5 (always), with higher scores indicating higher levels of negative automatic thoughts. Heo and Kim (2020b) reported an internal consistency of .93, and Cronbach's alpha in the present study ranged from .93 to .96.

Social Problem Solving Inventory-Revised-Short Form (SPSI-R-SF)

Social problem-solving ability was assessed using the Korean version of the Social Problem Solving Inventory-Revised-Short Form (K-SPSI-R-SF), shortened and validated by Kim et al. (2013) based on the original SPSI-R developed by D'Zurilla et al. (1999). The scale consists of 24 items assessing positive problem orientation, negative problem orientation, rational problem solving, impulsive/careless style, and avoidance style. Each item is rated on a 5-point Likert scale ranging from 1 (not at all true) to 5 (extremely true), with higher scores indicating higher levels of social problem-solving ability. Kim et al. (2013) reported internal consistency coefficients ranging from .65 to .81, whereas Cronbach's alpha in the present study ranged from .72 to .90.

Data analysis

Data analyses were conducted using Mplus version 8.3 and SPSS 25.0. Latent profile analysis (LPA) was performed to identify distinct subgroups based on NSSI-related functional characteristics and severity. To determine the optimal number of latent classes, models specifying one to five classes were estimated and compared. Model selection was based on multiple fit indices, including the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), sample-size adjusted BIC (aBIC), bootstrap likelihood ratio test (BLRT), and entropy. Lower AIC, BIC, and aBIC values were considered indicative of better model fit, whereas higher entropy values reflected more accurate classification. A significant BLRT indicated that the model with k classes provided a better fit than the model with one fewer class. In addition to these statistical criteria, parsimony, substantive interpretability, and minimum class size were considered in selecting the final model. To examine predictors of latent class membership, logistic regression analyses were conducted using latent profile membership as the dependent variable. Media exposure, interpersonal exposure, gender, age, religion, residential area, and economic status were included as predictors. Regression coefficients, standard errors, and odds ratios were used to evaluate the relative likelihood of membership in one latent class compared with another. To further examine whether the latent classes differed on theoretically relevant external variables, one-way analysis of variance (ANOVA) was conducted for positive automatic thoughts, negative automatic thoughts, positive social problem solving, and negative social problem solving. Bonferroni post hoc tests were applied following significant omnibus effects to determine which classes significantly differed from one another.

Results

Descriptive statistics and correlation analysis

Descriptive statistics and bivariate correlations among the study variables are presented in Table 1. Skewness and kurtosis values were within acceptable ranges, indicating no substantial departure from normality. The four NSSI function subscales were positively intercorrelated and were all positively associated with NSSI severity. In addition, NSSI severity was positively correlated with negative automatic thoughts and negative problem-solving orientation, but negatively correlated with positive automatic thoughts and positive problem-solving orientation. Overall, the correlations were in the expected directions.

Table 1

Descriptive Statistics and Bivariate Correlations Among the Study Variables

AVO	**AVO**	**INTRA**	**INTER**	**BELONG**	**NSSI**	**ME**	**IE**	**PAT**	**NAT**	**PSPSA**	**NSPSA**
	-										
INTRA	.659**	-									
INTER	.612**	.681**	-								
BELONG	.646**	.567**	.663**	-							
NSSI	.541**	.355**	.408**	.575**	-						
ME	.316**	.277**	.271**	.309**	.260**	-					
IE	.237**	.166**	.173**	.252**	.212**	.323**	-				
PAT	− .349**	− .238**	− .226**	− .262**	− .518**	− .202**	-0.08	-			
NAT	.472**	.351**	.353**	.404**	.609**	.313**	.130*	− .684**	-		
PSPSA	− .215**	− .121*	− .147**	− .137**	− .302**	-0.01	0.04	.510**	− .383**	-	
NSPSA	.416**	.341**	.347**	.321**	.459**	.263**	0.08	− .513**	.628**	− .396**	-
M	1.05	0.66	0.64	0.65	1.82	2.14	1.85	2.22	3.17	2.88	3.37
SD	0.74	0.60	0.54	0.57	0.50	0.69	0.69	0.90	1.10	0.77	0.78
S	0.45	1.24	1.32	0.88	0.02	0.54	0.63	0.88	-0.24	0.00	-0.59
K	-0.52	1.53	2.32	0.57	-1.16	-0.12	-0.29	0.67	-0.81	0.40	0.42

Note. * $p < .05$, ** $p < .01$. AVO = avoidance and control; INTRA = internal emotion regulation; INTER = interpersonal influence; BELONG = belongingness and identification; NSSI = nonsuicidal self-injury severity; ME = media exposure; IE = interpersonal exposure; PAT = positive automatic thoughts; NAT = negative automatic thoughts; PSPSA = positive social problem-solving ability; NSPSA = negative social problem-solving ability; M = mean; SD = standard deviation; S = skewness; K = kurtosis.

Latent profile analysis

The results of the latent profile analysis are presented in Table 2. Overall, model fit improved as the number of classes increased from one to five, as evidenced by the steady decrease in AIC, BIC, and adjusted BIC values across successive models. In addition, the BLRT was statistically significant for the 2-, 3-, 4-, and 5-class solutions ($p < .001$), indicating that each model fit the data significantly better than the model with one fewer class. Entropy values for the 2- to 5-class models ranged from .920 to .949, suggesting that all candidate solutions demonstrated adequate classification accuracy. Although the 5-class solution yielded the lowest information criterion values, the 4-class solution was retained as the final model because it offered a more parsimonious and substantively interpretable class structure. Moreover, one class in the 5-class solution comprised fewer than 5% of the total sample, raising concerns regarding the stability and practical usefulness of that model. Taken together, these findings supported the selection of the 4-class solution.

Table 2
Fit Indices for the Latent Profile Models

1-class	AIC	BIC	Adjusted BIC	BLRT	Entropy
	15312.43	**15423.05**	**15334.21**		
2-class	13308.54	13478.42	13341.99	2033.884***	0.944
3-class	12792.77	13021.91	12837.89	545.77***	0.92
4-class	12567.09	12855.49	12623.87	255.684***	0.935
5-class	12378.58	12726.24	12447.03	218.509***	0.949
Note. ***p < .001.					

Figure 2, Table 3 depicts the profiles of the four latent classes across avoidance/control, intrapersonal emotion regulation, interpersonal pursuit, belonging/identification, and NSSI severity. The four classes were distinguished by both overall severity and differences in motivational configuration. Class 1, labeled the “Low Function–Low Severity NSSI group” (n = 127, 33.1%), was characterized by low levels of avoidance/control, intrapersonal emotion regulation, and interpersonal pursuit, along with a moderate level of belonging/identification, and exhibited generally low NSSI severity. Class 2, labeled the “Intrapersonal–High Severity NSSI group” (n = 125, 32.6%), showed moderate levels of avoidance/control, interpersonal pursuit, and belonging/identification, but the highest level of intrapersonal emotion regulation and the highest overall NSSI severity among the four classes. Class 3, labeled the “Moderate Mixed-Function NSSI group” (n = 108, 28.1%), demonstrated moderate levels across all motivational dimensions and a generally moderate level of NSSI severity. Finally, Class 4, labeled the “Socially Oriented Mixed-Function NSSI group” (n = 24, 6.3%), was characterized by high levels of avoidance/control and intrapersonal emotion regulation, the highest level of interpersonal pursuit, and a very high level of belonging/identification, while showing an overall moderate level of NSSI severity. Overall, the identified latent classes differed not only in the severity of NSSI but also in the motivational patterns underlying self-injurious behavior.

Table 3
Distribution and NSSI Function Subscale Characteristics Across Four Profiles

Profile	*n*	%	NSSI Function Subscale Level				NSSI Severity	Profile Label
			AVO	***INTRA***	***INTER***	***BELONG***		
Profile 1	127	33.1	Low	Low	Low	Moderate	Generally low	Low Function–Low Severity NSSI
Profile 2	125	32.6	Moderate	Highest	Moderate	Moderate	Highest	Intrapersonal–High Severity NSSI group
Profile 3	108	28.1	Moderate	Moderate	Moderate	Moderate	Generally moderate	Moderate Mixed-Function NSSI group
Profile 4	24	6.3	High	High	Highest	Very high	Generally moderate	Socially Oriented Mixed-Function NSSI group

Note. AVO = Avoidance & Control; INTRA = Internal Emotion Regulation; INTER = Interpersonal Communication; BELONG = Social Belonging & Identity. Profile labels reflect the dominant functional motivation and severity pattern of each latent class. Bold entries indicate the highest value within that column across profiles.

Predictors of class membership

To examine predictors of latent profile membership, a series of logistic regression analyses was conducted, and the results are presented in Table 4. Using the Low Function–Low Severity NSSI group as the reference category, media exposure significantly predicted membership in the Intrapersonal–High Severity NSSI group, Moderate Mixed-Function NSSI group, and Socially Oriented Mixed-Function NSSI group. Specifically, greater media exposure was associated with higher odds of belonging to each of these three groups relative to the Low Function–Low Severity NSSI group. Interpersonal exposure also significantly predicted membership in the Intrapersonal–High Severity NSSI group and Socially Oriented Mixed-Function NSSI group. In addition, gender

significantly differentiated the Intrapersonal–High Severity NSSI group from the Low Function–Low Severity NSSI group. These findings suggest that greater exposure to NSSI-related content, particularly through media, was associated with membership in profiles characterized by higher levels of NSSI functions or severity.

Using the Intrapersonal–High Severity NSSI group as the reference category, socioeconomic status significantly predicted membership in the Moderate Mixed-Function NSSI group, such that higher socioeconomic status was associated with greater odds of belonging to the Moderate Mixed-Function NSSI group rather than the Intrapersonal–High Severity NSSI group. No other predictors significantly differentiated the remaining profile comparisons. Overall, media exposure emerged as the most consistent predictor of latent profile membership, whereas interpersonal exposure and gender showed more profile-specific associations, and socioeconomic status uniquely distinguished the Moderate Mixed-Function NSSI group from the Intrapersonal–High Severity NSSI group.

Table 4
Multinomial Logistic Regression Analyses Predicting Membership

Predictor	**Intrapersonal–High Severity NSSI group vs. Low Function–Low Severity NSSI group**			**Moderate Mixed-Function NSSI vs. Low Function–Low Severity NSSI group**			**Socially Oriented Mixed-Function NSSI group vs. Low Function–Low Severity NSSI group**		
	B	**SE**	**OR**	**B**	**SE**	**OR**	**B**	**SE**	**OR**
Media exposure	.827***	.216	2.287	.501*	.217	1.651	1.047**	.351	2.848
Interpersonal exposure	.604**	.214	1.83	.269	.217	1.308	.729*	.345	2.072
Gender	1.545*	.735	4.69	.221	.541	1.248	− .008	.895	.992
Age	.086	.077	1.089	− .003	.077	0.997	− .156	.139	.856
Religion	.176	.323	1.192	.112	.319	1.118	.353	.57	1.423
Urbanicity	.397	.332	1.487	.504	.324	1.656	− .237	.611	.789
Socioeconomic status	− .306	.241	.737	.21	.242	1.233	.101	.412	1.106
Predictor	**Moderate Mixed-Function NSSI vs.** Intrapersonal–High Severity NSSI group			**Socially Oriented Mixed-Function NSSI group vs.** Intrapersonal–High Severity NSSI group			**Socially Oriented Mixed-Function NSSI group vs. Moderate Mixed-Function NSSI**		
	B	**SE**	**OR**	**B**	**SE**	**OR**	**B**	**SE**	**OR**
Media exposure	− .326	.206	.722	.219	.338	1.245	.546	.344	1.726
Interpersonal exposure	− .335	.206	.715	.125	.332	1.133	.46	.34	1.584
Gender	-1.324	.74	.266	-1.554	.987	0.211	− .23	.896	.795
Age	− .089	.078	.915	− .241	.138	0.785	− .153	.139	.858
Religion	− .064	.325	.938	.177	.563	1.194	.242	.57	1.273
Urbanicity	.107	.308	1.113	− .634	.592	0.531	− .741	.597	.477
Socioeconomic status	.516*	.244	1.675	.407	.406	1.502	− .109	.412	.897

Note. *p < .05, **p < .01, ***p < .001.

3.4 Latent Profile Differences in Cognitive and Social Problem-Solving Variables

A one-way ANOVA was conducted to examine group differences in cognitive and social problem-solving variables across the four latent classes. As shown in Table 5, significant differences were found for positive automatic thoughts, negative automatic thoughts, positive social problem solving, and negative social problem solving. Bonferroni post hoc tests indicated that the Low

Function–Low Severity NSSI group scored significantly higher than the Intrapersonal–High Severity NSSI group, Moderate Mixed-Function NSSI group, and Socially Oriented Mixed-Function NSSI group on positive automatic thoughts. The Low Function–Low Severity NSSI group also scored significantly higher than the Intrapersonal–High Severity NSSI and Moderate Mixed-Function NSSI groups on positive social problem solving. In contrast, the Low Function–Low Severity NSSI group scored significantly lower than all other groups on negative automatic thoughts and negative social problem solving. In addition, the Intrapersonal–High Severity NSSI group showed significantly higher levels of negative automatic thoughts than the Moderate Mixed-Function NSSI group. No other pairwise differences were significant. Overall, these findings suggest that the Low Function–Low Severity NSSI group exhibited the most adaptive cognitive and problem-solving profile, whereas the Intrapersonal–High Severity NSSI group showed the most maladaptive pattern.

Table 5
Pairwise Comparisons of Cognitive and Problem-Solving Variables Across the Four Profiles

Variable	χ^2 (df = 3)	Pairwise comparison pattern
Positive automatic thoughts	36.11***	1 > 2, 3, 4; 3, 4 > 2
Negative automatic thoughts	58.366***	2, 3, 4 > 1; 2 > 3
Positive social problem solving	10.561***	1 > 2, 3
Negative social problem solving	26.764***	2, 3, 4 > 1; 3 > 2

Note. ***p<.001. 1 = Low Function–Low Severity NSSI; 2 = Intrapersonal–High Severity NSSI; 3 = Moderate Mixed-Function NSSI; 4 = Socially Oriented Mixed-Function NSSI. Group comparisons are based on Bonferroni post hoc tests.

Discussion

The present study sought to clarify heterogeneity in adolescent nonsuicidal self-injury (NSSI) by integrating functional motives and behavioral severity using a latent profile analytic approach. Four distinct subgroups emerged: a Low Function–Low Severity NSSI group, an Intrapersonal–High Severity NSSI group, a Moderate Mixed-Function NSSI group, and a Socially Oriented Mixed-Function NSSI group. Media exposure to NSSI consistently differentiated all three profiles from the Low Function–Low Severity NSSI group, whereas interpersonal exposure further distinguished the Intrapersonal–High Severity NSSI and Socially Oriented Mixed-Function NSSI group. Gender also differentiated the Intrapersonal–High Severity NSSI group from the Low Function–Low Severity NSSI group. Additionally, the Low Function–Low Severity NSSI group demonstrated more adaptive cognitive functioning, including higher positive automatic thoughts and more effective social problem solving. Collectively, these findings underscore that adolescent NSSI is a heterogeneous phenomenon characterized by meaningful differences in function, severity, and psychosocial vulnerability.

Integration with Theoretical Models of NSSI

A central contribution of the present study lies in its integration of functional motives and behavioral severity, which aligns with leading theoretical models of NSSI. NSSI has been conceptualized as a behavior maintained by both intrapersonal (e.g., affect regulation) and interpersonal (e.g., communication) reinforcement processes (Klonsky, 2007; Nock, 2010). Consistent with this framework, the Intrapersonal–High Severity NSSI group in the present study exhibited the highest levels of both NSSI severity and endorsement of emotion-regulation motives. This finding converges with robust empirical evidence indicating that affect regulation is the most prevalent and clinically central function of NSSI (Klonsky, 2007; Taylor et al., 2018). Indeed, meta-analytic findings demonstrate that intrapersonal functions, particularly the reduction of negative affect, are strongly associated with more frequent and severe NSSI behaviors (Taylor et al., 2018). The present findings further support recent person-centered approaches to NSSI, including latent profile analyses that emphasize heterogeneity in cognitive, emotional, and interpersonal risk factors (Lee et al., 2024). These approaches suggest that severe NSSI profiles are characterized by elevated emotional vulnerability, negative cognition, and poor coping, which closely aligns with the Intrapersonal–High Severity NSSI group identified in the current study.

The inclusion of Korean adolescents provides important cultural context, as NSSI and related self-harm behaviors represent significant concerns in South Korea. Population- and community-based research has documented NSSI among Korean adolescents (Jeong & Kim, 2021), and hospital-based evidence indicates an increasing number of adolescents presenting to emergency

departments for self-harm over time (Cheon et al., 2020). These findings underscore the importance of identifying heterogeneous patterns of NSSI and their associated vulnerabilities among Korean adolescents. These trends underscore the urgency of identifying distinct NSSI subtypes and tailoring prevention and intervention efforts accordingly. The present study contributes to this need by demonstrating that Korean adolescents engaging in NSSI are not homogeneous but instead fall into distinct profiles with differing levels of risk and underlying mechanisms.

The identification of a distinct Socially Oriented Mixed-Function NSSI group further underscores the heterogeneity of NSSI functions. Although interpersonal motives are generally less prevalent than intrapersonal motives, they remain theoretically and clinically meaningful (Nock, 2010; Taylor et al., 2018). Adolescence is a developmental period in which peer relationships and social belonging are especially salient, and NSSI may serve interpersonal purposes such as communicating distress or influencing others. Empirical research supports the importance of social context, demonstrating that exposure to peers who engage in NSSI is associated with increased likelihood of engagement and greater severity of self-injury (Prinstein et al., 2010). The present findings extend this literature by suggesting that socially motivated NSSI may represent a distinct subgroup characterized by moderate severity but heightened interpersonal orientation. These adolescents may benefit from interventions targeting interpersonal effectiveness, communication skills, and social support.

The Moderate Mixed-Function NSSI group was characterized by moderate levels across both functions and severity, suggesting a comparatively diffuse pattern of NSSI motives rather than a profile dominated by a single functional dimension. Previous research suggests that moderate or mixed-function patterns may be clinically meaningful in the context of varying stressors and coping resources (Turner et al., 2012). From a prevention perspective, adolescents in this group may benefit from early support addressing multiple NSSI functions before more entrenched patterns develop.

Another key finding concerns the role of social exposure. Media exposure significantly differentiated all three other profiles from the Low Function–Low Severity NSSI group, while interpersonal exposure distinguished specific subgroups. These findings are consistent with social learning and contagion models of NSSI, which posit that exposure to self-injury through peers or media increases the salience and perceived acceptability of NSSI as a coping strategy (Jarvi et al., 2013; Lewis et al., 2012). Empirical studies have demonstrated that both peer exposure and online NSSI-related content are associated with increased engagement in self-injury (Lewis et al., 2012; Prinstein et al., 2010). The present findings suggest that exposure may not only increase risk for NSSI but also differentiate distinct functional and severity-based subtypes.

Gender differences observed in the present study also align with broader epidemiological findings, although patterns are not entirely consistent across studies. Research generally indicates higher prevalence of NSSI among female adolescents (Muehlenkamp et al., 2012), though gender differences may vary depending on context and measurement. The finding that gender differentiated the Intrapersonal–High Severity NSSI group from the Low Function–Low Severity NSSI group suggests that gender may be particularly relevant for more severe, internally driven forms of NSSI. This may reflect gender differences in emotional processing and coping, including greater tendencies toward internalization and rumination among females (Nolen-Hoeksema, 2001), which have been linked to NSSI risk.

The observed differences in automatic thoughts and social problem solving across profiles further support cognitive-behavioral models of NSSI. Adolescents in the Intrapersonal–High Severity NSSI group demonstrated more negative automatic thoughts and poorer social problem-solving abilities, whereas the Low Function–Low Severity NSSI group exhibited more adaptive cognitive patterns. These findings are consistent with prior research indicating that NSSI is associated with negative self-referential cognition, cognitive rigidity, and deficits in problem-solving skills (Nock & Mendes, 2008). Such cognitive vulnerabilities may increase reliance on NSSI as a maladaptive coping strategy when adolescents are unable to generate effective alternative responses to distress. Thus, cognitive and problem-solving deficits may serve as key mechanisms underlying the development and maintenance of more severe NSSI profiles.

The present findings have several important clinical implications. First, they highlight the importance of assessing both the function and severity of NSSI in clinical practice. Adolescents who endorse strong intrapersonal motives may require more intensive interventions targeting emotion regulation and cognitive restructuring. Second, assessment of social exposure, including peer influences and online environments, should be incorporated into clinical evaluations. Third, interventions should be tailored to profile-specific needs. For example, socially motivated NSSI may benefit from interventions targeting interpersonal functioning,

whereas intrapersonal NSSI may require a stronger focus on internal coping mechanisms. These findings support a person-centered approach to intervention, consistent with recommendations for individualized treatment planning in NSSI (Klonsky et al., 2015)

Several limitations could be noted. First, the cross-sectional design precludes causal inferences regarding the relationships between exposure, cognitive factors, and NSSI profiles. Longitudinal research is needed to examine transitions between profiles over time. Second, reliance on self-report measures introduces the possibility of reporting bias. Third, the relatively small size of the Socially Oriented Mixed-Function NSSI group warrants cautious interpretation. Fourth, the exclusion of adolescents with suicidal intent limits generalizability, particularly given the established association between NSSI and suicidal behavior (Whitlock et al., 2013). Finally, cultural factors specific to Korean adolescents may limit generalizability to other populations.

Future research could examine longitudinal trajectories of NSSI profiles, particularly transitions from moderate to severe patterns. Additionally, further investigation of digital and peer-related exposure is warranted, given its role in shaping NSSI behaviors. Exploring culturally specific risk and protective factors will also be critical for developing effective prevention and intervention strategies.

Conclusion

The present study demonstrates that adolescent NSSI is a heterogeneous phenomenon characterized by distinct profiles of function and severity. The identification of intrapersonal and interpersonal subtypes highlights the importance of a person-centered, function-informed approach to understanding and treating NSSI. These findings suggest that the most clinically meaningful questions may not simply be whether adolescents engage in NSSI, but rather why they engage in it, how severe it is, and within what social and cognitive context it occurs.

Declarations

Conflict of Interest

The authors declare no conflicts of interest.

Ethics Statement

The study protocol was reviewed and approved by the Institutional Review Board of Sungkyunkwan University (SKKU-2021-12-012-001). The research was conducted in accordance with the ethical standards of the approving ethics committee and all applicable national guidelines and regulations governing research involving human participants.

Funding

The current study was supported by grants from the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF 2021S1A3A2A02089682).

Author Contribution

J.S.H.: Conceptualization, Methodology, Writing – Original Draft, Writing – Review & Editing. D.H.L.: Supervision, Investigation, Project Administration, Writing – Review & Editing. S.H.K.: Formal Analysis, Writing – Original Draft, Writing – Review & Editing. S.K.: Investigation, Writing – Review & Editing. All authors reviewed and approved the final manuscript.

All authors reviewed and approved the final version of the manuscript.

Acknowledgement

The authors used Microsoft Copilot (Microsoft, 2025) to support grammar editing. The final manuscript was reviewed and approved by the authors.

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Figures

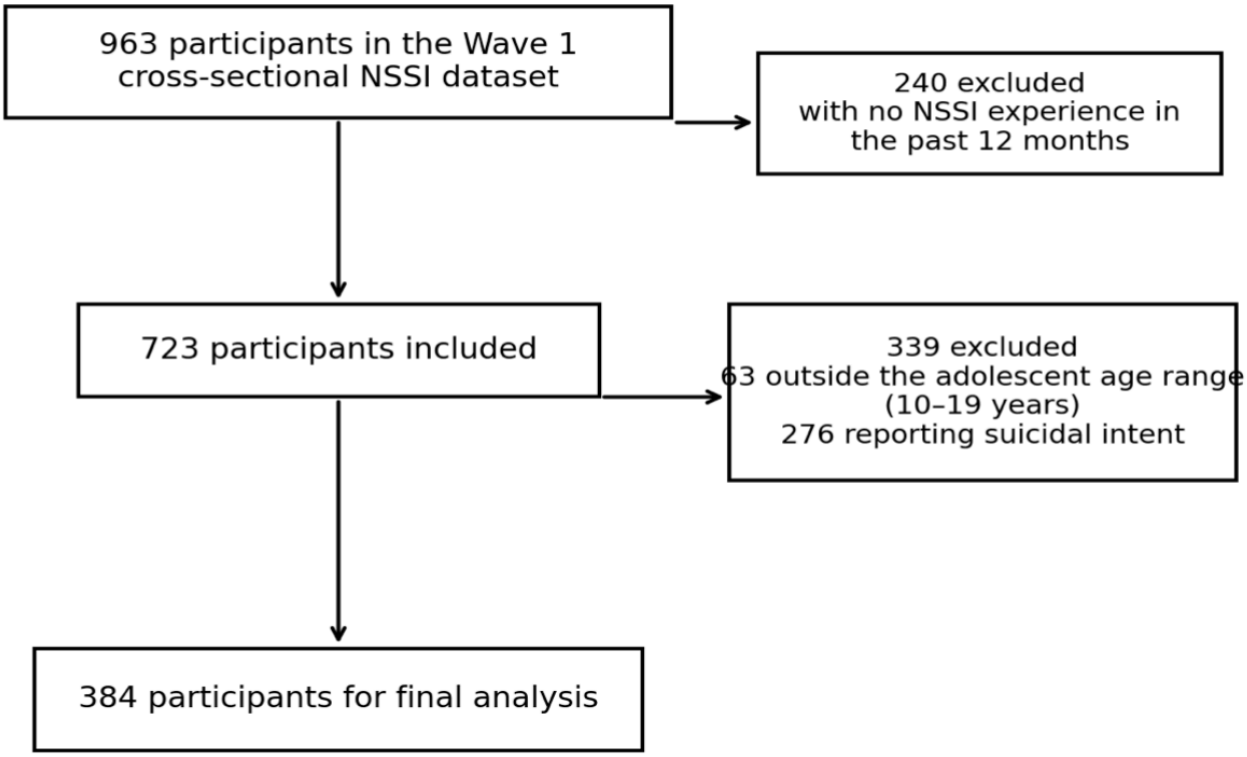


Fig. 1. Flowchart of sample selection.

Figure 1

See image above for figure legend

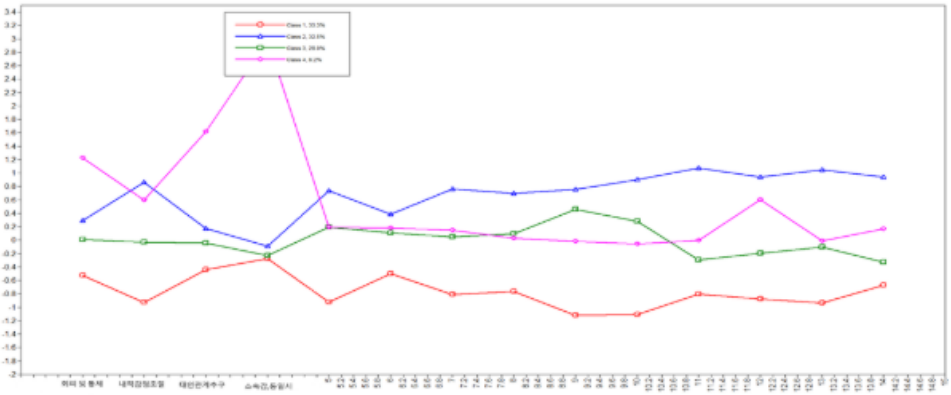


Figure 2

Latent Profile Plot of the Four-Class Solution